IS-BAO 20th Edition

Guidance

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IS-BAO (An International Standard for Business Aircraft Operations) Guidance

1 Table of Contents

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2 Introduction

2.1 Structure of the Standard

The IS-BAO is composed of a series of chapters that present the standards and recommended practices that have been derived from existing ICAO Standards and Recommended Practices (SARPs), national civil aviation regulations and business aircraft and helicopter association best practices. They are considered to be the norm of well-managed, progressive business aviation flight departments or helicopter operators. Chapters 3 through 12 are common with the corresponding chapters of IS-BAH, whereas chapters 13 through 15 are specific to IS-BAO.

The IS-BAO chapters present the standards that operators who choose to use the standard shall meet. The terms "shall" and "must" are used to indicate a standard that must be met, and the term "should" is used to indicate a recommended practice. The recommended practices, which are shown in italics, are also presented for the operator's consideration.

In the body of IS-BAO, the standards are shown in normal type font, and recommended practices are shown in italic type font with the "(Recommended Practice)" notation at the end of the recommended practice. Document titles are also in italic type font.

2.2 Structure of this Guidance

This Guidance was developed to assist users in understanding the standards and how they are audited. They are structured as follows:

- Chapters and sections from chapters 3 through 15 follow the same numbering as used in the IS-BAO itself, for easy cross reference between the two documents;
- All Standards and Recommended Practices of IS-BAO are addressed in this document;
- For each Standard or Recommended Practice, this Guidance first reproduces the text of the corresponding Standard or Recommended Practice as presented in IS-BAO. The Standards are shown in bold type font, and the Recommended Practices are shown in bold and italic type font with the "(Recommended Practice)" notation at the end;
- Each Standard or Recommended Practice is then followed by an *Explanation* section providing additional details on what the standard means and what should be considered when implementing or auditing against it, including additional reference documents where appropriate; and an *Assessment Criteria* section providing criteria for auditors to consider when auditing that Standard. For Recommended Practices, the Explanation and Assessment Criteria sections are shows in italic type font.

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3 Safety Management Systems

Introduction

The first component of Chapter 3 focuses on the establishment of the foundations of the Safety Management System. These fundamental building blocks are the principles, objectives and provision of resources for a successful SMS. This begins with the management's commitment to the implementation of the SMS. Key elements are: defining objectives of the system, the appointment of key safety personnel, establishment of the roles of each person with relation to the SMS, and the documentation of the system.

3.1 Safety Policy and Objectives

3.1.1 Management Commitment

3.1.1.1 The organization shall define the organization's safety policy which shall:

a. Be in accordance with national requirements, where applicable;
b. Communicate a strong organizational commitment regarding safety, including the promotion of a safety culture;
c. Include a clear statement about the provision of the necessary resources for the implementation of the safety policy;
d. Include safety reporting;
e. Clearly indicate which types of behaviours are unacceptable related to the organization's aviation activities and include the circumstances under which disciplinary action would not apply;
f. Be signed by the accountable executive of the organization;
g. Be communicated throughout the organization; and
h. Be reviewed and updated when appropriate to ensure it remains relevant and appropriate to the organization.

Explanation:

a. Be in accordance with national requirements, where applicable.
The operator must identify any local rules that might apply to their SMS and ensure that all elements of their SMS – to include the safety policy – comply with those rules (3.1.1.1.a). Many countries have already developed local regulations that apply to different types of organizations within the aviation community – airlines, air charter operators, airports, repair stations, flight schools, and even private operators of large airplanes. For instance, some local rules establish additional specific items that must be addressed within the safety policy, and the operator must take that into account when establishing the contents of the policy. Another example is that in some countries, it is required for the policy to have statements within itself that indicate how the policy is communicated within the organization, as well as the process for its review, whereas in other countries the regulations leave the option open for the operator to document those processes in other sections of the SMS manual, or even in other manuals or documents. IS-BAO

does not prescribe that these processes must be within the policy itself – however, if that is required by the local regulations, this must of course be complied with. For operators to which no local SMS regulations apply, item 3.1.1.1.a does not apply.

Note: If the operator is based in a country where safety management systems are not yet mandated for the types of operation conducted by the operator, check for recommended or voluntary programs from the regulator. In principle, these voluntary programs do not constitute actual regulations as their application is optional, however they should be viewed as requirements to be followed if the operator chooses to implement the voluntary program for recognition of their SMS by their CAA. In such cases, item 3.1.1.1.a applies if the operator chooses to have its SMS recognized by their CAA as part of the CAA's voluntary program.

b. Communicate a strong organizational commitment regarding safety, including the promotion of a safety culture.
A clear statement of the top management's commitment and expectations towards the SMS is a foundational element of the system. As with any management system, the SMS can only be effective when endorsed, supported and directed by the organization's senior management. It is therefore critical that senior management communicates its commitment and expectations with regards to the system and acts accordingly during the organization's daily activities.

The safety policy is the document that consolidates the principles and values that will drive the organization's safety management efforts and activities. It is a key document that lays the foundation for all safety management activities, and for the fostering of a strong safety culture within the organization. As a result, the policy must be written in a way that communicates a strong, positive organizational commitment regarding safety, promotes the principles of a positive safety culture and encourages participation in the SMS by all personnel (3.1.1.1.b). This is, of course, the overall message that a reader should be able to absorb when he/she reads the policy – rather than a specific statement within the policy.

The safety policy must, at a minimum, also include the following topics.

c. Include a clear statement about the provision of the necessary resources for the implementation of the safety policy.
A clear statement about the provision of the necessary resources for the implementation of the safety policy. This establishes a formal commitment, by the operator's Accountable Executive, that the resources necessary for the effective management of safety risks will be provided. (3.1.1.1.c)

d. Include safety reporting.
A reference to the operator's safety reporting processes. Of course, the policy is not the appropriate place to document, in length, the operator's safety reporting processes – these will be documented in the corresponding section of the operator's manual. However, it is important to let the entire staff know that they are expected to report safety deficiencies, and where they can find the information on how to report them. (3.1.1.1.d)

e. Clearly indicate which types of behaviours are unacceptable related to the organization's aviation activities and include the circumstances under which disciplinary action would not apply.

A clear indication on the types of behaviors that are unacceptable related to the organization's aviation activities, and on the circumstances under which disciplinary action would not apply. This is key to lay out the basis for the operator's just culture. People must be very clear on how they are expected to behave and be reassured that disciplinary actions will not apply if they disclose safety concerns, or even their own errors, if they are behaving according to those expectations; on the other hand, they must also be aware of the behaviors that are deemed unacceptable and could result in disciplinary action. This can be achieved via simple statements within the policy itself, or via more complex policies and processes that detail the operator's decision processes in specific documents or manuals. In the latter case, these documents must be referenced within the policy itself, so that the staff knows they exist and can refer to them for further details, and that the staff also acknowledges the AE's commitment to those principles. Of course, actions speak louder than words in building and safeguarding trust, and as such it is fundamental that these principles guide any future decisions and actions regarding disciplinary actions – otherwise the SMS will be very negatively impacted, as many operators have experienced, with discredit of the system as a whole and a decrease in participation and safety reporting. This makes it even more important to put the effort to develop and document these guidelines on acceptable behavior and disciplinary actions in a way that the operator (and their Accountable Executive) is willing to abide by for any future situations that may arise. (3.1.1.1.e).

Since the term 'negligence' is very likely to appear in many Safety Policies, operators are encouraged to check its meaning in their respective jurisdiction(s). Should a definition indeed exist in the applicable law(s), it may not fully capture or may even contradict to some extent what the organization considers negligent behaviour. These situations are likely to create challenges at both organizational and legal levels and should be prevented as much as possible.

It is not unusual to see operators implementing a 'just culture process' largely inspired by Neil Johnston's substitution test and James Reason's culpability decision tree. It is perfectly understandable and legitimate that organizations wish to define a clear process that remains the same regardless of the person who is subjected to it, and that provides managers "fair" guidance on their next actions toward that person. Negative events will spur emotional responses, the whole 'art' of remaining fair to those involved is to a great extent about the maturity of going beyond the knee-jerk reactions and rash judgements. When particularly negative events happen, the pressure to act quickly and decisively is even stronger. However, operators should bear in mind that such flowcharts have their limitations, e.g.,

- Tough questions won't just go away: the organization will have to make a decision regarding the person's intentions in the moments leading to the negative event(s). If this appears like a potentially thorny issue, 'soft sciences' provide sobering research findings showing that human beings are frequently mistaken when inferring other persons' intentions. Operators need to acknowledge that cognitive biases are omnipresent and must remain cautious with this inescapable limitation.
- There's usually no guidance on who should be subjected to the just culture process (or not): it usually involves the persons who are the closest (in both space and time) from the

negative event(s) and its consequences, but doesn't necessarily take a broader, more systemic perspective. This 'selection process' may be the source of tensions if it is perceived as unfair before the just culture process even started.

- Most just culture processes and flowcharts are structured in such a way that, ironically, the person subjected to it is guilty until proven innocent.
- IBAC has only heard of a single case so far (in a UK court) where the just culture process was directly challenged, however the process was deemed inappropriate to legally justify the termination of an employee's contract. The judicial system applicable to an operator may therefore have sharp views if 'just culture processes' are used in a vacuum.

As a general rule, and irrespective of the use of a just culture process or not, operators are encouraged to foresee three types of protections in any decision-making process in the aftermath of a negative event:

- the person or group of persons who will take a decision impacting a person's employment, career and personal life should not have any stake in the outcome (e.g., particularly a direct superior),
- decisions should be made by fellow aviation professionals with a deep understanding of the tasks leading to the negative event(s) and of the complexity of daily operations where the event(s) occurred,
- employees should be able to have their 'case' re-examined if they consider that the first decision was not taken in the best conditions and/or is unfair.

f. Be signed by the accountable executive of the organization.
The safety policy must ultimately reflect the commitment from the Accountable Executive and therefore must be signed by the AE. In some cases, the safety policy is initially drafted by the organization's management personnel, which can be positive in terms of developing a sense of ownership and shared responsibility for the policy. However, once the contents of the safety policy are determined and approved by the AE, it is key that the AE signs the policy, so as to clearly demonstrate his/her own personal commitment to it (3.1.1.1.f). Note that having other members of the organization sign it could diminish the strength of the AE's commitment as perceived by the rest of the staff and may also dilute the accountability for the policy which is a prerogative of the AE.

g. Be communicated throughout the organization.
The signed policy must be disseminated throughout the organization so that the entire staff involved in the safe operation of aircraft has access to it (3.1.1.1.g). This may be accomplished via posters in visible areas of the organization such as bulletin boards or electronic company portals for example, or via distribution of the policy in hard or digital copy, either by itself or within a manual, as part of the SMS training, or via any other means deemed appropriate by the operator – as long as they can ensure the staff receives it and understands its contents.

and

h. Be reviewed and updated when appropriate to ensure it remains relevant and appropriate to the organization.
The operator must therefore establish a process that accounts for a periodic review of the safety policy, to ensure it remains relevant and appropriate to the organization (3.1.1.1.h). It is important to recognize that aircraft operations are dynamic, and the operators' size and complexity may vary significantly over time. The organization's understanding and application of the SMS also evolves over time, as the system matures and new situations arise, and occasionally, there may be a change of the Accountable Executive or of applicable national requirements.

These reviews do not necessarily result in a revision to the policy if the person(s) responsible for the review conclude that it remains relevant and appropriate as is – but the operator must have a way to demonstrate that the review was conducted even if no change to the policy was deemed necessary. This can be achieved, for instance, via meeting minutes, a new date in the policy, or even a simple e-mail documenting the results of the review. The interval of the review, the person(s) responsible for it and the method used to accomplish it shall be documented by the operator.

Assessment criteria:

For Stage 1 audits:
Preaudit:

1. Check that there is a documented aviation safety policy (3.1.1.S1a)
2. If local regulations on the SMS / Safety Policy exist (or if the operator chooses to have their SMS recognized by their CAA through a voluntary program), review the policy for compliance with the applicable regulations, and/or verify that the policy has been accepted / approved by the local regulatory authority (3.1.1.S1b)
   Note: for operators to which no local regulation on SMS applies (e.g., operators registered in the USA not applying to the SMSVP, etc.), this protocol question is N/A.
3. Review the policy and verify that it includes:
   a. A clear statement about the provision of the necessary human and financial resources for its implementation (3.1.1.S1c)
   b. References to the operator's safety reporting processes (3.1.1.S1d)
   c. Clear definitions on unacceptable behaviors (3.1.1.S1e)
   d. The circumstances in which disciplinary actions would apply (3.1.1.S1f)
4. Verify that the safety policy is signed by the Accountable Executive of the organization (3.1.1.S1g)
5. Determine in which documentation/communication media the policy is made available to the staff members (i.e., in a manual, in posters/signs within the organization, in the intranet, etc.) (3.1.1.S1h)
6. Verify that the process for periodic reviews of the safety policy is clearly described, either within the policy or in another document/manual (3.1.1.S1i)
7. Read the policy and verify whether it transmits a strong commitment to safety (3.1.1.S1j)

Onsite*:*

8. Verify via interviews with staff and/or observation of the operator's facilities and documentation distribution system, that the policy is indeed available to all personnel (3.1.1.S1h)
9. Interview the AE to assess their commitment to the policy and the SMS as a whole.

For Stage 2 audits:

Stage 1 assessment criteria, plus:
Onsite*:*

10. Verify what evidence exists that the policy has been reviewed according to the established policy. Depending on the operator's process, this may involve a review of the policy itself, of meeting minutes, of other records, as well as interviews with personnel responsible for the review of the policy (3.1.1.S2a).
11. Verify via interviews with staff members from different areas of the organization (e.g., pilots, cabin crew, technicians, ground personnel, etc., as applicable) that they have access and that they understand the safety policy appropriately (3.1.1.S2b).
12. Assess the consistency of the Safety Policy against the maturity of the SMS components and elements. Commitments to 'establish' or 'implement' SMS (or specific SMS elements) would be nonsensical if the SMS or SMS elements have already been implemented and are indeed functioning. Contradictions like these usually are indicative of inconsistent review processes.

Note: it is important to note that question 3.1.1.S2b targets not only at the access, but at the understanding of the safety policy by all personnel involved in the SMS. Therefore, checking how the staff members have access to the policy only covers a part of the question. To fulfill the intent of this question, it is important to conduct interviews with a representative sample of line staff, checking on both their access and understanding of the policy.

For Stage 3 audits:

Stage 1 and Stage 2 assessment criteria, plus:
Onsite*:*

13. During the discussions on the operator's safety management activities, review of safety reports, review of safety meeting minutes or other records of the SMS, and/or interviews with staff members and leadership, look for examples of actions, behaviours and situations in which decisions were made that reflect a positive safety culture. This may involve, for instance, the adequate handling of incidents or errors in accordance with the safety policy's guidance on acceptable behaviors and exemption of disciplinary action, or the decision on making investments to adequately manage identified safety risks. The auditor should strive to assess aspects such as whether safety is understood in the organization and a good foundational principle for the organization, if everyone shares the same level of respect for safety, if opportunities for improvement are present, if communication is open and encouraged and if concerns are not met with reprimands, punishment, or negativity (3.1.1.S3a)

Note: auditors should not be unduly influenced by lavish facilities and top-shelf equipment, 'astronaut-grade' training programs or any other hint -subtle or ostentatious- that resources are not an issue at all to the operator. Similarly, vibrant written commitments, passionate pleas during interviews with managers and deluges of safety posters and safety notices on almost every wall should not be taken as definitive objective evidence that the operator's SMS is thriving. These very encouraging signs need to be validated by those who have the least amount of influence on the creation of all those hints, i.e., non-management staff. Front-line staff is usually the best-placed to assess the suitability of the SMS to manage risks in daily operations, to indicate whether management 'walks the talk' and if they feel 'psychologically safe' enough to raise any safety issue.

Alternative mean of compliance – IS-BAO 3.1.1.1.e

Some operators have not only mastered SMS and eventually seamlessly integrated it into every aspect of their operations but are also able to critically think about the ICAO framework itself to substantially improve it. They usually display high expertise in technical matters that goes beyond mere compliance, but also great humility about their ability to always exploit that expertise to their advantage in a volatile, uncertain, complex and ambiguous world. This was commonly summarized as a form of wariness or mindfulness of the dangers that are 'out there', and in more recent times also gradually incorporated the notions of building organizational resilience and adaptive capacities. Indeed, safety is now thought to be more likely to emerge from constant adaptations rather than from continuous repetition. Such mature organizations inevitably go beyond the traditional definitions and taxonomies of 'human error', and also have richer accident causation models that fully embrace the system thinking approach (e.g., AcciMap, STAMP, or even FRAM). The following 'alternative means of compliance' are meant for those mature operators exclusively, and for the auditors who can recognize them.

- Acceptable and unacceptable behaviours: possibly through research in the literature and experience from daily operations, mature operators are likely to reach a conclusion that, from their perspective, the question of the acceptability (or not) of certain behaviours is not so much about drawing a clear line, but rather about who gets to draw it after the event. Consequently, a mature operator may start to steer away from the error taxonomies inherited from the field of psychology in the 1990s (e.g., Reason), or at the very least to start balancing this mainstream worldview with a resolutely more systemic one (e.g., Rasmussen, Hollnagel, Woods). It would then be sensical -and acceptable in the context of an IS-BAO audit- to show openness to slightly different worldviews and methods to define accountability that do not explicitly draw a line in their Safety Policy and in their safety management manual.
- Just culture: in safety-critical industries such as aviation, finding balance between accountability and organizational learning is a thorny issue. Traditional methods of "rendering justice" in organizations usually involve a form of retributive justice where, essentially, the following questions need to be answered after each negative event:
    - Which rule was broken and by whom?
    - What is the severity of the breach?
    - What do(es) the offender(s) deserve in order to "settle his/her account"?

As previously hinted in this document, just culture processes have their limitations. Mature operators with a deep understanding of the system thinking approach will likely find such processes and questions somewhat cumbersome. Although this invites much broader debates about the meaning of accountability (e.g., "does the operator strive for backward-looking or forward-looking accountability?") or about how safety emerges from daily operations (e.g., "are the processes that lead to failure or to success really the same?"), mature operators usually find value in adopting a restorative approach to justice in their organization. There is no monolithic definition or method for restorative justice, and slightly different approaches can achieve essentially the same result. One of the most popular approaches (by Dekker) but definitely not the first nor the only one (e.g., Braithwaite), proposes to ask the following questions after a negative event:

- Who's hurt?
- What are their needs?
- Whose obligation is it to meet those needs?

Although a slightly less normative approach (i.e., without the use of error taxonomies and/or leaning towards restorative justice) would be a departure from the usual methods to "be fair" with employees and to meet the standard, it should not automatically be discounted during audits. Conformance with 3.1.1.1e may also be achieved using this approach and does not impact any other requirement from 3.1.1.

3.1.1.2 Taking due account of its safety policy, the organization shall define safety objectives. The safety objectives shall:

a. Form the basis for safety performance monitoring and measurement as required by 3.3.1;
b. Reflect the organization's commitment to maintain or continuously improve the overall effectiveness of the SMS;
c. Be communicated throughout the organization; and
d. Be periodically reviewed to ensure they remain relevant and appropriate to the organization.

Explanation:

Overview

As with any management system, the SMS can only be effective when endorsed, supported and directed by the organization's senior management. It is critical that senior management communicates its commitment and expectations with regards to the system and acts accordingly during the organization's daily activities. A clear statement of the top management's commitment and expectations towards the SMS is therefore a foundational element of the system.

The AE's commitment and qualitative expectations in terms of staff behavior, culture, reporting, etc., is to be documented in the Safety Policy, as discussed in item 3.1.1.1 above. Apart from those aspects, however, another foundational element of implementing an effective SMS is establishment of the organization's safety objectives.

Organizations do not have resources to act upon every single risk their operations are subject to, and in some cases, there is not much the organization can do to eliminate, or even reduce, a given risk. Managing safety relies on identifying those risks that are more significant to the organization and on which the organization can take action to eliminate or mitigate the risk, allocating/prioritizing the resources to manage those risks, and measuring how effective the organization's efforts were on reducing their exposure to those risks.

The organization's safety objectives constitute the priorities, determined by the AE and senior management, for the organization's safety management activities. In other words, they are a statement of the AE's expectations in terms of the outputs / results of the SMS. They are used to guide the allocation of resources to the system, and as a benchmark against which the effectiveness of the system will be measured.

a. Form the basis for safety performance monitoring and measurement as required by 3.3.1.
Objectives help an operator communicate about areas identified for improvement. These also define the framework in which SPIs and SPTs will be developed.

b. Reflect the organization's commitment to maintain or continuously improve the overall effectiveness of the SMS;
From the concepts discussed above, it is apparent that the safety objectives should form the basis for the organization's safety performance monitoring and measurement. That is, they should be the benchmark against which the organization will measure their safety performance and the effectiveness of their SMS (3.1.1.2.a) and reflect the organization's commitment to maintain or improve the overall effectiveness of the SMS (3.1.1.2.b).
A vague statement of intent (such as "No accidents or serious incidents") does not provide direction on the allocation of resources and efforts for the safety management activities, nor does it provide a basis for effective measurement of the organization's safety performance – since the absence of accidents or serious incidents does not necessarily translate into an underlying safe operation. In fact, a long time can go by without an accident or serious incidents even for business aircraft operators who do not abide by safe operating practices. Rather than a broad statement, Safety Objectives should be designed to encompass the specific areas that the organization wants to focus on and that will allow them to determine whether their safety management efforts are well targeted and effective.

It is natural, especially at the early stages of SMS implementation but also later on, that many such areas be related to the actual implementation of elements of the SMS (safety reporting, risk management, SMS training and communication, etc.) as the organization relies on those elements to manage their risks. Examples of a few common safety objectives of this nature widely used in the industry are:

- Provide SMS training to all flight department personnel holding safety responsibilities,
- Fulfill a given number of safety meetings or audits,
- Achieve a particular percentage of attendance by senior managers to safety meetings,
- Increase participation from all departments in the SMS.

Although those can be valid Safety Objectives, it is important to notice that they focus solely on the implementation of the SMS processes, not on the effectiveness of those processes in reducing the main risks to which the organization is exposed. It is therefore key that the organization also establish safety objectives specifically related to the most critical risks identified by the organization. In order to do that, the organization must have a good understanding of what their main risks are, and that understanding is an important first step for the implementation of an effective SMS. An initial identification of hazards and risks can serve as basis for the establishment of initial Safety Objectives. As the SMS matures, it is expected that the organization will rely more and more on Safety Objectives directly related to one of their most significant risks, and less and less on those related to the implementation of SMS elements. Of course, these objectives will depend on the organization's main risks, which will vary from organization to organization according to the operating environment and profile. A few common examples tied to risks that affect a broad spectrum of the business aviation community could be:

- Reduce the exposure to fatigue or, alternatively, implement Fatigue Risk Management software to support the fatigue management program,
- Reduce the rate of ground incidents,
- Hire additional personnel (e.g., to better share the workload)
- Reduce the rate of unstabilized approaches,
- Provide all pilots with both ground and flight training on upset recovery,
- Reduce the rate of aircraft releases for flight with MEL items.

Note: all the examples provided above are merely that – examples, and should not be understood as a requirement, or a recommendation, from IBAC. Each organization must determine the objectives that are most appropriate to them, according to the risks they are exposed to, their main concerns, and the resources available to them.

In determining the main risks and those that should have an associated Safety Objective, organizations should consider all areas of their organization (versus focusing solely on flight operations or solely on maintenance, for instance) and also consider the risks posed to their operations by the activities of outside organizations (e.g., their contracted FBOs, AMOs, training providers, air traffic control, airport management, etc.).

Safety Objectives can be long or short term and can be more or less specific in terms of what is to be achieved and when – that is, "Reduce the rate of ground incidents" is a valid safety objective, as is "Reduce the rate of ground incidents by 10% this year over the previous year". The organization should determine what is the best way to state the objectives so that they are well understood by everyone in the organization and are effective in their purpose, and that determination will impact the format used for the associated indicators and targets (covered in item 3.3.1 of the Standard).

c. Be communicated throughout the organization;
Once the Safety Objectives are established, they must be communicated throughout the organization (3.1.1.2.c) so that everyone in the organization understands the organization's priorities and can support the achievement of those objectives. Safety Objectives can be included in the Safety Policy (as many operators choose to do, and some CAAs require), or they can be documented elsewhere.

d. Be periodically reviewed to ensure they remain relevant and appropriate to the organization.
Finally, it is important to note that Safety Objectives are dynamic. As time goes by, the organization might be able to reduce a given risk so that is no longer is a main concern, and the organization may want to then direct their efforts to another risk. As operations change, new risks may be identified that require a new Safety Objective to be established. Safety Objectives must therefore be periodically reviewed to ensure they remain relevant and appropriate to the organization (3.1.1.2.d). The organization must establish the process for these reviews, determining who will be responsible as well as the method and the frequency for them to be accomplished.

Assessment criteria:

For Stage 1 audits:
Preaudit:

1. Review the operator's process to define and communicate documented safety objectives that reflect the organization's commitment to maintain or improve the overall effectiveness of the SMS (3.1.1.S1k)
2. Review the operator's process to review and update the safety objectives to ensure they remain relevant and appropriate (3.1.1.S1l)

Onsite

3. Through a wide range of interviews that encompass all organizational levels within the organization, collect the staff members' individual perception of the top safety risks in the operation. There is no right or wrong answer, all the answers should be considered as a whole and collectively compared against one crucial criterion: do they reasonably align with the Safety Objectives? If not, why not? Is the flow of information within the organization disrupted? In which direction? Does management not get appropriate information and/or sufficient information about the risk in the operation, or does it not effectively communicate the Safety Objectives with frontline workers?

For Stage 2 audits:

Stage 1 assessment criteria, plus:
Preaudit and/or Onsite:

4. Review the organization's safety risk profile, risk register or equivalent documents, and the current list of documented safety objectives, and verify if the organization has

established safety objectives addressing the most significant risks identified by the organization (3.1.1.S2c)

5. Check for evidence of period reviews of the safety objectives and verify that those reviews are being performed in accordance with the operator's documented process and are being effective in ensuring the objectives remain relevant and appropriate to the organization (3.1.1.S2d)

For Stage 3 audits:

Stage 1 and Stage 2 assessment criteria, plus
Onsite:

6. Check for evidence of the elements of a just culture per this item.

3.1.2 Safety Accountability and Responsibilities

3.1.2.1 The organization shall:

a. Identify the accountable executive who, irrespective of other functions, has ultimate accountability for the safety performance of the organization;
b. Clearly define lines of safety accountability throughout the organization, including a direct accountability for safety on the part of senior management;
c. Identify the responsibilities of all members of management, irrespective of other functions, as well as of employees, with respect to the safety performance of the organization;
d. Document and communicate safety responsibilities, accountability and authorities throughout the organization; and
e. Define the levels of management with authority to make decisions regarding safety risk tolerability.

Explanation:

Another important element for the implementation of the SMS is making sure that the system is appropriately staffed and that affected personnel understand their corresponding responsibilities and accountabilities. Standards 3.1.2.1 and 3.1.3.1 address this important step.

a. Identify the accountable executive who, irrespective of other functions, has ultimate accountability for the safety performance of the organization.
First and foremost, it is key to identify the Accountable Executive of the organization. The Accountable Executive is a single, identifiable person who has ultimate accountability for the safety performance of the organization.

The Accountable Executive is the person that lays out the foundation of the SMS through his/her commitment, who oversees the operator's safety management activities and holds managers accountable for their safety initiatives, and who provides the human and financial resources

necessary to manage safety risks. As such, in order to be able to exercise his/her responsibilities and accountability in regard to the SMS, the Accountable Executive must:

- Have authority over the human resources of the organization (or of the aviation department);
- Have authority to make decisions on the allocation of financial resources;
- Have direct responsibility over the organization's aviation activities;
- Hold a high-level understanding of aviation, or be willing to learn, so that he/she can make informed decisions on the management of aviation-related risks;
- Have direct contact with the management personnel responsible for the day-to-day aviation activities of the organization.

In organizations whose core business is aviation (e.g., air charter operators, AOC holders), the AE will typically be the owner or the CEO of the company. However, many non-commercial business aviation operators are a relatively small part of a much larger organization whose primary business is not related to aviation. In such cases, the CEO of the overall organization is often very distanced from the aviation department and is therefore not the appropriate person to be appointed as the AE of the aviation department. A Director or Manager having direct responsibility for the aviation department, or the head of the aviation department (e.g., the Director of Operations) could be better suited to fulfill the AE's responsibilities and accountabilities. The selection of the AE should consider the attributes listed above, to ensure that the AE will be able to provide the necessary support for the implementation and maintenance of the SMS.

b. Clearly define lines of safety accountability throughout the organization, including a direct accountability for safety on the part of senior management.
Once the AE is identified, the lines of safety accountability throughout the operator's structure, flowing from the AE to the operator's management and line staff, must be clearly determined and documented (3.1.2.1.b).

c. Identify the responsibilities of all members of management, irrespective of other functions, as well as of employees, with respect to the safety performance of the organization.
Likewise, the responsibilities of each position within the operator's structure with respect to safety and the organization's safety performance must also be determined and documented (3.1.2.1.c).

d. Document and communicate safety responsibilities, accountability and authorities throughout the organization.
The responsibilities, authorities and accountabilities resulting from the above steps must be clearly documented and communicated throughout the organization so that each person understands their own responsibilities and their role within the SMS (3.1.2.1.d).

As part of his/her responsibilities, the AE is expected to be available to the organization's staff on safety matters, understand the organization's main risks, be actively involved with reviewing

risk and mitigation strategies within the organization and hold senior management accountable for safety risk management activities, and monitor the overall performance of the SMS.

and

e. Define the levels of management with authority to make decisions regarding safety risk tolerability.
Finally, it is important to remember that safety management involves determining if given risks can be accepted as they are, i.e., without mitigation; if mitigation is required and if so, if the risk can then be accepted once mitigation is implemented; or if a given operation must be cancelled or avoided because the risk cannot be accepted. That activity is referred to as making decisions regarding safety risk tolerability and includes who can make decision on acceptability of risks as well as the authority to agree that a change can/must be implemented.

This authority may be assigned to an individual, a management position or a committee, but it must be commensurate with that individual's authority for overall decision making and allocation of resources as well as expertise. In certain organizations, lower-level managers, or in some cases line staff members, may be granted authority for tolerability decisions up to a certain level, above which they should be escalated to senior managers or the AE. In many cases, especially with regards to higher-level risks, a committee may be a more suitable forum for tolerability decisions as it can be formed by staff members holding the necessary expertise and understanding of the risks being explored and those holding the authority to allocate the necessary resources to mitigate them.

The levels up to which each individual, or committee, in the organization may make decisions on safety risk tolerability must be pre-determined (3.1.2.1.e) and made clear to all personnel to avoid having such decisions be made by persons not holding the appropriate authority or expertise, which could result in an ineffective decision or unsafe situations.

Assessment criteria:

For Stage 1 audits:
Preaudit:

1. Review the operator's SMS manual/documentation and verify that:
    a. the AE's name or position is identified (3.1.2.S1a)
    b. the AE's accountability for the safety performance of the organization is documented (3.1.2.S1b)
    c. the organization's structure, including lines of safety accountability, is documented (3.1.2.S1c)
    d. the responsibilities of each position within the organization with respect to the safety performance of the organization are explicit (3.1.2.S1d)
    e. the organization has documented the safety responsibilities, accountabilities and authorities with respect to safety (3.1.2.S1e)
    f. the levels of management with authority to make decisions regarding safety risk tolerability are defined (3.1.2.S1f)

Onsite:

2. Verify that the acting AE matches the AE identified within the SMS manual/documentation and that he/she is in an appropriate position within the organization and holds the necessary attributes to effectively fulfill the AE's role (3.1.2.S1a)
3. Verify via interviews with the AE and management personnel that the authority to make decisions regarding safety risk tolerability documented in the SMS manual/documentation reflects the organization's reality (3.1.2.S1f)

<u>For Stage 2 audits:</u>

Stage 1 assessment criteria, plus:
Onsite:

4. During review of safety risks management records and interviews with the AE and senior management, check for evidence that the resources to manage identified risks are made available as needed on a consistent basis (3.1.2.S2a)
   Note: although initiatives such as hiring of personnel, purchase of SMS software, etc., may demonstrate the overall allocation of resources, this item focuses on the allocation of resources to mitigate specific identified risks. For example, the purchase of a tire cage due to employee reporting a need for safer equipment, provision of upset recovery training following hazard reports on high altitude wake turbulence within the RVSM levels, pre-positioning of crew members for a long sequence of flights to mitigate fatigue, etc.
5. Verify via interviews with staff members from different areas of the organization (e.g., pilots, cabin crew, technicians, ground personnel, etc., as applicable) that they understand their responsibilities and accountabilities with relation to the SMS (3.1.2.S2b)
6. During review of safety risks management records or interviews, check for documented evidence that the decisions on safety risk tolerability are consistently made by person(s) holding the appropriate authority, as per the operator's documented policy/process (3.1.2.S2c)
7. During review of safety risks management records and interviews with the AE and senior management, check for evidence that AE actively reviews risks and mitigation strategies across the organization (3.1.2.S2d)

<u>For Stage 3 audits:</u>

Stage 1 and Stage 2 assessment criteria, plus:
Onsite:

8. During review of meeting minutes and other SMS records, and interviews with the AE and senior management, check for evidence that the AE holds managers accountable for risk management activities (3.1.2.S3a).

3.1.3 Appointment of Key Safety Personnel

3.1.3.1 The organization shall identify a safety manager to be the responsible individual and focal point for implementation and maintenance of an effective SMS.

Explanation:

It is critical that the organization identify a person as the responsible individual and the focal point for the implementation and the maintenance of an effective SMS (3.1.3.1). Although safety is a responsibility of all involved in the operations, the effective implementation and operation of an SMS requires consistent leadership.

That person leads the way for the implementation of the SMS and continues to lead the organization's ongoing safety management efforts and the maturation of the system, at the direction and on behalf of the AE. A direct access to the AE, on the part of the safety manager, is therefore a basic requirement for that function.

Note: although the standard refers to a safety manager, that is not to be understood as a requirement for the title of the person within the organization. Other titles such as Safety Officer, Director of Safety, or others, are commonly used within the industry with no impact to the intent of this standard.

For larger organizations, the safety manager may have additional staff members working with him/her on the safety department, but the safety manager maintains the responsibility for the implementation and maintenance of the SMS. In other organizations, the safety manager may perform that function with another operational role such as that of a line pilot or maintenance technician, and in other organizations still, the safety manager may be a contracted person.

All these arrangements are acceptable by the standard as long as they allow for the SMS to operate effectively. One important consideration that operators should give attention to when appointing the safety manager is that whatever arrangement is chosen, it should not result in conflicts of interest. Such conflicts of interest could include competition for funding or conflicting priorities for resources, and notably when the safety manager also has operational duties, impairment of their ability of, or bias on, assessing the operational activities they are involved in or those activities conducted by those to whom the safety manager reports operationally (e.g., the Chief Pilot when the safety manager is a line pilot, or the Chief of Maintenance when the safety manager is a line technician).

Where it is not possible for the operator to avoid having a safety manager with other operational roles, as is the case of many small business aircraft operators, considerations should be given to these potential conflicts of interest and, where possible, they should be addressed so that they do not impact the effectiveness of the SMS.

Assessment criteria:

For Stage 1 audits:
Preaudit:

1. Review the operator's SMS manual/documentation for the identification of the safety manager and his/her responsibilities, accountabilities and authorities as well as his/her position within the organizational structure (3.1.3.S1a)

For Stage 2 audits:

Stage 1 assessment criteria, plus:
Onsite:

2. During review of SMS records and interviews with the AE and the safety manager, check for evidence that the safety manager has direct access or reporting to the AE concerning the implementation and operation of the SMS (3.1.3.S2a).

For Stage 3 audits:

Stage 1 and Stage 2 assessment criteria, plus:
Onsite:

3. Analyze the safety manager's position within the organization structure and whether he/she has other operational roles. If the safety manager has other operational roles, during review of the SMS records and interviews with the AE, discuss any potential conflicts of interest and check for any safeguards the operator may have put in place to avoid those conflicts (3.1.3.S3a).

3.1.4 Coordination of Emergency Response Planning

3.1.4.1 The organization shall maintain a documented Emergency Response Plan (ERP) and ensure that it is properly coordinated with the ERPs of those organizations it must interface with during the provision of its services.

Explanation:

Most aviation emergencies will require a coordinated response involving not only the affected operator but other external entities they interface with. Coordination with other corporate departments of the organization might also be required especially for corporate flight departments. Examples of such organizations include:

- FBOs / handlers
- Airport authorities
- AMOs
- Flight planning / tracking vendors
- CAA
- Search and Rescue organizations

- Fire Department
- Police Department
- Hospitals
- Insurance Agencies
- Brokers
- Legal support
- Corporate Headquarters and Partners, including Human Resources, Public Relations, Legal Department, etc.
- Aircraft accident response vendors, for organizations relying on such organizations

The documented ERP manual/plan must include other organizations that could be involved with the operator in the event of an emergency and be coordinated with the ERPs of those organizations where applicable (3.1.4.1).

Often, the way a response was planned does not fully work in practice. In order to identify such potential shortcomings, it is important that the operator conduct emergency response exercises, as required in Chapter 4 of the IS-BAO. These exercises should include simulations of the coordination with external organizations prescribed in the ERP, so that potential shortcomings on that coordination can be identified ahead of time. The findings of those exercises must be documented for future reference, and trigger actions for improvement of the plan. As the organization matures, it is expected that these lessons and improvements be also shared with those organizations with which they will interface during the provision of ERP services, so that those organizations can themselves work on addressing potential shortcomings on their response protocols that could affect not only the organization itself, but also other operators who interface with those same external entities.

Assessment criteria:

For Stage 1 audits:
Preaudit:

1. Review the operator's ERP and verify that it covers proper coordination with other organizations with which they interface during the provision of its services (3.1.4.S1a)

Onsite:

2. Interview the safety manager and review records of communication/coordination with other organizations referred to in the organization's ERP (3.1.4.S1a)

For Stage 2 audits:

Stage 1 assessment criteria, plus:
Onsite:

3. Review records of the emergency response exercises conducted by the organization to confirm that other organizations were involved in those exercises as appropriate (3.1.4.S2a)

For Stage 3 audits:

Stage 1 and Stage 2 assessment criteria, plus:
Onsite:

4. Review records of the emergency response exercises and of communications with the external organizations that participated in such exercises to confirm whether any findings / lessons learned that were identified on that coordination as well as the resulting actions for improvement of the ERP were shared with those organizations (3.1.4.S3a)

3.1.5 SMS Documentation

3.1.5.1 The organization shall develop and maintain an SMS manual that describes its:
a. Safety policy and objectives;
b. SMS requirements;
c. SMS processes and procedures; and
d. Accountabilities, responsibilities and authorities for SMS processes and procedures

Explanation:

Overview
The final element of the first component of Chapter 3 requires the policies, processes and procedures that form the SMS to be formally described in a document, so that those processes and procedures are clearly determined and available for reference by the affected personnel.

That document is referred to in the IS-BAO as an "SMS manual", however it is important to note that although this "manual" may indeed constitute a stand-alone manual, it may also be integrated with other organizational manuals and documents maintained by the organization (such as the flight operations manual) or be in the form of a set of stand-alone documents.
Note: although the IS-BAO does not require a given format for the SMS manual, many CAAs do require a dedicated SMS manual which is subject to CAA approval. In those cases, the CAA required format must be complied with.

Regardless of the format chosen by the organization to publish its SMS manual, it must at a minimum describe (3.1.5.1):

a. The organization's safety policy and objectives,
b. Any applicable regulatory requirement to which the SMS is subject, and corresponding approvals where applicable,
c. The processes and procedures that form each element of the organization's SMS, and
d. The accountabilities, responsibilities and authorities for the SMS processes and procedures.

It is also important to note that the standard not only requires the development of the SMS manual, but also its maintenance. As such, the operator must have a process to ensure that the SMS manual be periodically reviewed and updated as appropriate (3.1.5.1).

Assessment criteria:

For Stage 1 audits:
Preaudit:

1. Review the SMS manual to ensure the minimum items required by IS-BAO 3.1.5.1 are described within the manual (3.1.5.S1a).
2. Review the operator's process to regularly review the SMS manual and update it where appropriate (3.1.5.S1b)

For Stage 2 audits:

Stage 1 assessment criteria, plus:
Preaudit:

3. Review the operator's process for distribution of the SMS manual, or parts thereof, to affected personnel (3.1.5.S2a)
4. Review the records of revision / updates to the SMS manual (3.1.5.S2b)
5. Review the SMS manual to check whether procedures reflect coordination or integration with external customer or subcontractor organizations where applicable (3.1.5.S2d)

Onsite:

6. Confirm through interviews or review of records that affected personnel have access to the SMS manual, or pertinent parts of the SMS manual relevant to their activities (3.1.5.S2a)
7. Check for evidence of reviews of the SMS manual conducted by the organization (3.1.5.S2b)

For Stage 3 audits:

Stage 1 and Stage 2 assessment criteria, plus:
Onsite:

8. Review the SMS documentation/manuals for evidence of the organization identifying opportunities for continuous improvement (3.1.5.S3a)

3.1.5.2 The organization shall develop and maintain SMS operational records as part of its SMS documentation.

Explanation:

As the SMS functions over time, a number of outputs of the system are generated. Typical outputs include SMS training records, safety bulletins, hazards that are identified, risks that are

analyzed and mitigated, decisions on safety risk tolerability and management of change, safety performance indicators, among many others.

These outputs demonstrate (internally and externally) that the system is working and provide information for the organization itself to assess the performance of the system and identify potential areas of improvement. They also build up safety knowledge and experience in the various levels of the organization.

However, if these outputs are not recorded, it is easy for lessons learned and safety information to be lost or forgotten as time goes by and people involved leave the organization. That can impact the organization's ability to continuously assess and improve the system and can also lead the organization to incur the same deficiencies that had already been identified and resolved previously. A common example of that situation is the cancellation of policies or procedures that were implemented as a result of safety risk mitigation actions but are later on deemed unnecessary by new leadership due to a lack of understanding of why that had been implemented in the first place.

Organizations must therefore maintain a set of records of SMS outputs as part of the SMS documentation (3.1.5.2). These records are key to allowing the organization to build upon previous safety knowledge and experience and also constitute useful information for the monitoring of the system's performance. Examples of SMS operational records to be kept as part the SMS documentation include:

- Safety Meeting Minutes
- Safety Risk Profile, Hazard Log, Risk Register, or equivalent
- Safety Reports and records of Safety Risk Assessment and Mitigation
- Records of Change Management
- Records of measurement and monitoring of Safety Performance Indicators and Targets
- Internal Audit Reports and follow-up on remediation of findings
- SMS training records
- Safety bulletins or other safety communication media or records
- Communication with relevant external customer or subcontractor organizations on safety matters

The standard does not establish the format for these SMS records or where they must be kept. This could be, for example, in a software program, or written documents in a filing cabinet or binder, or web-based, or any other format that works for the organization. SMS documentation may be stored in different areas, for example: hazard reports submitted and stored in software while an internal audit is paper based and filed accordingly.

Assessment criteria:

For Stage 1 audits:
Preaudit:

1. Review the operator's process for the development and maintenance of operational records as part of the SMS documentation (3.1.5.S1c)

For Stage 2 audits:

Stage 1 assessment criteria, plus:
Onsite:

2. Review the SMS operational records and ensure that up-to-date records on the various SMS activities are maintained and available to the appropriate personnel (3.1.5.S2c)
3. Check for evidence of relevant coordination or integration with external customer or subcontractor organizations, where applicable (3.1.5.S2d)

For Stage 3 audits:

Stage 1 and Stage 2 assessment criteria, plus:
Onsite:

4. Review the SMS operational records for evidence of the organization identifying opportunities for continuous improvement (3.1.5.S3a)

3.2 Safety Risk Management

This section will be incorporated in the next revision to this document.

3.3 Safety Assurance

This section will be incorporated in the next revision to this document.

3.4 Safety Promotion

This section will be incorporated in the next revision to this document.

3.5 Compliance Monitoring

3.5.1 The organization shall conduct assessments, at appropriate intervals, to identify regulations, standards, approvals and exemptions that are applicable to their operations and the procedures implemented by the organization to comply with them. In conducting such assessments, the organization shall ensure:

a. Any changes to existing or issue of new regulations, standards, approvals and exemptions applicable to its aviation activities are identified and assessed; and
b. Records of these assessments are kept by the organization.

Explanation:

Aviation and the operation and maintenance of aircraft is heavily regulated industry. In addition to the CAA regulations imposed by the aircraft State of Registry, operators are also subject to the regulations in the airspace in which operations are conducted. Even when an organization is not operating the aircraft, they are still subject to a wide variety of regulations, standards, approvals and exemptions and staying aware of all these changing rules is an essential task. To that end, the organization must: have a documented process to conduct assessments at appropriate intervals to identify regulations, laws, standards, approvals and exemptions that apply to them across all functional areas of operations; and keep records of those assessments. There are three distinct steps to this process, as described below.

Note: *for brevity purposes, all these laws, regulations, standards, approvals and exemptions may all be grouped under the generic term of 'norm' in this guidance material.*

Step 1 – Norms are everywhere; identify which ones apply or don't apply to your operation

The first step in compliance monitoring is to list all the various sources that demand compliance in one way or another. This includes some standards that may be optional but, once an organization elects to be held accountable for conformity with them, these must also be maintained. It is recommended that the operator make this a team effort in larger flight departments in order to include potential sources from all operational areas of the organization.

This includes assessment, as applicable, of

- *CAA Regulations*
- *ICAO (e.g., dangerous goods technical instructions and rules of the air)*
- *Industry audit standards OSHA/Environmental*
- *Airport Security requirements*
- *Airspace requirements*
- *National, regional and local laws*
- *Etc.*

This list will bring clarity to all employees, present and future, and minimize the risk of missing subsequent updates.

However, aviation enables travel to many different areas of the world and into various jurisdictions where regulatory requirements may vary widely. An operator that has bases in multiple locations will need to ensure that they are aware of, and remain current and compliant with, the regulations in each location. Even for ground operations, these regulations are significantly different state to state or even county to county when we begin to consider occupational health and safety and environmental regulations.

Compliance monitoring is a widespread task which may be best accomplished in larger organizations by having various personnel in the organization overseeing regulations related to their area of expertise. As long as the team is clear on who is responsible for what areas, this can be an effective way to manage compliance monitoring.

Step 2 – Regulatory watch; make sure the organization remains up to date

This concerns both the existing norms identified by the organization and any upcoming ones.

Regarding the existing framework applicable to the organization, the ease and speed at which changes will be identified is heavily influenced by the technological aptitude of the issuing authority or industry body in IT tools. Nearly automatic methods may take one or several forms, and are usually activated through simple sign-ups or subscriptions, often for free:

- E-mail newsletters and alerts,
- Social media alerts,
- RSS feeds,
- Dedicated IT platform/software,
- Etc.

The organization is then advised as soon as a change is in the air. It can then pass on the information to the appropriate staff for further action. In any case, organizations should also retain the more rudimentary and more resource-intensive method of regularly checking for updates at the source. This may be done on the website of the authority or industry body, or at any other source the organization deems reliable. The frequency of those checks should be commensurate with the usual life cycle of the norm. Some frameworks change several times per year, others only once or twice per decade. On the other hand, it would not be efficient nor advisable to set up a monthly routine to check a website that is only updated once a year at the most. In any event, it would be good practice to keep a log of those checks.

Becoming aware of new laws, regulations and standards may be a slightly more complicated task, once again depending on the technological aptitude of the authority or industry body with modern communication tools.

Step 3 – Cross-check and confirm; making sure the organization complies and conforms

Compliance and conformity audits only make sense if the organization uses the correct reference. This should normally be ensured by the two previous steps.

Depending on the resources of the organization, a range of tools and methodologies can be used (e.g., spreadsheets, software, external services). They usually revolve around two complimentary but not equivalent methods:

1. Compliance matrix or checklist: they typically list every requirement of an applicable norm (sometimes just stating a reference or a number rather than providing the requirements per se, which can sometimes be extremely long), leaving the organization to identify where in their documentation they address each requirement. A compliance matrix represents a significant investment during its initial set-up but streamlines subsequent regulatory update processes, since the organization has already precisely identified the correspondence between the (changing) norm and its own documentation. Compliance matrices obviously need to follow the evolution of the norm(s) they contain. They also require updates whenever the applicable framework changes. *See appendices for optional examples of a compliance matrix/checklist.*
2. Audits: it's the traditional method of checking compliance or conformance. Audits generally are greatly aided by well-maintained compliance matrices. In the absence of such matrix, the organization must be cautious to ensure that internal audits always use the latest version of the applicable law, regulation or standard (cf. steps 1 and 2).

Assessment criteria:

Preaudit:

1. Review the operator's manuals to determine if they have a documented process to conduct assessments at appropriate intervals to identify regulations, laws, standards, approvals and exemptions that apply to them across all functional areas of operations.
2. Should the operator have a compliance matrix or checklist, verify that its revision status matches the revisions status of any pertinent norm, and that it does indeed consider all applicable laws, regulations or standards. For instance, if the operator has aircraft registered in different States, does its compliance monitoring processes or procedures indeed cover them all?

Onsite:

3. Interview staff to ensure that the documented process is clearly understood and utilized in the organization.
4. Review records of assessments conducted by the organization to identify applicable regulations etc. and verify whether the latest changes have been identified.
5. Review records of any new requirements that they identified and what steps they took to ensure that their organization would remain in compliance with the new requirements.
6. Auditors also need to bear in mind APM 4, which states: *"If the organization does not conform to a recommended practice of the IS-BA which is required by relevant civil aviation, national or local requirements, a finding must be raised against the compliance monitoring standards of the IS-BA Programme."*

3.5.2 The organization shall establish and maintain a process to ensure that changes to IS-BAO are verified, analysed and incorporated into the organization's processes, as applicable.

Explanation:

The IS-BAO Standard is focused upon continuous improvement throughout an organization. For this reason, the Standard is revised periodically to provide improved guidance to the industry. It is the responsibility of the operator to check for new revisions to the IS-BAO Standard and ensure that the organization remains in conformity with the Standard. It is not appropriate to simply ignore the revisions until they appear as findings on the subsequent IS-BAO audits.

The operator must document the requirement to perform these periodic reviews in their company manuals and maintain records of these reviews in order to be able to provide evidence of implementation to their auditor.

During the course of the internal or external audit using the IS-BAO protocols as a guide, if it is evidenced that there are multiple findings related to items that were introduced to the Standard since the operator's last audit, it is worthwhile to determine if the review process required by this item is functioning effectively or not.

Assessment criteria:

Preaudit:

1. Review the operator's manuals to determine if they have a documented process to check for revisions to the IS-BAO on a periodic basis and maintain records of these assessments.

Onsite:

2. Interview staff to ensure that the documented process is clearly understood and utilized in the organization.
3. Ask the operator to demonstrate that they know how to access the IS-BAO Standard and how to locate and download new revisions.
4. Review records of any new requirements that they identified and what steps they took to ensure that their organization would remain in conformity with the new requirements.
5. A significant number of non-conformities during an IS-BAO audit should incite auditors to reflect on the effectiveness of the compliance monitoring processes/procedures.

3.5.3 The organization's internal audit programme (IAP) shall include the verification on whether the processes established to comply with applicable regulations, standards and exemptions are being followed during daily operations.

Explanation:

Once an organization has established processes for compliance monitoring, they must then ensure that the processes to comply with the requirements are followed by employees in the day-to-day operations otherwise procedural drift can creep into the workplace. Verification of the use of established procedures must be a focus of the internal audit programme (IAP).

Internal Audit Program (IAP) shall consider processes implemented in order to comply with the State of Registry regulations as well as the regulations in the airspace in which the aircraft is operated. It shall also include the IS-BAO Standard and other applicable voluntary Standards applicable to the operator.

The operator must keep records of the internal audits conducted and the results along with corrective actions implemented and the evaluation of the effectiveness of those corrective actions.

This one item in the Standard (3.5) has many tentacles which reach out into all areas of the IS-BAO Standard. During an internal or external audit using the IS-BAO protocols as a guide an operator may notice multiple findings in chapters outside of the SMS that are related to failure to be aware of and remain compliant with regulations in various areas. If the auditor notices a trend in this direction, it is worthwhile to determine if there is a systemic failure in the compliance monitoring processes.

Assessment criteria:

Preaudit:

1. Review the operator's manuals to determine if they have an Internal Audit Programme to be conducted on a periodic basis as well as a process to maintain records of these audits.

Onsite:

2. Interview staff to ensure that the documented process is clearly understood and utilized in the organization.
3. Review the audit checklist used for the IAP to ensure currency with applicable requirements.
4. Review completed audit results for timely completion.
5. Review corrective action for findings discovered by the IAP.

APPENDIX 3-A
Compliance Matrix excerpt example as applied to section 3.5.1:

The following image shows a partial example of a format for a compliance matrix of applicable regulations and revision/review status. This is just one example that can be accomplished in many ways and should be tailored for the operator's size and operational needs, as well as regulatory requirements.

UPDATE STATUS			
Regulation	**Amdt #**	**Dated**	**Reviewed on**
OVERARCHING AVIATION LAW			
Aviation Law, Part 111	Original	2/20/08	4/1/17
"	Rev. 1	10/21/09	4/1/17
AIR OPERATIONS REGULATION			
Air Operations, Part 222	Original	10/5/12	4/1/17
"	Rev. 1	8/14/13	4/1/17
"	Rev. 2	1/27/14	4/1/17
"	Rev. 3	1/29/14	4/1/17
"	Rev. 4	4/24/14	4/1/17
"	Rev. 5	1/29/15	4/1/17
AIRWORTHINESS REGULATION			
Airworthiness, Part 333	Original	12/17/14	4/1/17
"	Rev. 1	7/10/15	4/1/17
"	Rev. 2	9/16/15	4/1/17
"	Rev. 3	8/16/18	8/17/18
OCCURRENCE REPORTING REGULATION			
Reporting, Part 444	Original	4/3/14	4/1/17
"	Rev. 1	6/29/15	4/1/17
"	Rev. 2	4/2/19	4/5/19

UPDATE STATUS			
AMC/GM	**Amdt #**	**Dated**	**Reviewed on**
Overarching Aviation Law			
Guid. Material	Issue 1	24/04/2014	1/04/2017
Guid. Material	Amdt 1	23/03/2018	25/04/2018
Guid. Material	Amdt 2	22/11/2018	29/11/2018
Air Operations AMC/GM			
Guid. Material	Issue 1	24/10/2012	1/04/2017
Guid. Material	Amdt 1	23/08/2013	1/04/2017
Guid. Material	Amdt 2	30/01/2015	1/04/2017
Guid. Material	Amdt 3	4/05/2015	1/04/2017
Guid. Material	Amdt 4	2/08/2016	1/04/2017
Guid. Material	Amdt 5	7/10/2016	1/04/2017
Guid. Material	Amdt 6	30/03/2017	1/04/2017
AMC/GM	Amdt 7	14/12/2017	21/12/2017
AMC/GM	Amdt 8	6/05/2018	10/05/2018
Guid. Material	Amdt 9	20/02/2019	22/02/2019
AMC/GM	Amdt 10	27/02/2019	28/02/2019
Airworthiness AMC/GM			
AMC/GM	Issue 1	24/10/2012	1/04/2017
Guid. Material	Amdt 1	16/04/2013	1/04/2017
AMC/GM	Amdt 2	23/08/2013	1/04/2017
AMC/GM	Amdt 3	31/01/2014	1/04/2017
AMC/GM	Amdt 4	31/01/2014	1/04/2017
AMC/GM	Issue 2	24/04/2014	1/04/2017
Guid. Material	Amdt 1	31/01/2015	1/04/2017
AMC/GM	Amdt 2	4/05/2015	1/04/2017
Occurrence Reporting AMC/GM			
AMC/GM	Issue 1	24/04/2012	1/04/2017

EXAMPLE

APPENDIX 3-B
Compliance monitoring matrix example as applied to section 3.5.3:

The following image shows a partial example of a format for a company manual cross-reference checklist. This is just one example that can be accomplished in many ways and should be tailored for the operator's size and operational needs, as well as regulatory requirements.

	A	B	C	D	E	F	G
1		COMPLIANCE MATRIX - AIR OPERATIONS REGULATION					
2		Regulatory reference				Company manual reference	Notes
3		**AIR. OPS**	**100**		**Scope**	N/A	Intro text in regulation, no reference needed
4		**AIR. OPS**	**110**		**Competent authority**	N/A	Competent authority: CAA, no need to formally state it
5		**AIR. OPS**	**120**		**Operator responsibilities**	OM-A 0.5	
6		AIR. OPS	120	a)		OM-A 0.5.1	
7		AIR. OPS	120	b)		OM-A 0.5.1	
8		AIR. OPS	120	c)		OM-A 0.5.1 + OM-A 0.5.2	Caution: upcoming regulatory change (Q4 next year)
9		AIR. OPS	120	d)		OM-A 0.5.2	Caution: upcoming regulatory change (Q4 next year)
10		AIR. OPS	120	e)		OM-A 0.5.3	
11		AIR. OPS	120	f)		OM-A 0.5.1	Regulation revised Q1, needs OM update by Q2 next year
12		AIR. OPS	120	g)		OM-A 0.5	
13		AIR. OPS	120	h)		OM-A 0.5	
14		AIR. OPS	120	i)		OM-A 0.5 + SMM 2.1	
15		AIR. OPS	120	j)		OM-D 1.4.2 + OM-D 1.4.3	
16		AIR. OPS	120	k)		N/A	No such aircraft in the fleet
17		**AIR. OPS**	**130**		**Application for an AOC**	N/A	No AOC
18		**AIR. OPS**	**140**		**Means of compliance**	N/A	
19		AIR. OPS.	140	a)		N/A	No Alternative Means of Compliance used
20		AIR. OPS.	140	b)		N/A	No Alternative Means of Compliance used
21		AIR. OPS.	140	c)		N/A	No Alternative Means of Compliance used
22		AIR. OPS.	140	d)		N/A	Not subject to this authorisation process
23		**AIR. OPS.**	**150**		**Terms of approval and privileges of an AOC holder**	N/A	No AOC
24		**AIR. OPS.**	**160**		**Changes related to an AOC holder**	N/A	No AOC
25		**AIR. OPS.**	**170**		**Continued validity of an AOC**	N/A	No AOC
26		**AIR. OPS.**	**180**		**Access**	OM-A 0.2	
27		AIR. OPS.	180	a)		OM-A 0.2 + OM-B 1.1	Finding during last CAA audit, remedial action TBC

EXAMPLE

APPENDIX 3-C
Compliance Matrix excerpt example for smaller operator

The following image shows a partial example of a format for a compliance checklist for a smaller operator. This is just one example that can be accomplished in many ways and should be tailored for the operator's size and operational needs, as well as regulatory requirements.

COMPLIANCE MONITORING CHECKLIST Year:			
Subject	Date checked	Checked by	Comments/Non-compliance Report No.
Flight Operations			
Aircraft checklists checked for accuracy and validity			
Minimum five flight plans checked and verified for proper and correct information			
Flight planning facilities checked for updated manuals, documents and access to relevant flight information			
Incident reports evaluated and reported to the appropriate competent authority			
Ground Handling			
Contracts with ground handling organisations established and valid, if applicable			
Instructions regarding fuelling and de-icing issued, if applicable			
Instructions regarding dangerous goods issued and			

EXAMPLE

Ref: https://www.easa.europa.eu/document-library/easy-access-rules/online-publications/easy-access-rules-air-operations?page=17#_Toc338749455

3.6 Flight Data Analysis (IS-BAO Only)

<u>3.6.1</u> The organization should establish and maintain a documented flight data analysis (FDA) programme as part of its safety management system. The FDA programme should include, at least, the following:
a. Provisions for secure download and transfer of flight data,
b. Assurance of confidentiality of participants' data,
c. Identification of key metrics and appropriate thresholds based on aircraft type and mission,
d. Analysis of findings via the SMS for appropriate corrective actions, and
e. Implementation of corrective actions into flight operations and/or maintenance procedures and provisions for the evaluation of the effectiveness of those corrective actions.
(Recommended Practice)

Note 1: Flight data analysis programmes are also known as flight data monitoring (FDM) or flight operational quality assurance (FOQA) programmes.

Note 2: The FDA programme should be an integral part of the organization's SMS.

<u>Explanation</u>:

Note that this item is not N/A just because the operator chooses not to implement this recommended practice if the technology exists for their fleet.

Half a century ago, the first efforts to certify CAT III autoland capability in airliners meant that new types of quick access recorders (QAR) and software had to be developed to monitor and validate autopilot performance in daily operations. The industry almost immediately realized that this innovation could also be used to monitor all phases of flight and to identify any flight path deviation or any exceedance of specific parameters. However, legitimate concerns about the variability of human performance and particularly about the potential for misuse of data already were and still are a top priority for regulators, air operators, pilots and pilot associations. Hence the absolute necessity of clearly and comprehensively documenting any FDA Programme. Ideally, this would include at its core a Memorandum of Understanding (MoU) or a similar type of written agreement that will formalise clear expectations and infrangible boundaries. Moreover, guaranteeing confidentiality and anonymity can be difficult if not impossible in small and medium organisations. This makes the need to define clear policies, processes and procedures on the use and protection of FDA data and analyses even more essential. Regardless of the size and/or complexity of the operation or of the FDA programme, due consideration needs to be given to the role(s), responsibilities, and privilege(s) granted to, or requested by, any external entity provider (e.g., flight data analysts, cloud storage, etc.).

When designing and implementing an FDA programme, operators should not only foresee its 'routine' use, but also the possibility that FDA data might be sought as part of an internal investigation, an official accident investigation by an independent body, or even in legal proceedings. Although ample guidance material is publicly available (see the references, below), specialised legal advice is nevertheless recommended to ensure regulatory compliance and to

achieve the best consensus on the transparency, confidentiality, and effectiveness of the FDA programme.

Although not specifically addressed in this Recommended Practice, operators should bear in mind that FDA equipment must remain airworthy, serviceable, and reliable in terms of data quantity and quality. If FDA is implemented, appropriate inspections and functional checks need to be incorporated, as per OEM instructions, into the relevant maintenance control system and documentation, including the MEL.

Moreover, the term 'flight data' shouldn't be understood as restricted to flight parameters such as speed, altitude, etc. Some flight recorders now have the capability of recording audio and video as well.

Other essential FDA programme elements include, but are not limited to:

a) Secure download and transfer: while the traditional method of downloading flight data through cables remains common, technology now also offers wireless and datalink options. In any case, operators should have robust processes and procedures detailing who can (or cannot) access, transfer, store, process, and/or destroy data, but also when, and how. Electronic devices and/or external entities that store, even temporarily, sensitive data should be addressed as well, including on the ownership of the data.

b) Confidentiality of participants' data: the integrity and success of an FDA programme rest on the protection and appropriate use of sensitive data, and therefore on establishing and maintaining trust between management and flight crews. In addition to the technical processes and procedures dealing with practical aspects, operators should also have a policy that restricts access to authorised persons only. Several scenarios need to be considered to protect the confidentiality and/or anonymity of the staff involved, including possible unethical or illegal use.

c) Key metrics and thresholds based on aircraft type and mission: it is not uncommon that a breaking in period is necessary before the full potential of FDA is achieved, as not all default or 'factory' values, triggers, and thresholds in FDA software may prove useful and suitable from day one. It may even be that raw data from an uneventful flight (without any sort of caution or warning message on the flight deck) triggers the FDA software for unclear reasons. The level assigned to each exceedance (typically limited to one of three possible levels depending on the importance of the deviation) is another topic where operators could also change settings, assuming it is done within reason and backed by evidence. Moreover, operators are encouraged to not only seek exceedances, deviations, and known contributing factors to them, but to also consider when important safety functions or actions are performed well. For instance, tracking adherence to SOPs in normal operations can also provide useful information and allow to positively reinforce good practices. Other examples would be to track the percentage of departures or approaches where nothing happens or the percentage of flights where a full flight control check was performed before take-off, etc.

d) *<u>Analysis of findings via the SMS</u>: insights gained from FDA can provide valuable material and inputs for SMS processes related to safety risk management (i.e., hazard identification and risk management) or safety assurance (e.g., identifying and monitoring pertinent safety metrics, safety performance indicators, etc.). On the other hand, operators shouldn't stop at flight parameters but also seek and include, when available and appropriate, qualitative data from narratives, discussions, and interviews that provide valuable context for the event(s) being considered, including from external sources (e.g., ATS/ATC, especially if covered by a formal agreement to exchange safety information through each organisation's SMS).*

e) *<u>Implementation of corrective actions into flight operations and/or maintenance procedures and provisions for the evaluation of their effectiveness</u>: FDA supports organisational learning and is very likely to drive change in more than one area or department of an operator. Flight operations (e.g., SOP) and flight crew training are amongst the first that naturally come to mind; however, FDA may also positively impact maintenance processes or procedures, even if no operational deviation took place (e.g., a high turbine temperature is repeatedly recorded, or doubts exists whether a firm landing was outside the G limit or not, etc.). Depending on the case, it may also be pertinent to launch a formal Management of Change process to guide such effort. When potential corrective actions focus on one or several individuals, for instance if additional simulator or flight training is considered to improve their flying skills, it is commonly recommended to seek their inputs, feedback, and suggestions before even taking a decision on those actions.*

There have been a few instances where an air operator considered that they had implemented a Flight Data Analysis programme solely based on flight crew reports. Before discussing the pros and cons of this approach, it should be noted that none of the regulations, standards, or recommended practices dealing with FDA foresee the possibility that aircraft are ***not*** *equipped with recorders specifically designed to acquire and store in-flight parameters. Reliance solely on pilot reporting is not considered to meet this recommended practice. Airworthy and fully functioning recorders (Flight Data Recorders (FDR) or Airborne Data Recording Systems (ADRS)) are therefore required to conform with IS-BAO 3.6.*

Regarding the value of recording in-flight parameters and other pertinent information by flight crews, it is undeniable that pilots can memorise some information, including during phases of flight with a high workload. For instance, if pilots recognize that their final approach is unstable, they will almost certainly be able to still remember why they performed a go-around when a reasonable opportunity to write a report about it presents itself (i.e., once the aircraft is parked). Considering the potential for organisational learning that this feedback can offer, such accounts from daily operations are valuable and should be encouraged and welcomed. However, operators should also be cognizant of potential pitfalls, including:

- *<u>On the quantity and quality of in-flight data</u>: in comparison with modern FDR/ADRS that can acquire and store hours of hundreds of parameters several times per second, humans will of course only provide a mere fraction of that. The accuracy of this 'hand-picked'*

data will probably be problematic at varying levels as well (e.g., wrong figure(s), patchy set of data, no reliable and consistent timestamping, etc.).

- *<u>From cultural influences</u>: whether an event is reported throughout an organisation or not will heavily depend on its culture. For instance, when the organisational culture is built on blame, displaying authoritarian tendencies, and/or seeking the wrong kind of excellence by repeatedly letting production pressures overstep safety requirements and SOP, it would not be surprising if bad news such as simply performing a go-around were quickly suppressed by the flight crew involved in the event (although this is not bad news per se and should rather be seen as a normal procedure). Conversely, organisations with a culture that welcomes any type of news as raw material for organisational learning (i.e., where there are no more good news or bad news, but just news), reports of go-arounds are much more likely to be met with gratitude and curiosity, thereby maintaining, if not encouraging, a virtuous cycle of open reporting and continuous improvement. As the saying goes, "managers who don't listen end up surrounded by people who don't talk" and learning opportunities gradually evaporate.*
- *<u>On safety performance measurement and monitoring</u>: some safety metrics may lose their relevance once a target is set (e.g., with an SPT). As stated in ICAO Doc 9859, safety reporting is an example of when having a target could either discourage people to report if the target is not to exceed a number or encourage them to report trivial matters to meet a target if the target is to reach a certain number.*

To summarize, FDA can yield substantial benefits to safety and operational efficiency. Collecting in-flight data without the proper equipment may also be a good first step to build a case towards implementing a fully-fledged FDA programme. However, operators need to keep in mind the inescapable and significant limitations of this non-standard approach.

<u>Assessment criteria (if 3.6 applies)</u>:

Preaudit:

1. *Review the operator's documentation on FDA considering any pertinent regulatory requirement and/or guidance material (e.g., confirm that all aircraft that must be covered by an FDA programme are indeed part of one),*

Onsite:

2. *Review recent analyses, reports, and meeting minutes where evidence can potentially be found that insights from the FDA programme were collected and led to safety improvements or at least to launching initiatives going in that direction (e.g., immediate returns on investments in FDA are not always possible),*
3. *Verify the appropriateness of the maintenance control system and maintenance programme(s) concerning on-board recorders,*
4. *Discuss programme elements with various staff members,*
5. *Check available FDA programme records for consistency, completeness, and integrity.*

References

EASA. (2021). European Operators' Flight Data Monitoring Forum. Link
FAA. (2004). Advisory Circular AC 120-82. Flight Operational Quality Assurance.
ICAO. (2018). Annex 6, Part I.
ICAO. (2016). Annex 6, Part III.
ICAO. (2018). Doc 9859. Safety Management Manual (4th Edition).
SKYbrary. (2019). Flight Data Monitoring. Link
UK CAA. (2017). CAP 379 – Flight Data Monitoring.

4 Emergency Response Plan

Introduction:

An ERP is not just about accidents or incidents, it should address utility failures, natural disasters, contagious illness outbreaks, bomb threats, workplace violence—in other words, it should be a "what do we do if" guide. The first priority is always the safety of personnel and equipment, the second priority is the stabilization of the incident. The actions taken in the initial hours of an accident or incident are critical. An employee who is unprepared to respond to an emergency is a complication and potential hazard.

Overview:

An operator's emergency response plan (ERP) is an essential element of operational and safety planning. It should be created with the specific risks encountered by the operational profile, as well as taking into account non-operational issues. For example, operators in tropical locations generally include natural disaster planning, such as response to hurricanes, flooding, and even volcano eruptions. Other operators have found that nearby entertainment events can create unforeseen hazards, such as violence at a large event located near an operator's base of operations.

This guidance provides information about all different facets of planning, exercising and updating an ERP. For a larger operation, the ERP may be a separate manual, however, smaller operators may include the ERP within other manuals, such as their SOP or operations manual. It is recommended that the ERP include consideration of the interface with other response plans, such as a corporate emergency response, or local/regional disaster management plans. The ERP should set out the responsibilities, roles, and actions for personnel involved in dealing with emergencies as well as the various agencies and/or organizations with which the operator may have to interface. The content of an ERP will vary from organization to organization, but overall may include the following elements, as relevant:

A. Awareness, Confirmation and Magnitude Confirmation Processes
    a. Instructions for the front-line reception areas and/or published phone numbers
    b. Initial communication/notification form
    c. Mechanisms for confirming it is the company aircraft/facility/or employees
    d. Initial magnitude assessment (to ensure the proper escalation protocol is followed for minor, moderate, or major events
B. Initial Response should include:
    a. Tiered notification according to the event magnitude of company personnel;
    b. Identification of person in charge of the response;
    c. Formation of the initial response team;
    d. Identification of the operator's spokesperson at the accident site;
    e. Determination of special equipment, clothing, documentation, transportation, etc.;
    f. Interface with local authorities.

C. Establishment of a crisis management center:
   a. In some instances, it may be necessary to establish a separate crisis management center. In this case, the operator should detail the steps needed to move from normal operations to emergency operations.
   b. Considerations include
      i. Location, communications capabilities, and equipment, other supplies and equipment needed for the response;
      ii. Staffing, possibly 24/7 during the immediate aftermath of an accident;
      iii. How to secure company records relevant to the emergency;
      iv. Use of emergency activity logs;
      v. Availability of reference documents, such as emergency response checklists, manuals, airport or other emergency response plans, telephone lists, etc.

D. Transition from normal operations to emergency response:
   a. The operator should have a procedure to determine whether or not regular operations can continue.
      i. If not the plan should detail how that will be accomplished.
      ii. If operations will continue during the emergency response, the plan should detail the separation of the two modes of operation and include a plan for continued risk assessment on the decision to continue operations.

E. Securing the accident/incident site: The ERP should clarify aspects of the following actions and activities at the accident site:
   a. The first priority is how to care for the people involved in the accident or incident and securing/preserving the site, including the aircraft and any wreckage.
   b. Identify a senior company representative at the accident site.
   c. The ERP should include guidance regarding how to interface with state or local authorities who have authority over or access to the accident site.
   d. How to respond to the needs of victims' relatives.

F. Records and Information: The ERP should detail
   a. how all records related to the event will be secured (aircraft, aircrew, manifests, the operation, etc.).
   b. Records of communications in and out of the organization, including contact information.
   c. Tracking of statements or interviews with anyone associated with the event.
   d. Media interface records, including
      i. Protection of information that is protected by statute (ATC recordings, flight data, witness statements, etc.).
      ii. Designation of person(s) who may interface with the media, how and when.
      iii. Oversight of information on social media platforms.

G. Family and employee assistance is a critical part of any accident or serious incident response. If the operator works with an external entity for family and workplace

assistance, the ERP should include information about how to get in touch with them as well as how to set up resources for family, relatives and company personnel.

H. Post-accident/incident review: The ERP should direct the operator to conduct post-occurrence debriefing and document lessons learned. These may result in changes to the ERP and its checklists.

I. Transition from emergency to normal operations: After the event has been resolved, the operator should have in place a plan for returning to normal operations. This should include: provisions for unwinding the crisis management center; cleanup of the accident/incident site when allowed; continued communication and coordination with the media and any authorized agencies; provision of post-event support for personnel as they return to normal operations, and any other applicable actions required for return to normal.

4.1 ERP Contents

4.1.1 The organization shall establish a plan detailing the procedures to be followed in the event of an accident or incident involving substantial damage to aircraft or injury to passengers, crew members or persons on the ground.

Explanation:

Operators must establish and maintain their plan of action in the event of an accident or incident that includes substantial damage to aircraft or property, or injury to passengers, crew members or persons on the ground. The plan should have at its foundation any emergency response criteria required by the operator's civil aviation authority. Aviation risk planning involves taking into account these high-stress situations so that personnel who are involved are aware of their roles and know the procedures prior to such an event. Note that further details about the content of the ERP are included in section 4.1.4.

Assessment criteria:

Preaudit:

1. Review the written ERP document for accident/incident procedures.
2. Review the responsibilities and forms included in the response plan.

Onsite:

3. Ensure copies of revisions (written or electronic) of the ERP are the current edition and accessible on portable devices.
4. Interview personnel for awareness of the content of ERP for operational risks.

4.1.2 ***The organization should include in their ERP procedures for dealing with other forms of emergencies that could affect personnel or facility safety, as well as business continuity, such as utility failures, natural disasters, medical emergencies, contagious illness outbreaks, bomb threats, or workplace violence. (Recommended Practice)***

Explanation:

An operator's emergency response plan (ERP) is an essential element of operational and safety planning. It should be created with the specific risks encountered by the operational profile, as well as taking into account non-operational issues. For example, operators in tropical locations generally include natural disaster planning, such as response to hurricanes, flooding, and even volcano eruptions, while other operators in drought-prone areas may have to address issues related to fires or extreme heat. Other operators have found that nearby entertainment events can create unforeseen hazards, such as violence at a large outside event located near an operators base of operations.

ERP sections dedicated to non-operational emergencies should include the same basic information as for an aircraft accident or incident, however, it should include information specific to the risk, such as interface with firefighters, or interface with police or other agencies. See section 4.1.4 for further information on ERP contents.

An ERP may be in written or electronic form. If it is maintained electronically, the operator should ensure that the electronic copy is readily available on electronic devices. If the operator has both written and electronic formats, there should be a process to ensure both formats are current.

Assessment criteria:

Preaudit:

1. *Review the written ERP document for identification of non-operational risks and emergency procedures.*
2. *Review the responsibilities and forms included in the response plan.*

Onsite:

3. *Ensure copies of revisions (written or electronic) of the ERP are the current edition and are accessible to appropriate personnel.*
4. *Interview personnel for awareness of the content of ERP for non-operational risks.*

4.1.3 The emergency response plan shall address incidents involving injuries to, or serious medical problems suffered by, passengers, crew members, visitors, or company personnel.

Explanation:

Operators must establish and maintain their plan of action for incidents involving injury or serious medical problems to passengers, crew members, visitors or company personnel. This can be contained as one section of the ERP, or can be further broken down to such incidents 1) involving aircraft but with no damage to the aircraft (e.g. inflight illness), or 2) not involving aircraft at all (e.g. injury to passenger, client or personnel at the operator's facility). Note that further details about the content of the ERP are included in section 4.1.4. For the most part, the response will follow the aircraft accident/incident in 4.1.1 but may involve first responders that normally are not involved in aircraft incidents. This type of incident could come from non-aviation related activities: driving passengers or personnel or cargo, activity in company facilities, issues arising from outside events, etc. Think broadly about the possible hazards and risks the operator faces in order to determine appropriate response plans.

Assessment criteria:

Preaudit:

1. Review the written ERP document for accident/incident procedures
2. Review the responsibilities and forms included in the response plan

Onsite:

3. Ensure copies of revisions (written or electronic) of the ERP are the current edition and are accessible to appropriate personnel.
4. Interview personnel for awareness of the content of ERP for operational risks.

4.1.4 The emergency response plan shall include, as applicable:

a. Depending on the nature and location of the accident, procedures for the organization and/or flight crew to notify the appropriate authorities in the State of the operator and in the State where the accident occurred, and to seek medical assistance, as required;

b. Provisions to establish an Emergency Operations Centre and ensure all necessary administrative supplies (such as forms, paper, name tags, computers/laptops, as applicable) and critical telephone numbers and contact details (such as doctors, local hotels, translators/linguists, caterers, as applicable) will be available;

c. Procedures to notify appropriate company personnel of the accident, incident, or other event;

d. Procedures regarding communication with the emergency contacts of the person(s) involved in the accident, incident or other event;

e. On-site procedures to be taken by the flight and cabin crew to assist aircraft passengers, prepare visual distress signals (if in a remote area), and preserve the integrity of the accident site;

f. Procedures for the preservation of all related flight data and cockpit voice recorder records and, if necessary the associated recorders, as well as their retention in safe custody pending their disposition to the appropriate authorities;
g. Procedures for dealing with questions from and providing assistance to the families of passengers, crew members or other person(s) involved in the event;
h. Procedures for dealing with enquiries from the media, including use of social media;
i. Procedures for participating or co-operating with State agencies and police authorities who may be investigating the accident;
j. Considerations for dealing with the effects of the accident on the organization's operations and on employees (i.e. trauma counselling services and other crises intervention support for persons involved or affected by the event);
k. Actions to be taken by external entities in the event of any emergency situation that may arise; and
l. Business continuity procedures that provide for the orderly and efficient transition from normal to emergency operations, and the return to normal operations.

Explanation:

The ERP should include the company policies and priorities, governing laws and regulations for investigations, interaction with local agencies and authorities, and media relations. It should also include specific designation of responsibilities, and include as appropriate to the size of the operation:

- a description of the organizational flow of responsibility, reporting lines of authority, and communications processes;
- designation of response teams and team leaders;
- definition of roles and responsibilities of personnel involved in the response;
- instructions for establishing a crisis management center, if applicable;
- communications procedures for handling incoming requests for information from media, government agencies and authorities, and interested parties;
- designation of a spokesperson for interacting with the media;
- identifying resources available for financial needs for immediate concerns such as family needs, travel etc.;
- designation of the company representative for any formal investigations by State officials;
- a notification and communications plan for key personnel; and
- contact information for any family assistance programs available.

The operator should consider the following items, as applicable, for inclusion in the ERP. Note that this explanation is an introduction to what the contents of the ERP should be, but there are many materials, such as those referenced in the note to this section, that the operator can refer to for further details and examples that can assist them in developing their own ERP.

a. Notification of authorities
    i. Procedures should include who, when and how notification of state and local authorities, as relevant, will take place.
    ii. The ERP should also contain information on where, when and how medical assistance can be sought.
    iii. Checklists and forms should contain current contact information for all potential participants in the response, such as civil aviation regulators and investigation agencies, police, search and rescue organizations, etc.
b. Procedure to establish an emergency operations centre:
    i. In some instances, it may be necessary to establish a separate crisis management/operations centre. In this case, the operator should detail the steps needed to move from normal operations to emergency operations.
    ii. Considerations include
        1. Location, communications capabilities, and equipment, other supplies and equipment needed for the response;
        2. Staffing, possibly 24/7 during the immediate aftermath of an accident;
        3. How to secure company records relevant to the emergency;
        4. Use of emergency activity logs;
        5. Availability of reference documents, such as emergency response checklists, manuals, airport or other emergency response plans, telephone lists, etc.;
        6. Designating a corporate spokesperson for media inquiries.
c. Notification of company personnel:
    i. Internal notification procedures should be established to include an expeditious means of informing senior management and all other staff. Some options include group emails, telephone calling trees, or other communication methods.
d. Communication with emergency contacts of those involved
    i. The ERP should incorporate a means of having quick access to the emergency contact information for those involved in their operations, should the need arise to contact those contacts, and include information about who will contact them and what message will be conveyed.
        1. Note: if an operator is conducting an emergency response exercise, it is important to ensure that participants in the exercise know that they need to preface any communications with a statement that clearly states that this is a drill or not an actual emergency.
    ii. Emergency contact information can be contained in permanent files for those operators flying regularly with the same passengers, or through a manifesting type system that includes this information.
e. Onsite procedures
    i. The ERP should clarify aspects of the following actions and activities of the flight and/or cabin crew at the accident site:

1. The first priority is how to care for the people involved in the accident or incident and securing/preserving the site, including the aircraft and any wreckage.
2. Preparation of visual distress signals (if in a remote area), and preserve the integrity of the accident site.
3. Preservation of flight data and voice recorders.
4. Guidance regarding how to interface with state or local authorities who have authority over, or access to the accident site.

f. Governing laws may require the protection and preservation of flight data and voice recorders. The ERP should describe:
   i. What records, equipment and/or information need to be preserved;
   ii. Who is responsible for protecting those items;
   iii. Where the items may be found and where they should be placed for preservation;
   iv. Instructions for special handling requirements, as applicable.

g. Assistance to families of those involved in the accident
   i. Family assistance is a critical part of any accident or serious incident response. If the operator works with an external entity for family assistance, the ERP should include information about how to get in touch with them as well as how to set up these resources.
   ii. In some countries, there are agencies whose job it is to support operators in these situations. For example, in the United States, the NTSB has a dedicated family assistance team. In some cases, it may be required that an operator bring this team in to assist. Whether or not it is required, it is a valuable resource that operators can consider as part of their response plan.

h. Media relations, including social media use
   i. It is important to include a plan for how the organization will interact with news media inquiries as well as with social media posts. The media relations plan should include at least the following items:
      1. Designation of the person authorized to speak to the media;
         a. This can be an internal representative or
         b. A designated media specialist.
      2. Prepared statements for personnel answering inquiries from the media that direct the media to the proper company representative;
      3. Description of information that is protected by statute (including the flight data and voice recorders, among others);
      4. What the timing will be for initial statements to the media;
      5. Provisions for follow-up communication to the media;
      6. Guidelines for response to social media posts, across platforms
   ii. The ERP should contain guidance for personnel who are not authorized to interact with media to ensure they are aware of the above elements, and that they know that they are authorized only to direct such inquiries to the designated media representative.

i. Cooperation with state and local authorities

i. Contact information in the ERP should include current contact for all state and local authorities.
ii. The ERP should designate:
    1. who and when the state and local authorities will be notified, taking into consideration any legal requirements for notification by the CAA or other authorities;
    2. who will be the primary liaison between state and local authorities at the site, or any other location;
    3. as applicable, if there are any limits to the extent of the operator's participation in the response and/or investigation.

j. Employee and organizational post-event assistance
    i. Workplace assistance following an accident or incident is a critical part of emergency response planning, to ensure the well-being of the organization and its personnel going forward. Even those personnel who were not directly involved in the event may be impacted by it. Considerations involve providing post-event support, counseling, and other relevant services as needed. The ERP should include information about who the operator works with for workplace assistance, how to get in touch with them and setting up resources for personnel.
    ii. Other considerations for organizational post-event assistance include planning for dealing with impacts of the event, such as financial issues, equipment losses, insurance, maintenance among others.

k. Emergency Service Providers
    i. The ERP should include information and contracts for any external entities that may be included in the emergency response, including
        1. Fixed base operators;
        2. Media support organizations;
        3. Insurers;
        4. Search and rescue organizations;
        5. Specialized services; and
        6. Others as applicable.
    ii. External entities include those organizations or people with whom the operator interacts, but that are not a part of the operator's organization. Note that some vendors, for example, a media response team, might also interface with other parties as well. This should be a full system consideration and taken into account in the ERP.

l. Business continuity: After the crisis response is over, the operator will have to determine the best method for a return to normal operations. This will include a plan to close down any emergency response centers, ensure that operational control is well established and that the organization has no impediment to resuming normal operations, and ensuring the continued operation of aircraft is appropriately risk assessed.

Assessment criteria:

Preaudit:

1. Review ERP sections to ensure conformance to the protocols.

Onsite:

2. Interview personnel to ensure understanding of the ERP procedures and their roles.

4.2 Information for Rescue Coordination

4.2.1 (A) An operator of aeroplanes shall have a process to ensure that updated information on all on-board emergency and survival equipment is available for immediate communication to rescue coordination centres. This information shall include, as applicable to each aeroplane, at least:

a. The number, colour and type of life rafts and pyrotechnics;
b. Details of emergency medical supplies and water supplies; and
c. The type and frequencies of the emergency portable radio equipment.

Explanation:

Aeroplane operators are required to maintain an updated, itemized list of on-board emergency and survival equipment that includes, at a minimum, life raft, pyrotechnics, emergency medical and water supplies, the information about any emergency portable radio equipment carried, and any other emergency equipment carried. This information should be in a form and location such that it can be made available without delay to rescue coordination centres so that the responders are fully informed as to what resources are available to those involved in the incident/accident. Note that the content of a flight plan, ICAO or otherwise, may not meet the requirement of this section unless the operator ensures the information required by the standard, and which are not specifically asked for by the flight plan form, are added to the contents of the flight plan.

Assessment criteria:

Preaudit:

1. Review the operator's process for collecting and updating this information for each flight for which this is applicable.

Onsite:

2. Interview personnel responsible for the process of collecting and updating this information. It is recommended that a demonstration of this be conducted to ensure that the process contains the required information.
3. Inspect aircraft to confirm the presence of emergency and survival equipment onboard matches the contents of the itemized list.
4. Interview personnel involved with emergency response to ensure knowledge of how and when to get this information to emergency response personnel.

4.2.2 (H) ***An operator of helicopters should have a process to ensure that updated information on all on-board emergency and survival equipment is available for immediate communication to rescue coordination centres. This information should include, as applicable to each helicopter, at least:***

- ***a. The number, colour and type of life rafts and pyrotechnics;***
- ***b. Details of emergency medical supplies and water supplies; and***
- ***c. The type and frequencies of the emergency portable radio equipment. (Recommended Practice)***

Explanation:

It is recommended that helicopter operators maintain an updated, itemized list of on-board emergency and survival equipment as appropriate to the operations being conducted. This equipment could include, as applicable, life raft, pyrotechnics, emergency medical and water supplies, the information about any emergency portable radio equipment carried, and any other emergency equipment carried. This information should be in a form and location such that it can be made available without delay to rescue coordination centres so that the responders are fully informed as to what resources are available to those involved in the incident/accident. Note that the content of a flight plan, ICAO or otherwise, may not include this information and may need to be added to the contents of the flight plan.

Assessment criteria:

Preaudit:

1. *Review the operator's process for collecting and updating this information for each flight for which this is applicable.*

Onsite:

2. *Interview personnel responsible for the process of collecting and updating this information. It is recommended that a demonstration of this be conducted to ensure that the process contains the required information.*
3. *Inspect aircraft to confirm the presence of emergency and survival equipment onboard matches the contents of the itemized list.*
4. *Interview personnel involved with emergency response to ensure knowledge of how and when to get this information to emergency response personnel.*

4.3 ERP Training and Exercises

4.3.1 The organization shall provide role-specific training to personnel who have a role in the ERP.

Explanation:

Personnel whose duties include participating in response to an accident or incident, of any kind, should have specific training as to the extent and breadth of their responsibilities in the event of the emergency response plan being activated. The training should incorporate the required information at the level of their responsibility. For example, front line personnel will need to be informed as to their specific obligations if there is an emergency, to include, as applicable, the lines of communications, media response, care of passengers, clients, and others involved, etc. Senior management will have different responsibilities in terms of communicating within the organization, decision-making, and oversight of the response. Department heads may have department specific duties during an emergency response. The organization should assess the roles of each member of its team to determine the appropriate assigned responsibilities. Training should occur along with other indoctrination training when someone is hired, and recurrent training should take place at regular intervals after that. Exercise of the emergency response plan is a separate element of training, in that the exercise is where each member of the response team will have the opportunity to practice what they learned in their training. Exercise of the emergency response plan is addressed in section 4.3.3.

Assessment criteria:

Preaudit:

1. Review manuals to ensure that the training requirement is documented.
2. Review training syllabi for personnel involved in emergency response to ensure that role-specific training is included for initial and recurrent training.

Onsite:

3. Review records of training to ensure that the training required by this section has taken place.
4. Interview personnel about their roles in the event of an emergency to ensure that they received the required training and are knowledgeable about their roles in an emergency. Include questions about their participation in any emergency exercises the operator may have conducted, or in any actual events where the ERP was activated.

4.3.2 ***When resources allow, the organization should appoint alternates to each key ERP role and train them to the same capacity as the primary. (Recommended Practice)***

Explanation:

Despite the best-laid plans, it is always possible that key personnel are not available when an actual emergency arises. It is therefore imperative that there are assigned alternates for each role within an ERP and that those alternates are trained for this circumstance. Exercises (discussed below) should include scenarios where certain roles are not filled due to the absence of an assigned person, or where the assigned person can't access the location where they are needed. An example of this is to see what would happen if someone assigned to a key role in the response for an operator in a tropical location is cut off from the base of operations due to flooding. The operator may have someone else who lives at a different location who can fulfill that role instead, or perhaps there is a plan to set up a remote base to coordinate with the rest of the company. The goal is to ensure that all roles are filled and that personnel know how to adapt under these circumstances.

Assessment criteria:

Preaudit:

1. *Review the ERP and ensure that it includes alternate assignments for key roles, where resources permit.*

Onsite:

2. *Interview personnel to ensure understanding of their assigned and alternate roles.*
3. *Review training records to ensure the required training has been conducted with the appropriate personnel, in all assigned roles.*

4.3.3 The organization shall conduct an emergency response exercise, on at least an annual basis, in order to evaluate the effectiveness of the organization's emergency response plan. These exercises shall:

a. Include participation of other organizations involved in the ERP (where applicable); and

b. Include scenarios to address potential failures in the execution of the ERP (e.g. absence of key personnel, power supply shortages, communications failures, etc.), to identify contingency plans necessary for the safe conclusion of an actual emergency situation. Particular emphasis should be placed upon ensuring the operational reliability and compatibility of all communication equipment designated for use during an incident.

Note 1: The annual ERP exercise may be conducted as a "table-top" procedure.

Explanation:

Regular exercise of an operator's emergency response plan is essential to ensure that the intent behind the plan is backed by operational capabilities. This enables an operator to ensure that the ERP is effective and that personnel maintain familiarity and currency with the task required by the plan. In addition, it ensures that new personnel are informed about the plan and how it works. Exercises and Drills can take into account various "what-if" situations to address areas that could possibly fail. "Drills" are not the same thing as training as they run in real time, exercises may include a training component. The training required by 4.3.1 is a separate requirement of the IS-BAO.

Some portions of the ERP can be tested by the use of 'tabletop' exercises. These can include, for example, talking through a scenario to practice communications, notification, and identification of roles across affected organizations, including external entities with whom the operator may interface in the event of an emergency or urgent situation. This would include, among other things, ensuring that communications with other parties are working and that there are contingencies in place should unexpected hurdles to the ERP arise. Operators can also exercise their ERP by working specific parts of the ERP, such as the first stages of the activation checklist, or the onsite response, or just the call list. These kinds of exercises don't require a significant time commitment but allow for more frequent practice.

Other areas of an ERP have a broader reach and should be exercised with a more formal exercise, so that activities onsite, that involve other operators, agencies and authorities, can be practiced with those parties to determine where the plan works and where the plan has deficiencies. This allows for revision of the operator's plan as well as ensuring that the plan is adapted so that it works with the ERPs of other organizations involved in the response, recovery and resolution phases of the emergency.

In situations where an event occurs that triggers the use of the ERP, credit can be given for this as an exercise provided the lessons learned from the event are documented and utilized for continuous improvement purposes. This is not a substitute for an actual exercise but can enhance the continuous improvement of the response plan.

Assessment criteria:

Preaudit:

1. Ensure the ERP includes a regular schedule for ERP exercises.

Onsite:

2. Review records of past exercises and results.
3. Review ERP revisions for the inclusion of lessons learned.
4. Ensure there is a record of interaction with other organizations involved in the ERP.
5. Interview personnel regarding ERP exercises and exercises.

<u>4.3.4</u> A full simulation exercise of the ERP should be conducted at least every thirty six months. (Recommended Practice)

<u>Explanation</u>:

In addition to the regular exercises and exercises discussed in 4.3.3, it is recommended that the operator participates in a full simulation exercise every 36 months if possible. Full simulation (or full scale) exercises involve all of the other parties that an operator might engage within the event of an actual emergency. These are multi-agency, multi-jurisdictional, multi-discipline exercises that involve practicing response from both the function of the coordination among those parties involved, command and control between multi-agency coordination centers, and the practical actions required of first responders and others affected by the scenario being exercised. These types of exercises require a significant amount of time required to plan and execute a full simulation exercise, however, they are exceptionally beneficial to ensure a coordinated approach to responding to an emergency. Often these types of exercises are organized by an airport or first responder groups. If the operator has not participated in a full-scale exercise, explore whether there are options for this type of event.

<u>Assessment criteria</u>:

Preaudit:

1. *Determine if there is a documented plan for a full simulation exercise.*

Onsite:

2. *If the operator has participated in a full-scale exercise:*
    a. *review records of those exercises;*
    b. *interview relevant personnel about their participation in the exercise.*

<u>4.3.5</u> The organization shall document lessons learned from the ERP exercises and implement them for improvement of its ERP.

<u>Explanation</u>:

As part of the continuous improvement process for an ERP, regular exercises should be conducted. There are a variety of exercise types and the operator can choose which type to use. These can range from tabletop to functional exercises, to full simulation exercises which include external entities. Records of these exercises should include a description of the exercise, results of the exercise, lessons learned and identification of areas of improvement or change. Revisions of the ERP should reflect changes resulting from lessons learned.

Note that events that arise in the course of operations that trigger the execution of an operator's ERP can be included, after the fact, as opportunities for training and incorporation of lessons learned. For example, if an operator has a precautionary landing that results in an overdue aircraft, triggering the ERP, but the process is called off after the pilot contacts the operator with

the information about the precautionary landing, the operator can assess and debrief the response for lessons learned and any revisions to the plan.

Assessment criteria:

Preaudit:

1. Ensure ERP includes requirement to document lessons learned.

Onsite:

2. Interview personnel about ERP exercise and lessons learned.
3. Review records of ERP exercises for documentation of lessons learned.
4. Review revision history to ensure that revisions reflecting lessons learned from exercises.

5 Security

5.1 Security Programme

5.1.1 The organization shall establish, maintain and carry out a security programme that is proportional to the threat against the organization, its personnel, aircraft and facilities and the associated vulnerabilities and which meets the requirements of the State of the operator.

Note: It is important to recognize that a US Twelve-Five Standard Security Programme (TFSSP) does not address all of the areas required by the Standard and must be augmented by the development of processes and procedures in the organization's manuals.

Explanation:

Business aviation operators are involved in a wide range of operational activities, from flying in remote locations to global travel to operations into war zones. Their passengers' profile may also greatly vary, from the general public (for example, flightseeing or charter passengers) to company staff to celebrities to heads of state and their entourage. Baggage, cargo and/or equipment placed on board an aircraft may also pose considerable security risks. The security programme of each operator will therefore have to be tailored to their particular needs and to be constantly reviewed as the threats evolve. The focus for the security programme should include a continuous assessment of the following areas, and others as applicable.

While an operator engaging in commercial operations will have different needs than those operators providing non-commercial operations, carrying private parties, or operating in remote environments, the considerations should include identification of areas of threats and vulnerabilities specific to the organization and its operations. These include assessing the risks, both inflight and on the ground, of the geographic locations of the operation, information about passengers carried and personnel working for the operator, specific requirements for the airport or heliport or other base of operation, vetting of lodging and ground transportation for crew and passengers, as well as ensuring local, national and international requirements are met. The key is that the operator's programme is designed for the threats and vulnerabilities of that specific organization, whether those are permanent, changing or emerging.

Some key elements to include in a security programme, as applicable, include among others:

- A description of the programme objective based on the operation and the applicable local, national and/or international requirements;
- Description of roles and duties of those involved in the security programme. This could include information about the operator itself as well as any other organizations that may be involved with these security interests, such as an airport security department, law enforcement or other governmental security organizations, etc.;
- Information about communication channels;

- Security information for the protection of aircraft, personnel, passengers, baggage, catering, cargo, facilities, cybersecurity, and other items as applicable;
- Security related training requirements.
- Consideration should also be given to cyber security for both preventive and responsive measures to such a security breach.

It is important to note that a security program that meets the requirements of a Civil Aviation Authority will not automatically meet the requirements of this section. The organization must consider additional threats or vulnerabilities that may apply to its operations, such as operating in an area of regional or national conflict and how the organization will ensure protection of its crew, passengers, aircraft, etc., or needs related to exposure when operating in remote environments such as jungle, desert, or mountainous/glacial locations.

Operators with multiple registries must ensure that they meet any applicable security programme related to each registry.

Assessment criteria:

Preaudit:

1. Review documents to ensure that the operator has a security programme established that addresses the unique threats and vulnerabilities for their organization and operation.

Onsite:

2. Interview personnel to ensure understanding of and compliance with the security programme.
3. If possible, review relevant documents or logs for operational compliance with the programme.

5.1.2 The security programme shall include:

a. A process to assess threats and vulnerabilities;
b. Preventive measures designed to reduce vulnerabilities and deter and prevent the commission of unlawful acts;
c. Responsive measures to be taken when an unlawful act has been committed against the organization; and
d. Appropriate training and testing of personnel involved.

Explanation:

The operator's security programme is required to have the following elements.

a. There must be a process for the operator to assess threats and vulnerabilities specific to that organization. For example, some operators may rely on credible sources and trusted websites (whether their editors are a state or a private firm specializing in security issues) or can count on the security department of their parent organisation. When mapping the various threats and

vulnerabilities, operators are particularly encouraged to thoroughly consider security risks created by insiders, whether this risk is intentional (e.g., sabotage) or unintentional (e.g., weak passwords, lapses in security procedures).

b. The organization must determine what mitigating or preventive measures are required to minimize exposure to the identified threats and vulnerabilities, and to prevent commission of unlawful acts. For example, if the organization operates in high risk or conflict areas, dedicated flight profiles for take-off, enroute and landing may be considered, possibly in conjunction with the use of on-board technology (e.g., Electronic Countermeasures, aircraft monitoring and warning systems), security seals, etc. Provisions should also be taken to ensure that confidential information about passengers and/or cargo is protected.

c. The organization must establish procedures for actions to be taken should an unlawful act be committed against the organization. Possible examples where this might be needed include creating security checklists, notification procedures, determining response to presence of an explosive device, creation of a remote emergency response center in the event access to the organization is not possible due to the situation, and other circumstances that could be applicable to an organization given the geographic location and nature of their operations as well as the interest of people and/or cargo carried. These procedures should be appropriate to the organization's operational needs.

d. Relevant personnel involved in the organization's operations and security programme must be included in security training courses with appropriate testing.

The security programme should be aligned with the organization's emergency response plan, as applicable.

Assessment criteria:

Preaudit:

1. Review the operator's security programme manual(s) and processes to ensure all elements of this item are included, as applicable to the organization's requirements.

Onsite:

2. Review threat assessments for the security programme and accompanying mitigating or preventive measures to ensure these conform with the requirements of this item.
3. Review records of security training and testing.
4. Interview personnel to ensure understanding of and compliance with the requirements of the programme.

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6 Company Manuals

6.1 Company Manuals

<u>6.1.1</u> The organization shall establish and maintain a company operations manual, or suite of manuals, which shall include the instructions and information necessary to enable the personnel concerned to perform their duties safely. These manuals shall:

a. Contain a table of contents;
b. Contain a revision control page and list of effective pages, unless the entire manual is reissued with each revision and the manual has an effective date on it; and
c. Be published in language(s) understood by affected personnel.

Note: The company operations manual may be issued in separate parts corresponding to specific aspects of an operation.

<u>Explanation</u>:

The company manual, or suite of manuals, must contain instructions and information needed for personnel to perform their duties safely. The level of complexity for control of these documents will depend on the size of the organization. A smaller company may have only one company manual, while other organizations may find that a suite of manuals is more appropriate for their operational needs.

a. These manuals must include a table of contents which provides a list of the manual's contents with identifiable descriptions.
b. A revision control page and list of effective pages is also required when a manual is revised. If the organization chooses to reissue their manuals in full when publishing revisions, then the revision control page or list of effective pages is not needed provided there is an effective date on all reissued manuals.
c. The language of the manuals must be in the language or languages that is understood by personnel using the manuals. It is important to ensure that the users of the manuals can read and understand the contents. For example, for operators who have foreign staff it is important to make sure that the manuals and other materials such as safety reporting systems, etc., are available in a language that can be read and understood by affected personnel.

Note: When the industry first moved to 'electronic' manuals, usually in pdf format, hard-copy document management processes were replicated. This type of system may be appropriate in most cases, but where the organization relies on a central database of knowledge (such as a corporate wiki) where documents can be created, stored, and/or searched, a revision control page or list of effective pages may not be necessary if a digital manual has adequate controls to ensure only the current revision is available and is not available in hardcopy. In any event, a 'version control system' must be in place that is appropriate for the media being used to create, manage and distribute the manual.

Assessment criteria:

Preaudit:

1. Review the company manual or suite of manuals for conformance to these requirements.

Onsite:

2. Interview personnel to ensure that their understanding of how to perform their duties corresponds to the information in the company manuals, as appropriate.

6.2 Management and Control

6.2.1 The organization shall have a system for the management and control of documentation and/or manuals used in the conduct of its operations, to include:

a. A means of identifying the current version of each document/manual;
b. A distribution process that ensures availability of the current version of each document/manual to appropriate personnel in all areas of operation;
c. Review and revision as necessary to maintain the currency of information contained in each document/manual;
d. Retention of documents that permits the easy reference and accessibility; and
e. Identification and disposal of obsolete documents.

Explanation:

Aviation relies on paper to stay in the skies. It's needed for recordkeeping, for manuals and other documents describing policies, processes and procedures, as well as for proving that certain actions have been accomplished, such as in maintenance or flight logs. Document management and control of the company documents and/or manuals is essential in order to ensure that all personnel are using the same, current version of these materials, that recordkeeping and training are aligned with the current documents, and to ensure good organization and quality control. The goal of a good document management system is to have all company documents and manuals up-to-date and available at the designated location(s) for use. With an effective document control system, there should be no confusion about whether the correct version is being used.

In order to have an effective document and manual control system, the operator must establish a system that provides for clear distinction of current and obsolete documents and manuals. This system must include the following elements.

a. A means of identifying the current version of each document/manual:
   - Version control is important in order to ensure that no one is working from an obsolete document. This saves the time and effort taken to go back and re-do the project. Having a system to identify the current version also means that the organization doesn't have to worry about someone coming in and editing a

document or manual without having the change noted, or without having the update made to all distributed manuals or documents.

- A version control table at the beginning of a document or manual should include the version number and effective date at a minimum. More information may be required depending on the length and complexity of the document, as well as on any regulatory or other legal requirements for that document/manual.

b. <u>A distribution process that ensures availability of the current version of each document/manual to appropriate personnel in all areas of operation:</u>
   - Documents and manuals are often created, stored, distributed and revised solely in an electronic format; however, many organizations still rely on printed versions of some manuals as well. It is important for an organization to determine how they need to use their documents and manuals and whether they can operate with only electronic copies or if hard copies are required.
   - A master document register provides information about the format of the materials and how it is distributed. For an all-electronic format, centralized storage of the master documents should be in a secure location with controlled access by users. In the situation where personnel do not have access to the electronic files, the organization must make controlled printed copies available under an associated manual distribution system.
   - If the organization is using paper documents or manuals, then they must have a distribution log that includes the name of the person to whom it is distributed, and as applicable, the location (especially if the operator has remote or multiple bases of operation), the aircraft (for onboard documentation), and external entities (such as simulator training providers, repair stations, authorities, etc.), as well as a means to account for updates to those documents.

c. <u>Review and revision as necessary to maintain the currency of information contained in each document/manual:</u>
   - The operator's manuals and documents will need to be revised and modified to reflect both internal changes to the operator's scale and scope of operations as well as external changes in the operating environment and regulatory requirements. The operator will need to document the method chosen for periodic and targeted review, as well as the process utilized to create, approve, publish, distribute, and provide training, as appropriate, for revisions to manuals and documents.
   - Some options for identifying changes include change logs, a list of changes on a cover sheet, document formatting to identify changes throughout a document, etc.

d. <u>Retention of documents that permits the easy reference and accessibility:</u>
   - Where and how documents and manuals are retained should provide the means for users of these materials with appropriate access when and where

they need it. Considerations for retention of documents include the location of the documents, for example, are these materials in electronic form and if so, how will they be securely stored while providing access to the current users. If there are paper materials involved, the operator should ensure that all distributed versions are updated at the same time and that they are updated at all assigned locations.

and

e. Identification and disposal of obsolete documents:
   - It is important to ensure that obsolete documents are not used and if they are retained, then they must be identified. The simplest way to avoid using obsolete documents or manuals is to destroy them, either by gathering all hard copies and destroying them, or by deleting electronic documents or manuals.
   - If obsolete documents need to be retained, then the operator must establish a means to identify them as unusable except for specified uses such as historical reference or comparison. Obsolete documents should be in a controlled access location and marked appropriately, for example they could be marked "obsolete" or "uncontrolled" or "for reference only" or other similar statement.

Assessment criteria:

Preaudit:

1. Review documents and procedures for document management processes that conform to this item.

Onsite:

2. Interview appropriate personnel regarding execution of these processes for document control
3. Inspect documents at all locations to ensure that all available manuals are the most current revision and that any obsolete documents are destroyed or retained in a secure location and marked appropriately.

6.3 Deviations

6.3.1 The organization shall include in its suite of manuals a policy on whether any deviations from the provisions contained in it are allowed.

Explanation:

An organization can choose whether and to what extent deviations from its manuals will be allowed. The company's manuals must include a policy which states whether or not deviations will be allowed. Some examples of deviations include:

- How to conduct audits/risk assessments of external entities remotely if in-person options are not available;

- Maintenance actions such as granting one-time approval for an external entity to perform maintenance on an AOG aircraft;
- Extension of training requirements;
- Alternate processes for situations where key personnel may be absent or where information from usual sources becomes unavailable;
- Etc.

Assessment criteria:

Preaudit:

1. Review company manuals for inclusion of a policy for the organization's deviation process to ensure it conforms to this item.

Onsite:

2. Interview personnel for understanding of and compliance with the deviation process.

6.3.2 If the organization allows deviations from the provisions contained in its suite of manuals, the organization shall establish a process for such deviations. This process shall:

a. Identify the associated conditions under which deviations are permitted or required;
b. Specify the person who may approve such deviations; and
c. Except for deviations related to a PIC's emergency authority, require that a risk assessment of the deviation be completed.

Explanation:

For those organizations with a policy to allow deviations from the provisions in their manuals, there are specific requirements for this process.

a. The organization must identify the specific conditions where deviations can be allowed or even required.
b. The process must identify the person who can approve deviation based on information submitted during the deviation process. If deviations to the manual are allowed, then these must be approved by the appropriate company personnel and the deviation process must be documented. Some examples of a deviation approval process include using a company developed form, an operations approval process or a phone call process, among others.
c. The deviation process must include a risk assessment and analysis that supports approval of the deviation. The approved deviation should also include a determination that it is in accordance with applicable regulations.

Note: PIC Emergency Authority is not affected by this standard. The PIC is NOT required to ask for deviation approval in the event of an emergency.

Assessment criteria:

Preaudit:

1. Review company deviation approval process to ensure that it incorporates all elements of this item.
2. If available, review documentation of previously approved deviation(s).

Onsite:

3. If possible, have the company provide a demonstration of the process for approval of a deviation.
4. Interview personnel to ensure understanding of the deviation process.
5. Review documentation of any approved deviations to ensure that the risk assessment and approval process conforms to this item.

7 Organization and Personnel Requirements

7.1 Organizational Structure

7.1.1 The organization shall be staffed by qualified, competent and effective management and line personnel to ensure the organization's safe and efficient operation. The minimum management personnel are:

a. A person having overall management responsibilities for the flight operation (such as a "Flight Department Manager" or "Director of Operations");
b. A person responsible for managing the flying operations (such as a "Chief Pilot/Operations Manager"); and
c. A person responsible for managing aircraft maintenance.

In the case of a small operation, one person may occupy, or perform the functions of, two or more of the positions.

The tasks required to ensure the continuing airworthiness of an aircraft may be delegated to an external entity. However, the accountability for aircraft airworthiness remains with the operator. Therefore, in such cases, the duties and responsibilities of the person responsible for managing aircraft maintenance mentioned in 7.1.1.c above shall include the oversight of the activities performed by the contracted external entity.

Explanation:

The operator must ensure that its management and staff personnel are not only qualified, but also competent and effective in the fulfillment of their duties. Staffing needs will vary depending on the size and complexity of the organization's operational needs.

At a minimum, this item requires three specific management personnel as follows:

a. Overall manager or director for the flight operation;
b. A manager of flying operations, such as the chief pilot or operations manager; and
c. A manager of aircraft maintenance.

Note that in addition to these positions, the IS-BAO also requires a safety manager and an accountable executive (see chapter 3).

Depending on local regulations and the type of operation, there may be a requirement for an assessment to be accepted by the authority in order to hold one of these positions.

In smaller organizations, one person may fill multiple roles. When an organization outsources maintenance, accountability for aircraft airworthiness remains with the operator. The person responsible for maintenance management must therefore have appropriate oversight processes in place for the outsourced activities.

Assessment criteria:

Preaudit:

1. Identify organizational structure and minimum qualifications for each position to ensure staffing and qualifications in accordance with this item.

Onsite:

2. Interview personnel to assess not only qualifications, but also competence and effectiveness for their responsibilities and job duties.
3. If applicable, check for records of acceptance by the authority for regulated post holders.

7.1.2 Where the organization has more than one operating base, the management structure must address the exercise of the above responsibilities at all locations.

Explanation:

Organizations with multiple bases of operation must have a management structure that ensures oversight of the overall operation, the flying operations as well as the maintenance operations, as applicable, at all locations. The structure of these positions will vary depending on the size and complexity of the operations being conducted. In some cases, oversight can be exercised effectively by the primary responsible person from the main base of operations, however other organizations may need to assign local leadership positions who report to the primary responsible person.

Note that it is important in the audit planning process to determine, per APM Appendix E, the sample of bases that will be assessed during the audit. The flow chart in appendix E details the requirements for base assessment during the audit and may be used in discussion between the operator and auditor to ensure identification of those satellite bases that require an assessment.

Assessment criteria:

Preaudit:

1. Review documents/organizational charts, as available, to ensure management structures are in place at all bases of operation in accordance with this item.
2. Review the operator's website and/or other media/industry sources to ensure alignment with the requested scope of the audit and that all pertinent areas and types of operations are addressed.

Onsite:

3. Interview personnel and observe the organization's activities to assess management structure and oversight at all bases of operation.

7.2 Duties, Responsibilities and Authorities

7.2.1 The organization shall have an organizational structure that clearly defines qualifications, duties, authorities and accountabilities and that is staffed by qualified managerial and operating personnel who are capable of effectively carrying out the identified duties. In the appropriate section of the company operations manual, the organization shall provide a detailed description of the organizational structure containing at least the following information:

a. The position or title of the person to whom functions have been assigned;
b. A description of the functions and scope of work that have been assigned to each position or person, to include external entities;
c. Where necessary for clarity, a chart depicting the distribution of functions and lines of authority; and
d. The qualifications, duties and responsibilities for each function that has been assigned. These shall include the qualifications, duties and responsibilities related to each person's operational activities as well as the corresponding safety duties and responsibilities as prescribed in section 3.1.2, and shall be in accordance with any applicable State requirements.

Note: Depending on the size and functions, various other personnel specialties may be required to ensure the proper performance of the organization. These personnel may include flight operations schedulers or dispatchers, helicopter ground support personnel, security personnel, administrative personnel, hangar maintenance and line service personnel. In addition, the operation may include personnel (medical providers, operators of specialized equipment, news reporters etc.) who are not the organization's employees but perform duties that are essential to the operation. The description of the organizational structure required in section 7.2.1 should include such personnel.

Explanation:

A clear organizational structure provides clarity to personnel with regard to their assigned responsibilities and how each role in the organization fits with other roles. This structure helps an organization manage expectations about who does what, when, where, how and why. This structure in turn helps the organization achieve its operational objectives.

For the purposes of this item, the organizational structure defines the qualifications, duties, authorities and accountabilities required for each position. The organization's manuals or equivalent document(s) must include specific elements as follows.

a. The name of the position or title of the person to whom functions have been assigned;
b. The function and scope of the assigned work must be described, including whether oversight of external entities is included;
c. Where appropriate, a visual representation of the organizational structure. An organizational chart can provide clarity about lines of accountability and responsibilities, as well as potential conflicts; and

d. A description of the qualifications, duties and responsibilities for each function that has been assigned must also be included. These are as related to each person's operational activities. In addition the description must include information about the corresponding safety duties and responsibilities as prescribed in section 3.1.2. Each job function must be in accordance with any applicable State requirements.

Assessment criteria:

Preaudit:

1. Review documents/manuals to ensure the establishment of an organizational structure that meets the requirements of this item.
2. Review organization manuals (or equivalent documents) to ensure inclusion of the detailed descriptions required by this item, including contract vendors or organizations as appropriate.

Onsite:

3. Interview personnel to ensure understanding of assigned job requirements and competence, including SMS related responsibilities for their assigned position.
4. Review records to confirm personnel qualifications.

7.3 Provision of Organizational Resources

7.3.1 The organization shall ensure that all organizational departments related to the safe operation and maintenance of aircraft are provided with the staff, facilities and other resources necessary to ensure that their activities are conducted in accordance with the civil aviation authority requirements and meets the organization's safety management goals.

Explanation:

The organization's commitment to safety must extend to providing the resources necessary for the operation to successfully conduct its activities. These resources include appropriate staffing, facilities and any other resources needed for this purpose. This commitment to safety will be assessed by the auditor throughout the audit based on his/her observation of the activities of the organization, so it is important to note that this goes to actions beyond the safety commitment and is not limited to the existence of a statement of commitment in a policy or manual. If significant issues are found during the audit that are related to processes not being accomplished, records not being maintained, etc., this might be indication of lack of resources.

Assessment criteria:

Preaudit:

Not applicable.

Onsite:

1. Observe/inspect facilities, operations, activities and resources available to the relevant departments to ensure provision of necessary resources per this item.
2. Interview personnel to assess whether appropriate resources are available for them to conduct their responsibilities in accordance with this item.

7.4 Use of Safety-Related Data

7.4.1 The organization shall have a policy protecting any safety-related data from inappropriate use.

Explanation:

The protection of safety data or information from inappropriate use is essential to ensure its continued availability, because the use of safety information other than for safety-related purposes may inhibit the future availability of such information, with an adverse effect on safety. The term 'safety information' is defined in ICAO Annex 19 as "safety data processed, organized or analysed in a given context so as to make it useful for safety management purposes." Safety data is defined as "a defined set of facts or set of safety values collected from various aviation-related sources, which is used to maintain or improve safety." The operator's policy should ensure that safety information or data will be used only for the purpose of maintaining or improving aviation safety.

Safety reporting and the collection of safety-related data is predicated on a non-punitive system that ensures that such data is used for improvement of safety. It is therefore important that an organization establish a clear policy protecting any safety-related data from inappropriate use. Fundamental principles of an organization with a just culture that encourages the collection of safety data through the protections in its program include, among others:

- The option for confidentiality;
- Clear statements of acceptable and unacceptable behaviors;
- Consequences for unacceptable behaviors;
- Description of how safety-related data and information will be protected per the policy.

Ref: ICAO Annex 19, Appendix 3 (2019).

Assessment criteria:

Preaudit:

1. Review documents for the policy protecting safety-related data from inappropriate use.

Onsite:

2. Review safety-related data records to ensure conformance with the policy.
3. Interview personnel to assess understanding of the policy as implemented.

7.5 Use of Psychoactive Substances

7.5.1 ***The organization should develop policies on the use of psychoactive substances to ensure that licence holders do not exercise the privileges of their licences and other personnel do not undertake safety-related duties while under the influence of any psychoactive substance that might render them unable to safely and properly exercise their licence privileges or carry out their safety-related duties. (Recommended Practice)***

Explanation:

The conduct of safety-related aviation duties requires personnel to be alert, with maximum capability for judgment and decision-making as well as vigilance and coordination. This requires that personnel are functioning without the influence of substances that can alter their ability to acquire and process information. Policies regarding the use of psychoactive substances are recommended in order to clearly state the expectation that personnel will not work in their safety-related activities while under the influence of a substance that would adversely impact their ability to safely perform their work activities. Policies should also address the minimum times from use of such substances to the start of performance of job-related duties. Note that this item covers both legal and illegal substances.

Ref: https://www.skybrary.aero/index.php/Prescription

Assessment criteria:

Preaudit:

1. *Review documents for policies regarding the use of psychoactive substances.*

Onsite:

2. *Interview personnel to assess their understanding of and conformance to the policies.*

7.5.2 ***The policies referred to in section 7.5.1 should also address any problematic use of psychoactive substances. (Recommended Practice)***

> ***Note: Psychoactive substances include alcohol, opioids, cannabinoids, sedatives and hypnotics, cocaine, other psychostimulants, hallucinogens, and volatile solvents, whereas coffee and tobacco are excluded.***

Explanation

In addition to policies ensuring that personnel don't perform safety-related duties while under the influence of psychoactive substances (as noted in section 7.5.1), this recommended practice encourages organizations to make clear policies about problematic use of psychoactive substances. For this item, this means including in the organization's policy its stance on

situations where personnel are using such substances inappropriately and in a way that could increase the risk of working under the influence. This is especially relevant for those personnel who are habitual users of psychoactive substances and are thereby unsafe, even between uses. Even the effects of legal substances, if used excessively or inappropriately, will have a detrimental effect in the aviation environment. Having a policy addressing this possibility will help to clarify expectations of personnel in terms of their fitness for duty as well as informing them about consequences of not following the policy. The policy could address aspects such as removal from safety critical functions and reinstatement when appropriate, participation in support groups or other treatment requirements, etc. and should be in line with the local legal framework.

Assessment criteria:

Preaudit:

1. *Review documents for policies regarding the problematic use of substances.*

Onsite:

2. *Interview personnel to assess their understanding of and conformance to the policies.*

7.6 Mobile Phones and Other Portable Electronic Devices (PEDs)

7.6.1 The organization should provide guidance on the use of mobile phones and PEDs for all personnel, including critical phases of flight and ground operations, operating vehicles, and maintenance work. (Recommended Practice)

Explanation:

Mobile phones and personal electronic devices (PEDs) are part of daily life, whether in the air or on the ground. Pilots are trained in the use of installed flightdeck instruments in order to have a reliable method for gathering information, hearing alerts and warnings and responding appropriately. The availability of a mobile phone or PED has benefits in terms of providing additional information through various apps, however it also has the capability of being an instrument of distraction. This applies to any safety-related position. Ground personnel, maintenance technicians, and pilots all can easily be distracted by a text, phone call or email. Just as with the studies showing the dangers of distracted driving, the same principles apply perhaps more critically in aviation. Distractions and interruptions can be fatal if they occur during critical phases of an operation. Guidance from the organization on expectations with regard to when, where and how mobile phones or PEDs may, or may not be used will clarify for all personnel the expectations about such use and can provide additional clarity for assessing the risk in situations where distraction potential may exist.

Assessment criteria:

Preaudit:

1. *Review documents for guidance and, if applicable, for compliance with regulatory requirements regarding the use of mobile phones and/or PEDs.*

Onsite:

2. *Interview personnel regarding the policies addressed in this item to assess understanding and conformance with regard to mobile phone and PED use.*

7.7 Supplemental Lift/Additional Air Transport Capacity

7.7.1 The organization should have a process to ensure that any operator contracted for additional air transport capacity is qualified and competent to perform operations safely and effectively. (Recommended Practice)

Explanation:

Some organizations may need to contract for a substitute or additional aircraft in the event that one of their own aircraft becomes unavailable, for example for maintenance, replacement of an aircraft or a change in schedule. There are numerous other situations that could arise including those where an organization contracts additional lift for transporting groups that are larger than what is supported by their fleet, or where local operations are supported by a contract operator, among others. For those organizations that have these arrangements with external entities, it is recommended that they implement a process for assessing the qualifications and competency of the additional air transport. Just as with any outside vendor or service provider, ensuring that the external entity has been vetted to ensure that any risks associated with the arrangement are mitigation is an important element of the organization's own continuing risk assessment and management.

Assessment criteria:

Preaudit:

1. *Review documents for the organization's process to vet the qualifications and competence of additional air transport organization.*

Onsite:

2. *Review records of vendor assessments for supplemental/additional air transport.*
3. *Interview relevant personnel regarding their understanding of the qualifications required for additional air transport and conformance with the organization's process.*

7.8 External Entities

7.8.1 ***The organization should have a process to assess the risk of using services provided by external entities. (Recommended Practice)***

> ***Note: IS-BAH registration for ground handling service providers (GHSP) is an example of an effective assessment.***

Explanation:

As an extension of the recommended practice in 7.7, the same type of process should be implemented to assess risks encountered with frequently used outsourced service providers. For example, if an operator flies to a remote location where there is only one option for maintenance services with limited capabilities, then assessing any risks related to use of that provider would allow the operator to put in place appropriate mitigations, such as having a regular vendor audit or allowing only certain maintenance activities to be completed by that vendor.

Business aviation operators will often not be able to assess every single service provider they use, but in most cases, they have some service providers that are more commonly used, like their main maintenance providers and the FBOs they use in their bases and in places they frequently fly to. Assessing the risks of those is important to ensure the risk is acceptable.

It is important to remember that selection of service providers should be made not only based on costs, but also on safety impact. Having a process in place to ensure safety assessment of service providers is a useful tool for this determination. Knowing the safety efforts of frequently used outsourced service providers can inform an organization about whether or not that provider aligns with the organization's own safety objectives. These assessments can be done by the company itself via audits or other means, but the operator can also refer to recognized standards such as the IS-BAH as part of their assessment process

Assessment criteria:

Preaudit:

1. *Review documents for a risk assessment process for frequently used outsourced service providers.*

Onsite:

2. *Interview personnel regarding assessment of risk involved in the use of frequently outsourced service providers.*
3. *Review records of such assessments done per this item.*

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8 Training and Proficiency

8.1 Training Programmes

<u>8.1.1</u> The organization shall establish and maintain a training programme designed to ensure that a person who receives training acquires the competence to perform his/her assigned duties. The training programme shall:

a. Establish the required initial and recurrent training for all organization personnel involved in the safe operation of aircraft, either through an internal programme or through a training service provider;
b. Include or make reference to the course outline of each initial and recurrent training established by the organization; and
c. Include the minimum training courses required in this Chapter and in Sections 3.4.1, 4.3, 5.1.2, 9.1, and 12.1, as well as any additional training that is required to ensure a safe operation.

<u>Explanation</u>:

An effective training programme will help an operator ensure the competence of individuals, groups and the organization itself. Having a systematic approach to teaching necessary knowledge, skills and organization-specific content ensures that all personnel are aware of their responsibilities and that they are proficient in their assigned tasks and duties. The key is to determine what an organization's training needs are, what training is required and necessary for specific jobs, who should receive that training and how often. It is important to note that if personnel receive any kind of training covered in the IS-BAO, this chapter applies.

In designing training programmes, the operator should consider what training method and what means of evaluation is appropriate. For example, classroom, web-based, on-the-job, or hands-on training such as simulator or in-flight training, all can be effective when used appropriately.

<u>a. Establish the required initial and recurrent training for all organization personnel involved in the safe operation of aircraft, either through an internal programme or through a training service provider.</u>
Personnel who are directly involved with the safe operation of the aircraft include but are not limited to pilots, cabin crew, maintenance, aircraft handling, crew selection, management, dispatch, flight planning/following/scheduling, task specialists such as medical, survey or scientific research personnel, etc. The size of the organization and the scope of their operations will determine who requires training.

The training programme must include initial and (in many cases) recurrent sessions, as required either by law/regulation, other standards, or company requirements. The schedule for recurrent training may also be established by regulation or other standards, such as the IS-BAO. This is an example of the type of information that should be included in the organization's compliance monitoring program, including what training is required, for whom, when, where, and how often. Generally, flight crew training requirements are an example of training that has minimum

standards established by a regulatory authority, however the operator can complement these minimum requirements with additional training, based upon their operational risks. Unregulated job positions in an organization, such as surveyors, task specialists, etc., may have more flexibility as to content. This type of training can be developed internally or can be contracted with an outside training service provider and may have more flexibility with regard to content and scheduling provided the training meets the needs of the personnel affected.

b. Include or make reference to the course outline of each initial and recurrent training established by the organization.

A course outline is an important element of a training programme as it provides the checklist of all required training elements and ensures that each element is completed. These outlines may have required elements from regulatory bodies, but they should also include the elements required by the organization's operational needs. The process involves:

- identifying the topic(s) that must be covered and who should receive that training;
- determining what the people receiving the training should know by the end of the course;
- identifying the concepts required for the training and how it will be presented; and
- a method to evaluate whether the participants have learned the elements that they need to know to competently perform in their work capacity.

A course outline may also provide information such as requirements for instructor experience, who can conduct the instruction, where and what equipment is required, among others.

If an organization is receiving training from an external entity, then the organization should have a means to ensure the content fits the needs of their operation and the outline should be included or referenced in the organization's training programme.

The training course outline does not need to be complicated if the subject at hand is not complicated. It can be a list of the elements required to complete a specific task. For example, a person who provides a passenger briefing to clients and then escorts them to/from the aircraft may have specific training only for these tasks. This training outline could include elements such as the following:

- Passenger briefing content
- Passenger control
    - Escorting passengers to/from the check in area to the aircraft on the ramp
    - Ramp security processes
- Ramp safety awareness training
- Abnormal and emergency considerations
- Other topics as applicable.

and

c. Include the minimum training courses required in this Chapter and in Sections 3.4.1, 4.3, 5.1.2, 9.1, and 12.1, as well as any additional training that is required to ensure a safe operation.

While chapter 8 includes most of the training requirements to conform to the IS-BAO, it is important to note that there are five training elements contained in other chapters and these must also have a training course outline.

- 3.4.1: This standard requires development and maintenance of a safety training programme that ensures that the organization's personnel are trained and competent to perform their SMS duties, within the scope of their involvement with the SMS. See Guidance chapter 3.4 for more information.
- 4.3: The emergency response chapter requires role specific training and recommends training for role alternates where applicable. See guidance chapter 4 for more information.
- 5.1.2: The chapter for the organization's security programme requires both training and testing. See guidance chapter 5 for more information.
- 9.1: The occupational health and safety chapter includes a requirement that personnel are provided safety information as well as training for specific job requirements. See guidance chapter 9 for more information.
- 12.1: The organization's fatigue management programme must incorporate, for all personnel involved in the safe operation of the aircraft, both initial and recurrent training. See guidance chapter 12 for more information.
- Operators should also determine any additional training that is required to ensure the safety of their specific operations.

Assessment criteria:

Preaudit:

1. Review organization's manuals and documents for training programmes required by this standard.

Onsite:

2. Interview personnel involved in the development, maintenance and provision of training to ensure understanding and conformance to this section.
3. Interview personnel who have received training for additional insight into the effectiveness of the training provided.

8.1.2 The organization shall have a policy prohibiting the simulation of emergency or abnormal situations during flight when passengers are being carried.

Explanation:

A core element of flight training is practicing emergency and abnormal procedures. When these are conducted in the aircraft, it is fundamental to the training profile that these types of practice procedures are performed for proficiency but that there is an element of risk that is accepted in

order to achieve the requisite training and experience. In these scenarios, both the instructor and the pilot doing the training are aware of the risks and are prepared for the training event. However, this additional risk is not one that should be taken on with passengers on board.

Assessment criteria:

Preaudit:

1. Review the organization's manuals, training materials or other relevant documents for this policy.

Onsite:

2. Interview pilots regarding the policy to ensure understanding and compliance.

8.1.3 Flight Crew Training

8.1.3.1 The organization's ground and flight training programme for flight crew members shall include, at least, the following:

a. Initial and annual training on aircraft type and systems, including emergency and abnormal procedures related to the aircraft category and type (recurrent training could be conducted alternating aircraft types each year if acceptable to the State of Registry);

b. During initial training and every two years thereafter:

i. Emergency procedures training for each type of aircraft, including:

A. Instruction on the location and operation of all emergency and life-saving equipment installed; and

B. Emergency evacuation of the aircraft;

ii. Aircraft surface contamination training; and

iii. Dangerous goods training;

c. Initial and recurrent training on:

i. The organization's policies, processes and procedures, SOPs and Checklists;

ii. Use of the MEL, and where applicable NEF and CDL;

iii. Use of the EFB and each device function, if the organization uses any type of EFBs in flight;

iv. The use and updating of software applications that might be necessary for the performance of the flight crew duties, as determined by the organization;

v. High altitude physiology and the effects of rapid or explosive loss of pressurization, for all flight crew members operating aircraft above 10,000 ft. ASL;

vi. Recognition of unstabilized approaches and execution of proper go-around procedures;

vii. For international operations, the subject areas as required by the specific authorizations and as necessary to ensure competency in operations in such airspace; and

viii. For operations in airspace where specific CNS requirements exist, the subject areas as required by the specific State authorizations and as necessary to ensure competency in operations in such airspace;
ix. (H) For operations conducted either in conditions below standard VFR or with the use of NVGs, the subject areas as required by the specific authorizations and/or as necessary to ensure competency in these operations, including avoidance of Inadvertent IMC; and

d. Upgrade training (for SICs becoming first-time PICs).

Explanation:

A Flight crew member may include but is not limited to pilots and flight engineers. A Flight crew member is someone who serves a role on the aircraft flightdeck. Training requirements and recommendations for cabin crew, maintenance personnel, flight coordinators, schedulers, and dispatchers are detailed later in Chapter 8.

Flight crew member ground and flight training must include the following elements.

a. Initial and annual training on aircraft type and systems: This yearly training on the aircraft type and systems covers not only normal procedures, but it must include emergency and abnormal procedures related to the aircraft category and type. Because annual training is generally the only time that emergency and abnormal are conducted, the frequency of the training is designed to ensure that flight crews remain current and proficient in these procedures. Some operators may choose a more frequent schedule for recurrent training depending on their risk assessment of their operation. If an operator has more than one aircraft type, and if it is acceptable to the State of Registry, an operator may conduct recurrent training on alternating aircraft types each year.

b. During initial training and every two years thereafter: This recurrent training schedule requires specific training in emergency procedures for each type of aircraft in order to ensure current awareness and knowledge of these procedures. This includes information about the location and operation of installed emergency and life-saving equipment as well as training on emergency evacuation of the aircraft. Note that flight simulator training may not cover all emergency areas, such as use of life rafts, cabin doors, emergency medical equipment (e.g., defibrillators), fire extinguishers, etc.

Also required by this section is aircraft surface contamination training, addressing the types of contamination that may be encountered by the organization's flight crews whether on the ground or inflight, as well as coverage of de/anti-icing procedures.

Recurrent dangerous goods training is also required by this section to ensure currency in recognition and handling of dangerous goods. Training programs will vary depending on whether or not the operator transports dangerous goods. Even those operators that do not transport dangerous goods must provide recognition training to ensure that dangerous

goods are not inadvertently carried. Reference Chapter 11 guidance for more information on dangerous goods.

c. Initial and recurrent training on the following subjects:
The frequency for recurrent training should be defined by the organization. Although IS-BAO does not specify a frequency for these topics, they may have an established frequency by regulation or other standards.

i. The organization's policies, SOPs and Checklists: As discussed in the Chapter 13 guidance, both understanding and following the organization's policies, SOPs and checklists is essential for safe and efficient flight operations.

ii. Use of the MEL, and where applicable NEF and CDL: Determining whether an aircraft is airworthy when it has inoperative equipment depends on applicable regulatory requirements for deferral of maintenance and whether or not the aircraft has an MEL, CDL and/or NEF. The PIC is responsible for ensuring that inoperative equipment is deferred correctly in accordance with the MEL, CDL or NEF. Some deferrals place operational restrictions on continued flight, such as no flight into icing conditions, or flights below a given altitude, flights in RVSM airspace. Other deferrals might require maintenance or operational actions under the M&O procedures. Therefore, the flight crew must understand the structure of these documents, how they are used to defer maintenance, how to identify possible operational restrictions and the necessary maintenance, operational and placarding procedures to be accomplished prior to continued operation. See Chapter 14 guidance for further discussion about MELs.

iii. Use of the EFB and each device function, if the organization uses any type of EFBs in flight: Electronic Flight Bags (EFB) come in many shapes and sizes and it is critical that flight crews are trained for use of EFBs in flight. The term EFB includes any portable electronic display hardware that displays flight bag applications such as aviation data, flight calculations for fuel loading or performance, etc. EFBs can be portable, such as a mobile phone or tablet, but they can also be installed in the aircraft. Regardless of which type of EFB it is, if it is being used in flight then the organization must have initial and recurrent training on the functions of the device. Note that this item does not apply if the devices are used only on the ground.

iv. The use and updating of software applications that might be necessary for the performance of the flight crew duties, as determined by the organization:
Training for software use and updating will vary depending on what is being used by the organization. The training must be conducted if the software is necessary for flight crew duties, as determined by the organization. This section covers not only aircraft system training (which is often covered in aircraft training), but also other software to be used by flight crews in preparation for and during flight such as performance calculation or flight planning software. Regardless of whether

software is being automatically updated or must be manually updated, it's important to ensure that the flight crew can determine whether they are using the applicable version for their operation.

v. High altitude physiology and the effects of rapid or explosive loss of pressurization, for all flight crew members operating aircraft above 10,000 ft. ASL: There are unique challenges present during flight above 10,000' due to the thinning of the atmosphere and the effects that unprotected exposure to that atmosphere can have on the human body. Full operational capacity cannot be achieved by flight crews starting at about 10,000 ft above the ground without the aid of a pressurized cabin and supplemental oxygen. As with any system in the aircraft, response to an emergency/abnormal situation such as a rapid or explosive loss of pressurization requires the flight crew to understand the physiological needs of the human body, including getting access to supplemental oxygen as soon as possible, as well as being familiar with the processes and procedures to respond to an emergency situation such as this. For more information on this topic see, for example, https://skybrary.aero/bookshelf/books/1269.pdf, "Cabin Decompression Awareness."

vi. Recognition of unstabilized approaches and execution of proper go-around procedures:
Fixed wing aircraft generally have clear criteria for stabilized approaches and execution of a go-around. Rotorcraft flight crews have different considerations because of the unique nature of vertical flight, but the fundamental concepts are the same. Note that this standard applies to both fixed and rotor wing aircraft, and both VFR and IFR flight.

Any aircraft on approach to land should be in a stabilized flight configuration that can be maintained all the way to completion of the approach and landing. Pilots must be trained to recognize when an approach has become unstable, sometimes using specific performance criteria, and upon a determination that it is not possible to return to a stable configuration, successfully execute a go-around.

The consequences of continuing an unstabilized approach can result in an aircraft landing short of the designated landing area, or potentially overrunning the runway, or damaging the aircraft. Therefore, this training is essential for all flight crews. See Chapter 13 Guidance section 13.7.1 for more information.

vii. For international operations, the subject areas as required by the specific authorizations and as necessary to ensure competency in operations in such airspace: Organizations flying internationally must include training that address the specific requirements of the airspace in which they will be operating. This requires an assessment of each airspace being operated in, what the applicable regulations are and whether there are any specific authorizations required for the flight in order to develop an appropriate training outline for this section.

viii. For operations in airspace where specific CNS requirements exist, the subject areas as required by the specific State authorizations and as necessary to ensure competency in operations in such airspace: Organizations flying in CNS airspace (such as RVSM, PBN, NAT-HLA, MNPS, FANS 1/A, ADS, etc.) must include training that address the specific requirements of the airspace in which they will be operating. This requires an assessment of each airspace being operated in, what the applicable regulations are and whether there are any specific State authorizations required for the flight in order to develop an appropriate training outline for this section.

and

ix. (H) For operations conducted either in conditions below standard VFR or with the use of NVGs, the subject areas as required by the specific authorizations and/or as necessary to ensure competency in these operations, including avoidance of Inadvertent IMC: Many helicopter operations may be conducted in conditions that are either below standard VFR conditions and/or in conditions requiring the use of night vision goggles (NVG). There have been numerous fatal helicopter accidents where flight was continued from low visibility flight to conditions where visual reference was lost, resulting in spatial disorientation and consequent flight into terrain. For operations conducted in these types of conditions, the risk of entering inadvertently into areas of reduced or zero visibility is increased and therefore specialized training is required to mitigate that risk. Training should include recognition of and avoidance of IMC conditions as well as how to recover should IMC conditions be encountered. Night vision goggles are being used in helicopter flight in an increasing number of operations, including night firefighting. Training for these specialized operations must include subject areas as required by specific authorizations and/or as necessary to ensure competency.

Training in these areas must be both initial and recurrent at an interval that is appropriate to the organization.

d. Upgrade training (for SICs becoming first-time PICs): For those operators who utilize second-in-command (SIC) pilots who will eventually upgrade to the pilot-in-command (PIC) position, there must be an upgrade training programme that fulfills the requirements of the upgrade, based on regulatory and other applicable requirements, such as responsibilities and authorities of the PIC, differences in operational roles, etc.

Assessment criteria:

Preaudit:

1. Review the operator's manuals to determine if they have a documented initial and recurrent ground and flight training programme for flight crew members that meets the requirements of this standard.

Onsite:

2. Interview training personnel as well as flight crew members to ensure that the documented training programme is clearly understood and followed.
3. Review training records to demonstrate that initial and recurrent flight crew training is being provided in accordance with the documented training programme.

8.1.3.2 Organizations that do not use cabin crew members should include initial and recurrent first aid training in the flight crew members training programme. (Recommended Practice)

Explanation:

For those organizations who may operate flights with passengers but without cabin crew, it is recommended that first aid training for flight crew members be provided so that assistance can be given should the need arise. This training should include both general first aid elements as well as any aircraft or operation-specific subjects as appropriate. Different scenarios can occur from food poisoning, turbulence-related injuries, or other health issues. Such training will allow the flight crew to better assess the needs of the person requiring assistance and in determining whether or not the flight will need to be diverted in order to provide care.

Assessment criteria:

Preaudit:

1. *Review flight crew training programmes for inclusion of first aid initial and recurrent training if the organization does not use cabin crew members.*

Onsite:

2. *Review training records for completion certification.*
3. *Interview flight crew personnel for understanding of the training.*

8.1.3.3 Organizations should use flight simulators for flight training to the maximum degree practicable. Industry best practices are to use flight simulators for initial and annual recurrent training. (Recommended Practice)

***Explanation*:**

The use of flight simulators for training allows for practice of maneuvers and emergency/abnormal procedures that would not be advisable to conduct in an aircraft (such as one-engine inoperative) due to the potential risks involved, or the prohibition of practicing certain maneuvers in the aircraft. These types of maneuvers can be conducted in a simulator, allowing the crew to experience elements of this type of event without endangering themselves, the aircraft or people/property on the ground.

Other benefits from training in a flight simulator include the ability to pause in the middle of a maneuver or procedure, discuss it, and explore various scenarios at much less cost in terms of both time and money. Some operators may choose, for various reasons, to conduct all of their training in the aircraft. These reasons could include the lack of proximity to an appropriate simulator, or the cost and time required to send their pilots to the simulator, or they find actual in-aircraft training to be more effective for their specific operations. All operators should consider whether this industry best practice is a useful tool for their operation.

Note that this item is N/A only if a flight simulator for the operator's aircraft does not exist.

Assessment criteria:

Preaudit:

1. *Review manuals and/or training documents to determine whether training in flight simulators is conducted.*

Onsite:

2. *If the operator utilizes flight simulator training, review training records for conformance to this recommended practice.*

8.1.3.4 (A) Where it is the organization's practice to normally fly two crew aeroplanes from the left seat, the organization should establish right seat landing and take-off recency (or training and recency) requirements for pilots. (Recommended Practice)

Explanation:

This recommended practice applies if the operator's policy is to have the Pilot Flying (PF) always sit in the left seat with the Pilot Monitoring (PM) in the right seat. Regardless of the seat in which they are sitting they should be competent to fly the aircraft from that seat in all phases of flight. This obviously is more critical when the airplane is close to the ground, namely for takeoff and/or landing.

There are two main issues with flying an aeroplane from the right seat. The first is that the sight-picture may be different, the instrument layout may be different, habits developed for the left seat may not work in the right seat, and the 'feel' of the aircraft may be different. The second issue relates to the potential risk of the incapacitation of the pilot flying, which could happen at any phase of flight, and most critically at takeoff or landing. If the pilot in the left seat becomes incapacitated, then the pilot sitting in the right seat will need to be able to take over control immediately and handle getting the aircraft into the air or back on the ground with little margin for error. Training and recency of experience will greatly maximize both the ability of the right seat pilot to safely take over the aircraft and the chances that the flight will have a successful outcome regardless of phase of flight. That said, new technology in the flight deck has changed the nature of the differences that may have been inherent in older airplane designs and therefore may challenge the assumptions and traditions that come with aircraft design.

Airplane instrument panels initially were designed and configured with the left seat PIC/right seat SIC configuration in mind, putting the key instruments on the left side of the panel and just enough on the right side for the pilot in that seat. In today's world, airplane instrument panels are being configured more with the glass flight deck and computerized options where both pilots, regardless of where they are sitting, have access to all of the information needed to fly the aircraft. It follows that given the resources available to the pilots are no longer particularly different, that the flying capability and recency of experience requirements should apply to both members of the crew, regardless of their seat location.

Assessment criteria:

Preaudit:

1. *Review the operator's manuals to determine if they have documented training/recency requirements for two-crew aeroplanes for right seat takeoff and landings.*

Onsite:

2. *Interview relevant flight crew staff to ensure that the training/recency requirement is clearly understood and followed in the organization.*
3. *Review training records to ensure training/recurrency is being provided to pilots in accordance with the documented training programme.*

8.1.3.5 (H) Where it is the organization's practice to normally fly two crew helicopters from a particular seat, the organization should establish opposite seat landing and take-off recency (or training and recency) requirements for pilots. (Recommended Practice)

Explanation:

The PIC seat location in helicopters depends on the design of the helicopter and could be either right or left seat. Some helicopters can be configured either way depending on the operational needs. Regardless of the designation of the seats, the considerations are the same as noted in 8.1.3.4(A) above for airplanes. The sight-picture will be different, the instrument layout may be different, and the 'feel' of the aircraft may be different. And the potential risk of the incapacitation of the pilot flying, which could happen at any phase of flight and most critically at takeoff or landing, is still a possibility that must be taken into consideration. For these reasons, the training/recency recommended practice also applies to two-pilot helicopter operations.

Assessment criteria:

Preaudit:

1. *Review the operator's manuals to determine if they have documented training/recency requirements for two-crew helicopters for opposite seat takeoff and landings.*

Onsite:

2. *Interview relevant flight crew staff to ensure that the training/recency requirement is clearly understood and followed in the organization.*
3. *Review training records to ensure training/recurrency is being provided to pilots in accordance with the documented training programme.*

8.1.3.6 ***The organization should establish procedures and training requirements to ensure each pilot maintains competency in the following key safety areas:***

a. Manual Flying Skills;
b. Runway Excursion Prevention;
c. Automation Management; and
d. Upset Prevention and Recovery Training (UPRT). (Recommended Practice)

Explanation:

This recommended practice addresses additional training in areas that have been shown to have potential for error that can be mitigated through additional experience with the scenario.

a. *Manual flying skills have to be used for a pilot to stay proficient. With more technology available on many aircraft, the pilot's role may not be as much hands-on flying as it is monitoring computers and adjusting switches and dials. For these types of operations, it is possible that the automation may fail, leaving the flight crew susceptible to automation surprise and resulting delays in troubleshoot and responding to the situation as the flight crew tries to figure out what happened on the flight deck. The ability to quickly respond to an equipment malfunction is most urgent during takeoff and landing, but regardless of phase of flight, the crew should be trained in recognizing when the technology is not reliable as well as in the methods to transition to manual flying in various flight configurations.*
b. *A runway excursion happens when an airplane departs the runway either on takeoff or landing. Additional training can improve the awareness of flight crews as to the issues related to this problem and increase their competency in handling or avoiding this situation. Runway excursions can occur at takeoff or landing, and these phases have their own unique hazards. Rejected takeoff training should address the issues of aircraft speed and directional control for various runway/airport environments. Reducing the likelihood of landing excursions can be addressed through training on go-around procedures, consequences of not going around under certain circumstances, recognizing unstablized approaches, and equipment failure such as a landing gear malfunction or reduction in braking effectiveness.*
c. *Automation has become increasingly present in aircraft as technology has evolved to make air travel safer and more efficient. However, automation itself can bring about unexpected situations that are challenging for the flight crew and particularly for single pilot operations. This can be even more problematic when unanticipated situations require manual overrides or transition to degraded modes, and the pilot(s) may get overwhelmed responding to the various tasks required by the situation. Automation*

management training provides pilots with experience to respond to these types of scenarios.

d. *This recommended practice addresses additional training in areas that have been shown to have potential for error that can be mitigated through additional experience with upset scenarios.*

A large majority of pilots have little or no experience outside of the normal flight envelope. Upset recovery training instills required knowledge and skills that provide confidence based on the demonstrated ability to manage the startle and cognitive impacts inherent in unanticipated upset events, and still provide a safe and effective recovery. For example, a sudden wake encounter which rolls the aircraft significantly beyond 90 degrees needs crisp, prompt, management to prevent a rapid escalation. Certain upsets require counterintuitive skills not acquired in the normal flight envelope or by existing licensing requirements.

Understanding the correct responses and techniques for this and other upset scenarios decreases pilot reaction times and increases safety margins for a successful recovery. This training gives flight crews competence in both understanding these flight profiles and learning to control the aircraft under adverse circumstances. There are various ways of accomplishing this training, either in an aircraft or a simulator.

Simulator training allows completion of some maneuvers that would not be performed in the aircraft due to reduced safety margins, such as performance of maneuvers conducted at low levels below safe on-aircraft UPRT altitudes, in significant weather conditions obscuring the horizon, or at night. The quality and type of maneuvers trained in the simulator depend on the capabilities of the simulator as this type of training requires an expanded envelope data package. Simulators do not provide accurate sensory inputs of the aircraft, such as sustained G-loading, or full motion cues. Operators should be aware that training aircraft may not be representative of the responsiveness of the aircraft actually flown so it is essential that instructors are properly trained in UPRT concepts and use training aircraft only in a manner that imparts transferable skills. Operators should seek out an appropriate upset recovery training model that fits their operations. Ref: ICAO Document 10011, Manual on Aeroplane Upset and Recovery Training. Other references that may be useful include Airplane Upset Recovery Training Aid, Revision 2, and the Airplane Upset Prevention and Recovery Training, Revision 3.

Assessment criteria:

Preaudit:

1. *Review organization's manuals or flight crew training materials for the recommended elements in this item.*

Onsite:

2. *Review training records to ensure completion of all elements.*
3. *Interview personnel for understanding of the response in these safety areas.*

***8.1.3.7 (H)* The organization should provide Helicopter underwater escape training (HUET) to personnel involved in over-water helicopter operations in hostile environmental conditions. (Recommended Practice)**

Explanation:

A hostile environment is defined in ICAO Annex 6 Part III as an environment in which:

a) a safe forced landing cannot be accomplished because the surface and surrounding environment are inadequate; or
b) the helicopter occupants cannot be adequately protected from the elements; or
c) search and rescue response/capability is not provided consistent with anticipated exposure; or
d) there is an unacceptable risk of endangering persons or property on the ground.

This recommended practice focuses specifically on the consideration that pilots must give to overwater flight in a helicopter that is beyond autorotational glide distance from land. A helicopter with functional and undamaged floats may stay upright on the water long enough for its occupants to get out of the helicopter before it submerges, but if a float or floats are damaged, or inoperative, the occupants will likely have to egress the aircraft underwater. Helicopter underwater training provides the opportunity to practice egressing the aircraft in conditions that are not optimal, including being upside down and in the dark. Experiencing these conditions in a controlled environment provides the opportunity to plan for this situation and be able to know how to unbuckle their seatbelt by feel, handle their life vest and how to find the exit by following a pre-designated plan. The training also provides an opportunity for improvement of situational awareness and risk management when flying in a hostile overwater environment.

Assessment criteria:

Preaudit:

1. *Review training programme for inclusion of a helicopter underwater egress training programme.*

Onsite:

2. *Review training records for completion of a HUET course.*
3. *If possible, interview personnel for understanding of the application of this training.*

8.1.4 Training for Personnel Performing Duties in the Cabin

8.1.4.1 If flight attendants are required by the State of Registry, the organization's training programme for flight attendants shall include, at least, the following:

a. Initial and annual aircraft specific cabin systems training;
b. During initial training and every two years thereafter:

i. Emergency procedures training including instruction on the location and operation of all emergency and life-saving equipment installed;
ii. First aid training;
iii. Aircraft surface contamination training; and
iv. Dangerous goods recognition training.

Explanation:

For those organizations who are required by their State of Registry to have flight attendants as part of the aircraft crew, the following training must include at least the following elements.

a. Initial and annual aircraft specific cabin systems training: This yearly training is required for aircraft specific cabin systems and covers both normal and abnormal procedures.

b. During initial training and every two years thereafter:

i. Emergency procedures training including instruction on the location and operation of all emergency and life-saving equipment installed: This includes information about the location and operation of installed emergency and life-saving equipment as well as training on emergency evacuation of the aircraft.

ii. First aid training: Because flight attendants may have to handle situations where a person on their flight becomes ill or incapacitated, first aid training is required to provide information about how best to address certain medical situations until medical assistance can be provided. This training should include both general first aid elements as well as any aircraft or operation-specific subjects as appropriate. Different scenarios can occur from food poisoning, turbulence-related injuries, or other health issues. Such training will allow the flight crew to better assess the needs of the person requiring assistance and in determining whether or not the flight will need to be diverted in order to provide care.

iii. Aircraft surface contamination training: aircraft surface contamination training, addressing the types of contamination that may be encountered by the organization's flight crews.

and

iv. Dangerous goods recognition training: Initial and recurring dangerous goods training is required by this section to ensure currency in recognition of dangerous goods. Training programs will vary depending on whether or not the operator transports dangerous goods. Even those operators that do not transport dangerous goods must provide recognition training to ensure that dangerous goods are not inadvertently carried. Reference Chapter 11 guidance for more information on dangerous goods.

Assessment criteria:

Preaudit:

1. Review the operator's manuals to determine if they have a documented initial and annual training programme for flight attendants that meets the requirements of this standard.

Onsite:

2. Interview flight attendant training personnel as well as a representative sample of flight attendants to ensure that the documented training programme is clearly understood and followed.
3. Review training records to demonstrate that initial and annual flight attendant training is being provided in accordance with the documented training programme.

8.1.4.2 For operations other than those to which 8.1.4.1 applies, if the organization uses any person to perform duties in the cabin of its aircraft in flight (e.g., flight attendants, cabin attendants, cabin servers, etc.), the organization's training programme for such personnel shall include, at least, initial and recurrent training on the following subjects:

a. If the person is assigned by the organization to perform any duty onboard the aircraft:

i. Authority of the pilot-in-command and the relationship of their duties to those of the other crew members and any others performing any duties on board; and

ii. Means of communication and sterile cockpit procedures;

b. Additionally, if the person's duties onboard the aircraft involve the use of any aircraft equipment:

i. The aircraft equipment that the person may use; and

ii. Procedures for normal operations as well as abnormal and emergency situations;

c. Additionally, if the person is responsible for passenger safety:

i. Emergency procedures training including instruction on the location and operation of all emergency and life-saving equipment installed;

ii. First aid training;

iii. Aircraft surface contamination training; and

iv. Dangerous goods recognition training.

d. If the person is provided exclusively for passenger convenience (i.e., if the person is not responsible for passenger safety), the organization must establish a procedure to ensure that passengers are advised that the person does not have safety-related training and duties. In these cases, the person shall receive the training indicated in 8.1.4.2.a and 8.1.4.2.b, but the training indicated in 8.1.4.2.c is not required.

Explanation:

If flight attendants are not required by the State of Registry, there are specific training requirements depending on the duties they perform in the aircraft.

a. Any duty: A person performing any duty in the aircraft cabin must receive training on both the authority of the PIC and communications / sterile flight deck procedures.
   - Authority of the PIC: The pilot in command is the final authority for the safe conduct of a flight, and is responsible for the safety of the crew, passengers, cargo and the aircraft. Training for anyone performing duties in the cabin must include the chain of command onboard the aircraft, including the scope and duration of the PIC authority.
   - Means of communication: This training must cover communications processes and procedures as applicable for the duration of the flight. Sterile cockpit procedures, including limited communications with the flight crew during phases of flight requiring sterile cockpit, must be trained to ensure that the flight crew is not interrupted during those landing phases of flight.

b. Use of any aircraft equipment: If the person performing duties in the aircraft uses, as part of those duties, any aircraft equipment, then in addition to the training required by 8.1.4.2.a, training must be included on both the normal use of the equipment being used as well as any applicable abnormal or emergency training. For example, if galley equipment is used, then training must be provided in the operation of each component of the galley, the safety procedures and work practices associated with those components, recognizing potential hazards, how to handle malfunctions or other abnormal/emergency situations, securing and restraint of any components, and any other areas relevant to the equipment being used. Any other equipment being used must have comparable training. Ref: https://tc.canada.ca/en/aviation/publications/flight-attendant-training-standard-tp-12296/62-galleys

c. Passenger safety: When persons performing duties in the cabin are present for passenger safety then, in addition to the training required by 8.1.4.2.a & b, training must be provided on the following elements:

   i. operation of all emergency and life-saving equipment installed: This includes information about the location and operation of installed emergency and life-saving equipment as well as training on emergency evacuation of the aircraft;

   ii. First aid training: Because cabin personnel may have to handle situations where a person on their flight becomes ill or incapacitated, first aid training is required to provide information about how best to address certain medical situations until medical assistance can be provided. This training should include both general first aid elements as well as any aircraft or operation-specific subjects as appropriate. Different scenarios can occur from food poisoning, turbulence-related injuries, or other health issues. Such training will allow the flight crew to better assess the needs of the person requiring assistance and in

determining whether or not the flight will need to be diverted in order to provide care.

iii. Aircraft surface contamination training: aircraft surface contamination training, addressing the types of contamination that may be encountered by the organization's flight crews;

and

iv. Dangerous goods recognition training:
Initial and recurring dangerous goods training is required by this section to ensure currency in recognition of dangerous goods. Training programs will vary depending on whether or not the operator transports dangerous goods. Even those operators that do not transport dangerous goods must provide recognition training to ensure that dangerous goods are not inadvertently carried. Reference Chapter 11 guidance for more information on dangerous goods.

Training must be both initial and recurrent at an interval that is appropriate to the organization.

These requirements are summarized in the following table.

Training	a. Any duty	b. Use of any aircraft equip.	c. Responsible for passenger safety
Authority of PIC	X	X	X
Communications / Sterile cockpit	X	X	X
Aircraft equipment used		X	X
Normal / abnormal procedures		X	X
Emergency procedures			X
First aid			X
Surface contamination			X
Dangerous goods recognition			X

d. It is important to note that in the situation where a person is present for passenger convenience only, and therefore is NOT responsible for passenger safety, the operator must establish a procedure to ensure that their passengers are advised that the person who is attending to them for their convenience during the flight will not assist them in the event of an abnormal or emergency situation and does not have safety-related training and duties. Aircraft passengers may assume that anyone providing cabin services, of any sort, are there to assist in the event of an abnormal or emergency situation. Clarification of this person's role is needed to ensure that the passengers do not wait for instructions from her/him or hesitate to respond to the situation.

Assessment criteria:

Preaudit:

1. Review the operator's manuals to determine if they have a documented initial and recurrent cabin crew training programme for cabin crew members that meet the requirements of this standard.
2. Review documents/manuals to determine the scope of responsibilities of the cabin personnel, including whether there are any persons on board for passenger convenience only, as well as procedures for passenger notification when an operator has cabin personnel who are not responsible for passenger safety.

Onsite:

3. Interview cabin crew training personnel as well as cabin crew members to ensure that the documented training programme is clearly understood and followed.
4. Review training records to demonstrate that initial and recurrent flight crew training is being provided in accordance with the documented training programme.
5. When the operator uses personnel in the cabin who are present only for passenger convenience, interview relevant personnel to ensure understanding of the process for the passenger notification required by 8.1.4.2.d.

8.1.4.3 The organization should provide training on high altitude physiology and on the effects of rapid or explosive loss of pressurization for any person performing duties in the cabin of its aircraft above 10,000 ft. (Recommended Practice)

Explanation:

This recommended practice addresses the unique challenges present during flight above 10,000' due to the thinning of the atmosphere and the effects that unprotected exposure to that atmosphere can have on the human body. Full operational capacity cannot be achieved by aircraft crews starting at about 10,000 ft above the ground without the aid of a pressurized cabin and supplemental oxygen. As with any system in the aircraft, response to an abnormal situation such as a rapid or explosive loss of pressurization would have a better potential for success if the people involved understand the needs of the human body, including getting access to supplemental oxygen as soon as possible, as well as being familiar with the processes and procedures to respond to an emergency situation such as this. For more information on this

topic see, for example, https://skybrary.aero/bookshelf/books/1269.pdf, "Cabin Decompression Awareness."

Assessment criteria:

Preaudit:

1. *Review the operator's manuals to determine if they have a documented training programme covering high altitude physiology and effects of rapid/explosive loss of pressurization for any person performing duties in the cabin of the aircraft above 10,000 ft.*

Onsite:

2. *Interview relevant personnel to ensure that the documented training programme is clearly understood and followed.*
3. *Review training records to demonstrate that this training is being provided in accordance with the documented training programme.*

8.1.5 Other Onboard / Ground Personnel

8.1.5.1 The organization's training programme shall include initial and recurrent training for any other personnel or task specialists (such as loadmasters, EMS medical teams, observers etc.) who are assigned to perform duties onboard an aircraft during flight time and/or provide operational ground support.

Explanation:

Many flight operations include personnel onboard who have specific tasks to accomplish during flight or operational ground support. Some examples include loadmasters, medical personnel, observers, camera operators, etc. Because the tasks involved may be widely varied, each operator must consider the unique needs for their operation and develop training programmes that cover the specific onboard duties as well as normal and abnormal procedures that are relevant to the personnel or task specialists.

Where an operator has assigned onboard duties to those other than flight crew or cabin crew members, that person must also be given adequate initial and recurrent training to perform the procedures relevant to the duties with which the person is to be involved including:

a. authority of the pilot-in-command;
b. means of communication;
c. a general description of the aircraft and systems that the person may use;
d. procedures for normal, abnormal, and emergency situations;
e. location, operation and use of emergency, lifesaving and survival equipment carried; and
f. the relationship of their duties to those of the other crew members.

Training must be both initial and recurrent at an interval that is appropriate to the organization.

Assessment criteria:

Preaudit:

1. Review the operator's manuals to determine if they have a documented training programme to ensure that other personnel or task specialists receive initial and recurrent training.

Onsite:

2. Interview relevant staff to ensure that the documented training programme is clearly understood and followed.
3. Review training records to demonstrate initial and recurrent training being provided to personnel in accordance with the documented training programme.

8.1.6 Flight Coordinators, Schedulers and Dispatchers

8.1.6.1 If the organization has flight coordinators, schedulers and/or dispatchers, the organization's training programme shall include initial and recurrent training for such personnel that is appropriate to the scope of their duties.

Explanation:

Organizing all the elements of a trip, from pre-departure planning to arrival at a destination, requires knowledge of all aspects of business aviation. These include aircraft requirements, company policies and procedures, logistics, and the ability to plan thoroughly as well as adapt to changing conditions such as weather or visa requirements or mechanical needs, for example. The personnel who perform these types of tasks may have various titles, but the essence of their responsibilities is the same: to ensure that a flight goes smoothly from the first planning steps to the safe arrival of aircraft and people at the intended destination. This requires coordination, communication and thorough knowledge of the organization's flight requirements. To this end, the organization must provide a training programme for their flight coordinators, schedulers and/or dispatchers that covers the scope of their assigned duties. Because every operator will have a different set of operational needs, it is important that this training be tailored to provide the necessary knowledge and skills for their operation.

Subjects that could be included in this training programme, include but are not limited to:

a. Operator policy and procedures;
b. Computer skills and scheduling software application;
c. Aircraft performance and weather;
d. Fatigue management/Human factors;
e. Safety Management Systems;
f. Emergency Response;
g. Leadership and teamwork;
h. Regulations and international standards;

i. Interpersonal skills and effective communication; and
j. CPR and hangar safety.

Training must be both initial and recurrent at an interval that is appropriate to the organization.

Assessment criteria:

Preaudit:

1. Review the operator's manuals to determine if they have a documented training programme to ensure that flight coordinators, schedulers and/or dispatchers, as applicable, receive initial and recurrent training.

Onsite:

2. Interview relevant staff to ensure that the documented training programme is clearly understood and followed.
3. Review training records to demonstrate initial and recurrent training being provided to personnel in accordance with the documented training programme.

8.1.7 Maintenance Personnel

8.1.7.1 The organization's training programme shall include initial and recurrent training for all maintenance personnel to ensure they have the competencies appropriate to the levels of maintenance performed and the frequency with which the maintenance is performed.

Explanation:

The organization must establish a training programme for the maintenance personnel in the group. Depending upon the organization, the needs of the training programme may vary significantly.

In organizations that perform maintenance in house, this must include the training relevant to the aircraft type(s) operated and maintained by the organization. This could be factory approved training taken at a training facility, but it doesn't necessarily have to be. It could also be on-the-job training provided by qualified technician or supervisor. While factory approved training is obviously preferred, this may not be reasonable for organizations with a mixed fleet of aircraft types and models.

Organizations that do not perform maintenance in house will have to ensure that the person or persons responsible for the oversight and scheduling of maintenance are trained to perform their job functions effectively. This could apply to a Director of Maintenance or Maintenance Controller, for example. Even though they do not turn wrenches on the aircraft they need to be trained in the maintenance requirements and use of the tools used to track and schedule maintenance.

Training must be both initial and recurrent at an interval that is appropriate to the organization.

Assessment criteria:

Preaudit:

1. Review the operator's manuals to determine if they have a documented training programme to ensure maintenance personnel have the competencies appropriate to the level of maintenance performed in the organization.

Onsite:

2. Interview staff to ensure that the documented maintenance training programme is clearly understood and followed in the organization.
3. Review training records to demonstrate initial and recurrent training being provided to employees in accordance with the documented training programme.

8.1.7.2 The training programme for maintenance personnel shall include training on the following subjects as appropriate to the person's duties:

a. The organization's policies and procedures;
b. Use of applicable software applications; and
c. The use of the aircraft's MEL.

Explanation:

The organization must ensure that the maintenance personnel receive initial and recurrent training on the company polies and procedures. This should be done as a part of indoctrination to the new employees as well as recurrently in the years to follow.

The frequency for recurrent training should be defined by the organization. Although IS-BAO does not specify a frequency for these topics, they may have an established frequency by regulation or other standards.

The use of applicable software systems must be taught to those maintenance employees that will utilize them in the performance of their duties. This would include online maintenance tracking programmes, electronic retrieval of manufacturer technical manuals and instructions, systems on board the aircraft with which the technicians must interface, maintain or update, flight scheduling software or basic office software used to create and maintain spreadsheets or other documents.

Maintenance personnel must be trained in the proper use of the aircraft MEL. In many cases, the maintenance personnel will be assisting the fight crews remotely when the aircraft breaks down away from home base and the crew needs to determine if the discrepancy can be deferred in accordance with the MEL in order to get the aircraft home. At other times, they may be writing

up or rectifying the deferral themselves and will need to know how to document it in accordance with company processes including the use of INOP placards for affected equipment. They may also need to know what to do if they cannot correct a deferred item within the time limitation and need to get an extension.

Assessment criteria:

Preaudit:

1. Review the operator's manuals to determine if they have a documented training programme to ensure maintenance personnel receive training on the above topics.

Onsite:

2. Interview staff to ensure that the documented maintenance training programme is clearly understood and followed in the organization and that maintenance personnel are able to speak knowledgably on the topics above as applicable to their job functions.
3. Review training records to demonstrate initial and recurrent training being provided to employees in accordance with the documented training programme.

8.1.7.3 Persons who hold maintenance release authority should undertake recurrent training every two years on at least one aircraft group (e.g. large or small cabin, etc.), or system for which they exercise that authority. (Recommended Practice)

Explanation:

For personnel that hold maintenance release authority, it is recommended that they receive recurrent training ever two years on at least one aircraft group for which they exercise that authority. This is classified into large or small cabin aircraft groups.

This does not mean that an organization with a mixed fleet has to send their technicians to train on every aircraft in the fleet every two years but rather that they should provide training on at least one aircraft type each two years at a minimum. With a mixed fleet, it would be appropriate to send different technicians to different course so that they can come back and provide on-the-job training to the other technicians.

For organizations with only one aircraft this does not mean that the Director of Maintenance has to go to the same aircraft training every 24 months which would be a poor use of training funds. Rather, it would be beneficial to send that Director of Maintenance to various training courses to expand their understanding of the aircraft and its systems. Training on the engine types or avionics systems, Principals of Troubleshoots, etc. are more valuable than repeating the same aircraft recurrent training every time.

Assessment criteria:

Preaudit:

1. *Review the operator's manuals to determine if they have a documented training programme to ensure maintenance personnel holding maintenance release authority receive initial and recurrent training every two years.*

Onsite:

2. *Interview staff to ensure that the documented maintenance training programme is clearly understood and followed in the organization.*
3. *Review training records to demonstrate initial and recurrent training being provided to employees in accordance with the documented training programme.*

8.2 Human Factors (HF) and Crew Resource Management (CRM) Training

8.2.1 The organization shall provide initial and recurrent HF and, where applicable, CRM training to all personnel involved in the safe operation of aircraft.

Explanation:

It is recommended that Human Factors and, where applicable, CRM initial and recurrent training be provided to any personnel involved with the safe operation of aircraft. Flight operations have a wide variety of tasks that must be coordinated, and those tasks are, for the most part, overseen by humans. The subject of human factors has evolved over the last 50-plus years to drive a focus on the interaction of the many facets of an organization and its outside vendors to work safely and efficiently towards a common goal. Historically, human error accounts for the vast majority of aviation accidents and incidents, and human factors training was developed to provide a better understanding of the elements that can impact human performance, from physiological issues to ergonomic design to interpersonal interactions.

Humans, just like the equipment used in aviation, require care and upkeep in order to maintain optimal performance. Human factors training provides personnel with knowledge and awareness of the impact of fatigue, stress, overall health of a person in order to give tools for them to optimize their performance. Getting sufficient rest, eating well and exercising are foundational tools for personnel to perform well and understanding these elements can help an organization and its personnel with functional aspects such as scheduling as well as recognition of circumstances that may require taking action to counteract fatigue or stress.

The equipment with which personnel interact is also a major human factors consideration. Design for the human-machine interface is a key to better human performance and training in this area allows personnel to learn to adapt their workspace to their individual needs. This could be anything from a desk that allows for sitting and standing, a different computer keyboard, a noise-cancelling headset, a better desk chair, the proper technique for using equipment, and much more.

Perhaps most important to human factors training, is the development of communication skills to allow better interactions between personnel from all departments within an organization. Having a common understanding of the elements of interpersonal interactions lays the groundwork for a more productive team environment.

There are numerous resources for human factors material. A useful starting point is https://skybrary.aero/index.php/Main_Page#human-performance and select the "Human Performance" tab.

Assessment criteria:

Preaudit:

1. Review the operator's manuals to determine if they have a documented human factors training programme, including as applicable CRM training, for crewmembers, schedulers, dispatchers, maintenance personnel and other personnel connected with the safe operation of aircraft.

Onsite:

2. Interview relevant personnel to ensure that the documented training programme is clearly understood and followed.
3. Review training records to demonstrate that this training is being provided in accordance with the documented training programme.

8.2.2 The organization should provide HF and, where applicable, CRM recurrent training at least every 24 months to all personnel involved in the safe operation of aircraft. (Recommended Practice)

Explanation

This recommended practice of providing recurrent training in the human factors and CRM subject areas at least every 24 months is in recognition of the need to revisit these subjects on a frequent enough basis that personnel remain current in both their understanding and practical application of human factors and CRM skills.

Assessment criteria:

Preaudit:

1. *Review the operator's manuals to determine if they have a documented recurrent human factors and CRM training programme for all personnel involved in the safe operation of the aircraft and to confirm that it is scheduled at least every 24 months.*

Onsite:

2. *Interview relevant personnel to ensure that the documented training programme is clearly understood and followed.*
3. *Review training records to ensure that this training is being provided.*

8.2.3 The organization should ensure the training of aircraft crew members in Threat and Error Management (TEM) principles. (Recommended Practice)

Explanation:

This recommended practice provides aircraft crew members with another tool to address management of flight operations from the perspective of actively identifying threats, errors and undesired aircraft states. These terms are defined as follows:

- *Threats: "events or errors that occur beyond the influence of the line personnel, increase operational complexity, and which must be managed to maintain the margins of safety."*
- *Errors: "actions or inactions by the line personnel that lead to deviations from organizational or operational intentions or expectations."*
- *Undesired aircraft states: "operational conditions where an unintended situation results in a reduction in margins of safety."*
  Ref:https://www.skybrary.aero/index.php/Threat_and_Error_Management_(TEM)#Related_Articles

This training is intended to provide a focus on the interface between the people involved in an aviation operation and the factors that define the context of operational activities such as regulatory, organizational and environmental factors present during an operation. This framework provides the aircraft crew members skills to more accurately describe a situation as well as diagnose the situation in order to better determine actions to address the needs of the operation. (Ref: https://www.skybrary.aero/index.php/Threat_and_Error_Management_(TEM)).

Assessment criteria:

Preaudit:

1. *Review the operator's manuals to determine if they have a documented recurrent TEM training programme for all aircraft crew members.*

Onsite:

2. *Interview aircraft crew members to ensure that the documented training programme is clearly understood and followed.*
3. *Review training records to demonstrate that TEM training is being provided to aircraft crew in accordance with the documented training programme.*

8.3 Emergency Procedures Training for Passengers

8.3.1 ***Passengers who fly frequently should receive emergency procedures training, particularly for aircraft without cabin attendants. (Recommended Practice)***

Explanation:

For those operators who have passengers that fly with them regularly, it is recommended that those passengers receive emergency procedures training. Whether the frequent passenger is a corporate VIP or a regular member of a working crew with the operator (such as firefighting or scientific research flights, for example), these passengers would benefit from the additional knowledge and experience this training provides. In operations where there are no cabin crew to assist passengers in the event of an emergency, this type of training may well save lives.

Assessment criteria:

Preaudit:

1. *If the operator includes this training, review training manuals and documents for content of the frequent passenger emergency procedures training.*

Onsite:

2. *Review records of training if applicable.*
3. *Interview personnel and/or frequent passengers for more insights about the training, as applicable.*

8.4 Proficiency Certification

8.4.1 National civil aviation regulations vary in the requirements and processes for proficiency certification for aircraft crew members. Organizations must ensure that personnel meet national proficiency requirements and shall have processes to ensure that the training objectives for all crew member training courses required by the national civil aviation authority are met.

Explanation:

Aircraft crew members are required by national civil aviation authorities to have specific proficiency certification requirements. Awareness of these requirements are part of the organization's compliance monitoring processes. The organization must have a documented process for ensuring that their personnel in fact meet the national requirements and that their training objectives for all crew members meet those requirements.

Assessment criteria:

Preaudit:

1. Review training manuals and documents for content of the training objectives and completion of the required proficiency certification in accordance with this standard.

Onsite:

2. Review training records to ensure completion of the required training and proficiency certification.
3. Interview relevant personnel to ensure that the requirements of this standard are clearly understood and followed.

8.4.2 The Chief Pilot/Operations Manager is responsible for the proficiency of pilots and for ensuring that the proficiency is certified through a pilot proficiency check (PPC) conducted:

a. At the conclusion of initial aircraft type training; and
b. At a minimum of every 24 calendar months thereafter.

Explanation:

The chief pilot/operations manager's responsibilities must clearly include that he/she is responsible for the proficiency of the organization's pilots and for ensuring that proficiency is certified through pilot proficiency checks. The proficiency check must be conducted and passed at the conclusion of initial aircraft type training and thereafter at a minimum of every 24 calendar months. A training/certification matrix can be used to ensure tracking of this requirement. Some operators have software programs that track this information as well. Regardless of the format, the documented tracking must clearly show the status of proficiency certification for the organization's pilots.

Assessment criteria:

Preaudit:

1. Review manuals/documents to ensure that proficiency certification is the responsibility of the chief pilot/operations manager.
2. Review manuals/documents to ensure inclusion of the requirement to complete the proficiency check at the required intervals.

Onsite:

3. Review pilot training records for documented proof of proficiency certification through a pilot proficiency check.
4. Interview chief pilot/operations manager for understanding of and compliance with this Standard.

8.4.3 Such pilot proficiency checks shall be conducted by:

a. An approved national civil aviation pilot examiner, e.g., a Type Rating Testing Officer; or
b. A company check pilot approved or designated by the State civil aviation authority; or
c. A pilot examiner that holds approval authority from an ICAO Contracting State; or
d. The Chief Pilot/Operations Manager.

Pilot proficiency may also be certified by training to proficiency using the same standard.

Explanation:

The pilot proficiency checks required by section 8.4.2 must be conducted by a check pilot with authority granted by a civil aviation authority. This includes

a. An approved national civil aviation pilot examiner;
b. A company check pilot who has been approved or designated to serve in that capacity by the State civil aviation authority;
c. A pilot examiner who has been granted approval authority from an ICAO Contracting State; or
d. The operator's Chief Pilot/Operations Manager.

Note that proficiency checks may not be able to be conducted by all of the check pilot options noted above. Appropriate check pilots will vary depending on the regulations applicable to the operation being conducted and the State of licensing.

Pilot proficiency may also be certified using "training to proficiency" where the pilot's proficiency is examined at various stages of the training programme instead of at the completion of all elements of the training, where allowed by the regulatory authority.

See the Note in the standard for considerations where no specific test standards exist.

Assessment criteria:

Preaudit:

1. Review manuals for information about the conduct of pilot proficiency checks to ensure conformance to this item.

Onsite:

2. Review training records for completion of pilot proficiency checks by appropriately authorized personnel per this standard.
3. Interview relevant personnel regarding the conduct of pilot proficiency checks.

8.5 Training and Qualification Records

8.5.1 For each person in the organization who is required to receive training, the organization shall establish and maintain records that meet the applicable national requirements and include, at least, the following:

a. The person's name and, where applicable, personnel licence number, type and ratings;
b. If applicable, the person's medical category and the expiry date of that category;
c. The dates on which the person successfully completed any required training, proficiency check or examination;
d. Information relating to any failure of the person to successfully complete any required training or proficiency check, or to obtain any required qualification;
e. If applicable, the type of aircraft or flight training equipment used for any training, proficiency check or required qualification; and
f. For pilots, the results of the most recent examination completed by each pilot for each type of aircraft for which the pilot has a qualification.

Explanation:

Records of training and testing must be maintained for all personnel who are required to receive testing. These records must meet the applicable national standards and must include the items listed in this standard. It is important to note that this section applies to anyone in the organization who is required to receive training, which includes those personnel who receive training that is required by the organization and not necessarily by an overseeing regulatory authority. This will vary for different organizations, but could include, for example, office or reception personnel, ramp personnel, company drivers, etc. Records of training do not necessarily need to be centralized. Management of these records can be accomplished by the appropriate department within the organization as long as the requirements of this item are met by all of those departments.

The training records must clearly:

a) identify the person receiving the training and any necessary license information;
b) include applicable medical category information, including expiration;
c) the dates of successful completion of required training, proficiency check or examination;
d) information about failure to complete any required training or check or maintain a qualification;
e) where applicable, the aircraft type or flight training equipment used; and
f) pilot records must include the most recent examination completed by the pilot for each type of aircraft on which they are qualified.

Assessment criteria:

Preaudit:

1. Review manuals/documents for recordkeeping requirements in accordance with this item.

Onsite:

2. Review training records in all departments of the organization where training is required to ensure records contain the information listed in this item.
3. Interview personnel regarding process for maintenance of training records.

8.5.2 The organization shall retain these records listed in items 8.5.1.a through 8.5.1.e and copies of pilot proficiency checks, or ensure that they are retained by the training service provider, for at least three years.

Explanation:

The minimum period of time that the records required by items 8.5.1.a through 8.5.1.e must be retained is at least three years. As the use of electronic records becomes more prevalent, it is possible that the retention time is essentially unlimited. Regardless of the format of these records, the minimum retention period should be clearly documented.

For organizations whose records are maintained by a service provider, the operator must ensure continued availability of those records, especially in the event of a change of service provider.

Records must also be retained for the required period for any personnel who leave the organization.

Assessment criteria:

Preaudit:

1. Review manuals/documents for a records retention policy that is in accordance with this item.

Onsite:

2. Review records to ensure conformance with the minimum retention period.
3. Interview relevant personnel regarding the record retention practices in the organization.

9 Occupational Health and Safety

9.1 Occupational Health and Safety Requirements

9.1.1 The organization shall have a process to identify and comply with all national and local occupational health and safety laws and requirements applicable to its operations. In the absence of national/local regulations, the organization shall establish processes to ensure:

a. Conformance with fire safety, first aid and sanitary industry best practices;
b. Provision of safety and protective clothing and equipment applicable to each person's duties within the organization (e.g. hearing protection for crewmembers and ramp personnel, fall protection from elevated surfaces, reflective outerwear for persons performing duties on the ramp at night, etc.);
c. Provision of safety information and training to employees;
d. That machinery, tools and equipment, including lifting equipment, meets safety standards; and
e. That hazardous materials are controlled and that employees have information and training in their handling and storage.

Explanation:

The organization must establish a process by which they are aware of all occupational health and safety laws and requirements at their base(s) of operations. These laws and requirements will differ significantly from one geographical location to another. If an operator has multiple bases of operations, this process must include all base locations.

Whether or not the operator is based in a location that has national/local regulations related to occupational safety and health, the operator must establish processes to provide the following items in accordance with industry best practices:

a. Conformance with fire safety, first aid and sanitary industry best practices: This means that the operator must provide the necessary resources and supplies to identify the industry best practices for fire safety, first aid and sanitary requirements.
b. Provision of safety and protective clothing and equipment applicable to each person's duties within the organization (e.g. hearing protection for crewmembers and ramp personnel, fall protection from elevated surfaces, reflective outerwear for persons performing duties on the ramp at night, etc.): In this item an operator is expected to assess the needs of all personnel in the organization for personal protective equipment and ensure that personnel have access to the required equipment and training on how and when to use it effectively.
c. Provision of safety information and training to employees: The operator is expected to establish a safety programme to provide employees with the training and information that they need to successfully accomplish their job assignments in the safest manner possible.
d. That machinery, tools and equipment, including lifting equipment, meets safety standards: Here the organization is expected to have a regular process to inspect and

maintain machinery, tools and equipment to ensure it meets safety standards. This would include ensuring the safety guards are installed on workshop machinery, that lock out/tag out equipment is available, hoists are inspected and in good condition, and that lifts, stands and ladders used for elevated surface work are safe for use.
e. That hazardous materials are controlled and that employees have information and training in their handling and storage: This item in the Standard is frequently misunderstood. This is not related to the transportation of Dangerous Goods but rather the employee interaction with hazardous substances they may encounter in the process of doing their job assignment. This items applies to all areas of the organization; not just the maintenance hangar. There are hazardous materials present in most workspaces including office environments. These can include toner cartridges, cleaning supplies, solvents, chemicals, etc. The organization must ensure that their employees understand which items are hazardous and what precautions should be taken to handle and store them safely.

Assessment criteria:

Preaudit:

1. Review the operator's manuals to determine if they have a documented process to ensure compliance with applicable occupational health and safety laws and requirements in all areas of operations.
2. Review the operator's manuals to determine if they have a documented process to monitor new requirements and ensure that they remain in compliance with applicable laws and requirements.
3. If the operator is based in an area where there are no such laws and regulations, review the manuals for a documented process to meet the intent of items 9.1.1 a-e.

Onsite:

4. Interview staff to ensure that the documented process is clearly understood and utilized in the organization.
5. Ask the operator to show you records of any new requirements that they identified and what steps they took to ensure that their organization was in compliance with the new requirements.
6. Review training records to demonstrate training being provided to employees on occupational health and safety topics.
7. Sample the facility for compliance with requirements including (as applicable);
   - Check equipment for safe condition.
   - Presence of adequate fire extinguishers in the work area
   - Presence of first aid supplies
   - Ensure firefighting equipment, eye wash stations, first aid kits, emergency showers and exits, etc., are serviceable, accessible and not blocked with other equipment.
   - Observe employees to ensure that they are utilizing personal protective equipment as appropriate to their job functions.
   - Ensure that employees have access to Safety Data Sheets or other information on hazardous materials in the workplace.

- If the operator does any elevated surface work, check for the availability of fall protection devices for employees performing this work.
- Other items as applicable to the operation.

9.1.2 The organization shall develop procedures to ensure that all company personnel, passengers and visitors accessing hangar or ramp areas comply with the occupational health and safety requirements.

Explanation:

The aviation operating environment presents a wide variety of hazards to those that enter the hangar or ramp area. The organization must develop a way to make sure that everyone that enters these hazardous areas follows the occupational health and safety requirements put into place to protect them from these hazards.

Especially at risk are those people that do not normally inhabit the aviation environment. Visitors to the facility are not as aware of the hazards or as familiar with the safety rules and regulations as aviation professionals are. Visitors can include potential clients, local community groups taking tours, contractors, outside auditors, family members of employees, etc.

Additionally, many passengers are not aware of their surroundings as they access the hangar or ramp to board or disembark from the aircraft.

It is the responsibility or the organization to develop procedures to ensure that these people, in addition to their employees, remain in compliance with occupational health and safety rules and regulations when in the aviation environment.

Assessment criteria:

Preaudit:

1. Review the operator's manuals to determine if they have documented procedures to ensure that employees, visitors and passengers accessing the hangar and/or ramp area remain in compliance with applicable occupational health and safety laws and requirements.

Onsite:

2. Interview staff to ensure that the documented procedure is clearly understood and utilized in the organization.
3. Observe how you, as a visitor to the facility, were made aware of the safety rules and requirements and how the organization ensured that you remained in compliance with these rules.

Alternative ways to achieve this:

There are many ways to ensure compliance with safety rules and regulations for visitors and passengers in the hangar or on the ramp. Some organizations require employee escort at all times for visitors and passengers in these areas. Others brief visitors on the safety rules and regulations upon arrival and attain the signature of the visitor before allowing access to the facility.

Some organizations are tenants of an FBO that controls all access to the ramp and/or hangar and thereby takes responsibility for the compliance of visitors and passengers. If this is the case, the organization should have some method of oversight to ensure that the FBO is managing this risk effectively on their behalf.

9.1.3 The operator shall establish procedures to manage the risks associated with maintenance personnel working alone.

Explanation:

The potential for personnel injury when working alone is especially dangerous since there is no one around to assist an employee who becomes injured. The maintenance environment is filled with hazards that can cause injury and in corporate aviation, maintenance personnel are frequently required to work by themselves. This doesn't mean that maintenance employees can't work alone. It just means that an operator must be aware of this and establish procedures to manage the risk associated with these types of situations.

Lone worker procedures can vary greatly from operator to operator. Some operators choose to utilize electronic notification devices that record falls or allow an injured employee to contact help. Other operators establish a list of high risk activities such as elevated surface work or jacking of aircraft and prohibit those activities when someone is working alone. Some choose to have the employee check in and out with someone when they are working alone. There are many ways to accomplish this. The operator just has to find a method that works for their operation.

Assessment criteria:

Preaudit:

1. Review operator manuals to ensure that they have documented the procedures or policy related to maintenance personnel working alone.

Onsite:

2. Confirm via interviews that the procedures are clearly understood and followed.
3. Examine any applicable records of these procedures being utilized.

9.1.4 ***The organization should establish procedures to manage the risks associated with any person who may be working alone. (Recommended Practice)***

Explanation:

The potential for personnel injury when working alone is especially dangerous since there is no one around to assist an employee who becomes injured. While the Standard requires, in section 9.1.3, that the organization have procedures to manage these risks for maintenance personnel, this recommended practice extends to the other employees in the organization. The hangar and ramp areas present many hazards to any employee entering the aviation environment but even an employee that works in an office environment is at some risk when they are alone in the facility. Consideration should be given to pilot or crew member duties performed alone. It is possible for someone to, for example, fall or suffer a heart attack and have no way to get help. This does not mean that employees cannot work alone. It just means that the organization should be aware of this situation and establish procedures to manage the risk associated with these types of situations.

Assessment criteria:

Preaudit:

1. *Review operator manuals to determine if they have documented procedures related to personnel working alone.*

Onsite:

2. *Confirm via interviews that the procedures are clearly understood and followed.*
3. *Examine any applicable records of these procedures being utilized.*

Alternative ways to achieve this:

Lone worker procedures can vary greatly from operator to operator. Some operators choose to utilize electronic notification devices that record falls or allow an injured employee to contact help. Other operators establish a list of high risk activities and prohibit those activities when someone is working alone. Some choose to have the employee check in and out with someone when they are working alone. There are many ways to accomplish this. It is recommended that the operator establish a system that works for their operation.

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10 Environmental Management

10.1 Environmental Management Requirements

<u>10.1.1</u> The organization shall have a process to identify and ensure compliance with all national and local environmental laws and requirements applicable to its operations. This process shall address any requirements that are applicable to the organization's aviation activities, including those related to:

a. Ground operations noise abatement to include engine run-ups and auxiliary power unit operations consistent with safety, including airport curfews;
b. Ground operations including aircraft fuelling and de/anti-icing procedures;
c. Spill containment of toxic and flammable materials and chemicals, including disposal of collected materials;
d. Disposal of waste materials;
e. The operation and/or use of:
i. Hangars, workshops, stores, etc.;
ii. Fuel storage and dispensing equipment, and
f. Operations subject to emissions charges, fees, or purchase of credits related to Market-Based Measures regulations (e.g., Emissions Trading Schemes).

<u>Explanation</u>:

The organization must establish a process by which they are aware of all environmental laws and requirements both locally at their base(s) of operations as well as areas of operations away from home. These laws and requirements will differ significantly from one geographical location to another. If an operator has multiple bases of operations, this process must include all base locations.

The operator must establish processes to provide the following items in accordance with environmental laws and requirements:

a. <u>Ground operations noise abatement to include engine run-ups and auxiliary power unit operations consistent with safety, including airport curfews:</u> This section means that the operator must provide the necessary resources and supplies to identify the noise abatement requirements at locations where they are conducting ground operations. It is important to recognize that this item is specific to ground operations including but not limited to maintenance, servicing and ramp operations.

<u>b. Ground operations including aircraft fuelling and de/anti-icing procedures:</u> This means that if the operator conducts ground operations such as aircraft fuelling and de-icing, they must have a process by which they stay aware of the environmental laws and requirements related to these activities and remain in compliance with them. This should also include understanding of the run-off and containment of both these activities into the aerodrome drainage system and any potential local pollution risk, including any other materials as described in item 'c' below.

c. Spill containment of toxic and flammable materials and chemicals, including disposal of collected materials: Although no one intends to spill toxic and flammable materials and chemicals, the reality is that it does happen. Whether it is hydraulic fluid, fuel, oil, deicing, or any other fluid in the hangar or on the ramp, the operator must have a process by which they identify the laws and requirements related to such spills to include how to contain the spill as well as how to dispose of the collected material such as fuel-soaked kitty litter or other absorbent materials. This process should also include monitoring and replenishment of spill containment equipment. When away from home base, the airport authority may need to be consulted for assistance with local requirements.

d. Disposal of waste materials: The operator must have procedures related to the collection, disposal and/or recycling of waste materials generated in their operation to include, but not limited to, waste oil, fuel, sealants, resins, batteries, electronics, paint and other waste items from both the hangar and office environments. These will vary depending upon the location of operations so the operator must be aware of these requirements at all bases of operation. This procedure should also include provision for the safe disposal of waste generated during flight operations, including but not limited to catering waste, recyclables, etc., taking into account local requirements at destination locations.

e. The operation and/or use of:

i. Hangars, workshops, stores, etc.: The operator must first identify and then ensure compliance with all environmental laws and regulations related to maintenance facilities and the many environmental hazards that inhabit such facilities. This would include proper storage, separation, handling and disposal of chemicals, flammables, cleaning products, etc., utilized in maintenance activities in addition to the pollutants generated in these environments, especially where there is proximity to local water courses.

ii. Fuel storage and dispensing equipment, If the operator has any fuel tanks or trucks or other dispensing equipment, they must have procedures to ensure compliance with the environmental laws and requirements related to this equipment. If they do not have such equipment, this item will be not applicable.

f. Operations subject to emissions charges, fees, or purchase of credits related to Market-Based Measures regulations (e.g., Emissions Trading Schemes): Operators must have a process to determine whether or not their operations are subject to regulatory based emissions charges, fees or Market Based Measures. If determined to be applicable, the operator must monitor fuel use as part of their operations to enable accurate output and monitoring of carbon dioxide (CO_2) emissions from their operations. These could include the Carbon Offsetting and Reduction Scheme for International Aviation (CORSIA), the European Union Emissions Trading System (EU-ETS), Swiss ETS, or any other regulatory market-based mechanism, even if they are not currently directly affected by these measures. Operators must have a way to establish how and when they might become subject to these regulatory measures. For example, if they were to change

the areas of operation or the quantity of flights in a given airspace, and track their activity to be able to demonstrate that they are not subject to these types of fees and why that is the case. Free tools are available for emissions monitoring from the International Civil Aviation Organization (ICAO) CORSIA dedicated webpages.
References:
https://www.icao.int/environmental-protection/CORSIA/Pages/default.aspx
https://ibac.org/sustainability/corsia

Assessment criteria:

Preaudit:

1. Review the operator's manuals to determine if they have a documented process to ensure compliance with applicable environmental laws and requirements in all areas of operations.
2. Review the operator's manuals to determine if they have a documented process to monitor new requirements and ensure that they remain in compliance with applicable laws and requirements.

Onsite:

3. Interview staff to ensure that the documented process is clearly understood and utilized in the organization.
4. Ask the operator to show you records of any new requirements that they identified and what steps they took to ensure that their organization was in compliance with the new requirements.
5. As applicable, review training records to demonstrate training being provided to employees on environmental topics.
6. Sample the facility for compliance with requirements including (as applicable).
   - Presence of spill containment equipment, monitoring and replenishment in the work area.
   - Presence of proper waste disposal, including catering waste, collection sites.
   - Presence of proper storage for flammables and other chemicals.
   - Proper containment for control of pollutants created during maintenance operations such as paint booths, etc.
   - Observe employees to ensure that they are conducting themselves in accordance with environmental laws as appropriate to their job functions.
   - Inspect any fuel storage facilities or dispensing equipment for compliance with local environmental laws and general conditions.
   - Ask the operator to demonstrate how they monitor their emissions to ensure they remain in compliance with applicable emissions programs around the world.
   - Other items as applicable to the operation.

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11 Transportation of Dangerous Goods

11.1 Considerations for All Organizations

<u>11.1.1</u> The organization shall have a process to ensure that dangerous goods are not transported onboard their aircraft except where authorized under and in accordance with:

a. The State of Registry regulations; and
b. For international operations, the provisions of the ICAO Technical Instruction for the Safe Transport of Dangerous Goods (hereafter called ICAO Technical Instructions) or the IATA Dangerous Goods Regulations.

<u>Explanation</u>:

Regardless of whether or not an organization is approved to carry dangerous goods, they must have a process in place to ensure that dangerous goods are not unintentionally carried onboard their aircraft unless such carriage is authorized and in accordance with applicable laws and standards.

This process must ensure that personnel recognize items that either contain or are considered regulated dangerous goods, as well as how to follow the organization's specific policy, process and procedure for the handling of the material. The organization must therefore identify personnel who perform duties that involve transportation of persons, baggage or cargo and provide those people with training to ensure achievement and assessment of the competencies and knowledge required for handling of dangerous goods, including recognition, processing, handling, acceptance/rejection of dangerous goods. The process must also be in accordance with national/international laws, regulations and standards, as applicable and will vary depending on the organization's operational needs.

a. The organization's process must comply with the regulations of their State of Registry.

b. For those operators who fly internationally, the process must also be developed to be in accordance with the provisions of the ICAO Technical Instruction for the Safety Transport of Dangerous Goods or the IATA Dangerous Goods Regulations.

   Having the ICAO or IATA documents is not mandatory (although appropriate especially for operators that do transport DG), as long as the operator has a process that ensures they operate in accordance with the provisions of those documents when flying internationally. Operators can establish other processes that fulfill this standard.

   There are some resources available online, and some operators also rely on specialized organizations providing updated training to them or even consulting services on occasion. Guidance provided by IATA with regards to passenger and

crew carry-on items is located in their Passenger DG Corner at https://www.iata.org/en/programs/cargo/dgr/dgr-guidance/.

Other useful resources include

- FAA: https://www.faa.gov/hazmat/packsafe/
- ICAO publishes the State variations that were notified by the States to them: https://www.icao.int/safety/DangerousGoods/Pages/StateVariationPage.aspx

Assessment criteria:

Preaudit:

1. Review manuals for the organization's process regarding the transportation of dangerous goods to ensure it meets the requirements of this item.

Onsite:

2. Review records for training in recognition of dangerous goods.
3. Interview personnel to ensure understanding of the responsibilities of the organization and the process for ensuring that dangerous goods are either not carried or carried only as approved.

11.1.2 The organization shall have a system to advise passengers of what constitutes dangerous goods, and whether and how those goods can be carried on aircraft.

Explanation:

The carriage of dangerous goods in aviation is tightly controlled in order to keep persons and property safe both on the ground and in the air. Specific rules of carriage must be followed, and operators need to know not only how to recognize dangerous goods, but are responsible to warn their passengers about dangerous goods and what can or cannot be carried.

Dangerous goods, regardless of whether an operator is authorized to carry them, have been not only involved in aviation incidents or accidents, but have also been the cause of incidents or accidents. The system required by this item is intended to ensure that passengers are not unknowingly carrying dangerous goods onboard a flight that is not authorized to carry such goods. The notification system will vary by operator, but can include visual notices, such as posters or brochures, as well as verbal briefing, checklists or briefing cards in an appropriate language for the operation, notices or questionnaires as part of the booking and/or check-in procedure, or a pre-departure checklist, among others. There are several methods for this and ideally operators use a combination of several of these in order to ensure passengers are adequately informed.

Assessment criteria:

Preaudit:

1. Review written materials regarding passenger notification of dangerous goods to ensure conformance with this item.

Onsite:

2. Interview personnel involved with the passenger notification process to ensure understanding of the requirements of this item.

11.2 Dangerous Goods Transportation Requirements

11.2.1 Organizations that transport dangerous goods, whether they are organization's property, the property of organization personnel, or received from an external entity, shall ensure that the goods are transported in accordance with:

a. The rules specified by the State of the Operator; and
b. For international operations, the provisions of the ICAO Technical Instructions, or the IATA Dangerous Goods Regulations.

Explanation:

Note that section 11.2 of the standard applies to those operators who carry dangerous goods. For the will-not-carry operators, section 11.2 of Chapter 11 is not applicable.

Organizations that transport dangerous goods, regardless from whom such material is received, must ensure that the handling and carriage of such goods is done in accordance with the relevant requirements.

a. The operator must comply with the rules set out by the State of the Operator.

b. The second element of this item applies to operators who fly internationally and are authorized to carry dangerous goods. The information covering international operations with dangerous goods can be found in the ICAO Technical Instructions or the IATA Dangerous Goods Regulations. Note that where a contracting State's requirements for dangerous goods transport vary from the ICAO Technical Instructions, the State is required to publish their variations in Attachment 3, Chapter 1 to the Technical Instructions. Ref: https://www.icao.int/safety/dangerousgoods/pages/statevariationpage.aspx

Assessment criteria:

Preaudit:

1. Review manuals regarding the operator's dangerous goods program to ensure conformance with this item.

Onsite:

2. Interview relevant personnel to ensure understanding of and conformance with the requirements of this item.

<u>11.2.2</u> The organization shall ensure that all personnel involved in the transportation of dangerous goods are trained and certified in accordance with the ICAO Technical Instructions or the IATA Dangerous Goods Regulations and the rules specified by the State of the operator.

<u>Explanation</u>:

There is a broad range of personnel that are involved in the transportation of dangerous goods, and all of these people must be trained and certified according to the rules specified by the State of the Operator and with the ICAO Technical Instructions or the IATA Dangerous Goods Regulations. These personnel include

- Shippers and packers
  - Shippers includes anyone acting as a shipper, including the operator's staff, when preparing dangerous goods for transport. This applies to transport of company materials as well.
- Freight forwarders who are involved in
  - processing dangerous goods;
  - processing cargo or mail, other than dangerous goods; and
  - the handling, storage and loading of dangerous goods.
- Operators and ground handling agents including
  - those personnel who accept dangerous goods as well as cargo or mail that is not considered dangerous goods; and
  - staff or agents who are involved in the handling, storage and loading of dangerous goods;
  - passenger handling staff;
  - flight crew members, load masters, load planners and flight operations officers/flight dispatchers.
- Security screeners
  - Staff who are involved with the screening of passengers and their baggage, cargo and/or mail, including supervisors and staff involved with developing security procedures.

See table below for a graphic representation.

Aspects of transport of dangerous goods by air with which they should be familiar, as a minimum	Shippers and Packers		Freight forwarders			Operators and ground handling agents						Security screeners
	CATEGORY*											
	1	2	3	4	5	6	7	8	9	10	11	12
General philosophy	✔	✔	✔	✔	✔	✔	✔	✔	✔	✔	✔	✔
Limitations	✔		✔	✔	✔	✔	✔	✔	✔	✔	✔	✔
General requirements for shippers	✔		✔			✔						
Classification	✔	✔	✔			✔						✔
List of dangerous goods	✔	✔	✔			✔				✔		
General packing requirements	✔	✔	✔			✔						
Packing instructions	✔	✔	✔			✔						
Labelling and marking	✔	✔	✔	✔	✔	✔	✔	✔	✔	✔	✔	✔
Shipper's Declaration and other relevant documentation	✔		✔	✔		✔	✔					
Acceptance procedures						✔						
Recognition of undeclared goods	✔	✔	✔	✔	✔	✔	✔	✔	✔	✔	✔	✔
Storage and loading procedures					✔	✔		✔		✔		
Pilots' notification						✔		✔		✔		
Provisions for passengers and crew	✔	✔	✔	✔	✔	✔	✔	✔	✔	✔	✔	✔
Emergency procedures	✔	✔	✔	✔	✔	✔	✔	✔	✔	✔	✔	✔

*CATEGORY DETAILS

1 Shippers and persons undertaking the responsibilities of shippers', including operator's staff acting as shippers, operator's staff preparing dangerous goods as Company Materiaals (COMAT)

2 Packers

3 Staff of freight forwarders involved in processing dangerous goods

4 Staff of freight forwarders involved in processing cargo, mail or stores (other than dangerous goods)

5 Staff of freight forwarders involved in the handling, storage and loading of cargo, mail or stores

6 Operator's and ground handling agent's staff accepting dangerous goods

7 Operator's and ground handling agent's staff accepting cargo, mail or stores (other than dangerous goods)

8 Operator's and ground handling agent's staff involved in the handling, storage and loading of cargo, mail or stores and baggage

9 Passenger handling staff

10 Flight crew members and load planners

11 Crew members (other than flight crew members)

12 Security staff who deal with the screening of passengers and their baggage and cargo, mail or stores, e.g. security screeners, their supervisors and staff involved in implementing security procedures

Ref: https://www.iata.org/contentassets/8bf966983e474747abae2663ac8e0c5f/dgr-training-requirements.pdf

Assessment criteria:

Preaudit:

1. Review training and certification materials for the operator's dangerous goods training programme to ensure that it conforms to the requirements of this item.

Onsite:

2. Review records of training for appropriate dangerous goods training as required by this item.
3. Interview personnel to ensure understanding of and conformance with the requirements of this item.

11.2.3 The organization shall ensure that the pilots-in-command of their aircraft are informed of what dangerous goods are being carried onboard the aircraft as early as practicable before the departure of the aircraft.

Explanation:

The requirement that the pilot(s)-in-command of an aircraft be informed of the dangerous goods to be carried on-board is in place to ensure that in the event of an emergency, the PIC has the information readily available to inform relevant parties of what kind of dangerous goods are being carried on board in order to facilitate the appropriate response by emergency services to the situation. This notification will ensure that the PIC knows that it has been properly loaded, is aware of the conditions for the transport that must not be changed in flight, and being aware of the location and quantity of the DG in the event that there is a fire or other issue, etc. The notification must be done as early as practicable prior to the departure of the flight. Ref: https://www.icao.int/safety/dangerousgoods/pages/background.aspx

Assessment criteria:

Preaudit:

1. Review manuals to ensure that the operator has a process in place for notifying the pilots-in-command of any dangerous goods to be carried on a flight.

Onsite:

2. Review records of dangerous goods documentation for flights to ensure the process for notification was followed and is appropriate.
3. Interview personnel regarding the PIC notification process to ensure understanding of and conformance with the requirements of this item.

<u>11.2.4</u> The organization shall have a process to ensure that, in the event an aircraft carrying dangerous goods is involved in an accident or serious incident, it will provide information about the dangerous goods onboard, without delay, to emergency personnel responding to the accident or serious incident and to the appropriate authorities of the State of the Operator and the State in which the accident or serious incident occurred. The process shall also ensure that, for incidents of a non-serious nature, this information shall be provided if requested.

<u>Explanation</u>:

The organization's dangerous goods programme must include a process, in the event of an accident or serious incident, to immediately inform responding emergency personnel of what materials are on-board the aircraft and where it is located. This allows the responders to be appropriately prepared for the hazards they face at the site of the accident or serious incident. The notification process must also include notifying the authorities of the State of the Operator and of the State in which the accident/incident occurred so that they can be appropriately prepared for their investigation efforts.

For incidents of a non-serious nature, the information noted above must be available to the appropriate authorities upon request.

<u>Assessment criteria</u>:

Preaudit:

1. Review documents for the notification process to emergency responders of dangerous goods that are on board an aircraft involved in an accident or serious incident.
2. Review documents for the notification process of dangerous goods carried on board when requested in the event of an incident of a non-serious nature.

Onsite:

3. Review records of flights carrying dangerous goods, if available, to ensure the information for the notification process required by this item is included the flight documents.
4. Interview personnel regarding this notification process to ensure understanding of and conformance with the requirements of this item.

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12 Fatigue Management Programme

Introduction

Fatigue has been and will remain a significant and immediate threat to aviation operations, both on the ground and in the air. Although it is a complex phenomenon that can be attributed to many factors, fatigue and its effects on alertness and human performance at the workplace have been the subject of scientific research for more than two centuries. Therefore, a wealth of information and many tools are readily available to help prevent hazardous work caused by fatigue impairment. Recognising that the prescriptive flight/duty time limitations have sometimes been ineffective at preventing incidents or accidents, and that such predefined schemes cannot anticipate or even simply encompass the diversity and complexity of our industry, the aviation community – through ICAO, IBAC and the Flight Safety Foundation – introduced a performance-based approach to complement the existing prescriptive approach.

There's currently no internationally accepted definition of a fatigue management programme. Moreover, neither ICAO, EASA, FAA, Transport Canada nor ISO have even defined the word 'programme'. This may understandably create some confusion with the more extensive, better defined, and now widespread concept of Fatigue Risk Management System (FRMS).

On the one hand, both ICAO Annex 6 Part I (International Commercial Air Transport) and Part III (International Operations-Helicopters) define an FRMS as: *"A data-driven means of continuously monitoring and managing fatigue-related safety risks, based upon scientific principles and knowledge as well as operational experience that aims to ensure relevant personnel are performing at adequate levels of alertness."*

On the other hand, ICAO Annex 6 Part II (International General Aviation-Aeroplanes) doesn't even mention FRMS. Instead, Part II requires a fatigue management programme in international general aviation operations with large and/or turbojet aeroplanes, to ensure that operator personnel perform their duties at an adequate level of alertness. At face value, it looks as if FRMS were for commercial operations or helicopter operations whereas fatigue management programmes were for general aviation and non-commercial operations. This may often be true, depending on the State, but not always. As Annex 6 Part III shows (§ 2.8), the State of the Operator is given considerable latitude to regulate fatigue management in commercial helicopter operations. States can combine both prescriptive and performance-based approaches, as they deem appropriate, or may even completely omit the performance-based approach.

This underlines the absolute necessity of precisely identifying and clearly understanding what the applicable States require in terms of fatigue management, irrespective of the type of aircraft or of the type of operation. These legal requirements may be quite different from the IS-BAO™ standards and recommended practices. They also have precedence over the IS-BAO™. The applicable regulatory framework may also be going through a transition period at the time of an IS-BAO™ implementation or audit. All these aspects and their implications must be taken into account and carefully managed through the operator's compliance monitoring system.

12.1 Fatigue Management Programme Elements

12.1.1 The organization shall establish and implement a fatigue management programme designed to ensure that all organization personnel involved in the safe operation of aircraft do not carry out their duties when fatigued. The programme shall contain the following elements:

a. Fatigue management guiding principles;
b. Appropriate initial and recurrent training and education regarding preventive and operational fatigue countermeasures;
c. Flight and duty time limitations for aircraft crew;
d. Duty time limitations for other organization personnel involved in the safe operation of the aircraft, including, but not limited to, maintenance personnel, schedulers and dispatchers; and
e. An evaluation process that assesses the fatigue management programme's effectiveness.

Explanation:

a. Fatigue management guiding principles

In its simplest form, a fatigue management programme needs to address two core principles:

1. Establish duty and rest limitations for crew members, and duty time rules for other personnel involved in the operation and maintenance of aircraft (safety-sensitive activities); and
2. Manage the fatigue risks in order to ensure that personnel perform at adequate levels of alertness.

This is where fatigue management programmes and FRMS typically start to branch off. Whereas a fatigue management programme is commonly embedded in an operator's Safety Management System (i.e., embedded in the SMS reporting, hazard identification, risk management, training and communication processes), an FRMS is a separate system (with its own forms, processes and perhaps even its own dedicated staff) that eventually interfaces with the SMS. Defining the perimeter and purpose of the fatigue management programme or FRMS is the first step.

The guiding principles must also inform staff of the overall company strategy towards fatigue management. Some organisations even include a fatigue policy. As for any strategy, the organisation must ensure that it remains relevant both in the face of changing conditions and in seemingly routine operations. This is due to the fact that the organisation only owns part of the issue and of its solutions, whereas frontline staff own the other part. An effective strategy for fatigue management must therefore be grounded in a solid partnership between all levels of the organisation, where clear, pertinent and up-to-date goals are supported by constructive communication and fact-based decision making.

Moreover, the performance-based approach to fatigue management is likely to have far-reaching implications that shouldn't be underestimated. Depending on the technology involved and how intrusive in the private sphere it can be, the organisation may access raw data related to personal activities that no employer is usually allowed to store, process, or even collect in the first place. In other words, a fatigue management programme or FRMS is likely to have, at varying degrees, an impact on an employee's roster, life-work balance, remuneration, and last but definitely not least, overall relationship with his/her employer. Gaining a solid understanding of fatigue management and its ramifications is therefore highly recommended before embarking on its implementation. Once again, this also involves establishing and maintaining a fruitful dialogue in a collaborative atmosphere defined by openness and trust among colleagues. Without it, no programme or initiative to manage fatigue is likely to make progress or even to return any value; the exact opposite is almost certain.

In any case, copy-pasting a prescriptive rule into an Operations Manual does not equate to fully implementing a fatigue management programme. When used in isolation, the prescriptive schemes developed many decades ago are indeed an important tool (among others) but are insufficient to ensure staff alertness in a range of situations. For a fatigue management programme to be considered in conformance with IS-BAO™, there must also be dynamic components of risk management at operational level (i.e., not exclusively through published limits), and all the elements from (a) to (e) in this standard must be adequately addressed. What is 'adequate' will obviously vary based on the size, type and complexity of the operation, and particularly on its propensity to generate fatigue among staff or not. For some operators, fatigue is relatively a non-issue, whereas it is the number one concern for others.

b. Training and education

The training programmes need to be adapted in a building block approach to the role of each operator personnel, and to the specificities of the operation. If generic e-learning courses are provided, they should be complemented with operator-specific training to cover any difference or particularity of the operation (e.g., reporting, hardware or software specific to the operator).

For all staff, the following topics are recommended to be included in training:

- Circadian body clock and its effects on the daily cycle;
- Dynamics of sleep loss and recovery;
- Causes and consequences of fatigue;
- Basic information on sleep disorders and related treatments;
- Influence of workload;
- How to identify fatigue in themselves and others;
- Personal strategies (at home and away) to manage and improve sleep, and to mitigate fatigue risks;
- Overview of the fatigue management programme, including the concept of shared responsibility;
- Operator's policies, processes and procedures related to fatigue;

- How to use the reporting system and how the data is protected from inappropriate use;
- Any specific fatigue risks identified through SMS processes;
- Effect of work and trip schedules on sleep opportunities.

Additionally, for personnel involved in crew scheduling and for any person who performs duties in or on the aircraft before, during, and/or after a flight or series of flights (including but not limited to, e.g., active crew members, task/mission specialists, maintenance staff on missions/rotations, etc.), as applicable:

- In-flight rest;
- Use and limitations of scheduling tools and biomathematical models that might be in use;
- Processes and procedures for assessing the potential fatigue impact of scheduling changes;
- Processes and procedures for ensuring that management is engaged early on in the planning of changes and deviations (if deviations are allowed).

c. Flight and duty time limitations for aircraft crew

Most regulatory frameworks already define precise flight time, duty and rest limitations. However, in the absence of any clear rule, a vast body of scientific knowledge is available to guide decision making on the subject. The "Fatigue Management Guide for General Aviation Operators of Large and Turbojet Aeroplanes" jointly prepared and published by IBAC, ICAO and FSF is the most appropriate starting point in that respect. It covers both prescriptive and performance-based aspect of fatigue management, and contains tables with recommended limitations on duty periods, flight time and off-duty period in a range of situations. The IBAC-ICAO-FSF guide is available in the Fatigue Management section of the ICAO website.

Operations not directly addressed by the Guide (e.g., private helicopter operations) will still find very useful information to put in place the building blocks of their fatigue management programme.

d. Duty time limitations for other organization personnel

Most nations have at least a basic framework defining limitations on work/duty periods because research has abundantly demonstrated that the risks of an accident sharply rise after approximately 8 consecutive hours on the job. This regulatory basis needs to be clearly identified and at the very least referred to in the operator's documentation, so as to preclude any ambiguity on what applies to who. It also needs to be incorporated in the operator's compliance monitoring activities to ensure continued compliance.

If no legal requirements exist for certain positions, operators are strongly encouraged to voluntarily set company limitations if:

- Work is being performed outside normal business hours (i.e., at night and especially during the window of circadian low); and
- Work has a critical impact on safety, especially with little redundancy.

Should the organisation experience some difficulties in deciding whether a certain staff category deserves company limitation and/or needs to be included in the operator's fatigue management programme or FRMS, the following question may help. Since several experiments repeatedly indicated that the performance impairment caused by fatigue after 17 hours of sustained wakefulness is similar to that associated with moderate levels of alcohol consumption (that generally correspond to the maximum permissible blood alcohol concentration in many nations), the organisation should ask itself: "can we accept the risks of having an impaired and (legally) drunk employee on the job?". This question may be equally relevant when the operator contracts certain tasks (e.g., flight following, maintenance).

In developing their fatigue management programme for maintenance and ground operations personnel, operators are encouraged to review the publications available (see references below) and may wish to consider the following items.

1. Work Schedules
   - The nature of tasks undertaken during the latter portions of work schedules should be considered. Levels of risk may be reduced during such periods by having persons who are in the early portion of their work schedule assist with work and provide quality control.
   - Provisions for eight hours prone rest should be provided. Time between work schedules should take travel time and personal time into account, especially when overtime work is involved.
   - In order to reduce fatigue build-up, regular breaks should be integrated into work schedules.
   - The scheduling system should include a maximum work hour duration limitation for each work shift. The system should also include a process to assess extended work periods and to make decisions to terminate or continue the work shift. The process should require the assessment and decision to be documented. It should include training so that the system and expectations are clearly understood by all persons involved.

2. Shifts
   - As early morning starts can disrupt rest periods, consideration should be given to reducing the shift duration when early starts are involved. Also, the nature of work performed at the end of early start shifts should be considered.
   - Limits on the number of successive early start shifts should also be considered.
   - Levels of risk increase significantly with successive night shifts. Limits on successive night shifts, their end time and required rest periods at the end of a series of night shifts should be considered.
   - Useful information on shift work can also be found in publications originally written for air traffic controllers.

3. Weekly Limits
   - As fatigue accumulates over successive work periods, weekly work limits should be established.

- In order to relieve fatigue build-up associated with night shifts or early morning starts, a scheme such as a weekly rest period of two successive recovery nights in a seven-day period should be considered.

e. Evaluation process

The requirement for an evaluation process flows directly from both the inherent complexity of fatigue as a physiological phenomenon and from the realisation that some organisations implement programmes and systems without (ever) assessing their effectiveness. Operators are therefore expected to regularly take a critical look at any pertinent data available to confirm that the fatigue management programme has a positive effect on safety, and to take appropriate follow-up actions.

Users of fatigue management software will perhaps find this task relatively easy to complete considering the wealth of data and insights that those tools are supposed to provide (operators are encouraged to compare and ideally test the functionalities of each before committing to a vendor).

However, there's no requirement to implement such tool, and there are other ways to evaluate a fatigue management programme. At its most basic level, the evaluation process should be built upon:

- The collection of feedback on fatigue issues, from all staff covered by the programme;
- The recording of any instance where flight, duty and/or rest time limitation(s) was(were) exceeded;
- Ideally, an early identification of trends or emerging risk(s);
- An organisational review at the highest safety meeting(s), supported by top management;
- Timely follow-up actions and communication/training efforts;
- Quick checks on the effectiveness of the programme and of any modification.

Depending on both the size and complexity of the operation and on the importance of fatigue on the overall risk profile of the organisation, those six items will be translated differently by each organisation and may be performed over differing periods of time.

On a more advanced level, operators might wish to incorporate a data-gathering methodology developed in the transportation sector and, in particular, by the Australian Transportation Safety Bureau. This methodology consists of a model covering five areas of fatigue risks with corresponding fatigue risk controls and/or indicators to assesses to what extent fatigue played a contributing role in an event (i.e., typically an accident). In its original version, this investigative path starts with the event itself, then gradually zooms out to eventually look at systemic factors. For our purposes, this practical framework has been slightly adapted to allow operators to identify to what extent fatigue might be an issue in their operations, and to assess the effectiveness of their fatigue management activities. Rather than starting at a particular event and ending at system level, the path has been reversed. It therefore considers, in sequence:

- Organisational support for managing the risks of fatigue impairment;
- Provision of adequate sleep opportunity;
- Sleep obtained;
- Ability to maintain adequate alertness whilst on duty; and finally
- Fatigue-related errors (if any).

Each component contains sources of evidence in support of the assessment, and a few examples (either positive or negative). They guide operators on what to look for, which document or record to use, and where the opportunities for improvement are likely to be.

ASSESSMENT COMPONENT	SOURCE OF EVIDENCE	EXAMPLES
Organisational support	○ Documented fatigue management or FRMS policies and procedures ○ Use of fatigue-modelling tools ○ Fatigue reporting and action management ○ Fatigue awareness training content, and attendance ○ Individual knowledge/attitudes about fatigue management	○ Fatigue training limited to an overview of fatigue, sleep and fatigue countermeasures ○ Absence of biomathematical modelling on roster patterns ○ Availability of fatigue assessment tools to assist in determining fitness for duty
Provision of adequate sleep opportunity	○ Planned and actual duty rosters ○ Fatigue risk assessment of rosters ○ Suitability of sleeping environment ○ Commute method and duration	○ Crew member's duty records indicating repeated exceedances ○ Fatigue report regarding a destination where the crew members couldn't get sufficient sleep due a construction site next to their hotel
Sleep obtained	○ Sleep quantity and quality over the last 72 hours ○ Estimation of individual need for sleep ○ Description of the sleeping environment ○ Other factors, e.g., sleep disorders, alcohol/drug use, use of stimulants, etc. ○ Recorded data, i.e., actigraphy	○ Survey among staff regarding the quality of their sleep at home and away from home ○ Discussion with a crew member with a new-born

Ability to maintain alertness	○ Self/other reported observations of alertness ○ Fatigue proofing strategies, e.g., caffeine, controlled rest, etc. ○ Subjective alertness scale responses ○ Workload dimensions (physical, cognitive, pace of work)	○ Account of feeling 'drowsy' and 'tired' prior to commencing duty ○ Elevated workload on departure or arrival due to a crew member's reduced familiarity, adverse weather in the region, etc. (i.e., alertness degrading faster due a higher load on cognitive functions)
Fatigue-related errors	○ Account of an actual event or near-miss via interview, report, etc. ○ Performance (actions, decisions, communications) leading up to and during the event itself.	○ Errors noticed or reported are consistent with performance decrements due to the effects of fatigue (on attention, decision making and reaction times)

The categorisation into 5 components and the precise delineation between them is much less important than the availability of multiple, varied sources of evidence in each component. The table above aims primarily to offer a range of ideas to holistically assess the effectiveness of the programme.

Assessment criteria:

Strategically speaking, the following items should allow the auditor to (1) correctly identify how problematic fatigue really is (or is not) in daily operations; and (2) help form an opinion on whether the response of the organisation is systematic, consistent and adequate considering operational needs and constraints.

Preaudit:

1. Confirm and review the regulatory requirements that apply to the operator. Bear in mind that the regulatory framework may be transitioning (or may not have yet transitioned) from prescriptive to performance-based rules, and therefore impact the latitude given to the operator.
2. Assess how the IS-BAO™ requirements were documented into pertinent policies, processes and procedures;
3. Confirm that the document references provided by the operator are correct;
4. Ensure correct references to legal time/duty limits for non-crew personnel are included wherever needed in the operator's documentation;
5. Ask for clarifications and/or additional documents or records, as appropriate, in order to maximise the time spent on-site;
6. Build a mental picture of the operator's programme, even an incomplete or imperfect one, to guide your on-site activities. At the same time make sure to remain open to

contradicting evidence that might reverse your initial assessment of the conformance of the fatigue management programme or FRMS;

Onsite:

7. Collect facts about the volume(s) of activity (e.g., through interviews and reviews of logbooks);
8. Sample records such as duty reports, rosters, fatigue/safety reports, SRB meeting minutes, hazard log/register, risk assessments, deviation/discretion reports, audit findings, etc. Do not limit yourself to the last few months. Instead, acquire a high-level but nevertheless holistic view of the fatigue management programme (e.g., history, outputs, struggles, changes, interactions with the SMS, etc.);
9. Identify any mismatch between documentation and actual operations;
10. Assess whether the operation (or a part thereof) is prone to inducing fatigue (e.g., particularly long days, short rest periods, multi-time zone crossings, operations through the WOCL, commuting, staff shortages, frequent last-minute missions, multi-tasking staff with duties and responsibilities both as a crew member and at the office, environmental inducers of fatigue, etc.);
11. If the operator uses software and/or hardware to manage fatigue; observe as much as practical how staff uses them in daily operations;
12. Ensure that all departments and areas of the operations covered by the programme are indeed part of it in practice;
13. Assess how the operator takes schedules and work performed by external entities into account (e.g., part-time and freelance workers);
14. Openly discuss fatigue with both management and, crucially, non-management staff. Those discussions should assist in verifying that the fatigue management programme is implemented as documented. If not, the operator should already be aware of the gaps and taking steps to address them. A key discussion topic is how all stakeholders address production pressure and customer demand with finite resources and inescapable limits to human performance.

12.1.2 ***Unless superseded by more strict regulations by the State of Registry, the organization should implement the flight and duty time limitations for aircraft crew contained in the IS-BAO Guidance. (Recommended Practice)***

Explanation:

If the State of Registry has not published any flight and duty time limitations applicable to the operator, the following tables should be used, as applicable. Those tables are also recommended if the limitations published by the State are less strict.

In order to preclude any ambiguity, the source(s) of the limitations used by the operator should be clearly stated in its company documentation.

Table 1 – Flight and Duty Limits for non-augmented crews
Recommended guidance (24-hour period)

Type of operation	Duty period (maximum hours)	Flight time (maximum hours)	Off-duty period (minimum hours)
Standard[1]	14 hours	10 hours	10 hours Weekly: minimum of 36 continuous hours, including two consecutive nights, in seven-day period
WOCL[2]	12 hours	10 hours	12 hours 48 continuous hours in seven-day period following multiple WOCL duty periods.
Extended[3]	14 hours	12 hours Restricted landings and compensatory time off duty. Weekly: maximum 4 cumulative hours of extension	12 hours
WOCL	No extensions recommended		48 continuous hours in seven-day period following multiple WOCL duty periods.
Multiple time zones			48 continuous hours off duty on return home following a duty period crossing multiple time zones.

Notes:

1. **Standard operations** are defined as operations that do not encroach on the WOCL and are not extended operations.
2. **Window of circadian low** (WOCL) operations are defined as a flight in which landing occurs during the WOCL, the flight passes through both sides of the WOCL, or the duty period starts at 0400 or earlier in the WOCL
3. **Extended operations** are defined as any operation with a duty period longer than 14 hours or flight time longer than 10 hours. Extended operations can involve duty/rest cycles longer than 24 hours.

Sources: Flight Safety Foundation, NBAA, NASA

Table 2 – Flight and Duty Limits for augmented[1] crews
Recommended guidance (24-hour period[2])

Type of operation	Duty period (maximum hours)	Flight time (maximum hours)	Off-duty period (minimum hours)
Reclining seat available for rest	18 hours	16 hours	12 hours
Supine bunk available for rest	20 hours	18 hours Each flight crew member to have maximum sleep opportunity with a minimum of 4 hours total	12 hours Maximum of two consecutive duty periods with 18 hours off duty after the two consecutive duty periods.
WOCL[3]	No extensions recommended		
Multiple time zones			48 continuous hours off duty on return home following a duty period crossing multiple time zones.

Notes:

1. **Augmented crew** is a flight crew that comprises more than the minimum number required to operate the aeroplane so that each crew member can leave his or her assigned post to obtain in-flight rest and be replaced by another appropriately qualified crew member.
2. **Augmented operations** can involve duty/rest cycles longer than 24 hours.
3. **Extended operations** are defined as any operation with a duty period longer than 14 hours or flight time longer than 10 hours. Extended operations can involve duty/rest cycles longer than 24 hours.

Sources: Flight Safety Foundation, NBAA, NASA

<u>Assessment criteria for consideration</u>:

Preaudit:

1. *Assess whether the State of Registry has issued flight and duty time limitations for aircraft crew or not, and therefore whether this Recommended Practice applies or not;*
2. *In the affirmative, assess whether they're stricter than those published in appendix C of the IBAC-ICAO-FSF Fatigue Management Guide;*
3. *In the negative, verify that the operator documented flight and duty time limitations in line with appendix C of the IBAC-ICAO-FSF Fatigue Management Guide.*

Onsite:

4. *There's no particular or additional step to those described at 12.1.1 as the verification of implementation of both standards will effectively be embedded.*

12.1.3 ***If the organization's flight and duty time limitations for aircraft crew exceed those contained in the IS-BAO Guidance, or other considerations exist, the organizations should conduct a risk assessment process. (Recommended Practice)***

Explanation:

This recommended practice exclusively refers to 12.1.2 (above) in relation to the limitations defined by the State of Registry and/or by the operator, as applicable. It does ***not*** *refer to any actual exceedance of flight or duty time limitations on a specific flight (i.e., on that topic, see 12.2 below).*

This recommended practice essentially calls for a risk assessment process before the operator documents and implements limits on duty, flight or rest times that would be beyond the values in table 1 or table 2 in 12.1.2.

Assessment criteria for consideration:

Preaudit:

1. *Assess whether this Recommended Practice applies or not based on the answer to 12.1.2;*

Onsite:

2. *Obtain records of decision-making processes leading to exceed the limitations (see appendix C of the IBAC-ICAO-FSF Fatigue Management Guide);*
3. *Critically assess risk management activities upon which the decisions to exceed the limitations were based;*
4. *Consider making this item a specific subject of discussion with aircraft crew.*

12.2 Deviations

12.2.1 If deviations from the flight and/or duty time limitations are permitted, the operator shall establish the maximum extent and frequency of such deviations.

Explanation:

In line with risk-based and performance-based approaches, the standards 12.2.1 and 12.2.2 are meant to provide operators with a reasonable amount of flexibility whenever they wish to address operational needs

- using a predefined process (detailed in 12.2.2),
- without exceeding applicable regulatory requirements.

On the other hand, operators may as well decide that deviations from flight and/or duty time limitations are not permitted under any circumstance. After all, and as recent research among pilots shows, even far less duty and flight hours than legally allowed lead to high levels of fatigue, sleep problems, and significant mental health issues.

When deciding whether to permit deviations or not, operators should first ensure that they wouldn't infringe on any duty/rest rule or law applicable to all their staff involved in the safe operation of the aircraft, including but not limited to, maintenance personnel, dispatchers, schedulers, etc.

If such deviations are permitted, the "maximum extent and frequency" element of this standard needs to be documented in company manual(s) and be specific enough to inform all personnel of a definitive limit as applied to:

- A time limit (e.g., maximum X minutes/hours), and
- How frequently a specific deviation can be applied (e.g., X times per staff member per month/year/etc.).

When referring to deviations, a distinction must be made with what some regulations currently allow in terms of modification(s) to flight, duty and/or rest limits for crewmembers. On the one hand, such regulations tend to focus on unforeseen circumstances occurring after the crew duty period has started, and on their reporting to both the operator and the CAA (usually after flight). On the other hand, IS-BAO 12.2 focuses on foreseeable exceedances and on their proactive mitigation or avoidance before the crew duty period has started. Obviously, both approaches are complementary and not mutually exclusive.

In the context of this standard, a deviation from flight, duty and/or rest time limitation(s) is a planned course of action that is evaluated, formally authorized, and recorded ahead of the actual deviation itself. Therefore, this standard does not apply to deviations decided and made while inflight due to unforeseen circumstances, since the key decision-making process is unlikely to be completed before the deviation even starts. In such case, operators are expected to meet any applicable regulatory requirement or, if no regulation applies, to first decide whether such deviations will be permitted or not.

Assessment criteria for consideration:

Preaudit:

1. If deviations from flight and/or duty time limits are permitted, ensure that the operator has documented the maximum extent and frequency of the allowed deviation(s).

Onsite:

2. Review records of deviation to ensure conformance to the established limits;
3. If possible, confirm through interviews with staff involved that they understand the extent of the allowable deviations.

<u>12.2.2</u> If deviations from the flight and/or duty time limitations are permitted, the programme shall include a process to:

a. Assess the associated risks and apply appropriate mitigation to maintain an acceptable level of risk for that operation;
b. Identify the management person who is authorized to approve the deviation;
c. Record the deviations, the risk assessment and related mitigation; and
d. Ensure deviations are only made with the express approval of all personnel involved.

<u>Explanation</u>:

As indicated in 12.2.1, a good understanding of the applicable regulatory framework is essential: ensure that the operator has well identified the limitations and both the possibilities and conditions for deviating from those limitations. Deviations are a two-step process comprising a thorough risk assessment and decision-making process, followed by the deviation itself.

The deviation process must include the following elements:

a. an appropriate risk assessment process that enables the operator to continue operations at an acceptable level of safety;
b. a specific management person who has the authority to approve the deviation;
c. a record of deviations that includes the risk assessment and mitigation; and
d. ensure that the deviation is approved by all personnel impacted by the planned deviation. Note that this could include personnel on the ground if their duty day may be affected by the deviation, including but not limited to, maintenance personnel, dispatchers, flight followers, etc.

<u>Assessment criteria for consideration</u>:

Preaudit:

1. If this standard applies, ensure that a conforming process is appropriately documented;

Onsite:

2. Review records of deviation to ensure the full implementation of the deviation process;
3. If possible, confirm through interviews with staff involved in those deviations that the process was indeed followed to the letter;
4. Evaluate whether any mandatory reporting procedure has been dutifully followed.

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CASA Australia: https://www.casa.gov.au/safety-management/fatigue-management
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IFALPA : https://www.ifalpa.org/publications/fatigue/
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NASA Human Systems Integration Division: https://human-factors.arc.nasa.gov/index.php

13 Flight Operations

13.1 Standard Operating Procedures and Checklists

13.1.1 Standard operating procedures (SOPs) are the foundation of effective crew coordination and a key component of crew resource management and threat and error management (CRM/TEM).

a. Operators shall establish and maintain an SOP for each type of aircraft operated that is in accordance with the current revision of the TCH Checklists/AFM;
b. If the operator conducts international operations, it shall establish and maintain SOPs for international operations;
c. A copy of the SOP shall be issued to each aircraft crew member; and
d. The operator shall ensure that crew members use the established SOPs.

Explanation:

Standard operating procedures (SOPs) and checklists are essential to safe aviation operations and reflect the concepts of standardization in crew resource management to increase situational awareness. SOPs should be clear and comprehensive, and be easily available to flight crews. Numerous accidents worldwide are attributed to the crews' failure to follow procedures. *See NTSB presentation "Standard Operating Procedures: The backbone of professional operations" by Robert Sumwalt.* *https://www.ntsb.gov/news/speeches/RSumwalt/Documents/Sumwalt_130916_sop.pdf*. Because unintentional and intentional noncompliance has been found to be the root cause of many accidents, an operator's conformance with this item is a fundamental step to increasing safety margins and minimizing the chance that an SOP noncompliance would cause an accident or incident.

For each type of aircraft used by an operator, an SOP must be established and maintained in accordance with the type certificate holder's manuals and checklists. The contents of an SOP might vary from operator to operator, but usually cover topics that include, as applicable:

- Policies related to the use of onboard equipment specific to the type of aircraft;
- Use of checklists;
- Task coordination between crew members;
- Call outs;
- Flight profiles for normal and abnormal operations; and
- Specific policies and procedures for various operations and/or locations.

An SOP may be in the form of a single, controlled SOP manual and/or document, or as part of the flight operations manual. The operator may also choose to cover items that are common to their whole fleet within their flight operations manual, while other non-fleetwide items are covered in a separate SOP document that is applicable to a specific type of aircraft. The structure of the SOP document(s) should reflect the operational needs of the organization, whether it is a formally accepted or approved document, or an internal set of documents not requiring formal approval. In either case, there should be a documented process in place to

ensure that all personnel who are required to follow these procedures are trained and maintain current knowledge and proficiency in using these procedures.

Some operators may choose to use checklists/SOPs developed by the OEM, others may choose to use SOPs developed by other organizations, such as training providers. These might be suitable solutions if the organization operates in accordance with those procedures and the operator has a process to ensure that the SOP is current and reflects the latest revision of the OEM AFM/POH.

For international operators, an international specific SOP must be established and maintained as well to cover procedures to be used in the specific international airspace such as North Atlantic High Level Airspace (NAT HLA), Automatic Dependent Surveillance (ADS), Performance Based Navigation (PBN), Reduced Vertical Separation Minima (RVSM), etc.

The operator must have a documented process that ensures that each aircraft crewmember is issued a copy of the current SOP in hard copy or electronic form.

Just as important as developing the SOPs is ensuring the consistent use of the SOPs by crew members, starting with emphasis on its use during initial, recurrent and, as needed, remedial training. The operator must have a process to ensure that crew members use the established SOPs. This can be accomplished in a variety of ways depending on the type of aircraft being operated, equipment available, and other resources. Some operators may have recording equipment on board allowing flight data analysis, or other equipment such as flight deck recording devices. Operators with a sizeable fleet may also implement a line operations safety assessments (LOSA) program where resources allow. Information from these resources can be used to verify use of the SOPs during operations. In the absence of this type of information, operators should consider use of regular flight observations, check rides, or other observation opportunities as applicable, such as simulator training. Regardless of how an operator verifies the appropriate use of the SOPs, the fundamental principle is that the actual flight operations are reflected in the operator's SOPs.

Assessment criteria:

Preaudit:

1. Review SOP manuals and documents to ensure that all aircraft types used by the operator are included and that the SOPs are in conformance with current TCH manuals and checklists.
2. Confirm whether the operator conducts international operations. If they do, review international SOP manuals and checklists for their operations.
3. Review training syllabi to ensure they include SOP training for aircraft and other appropriate crewmembers.

Onsite:

4. Inspect aircraft to ensure each carries a copy of any SOPs and checklists on board and that these are accessible to aircraft crew members.

5. Inspect aircraft SOPs, manuals and checklists to verify they are based off of the current requirements by the TCH.
6. Review records of training for conformance with training for SOPs. (See 8.1.3.1.c).
7. Interview crewmembers regarding the process to distribute updated SOPs, and their use of the SOPs and checklists to confirm understanding of the processes.
8. Actual use by flight crews can be confirmed through observation and interviews.

<u>13.1.2</u> The type certificate holder (TCH) develops checklists as part of the aircraft certification process. Operators may use the TCH checklists directly, or they may choose to use checklists produced either internally or by external entities. In any case, it is the operator's responsibility to ensure that the checklists used are in accordance with the current TCH checklist. The operator shall ensure that:

a. A checklist covering normal, abnormal and emergency operations is established for each aircraft type it operates;
b. The checklist is made available to all crew members;
c. There is an established process to ensure the checklists are updated according to the current revision of the TCH Checklists or AFM;
d. If the operator uses a checklist produced either internally or by an external entity other than the TCH, the checklist includes its revision date and a reference to the revision of the TCH Checklists or AFM used for its development; and
e. Every crew member shall utilize these checklists in the performance of their assigned duties using the methods required by the operator and comply with best practices for checklist execution.

<u>Explanation</u>:

Aircraft checklists are used to ensure that all steps are followed during all phases of flight. The checklist(s) must be current, available in the aircraft and used by the pilots. The operator can use the checklist provided by the manufacturer/type certificate holder (TCH), or they can use one that is modified internally. These can be included in an operator's SOP or other manual. Electronic checklists are becoming more normal as operators move to glass flight decks and/or crews implement the use of iPads. Whether the operator is using paper or digital checklists, the fundamental principles of appropriate checklist design and consistent usage apply.

If the operator uses checklists provided by an external entity that is not the type certificate holder, or uses checklists modified or produced internally then the operator must include an indication of both the revision date and a reference to the aircraft document (flight manual or TCH checklist) that was used to create the company-specific checklist. In addition, the operator must develop a process for checking that the checklists remain current. One way this can be done would be to check the checklists in conjunction with other aircraft document audits or reviews, such as flight manual updates, or with internal audit processes.

The operator also needs to establish a checklist-use method that: 1) ensures that checklists are used by every crew member during assigned duties and 2) that complies with industry best

practices for use of checklists, such as read/do, do/check, or other checklist philosophy methods. Whatever the method chosen, it is important to understand that the "major function of the checklist is to ensure that the crew will properly configure the plane for flight, and maintain this level of quality throughout the flight and in every flight." (Degani, A. and Wiener, E; Human Factors of Flight-Deck Checklists: The Normal Checklist; (1990)). Reasons why checklists may not be used correctly include the attitude of the crew, distractions and/or interruptions, expectations or perceptions of the crew, time pressures, flow-check performed as a read-do checklist, responding without looking at the corresponding setting, omitting a checklist item or performing it incorrectly or only partially, performing the checklist at the wrong time, performing the checklist from memory, or failing to initiate a checklist. (Degani & Wiener, 1990; ATSB Loss of control and collision with terrain involving B200 King Air, VH-ZCR at Essendon Airport, Victoria on 21 February 2017; AO-1071-024; retrieved from https://www.atsb.gov.au/publications/investigation_reports/2017/aair/ao-2017-024/). Crews must be trained on the checklist method chosen by the operator and use the checklist(s) consistently. For single pilot operations, ensuring that each pilot is consistent, thorough and precise in their use of checklists, whether they utilize a read-do method, or a flow then check with checklist procedure (which provides a double check of actions taken while running the checklist), is imperative to maximizing the benefits of the checklist use.

It is also important to ensure the consistent use of checklists by crew members, starting with emphasis on its use during initial, recurrent and, as needed, remedial training. The operator must have a process to ensure that crew members use the established checklists. This can be accomplished in a variety of ways depending on the type of aircraft being operated, equipment available, and other resources. Operators can verify the appropriate use of checklists through means such as, the use of regular flight observations, check rides, or other observation opportunities as applicable, including simulator training.

Assessment criteria:

Preaudit:

1. Review manuals/documents to ensure that the operator has a written process that states the frequency for checking currency of the checklists for all aircraft against the current TCH or AFM checklists.
2. Confirm that the operator has established a documented method by which flight crews will use the checklists, taking into account best practices for such use.

Onsite:

3. Ensure that every aircraft type operated has a checklist specific to that aircraft that includes normal, abnormal and emergency checklist items.
4. Confirm that the current checklist is readily available to all crew members. This means that it is in a location where it can be easily reached at any time during any flight phase.
5. Inspect checklists to ensure that they are updated according to the current revision of the TCH checklists or AFM, and are current with the latest version for the specific aircraft.

6. If the operator uses checklists provided by an external entity that is not the type certificate holder, or uses checklists modified or produced internally, confirm that those checklists include a revision date and a reference to the aircraft document from which the checklist content was generated.
7. Look for evidence of the operator's process to ensure crew members are using the checklist(s). Actual use by flight crews can be confirmed through observation and interviews.

13.2 Flight Planning and Preflight Requirements

13.2.1 General Considerations

13.2.1.1 The operator shall establish a process to ensure that the pilot-in-command will not commence a flight without ascertaining that the facilities available and required for such flight and for the safe operation of the aircraft are adequate, including communication facilities, navigation aids, NOTAMs, etc.

Explanation:

The operator's preflight planning process must include a determination by the pilot-in-command that locations where flight operations will take place, and along the route of flight, have the facilities and resources available to ensure the safe operation of the aircraft. For takeoff and landing operations, this may range from airports, to remote airstrips or remote areas for helicopter operations. For the route of flight, the PIC must determine that any navigation aids, communication facilities, informational aids, and other applicable facilities are appropriate for the needs of the flight. There are many external entities who can assist with this requirement, such as flight planning services or aeronautical chart providers, but operators may also do this in-house.

If the operator has consistent operations in and out of specific locations, they could have a standard assessment for routine items, supplemented by checks on items that might have changed, e.g. NOTAMS, etc.

Assessment criteria:

Preaudit:

1. Confirm that there is a written process for preflight planning, that includes the pilot-in-command's determination that facilities available for a flight meet the requirements for the safe operation of the flight and aircraft.
2. Confirm that this process includes a check for adequacy of the facilities, as appropriate for the specific operation, including communication facilities, navigational aids, NOTAMs, etc.

Onsite:

3. Confirm through interviews that pilots and relevant personnel are knowledgeable about the preflight planning process.
4. Observe the preflight planning process to confirm that it conforms to the standard as used by the operator.

<u>13.2.1.2</u> The operator shall establish a process to ensure that the pilot-in-command, before commencing a flight or series of flights, will be familiar with all available meteorological information appropriate to the intended flight. This process shall include:

a. A review of available current weather reports and forecasts; and

b. The planning of an alternative course of action to provide for the eventuality that the flight cannot be completed as planned because of weather conditions.

<u>Explanation</u>:

The operator's preflight planning process must include a determination by the pilot-in-command, in a timely manner, that the meteorological conditions for the entire route of flight are adequate for the safe conduct of the flight. This includes checking current weather reports and forecasts from aviation and national and/or local weather forecast providers that covers the intended route of flight, and refreshing this information shortly before flight. This process must also include a determination by the pilot-in-command of an alternative plan for the flight if the weather conditions change such that the flight has to be rerouted, either to a new flight route or a new destination.

For operations in remote areas where there is no specific weather information available, the planning process should include assessments of all information available for the local and regional area, including but not limited to, area information, PIREPS, weather camera information, and checking in with other operators in the area if available.

<u>Assessment criteria</u>:

Preaudit:

1. Confirm that there is a written process for preflight planning, including that the pilot-in-command checks all available meteorological information for the route of flight.
    i. This will include a determination that weather conditions are adequate for the operation,
    ii. as well as a plan for an alternative course of action if the weather conditions should change.

Onsite:

2. Confirm through interviews that pilots and relevant personnel are knowledgeable about the preflight planning process for checking meteorological conditions throughout the route of flight, including any alternates that may be included in the plan.

3. Observe the preflight planning process to confirm that it conforms to the standard for confirming that weather conditions are acceptable for the planned flight. If no flights are scheduled, ask the operator to demonstrate their preflight planning process.
4. Review records of preflight planning, including the determination about weather conditions, if available.

13.2.1.3 The operator shall establish a process to ensure flight crews are familiar with national, regional and international air navigation procedures and associated requirements prior to the commencement of flight into such airspaces. The process shall also ensure that flight crews comply with the requirements of their State of Registry or Operations, published Regional Procedures and the regulations of each airspace in which they intend to land or overfly, whichever is more restrictive.

Note 1: Operators should check GEN 1.7 of the State AIPs to identify where State requirements deviate from ICAO SARPS. Operators may be able to obtain such a service from flight planning service providers.

Note 2: The rules in force relating to flight and manoeuvre of aircraft when operating outside the airspace of any sovereign state, i.e., oceanic or high seas, shall be in accordance with ICAO Annex 2, Rules of the Air.

Explanation:

An essential element of preflight planning is understanding the regulatory requirements of the airspace the operator will be flying through or operating in. These requirements may have overlapping authorities, with regional requirements overlaying national requirements. There are many external entities who can provide this service, such as flight planning service or aeronautical chart providers, but operators may choose to do this in-house. In any case, the operator must have its own procedures on how to obtain and validate this information. The operator's flight planning procedures must come from a documented process for ensuring all requirements are understood by the flight crews. In addition to knowing what the requirements will be, the operator must have a process to ensure their flight crew's conformance with those requirements.

These requirements are obvious when flying from one country to another, however, when operating near borders, it is important to be aware of the potential for flying in foreign airspace even when the takeoff and landing areas are within one's own nation. For example, an operator flying from Seattle, Washington to Ketchikan, Alaska will fly through Canadian airspace and their aircraft and operation must comply with Canadian regulations even though they do not plan to land in Canada.

Per the notes to this protocol, differences for States can be found in Aeronautical Information Publications (AIP) under GEN 1.7. These can be found through an online search or through flight planning service providers. Note that operators must have a process for complying with

these differences as well as complying with ICAO Annex 2 when flying outside sovereign airspace.

Assessment criteria:

Preaudit:

1. Review manuals and flight planning documents to determine if the operator's process is appropriate for their operations and meets the requirement of this section to determine the applicable regulations for planned flights.
2. If the operator flies internationally or outside sovereign airspace, review manuals and flight planning documents to verify that the operator's flight planning incorporates application of these rules to the flight plan

Onsite:

3. Interview flight crews, dispatch and schedulers to determine sufficient knowledge to determine the applicable regulations and to ensure that a flight will conform to those requirements throughout all phases of flight.
4. Review records of flight planning to verify that flights have been conducted in compliance with applicable regulations.
5. Observe the flight planning process to determine if all involved are knowledgeable about the processes and conduct them appropriately.

***13.2.1.4* Operators intending to operate in international airspace should maintain or have access to a library of publications relevant to flight in international airspace.**

Explanation:

For those operators who fly in international airspace, it is recommended that a library of information about flight in international airspace be maintained in an easy to access format. This 'library' of information can be either in hard-copy or electronic files. The operation should also have a procedure in place to ensure that this library is kept up-to-date and current for their operations. Flight crew members should be familiar with the contents of these documents and make use of the appropriate documents when planning and conducting operations in international, NAT HLA, RNP or RVSM airspace.

The following is a list of documents that may be considered for inclusion in the Aviation library:

1. *Convention on International Civil Aviation (Document 7300);*
2. *ICAO Annex 2 (Rules of the Air);*
3. *ICAO Annex 5 (Units of Measurement to Be Used in Air and Ground Operations);*
4. *ICAO Annex 6 (Operation of Aircraft);*
5. *ICAO Annex 11 (Air Traffic Services)*
6. *ICAO PANS/OPS (Document 8168, Vol. I);*
7. *ICAO PANS/ATM (Document 4444);*

8. ICAO Manual on Implementation of a 300 m (1 000 ft.) Vertical Separation Minimum Between FL 290 and FL 410 Inclusive (Document 9574)
9. ICAO Performance-Based Navigation Manual (Document 9613)
10. North Atlantic Operations and Airspace Manual (NAT Doc 007)

Assessment criteria:

Preaudit:

1. *If the operator flies in international airspace, review any references to the content of the operator's library of information about flight in international airspace.*

Onsite:

2. *Review library of international flight references to confirm appropriate content for the type of international operations conducted by the operator.*
3. *Interview personnel involved with international flight planning to confirm their awareness and understanding of the information required for planning international flights.*

13.2.2 VFR Flight

13.2.2.1 The operator shall establish a policy stating that flights to be conducted in accordance with visual flight rules shall not be commenced unless current meteorological reports or a combination of current reports and forecasts indicate that the meteorological conditions along the route or that part of the route to be flown under the visual flight rules will, at the appropriate time, be such as to enable compliance with these rules.

Explanation:

Studies of accident reports show that when a flight conducted under visual flight rules (VFR) continues into deteriorating weather below VFR minimums, the odds of a successful outcome drop dramatically. From loss of control to controlled flight into terrain, the outcome is often deadly. (*Ison, D. (2014).*

This standard provides that a written policy must be established that requires the aircraft crew to determine during the preflight planning process that weather conditions for all phases of a planned flight will remain VFR and that the crew will be able to comply with all visual flight rules for the duration of the flight. This policy must be supported by the flight planning process referenced in 13.2.1.2 regarding preflight assessment of meteorological conditions. This could be done with preflight planning software applications, records of calls to a flight service provider, hard copy or electronic flight plans, among others, that indicate the source of the meteorological information.

Note that this item applies even if the operator flies any part of the flight under VFR. These situations include, but are not limited to, for example, taking off under VFR prior to picking up

an IFR clearance or cancelling IFR to shoot a visual approach. If the operator intends to never fly VFR, then this item could potentially be N/A but only if there is a documented policy stating that all VFR flight is prohibited and VFR flight is never conducted.

Reference: (*Ison, D. (2014). Correlates of Continued Visual Flight Rules (VFR) into Instrument Meteorological Conditions (IMC) General Aviation Accidents. Journal of Aviation/Aerospace Education & Research, 24(1). Retrieved from http://commons.erau.edu/jaaer/vol24/iss1/1).*

Assessment criteria:

Preaudit:

1. Review VFR flight planning policy to verify that it clearly states that VFR flights will not be commenced until the aircraft crew and/or pilot-in-command has determined that the flight can be conducted under visual rules for the duration of the planned flight.

Onsite:

2. Review flight planning documents to confirm that the policy is followed during preflight planning.
3. Interview aircraft crew and other appropriate personnel to confirm their knowledge and understanding of the policy.
4. Observe preflight planning process, including acquisition of meteorological information for flights under visual flight rules.

13.2.2.2 The operator shall establish a process to assess the obstacle and terrain avoidance risks related to VFR flight.

Explanation:

Operating under visual flight rules, whether day or night, requires the pilot to ensure that they will be able to see and avoid certain obstacles and/or terrain. Obstacle and terrain clearance require planning for the route of flight and altitude. Checking the maximum elevation figures (MEF) and other elevation information noted in aeronautical charts will aid in determination of enroute altitude and the route itself to best avoid those obstacles. In addition, knowing the obstacles, natural and man-made, that lie along a flight route is an important element of this risk assessment. Certain operations will require specialized planning for obstacle and terrain avoidance, for example in helicopter external load operations and low altitude flight in both fixed and rotor wing aircraft to ensure appropriate routing.

Risks that are more prevalent at night include loss of visual reference to the ground, especially if flying over water or over unpopulated areas. Darkness changes human perception of the landscape and navigating by visual landmarks such as rivers, hills, trees, buildings, among others, can change dramatically from daytime because these landmarks may disappear from sight at night. This loss of visual reference can result in inadvertent IMC encounters, controlled flight into terrain (CFIT), and the inability to see an appropriate precautionary landing spot if needed.

The assessment of the potential risks that can be encountered during a night VFR flight can be mitigated through training, thorough preflight planning. The use of available technology such as autopilot, instrument displays, GPS, etc. may provide much needed workload reduction for the crew. The operator's VFR risk assessment process should reflect the risks inherent in their operation, including human factors such as fatigue, get-home-itis, duck-under syndrome, etc. and have in place mitigations to increase safety margins during operations in conditions of low visibility and/or during nighttime. These could include, as applicable to the operation, the use of supplemental oxygen, night vision goggles, or other equipment that could enhance visual capabilities.

Assessment criteria:

Preaudit:

1. Review operator's process for VFR risk assessment of obstacle and terrain avoidance to confirm its applicability to their operations.

Onsite:

2. Review available flight planning documents for VFR flights to determine if the operator's process has been complied with.
3. Interview personnel regarding the use of this risk assessment process for flight planning to verify understanding and conformance with that process.
4. If applicable, inspect aircraft for additional terrain/obstacle avoidance equipment.

13.2.3 IFR Flight

13.2.3.1 The operator shall establish a policy stating that flights to be conducted in accordance with the instrument flight rules shall not be commenced unless the available information indicates that conditions at the aerodrome or heliport of intended landing or at least one destination alternate will, at the estimated time of use, be at or above the aerodrome or heliport operating minima.

Explanation:

This standard essentially addresses the need to obtain, as applicable, suitable weather information and forecast before a flight or series of flights. It aims to ensure that operators systematically answer a very simple question: "will the weather at destination (or at least one destination alternate) pose a risk to the completion or even to the safety of the flight?".

A widely accepted time margin for "estimated time of use" is one hour before and after the earliest and latest time of arrival. The operator should also consider any applicable State of Registry criteria for "estimated time of use". Additional considerations can be found in the Flight Planning and Fuel Management (FPFM) Manual (ICAO Doc 9976).

Assessment criteria:

Preaudit:

1. Ensure proper documentation of the policy and any related processes or procedures to complete the task, in compliance with applicable regulatory requirements.

Onsite:

2. Implementation must be evidenced through interview(s) or, ideally, by witnessing how the activity is being done in daily operations (e.g. with an actual or hypothetical example flight);
3. Post-flight records, if available and complete, may assist in verifying implementation;
4. If the process or activity is automated (e.g. flight planning software), assess whether the operator conducts pre-flight cross-checks and/or post-flight audits to ensure the adequacy of any airport selection.

13.2.3.2 The operator shall establish a policy stating that a take-off alternate aerodrome/heliport shall be selected and specified in the flight plan if the weather conditions at the aerodrome/heliport of departure are at or below the applicable operating minima or it would not be possible to return to the point of departure for other reasons.

Explanation:

The main safety concern addressed by this standard is the possibility that the aircraft needs to shorten the flight, or possibly return to the departure aerodrome/heliport but is unable to do so due to bad weather or for any other reason (e.g. airport closure due to an incident or to debris found on the sole runway, strictly-enforced curfew, etc.). In order to expedite a response once the aircraft is airborne, the operator must establish a policy that requires a course of action be planned prior to flight and that it includes a take-off alternate.

Assessment criteria:

Preaudit:

1. Ensure proper documentation of the policy and any related processes or procedures to complete the task, in compliance with applicable regulatory requirements.

Onsite:

2. Implementation must be evidenced through interview(s) or, ideally, by witnessing how the activity is being done in daily operations (e.g. with an actual or hypothetical example flight);
3. Post-flight records, if available and complete, may assist in verifying implementation;
4. If the process or activity is automated (e.g. flight planning software), assess whether the operator conducts pre-flight cross-checks and/or post-flight audits to ensure the adequacy of any airport selection.

<u>13.2.3.3</u> The operator shall establish a process to ensure that the take-off alternate is suitable, considering items such as, but not limited to, weather at estimated time of use, flying time, and airport infrastructure and services. For an aerodrome/heliport to be selected as a take-off alternate, the available information shall indicate that, at the estimated time of use, the conditions will be at or above the applicable operating minima for that operation.

> ***Note: A widely accepted time margin for "estimated time of use" is one hour before and after the earliest and latest time of arrival.***

<u>Explanation</u>:

The operator must establish a process that incorporates an assessment of the conditions at the takeoff alternate at the estimated time of use, that ensures its suitability and that weather conditions will be at or above applicable operating minima (for landing). With reference to 13.2.2, operators are expected to demonstrate that they do not simply pick the nearest take-off alternate but carefully consider their options and select a suitable aerodrome/heliport. This assessment could include criteria such as services available to passengers, category of firefighting services, size of heliport, length and strength of runway (PCN), hours of curfew, availability of fuel, etc. The suitability of the take-off alternate may vary at every flight, for example due to changing weather conditions, services available at time of arrival or airport conditions.

Note: A widely accepted time margin for "estimated time of use" is one hour before and after the earliest and latest time of arrival. The operator should also consider any applicable State of Registry criteria for "estimated time of use". Additional considerations can be found in the Flight Planning and Fuel Management (FPFM) Manual (ICAO Doc 9976).

<u>Assessment criteria</u>:

Preaudit:

1. Ensure proper documentation of the process, and any related policies or procedures, to complete the task, in compliance with applicable regulatory requirements.

Onsite:

2. Implementation must be evidenced through interview(s) or, ideally, by witnessing how the activity is being done in daily operations (e.g. with an actual or hypothetical example flight);
3. Post-flight records, if available and complete, may assist in verifying implementation;
4. If the process or activity is automated (e.g. flight planning software), assess whether the operator conducts pre-flight cross-checks and/or post-flight audits to ensure the adequacy of any airport selection.

13.2.4 Destination Alternate Aerodrome

13.2.4.1 The operator shall establish a policy stating that, for a flight to be conducted in accordance with the instrument flight rules, at least one destination alternate aerodrome or heliport shall be selected and specified in the flight plan.

a. If the operator deems appropriate, the policy may preclude selecting an alternate in the following situations:

i. The duration of the flight and the meteorological conditions prevailing are such that there is reasonable certainty that, at the estimated time of use at the aerodrome or heliport of intended landing, the approach and landing may be made under visual meteorological conditions; or

ii. The aerodrome or heliport of intended landing is isolated and there is no suitable destination alternate aerodrome; and

A. An instrument approach procedure is prescribed for the aerodrome or heliport of intended landing; and

B. A point of no return has been determined, and the flight is not be continued past this point unless available current meteorological information indicates that the following meteorological conditions will exist at the estimate time of use:

1. A cloud base of at least 300 m (1,000 ft.) above the minimum associated with the instrument approach procedure; and

2. Visibility of at least 5.5 km (3 NM) or of 4 km (2 NM) more than the minimum associated with the instrument approach procedure.

Explanation:

This standard essentially contains two expectations. The first is that operators establish a reliable mechanism to determine a destination alternate for every IFR flight. This usually starts with a company policy but is ideally complemented with a clear process and/or procedure that is consistently implemented for every flight. The level of detail in the documentation will obviously vary with the type and size of the operation, and with the types of tools and resources that are provided to personnel (e.g. flight planning software, contractors, etc.).

However, selecting a destination alternate may not always be an option (i.e. if the destination airport is isolated) or a requirement (e.g. if gorgeous weather is almost certain at destination). The second expectation is therefore that operators document any criteria that preclude the selection of a destination alternate, in accordance with 13.2.4.1.a, and include mitigation measure(s) to be put in place whenever an IFR flight will be launched and operated without a destination alternate.

Assessment criteria:

Preaudit:

1. Ensure proper documentation of the policy and any related processes or procedures to complete the task, in compliance with applicable regulatory requirements.

Onsite:

2. Implementation must be evidenced through interview(s) or, ideally, by witnessing how the activity is being done in daily operations (e.g. with an actual or hypothetical example flight);
3. Post-flight records, if available and complete, may assist in verifying implementation;
4. If the process or activity is automated (e.g. flight planning software), assess whether the service provider or operator conducts pre-flight cross-checks and/or whether the operator performs post-flight audits to ensure the adequacy of any airport selection.

***13.2.4.2 (A)* If the policy required in 13.2.4.1 allows the operator to preclude selecting an alternate in accordance with 13.2.4.1.a.i, the operator's policy should state that at least one destination alternate aerodrome will be selected and specified in the flight plan if the destination aerodrome has only one usable runway with an operational instrument approach procedure at the estimated time of use. (Recommended Practice)**

Explanation:

The recommended practice in 13.2.4.2 (A) refers to the circumstance where the destination aerodrome has only one usable runway with an operational instrument approach procedure at the estimated time of use. The standard recommends that the operator's policy include a statement that, in this circumstance, at least one destination alternate aerodrome will be selected and specified in the flight plan. This allows the operator to be prepared for an expeditious response for landing at the alternate if they are unable to land at the destination aerodrome.

Assessment criteria:

Preaudit:

1. *Ensure proper documentation of the policy and any related processes or procedures to complete the task, in compliance with applicable regulatory requirements.*

Onsite:

2. *Implementation could be evidenced through interview(s) or, ideally, by witnessing how the activity is being done in daily operations (e.g. with an actual or hypothetical example flight);*
3. *Post-flight records, if available and complete, may assist in verifying implementation;*
4. *If the process or activity is automated (e.g. flight planning software), assess whether the service provider or operator conducts pre-flight cross-checks and/or whether the operator performs post-flight audits to ensure the adequacy of any airport selection.*

13.2.5 (A) Fuel Requirements (Aeroplanes)

13.2.5.1 (A) An operator shall establish policies and procedures to ensure that the aeroplane carries sufficient fuel to safely complete each flight and land with the planned final reserve fuel.

Explanation:

Good fuel planning procedures (and in-flight management of course) remain key to keeping the engines running, particularly when deviations from planned operations must be made. Regulatory requirements provide information about fuel reserves required for flight, but an operator may also make more stringent requirements if they consider that necessary for the safe outcome of an operation. The operator's fuel planning policies and procedures should establish the framework for consistent fuel planning that takes into account all the relevant elements of the planned flight, including winds, potential for a long taxi, being re-routed or put into a holding pattern due to traffic, etc.

Assessment criteria:

Preaudit:

1. Ensure proper documentation of the pertinent policies and procedures to complete the task, in compliance with applicable regulatory requirements.

Onsite:

2. Implementation must be evidenced through interview(s) and ideally by witnessing how the activity is being done in daily operations (e.g. with an actual or hypothetical example flight);
3. Review post-flight records, as available, to assist in verifying implementation;
4. Assess whether the operator conducts pre-flight cross-checks and/or post-flight audits to ensure that the required amount of fuel is computed and carried on each flight.

13.2.5.2 (A) The operator shall have a process to ensure the computed final reserve fuel meets both the State of Registry and State of Operations requirements, taking into account possibly more conservative values.

Explanation:

This standard requires that the operator has a process in place for computing the final reserve fuel in accordance with State of Registry and State of Operations requirements. Despite decades of harmonization and standardization, the final reserve fuel requirements of various nations may not perfectly match. Although the number of 30 minutes seems to be consistently used worldwide, there may still be minor differences. For instance, flying for 30 minutes at normal cruising speed (without specifying the altitude) may not burn the same fuel quantity than 30

minutes at normal cruising altitude (without specifying the speed). Ultimately the standard requires that the operator identifies the final reserve fuel rules that apply to that operation (in accordance with the requirements from the State of Registry and the State of Operations, whichever is more conservative) and ensures those rules are complied with when calculating the amount of fuel for the flight.

Assessment criteria:

Preaudit:

1. Ensure proper documentation of the process in place to complete the task;
2. Ensure that processes or procedures address situations where different regulatory requirements apply.

Onsite:

3. Implementation must be evidenced through interview(s) and ideally by witnessing how the activity is being done in daily operations (e.g. with an actual or hypothetical example flight);
4. Review post-flight records, as available, to assist in verifying implementation;
5. Assess whether the operator conducts pre-flight cross-checks and/or post-flight audits to ensure that the required amount of final reserve fuel is computed and carried on each flight.

13.2.5.3 (A) Operators should determine one final reserve fuel value (pounds/kilos) for each aeroplane type and variant in their fleet rounded up to an easily recalled figure. (Recommended Practice)

Explanation:

Although many operators use the final reserve fuel value computed at planning stage, a conservative rounded figure that covers most, if not all flight conditions could be a valuable addition to avoid landing below that value or running out of fuel. There might also be another benefit in defining an easily recalled figure. For instance, to mentally link a certain fuel quantity with the associated radio calls to declare a MINIMUM FUEL or a MAYDAY MAYDAY MADAY FUEL.

Assessment criteria:

Preaudit:

1. *If the operator decided to implement this Recommended Practice, ensure proper documentation of the fixed final reserve fuel for all types and variants concerned by the decision;*

Onsite:

2. *Implementation could be evidenced through interview(s) and ideally by witnessing how the activity is being done in daily operations (e.g. with an actual or hypothetical example flight).*

13.2.5.4 (A) The operator shall establish policies and procedures to ensure the pilot-in-command continually ensures that the amount of usable fuel remaining onboard is not less than the fuel required to proceed to an aerodrome where a safe landing can be made with the planned final reserve fuel remaining upon landing.

Explanation:

Although in-flight fuel management might be taken for granted, accidents still occur to remind us of its importance. And while most instances occur in general aviation small airplane operations, the business aviation and airline industries are not exempt from fuel-related hazards and significant risks (e.g. exhaustion, leaks, imbalance). The frequency of the fuel checks will naturally be determined by the duration of the flight, and must allow the pilot to have an ongoing awareness of the remaining useable fuel and recognize discrepancies in expected remaining fuel quantity. The operator's policies and procedures should reflect the unique needs of their operations and equipment. Note that IS-BAO does not require recording of the fuel checks although this may be required by the regulations of specific airspaces and/or State of the operator.

Assessment criteria:

Preaudit:

1. Ensure proper documentation of the pertinent policies and procedures to complete the task and to ensure that these are in accordance with applicable regulatory requirements.

Onsite:

2. Review post-flight records, as available, to assist in verifying implementation;
3. Implementation could also be evidenced through interview(s);
4. Assess whether the operator conducts post-flight audits to ensure that fuel checks are being carried out on each flight per the operator's policies and procedures and in accordance with applicable regulatory requirements.

<u>13.2.5.5 (A)</u> The operator shall establish a policy requiring the pilot-in-command to advise ATC of a minimum fuel state by declaring MINIMUM FUEL when, having committed to land at a specific aerodrome, the pilot calculates that any change to the existing clearance to that aerodrome may result in landing with less than planned final reserve fuel.

<u>Explanation</u>:

To reduce the number of different meanings used around the globe, ICAO introduced the term MINIMUM FUEL in Annex 6 in 2012. Declaring such situation to ATC will essentially commit the flight to land at a specific aerodrome and no additional delay can be accepted. However, it is merely an information message and not an emergency message that will provide priority to the aircraft (unless a PAN or MAYDAY MAYDAY MAYDAY FUEL is declared afterwards).

<u>Assessment criteria</u>:

Preaudit:

1. Ensure proper documentation of the pertinent policy.

Onsite:

2. Implementation would typically be evidenced through interview(s).
3. If a 'minimum fuel' situation already occurred in the organization, this topic can be a useful follow-up question for a conversation with frontline employees on daily safety management activities.

<u>13.2.5.6 (A)</u> The operator shall establish a policy requiring the pilot-in-command to declare a situation of fuel emergency by broadcasting MAYDAY MAYDAY MAYDAY FUEL, when the calculated usable fuel predicted to be available upon landing at the nearest aerodrome where a safe landing can be made is less than the planned final reserve fuel.

<u>Explanation</u>:

In contrast with the MINIMUM FUEL message (cf. 13.2.5.5(A)), a MAYDAY MAYDAY MAYDAY FUEL is an explicit declaration of emergency and that priority handling is both required and expected. This terminology was also standardized by ICAO in Annex 6 in 2012 to reduce the number of different meanings used around the globe.

<u>Assessment criteria</u>:

Preaudit:

1. Ensure proper documentation of the pertinent policy.

Onsite:

2. Implementation would typically be evidenced through interview(s).
3. If a 'mayday fuel' situation already occurred in the organization, this topic can be a useful follow-up question for a conversation with frontline employees on daily safety management activities.

13.2.6 (H) Fuel and Oil Supply Requirements (Helicopters)

13.2.6.1 (H) The operator shall establish a policy prohibiting commencement of a flight unless, taking into account both the meteorological conditions and any delays that are expected in flight, the helicopter carries sufficient fuel and oil to ensure that it can safely complete the flight, as well as reserve fuel to provide for contingencies.

Explanation:

The preflight planning policy must include a clear statement that a helicopter flight may not depart unless weather conditions and expected flight delays have been accounted for in the calculation of the fuel and oil, including required reserves, that will be necessary to safely complete the flight.

The operator's written policy establishing decision making guidance for a go/no-go decision is a fundamental component of good flight planning and risk management. Flight planning is made less stressful and more efficient if the go/no-go line is clearly delineated by a written policy that prohibits a flight's departure if fuel and oil are insufficient to complete the planned flight with the required reserves on board at the planned completion.

Assessment criteria:

Preaudit:

1. Review the operator's policy regarding prohibition of flight commencement to ensure that the flight planning process has considered meteorological conditions and expected delays when calculating fuel and oil burn, such that sufficient reserves will be available for unexpected/unforeseen events.

Onsite:

2. Review flight planning documents to ensure conformance with the policy.
3. Interview staff regarding the flight go/no-go criteria to ensure they understand the policy and to determine the process for decision making for those flights where the go/no-go decision is close.
4. Observe flight planning process to ensure it follows the policy and takes into account the fuel and oil calculations for the planned flight, and incorporates adequate reserves.

<u>13.2.6.2 (H)</u> VFR operations. The operator shall establish a process to ensure that the fuel and oil carried to comply with 13.2.6.1(H) shall, in the case of VFR operations, be at least the amount sufficient to allow the helicopter:

a. To fly to the heliport to which the flight is planned;
b. To fly thereafter for a period of 20 minutes at best-range speed; and
c. To have an additional amount of fuel, sufficient to provide for the increased consumption in the event of any of potential contingencies specified by the operator and complying with the regulations of the State of the Operator.

<u>Explanation</u>:

Regulatory requirements provide information about fuel reserves required for helicopter flight. An operator may also make more stringent requirements if they consider that necessary for the safe outcome of the operation. Potential contingencies in helicopter operations will vary depending on the type of operation and the environment in which the helicopter is flying. Operators should develop their planning for adequate fuel and oil based on their specific risk profile. Planning for the possibility of increased fuel and oil consumption should take into account consideration of the possibility of, among other things, route deviations, terrain and obstacle avoidance, weather conditions, day versus night flight, and distance between populated areas. In addition, planning should include considerations for the duration and type of the operation, for example assessing the needs in a short haul or "hop ride" type flights, or for flights in remote locations where planning for a fuel cache may be warranted.

The operator's process for planning for fuel and oil carried on board for any VFR flight must include the following cumulative requirements:
Sufficient fuel and oil:

a. for the intended route of flight, and
b. to continue flight beyond the intended destination for 20 minutes at the best-range speed, and
c. to plan for additional fuel that may be required in the event of contingent circumstances, which are to be identified by the operator, and
d. are increased as required by applicable local regulations.

<u>Assessment criteria</u>:

Preaudit:

1. Review flight planning processes for conformity with the fuel and oil requirements in this part.

Onsite:

2. Review flight planning documents to verify that the fuel and oil carried conforms with this part.
3. Interview staff involved in flight planning to confirm their understanding of this requirement. If possible, observe flight planning in process.

<u>13.2.6.3 (H)</u> IFR operations. The operator shall establish a process to ensure that the fuel and oil carried in order to comply with 13.2.6.1(H) shall, in the case of IFR operations, be at least the amount sufficient to allow the helicopter:

a. When an alternate is not required in accordance with 13.2.4.1.a, to fly to the heliport to which the flight is planned, and thereafter:

i. Fly 30 minutes at holding speed at 450 m (1 500 ft.) above the destination heliport under standard temperature conditions and approach and land; and

ii. Have an additional amount of fuel, sufficient to provide for the increased consumption in the event of potential contingencies;

b. When an alternate is required, to fly to and execute an approach, and a missed approach, at the heliport to which the flight is planned, and thereafter:

i. Fly to the alternate specified in the flight plan; and then

ii. Fly for 30 minutes at holding speed at 450 m (1 500 ft.) above the alternate under standard temperature conditions, and approach and land; and

iii. Have an additional amount of fuel, sufficient to provide for the increased consumption in the event of potential contingencies;

c. When no alternate heliport or landing location is available, in accordance with 13.2.4.1.a.ii (i.e. the destination is isolated), to fly to the destination to which the flight is planned and thereafter for a period that will, based on geographic and environmental considerations, enable a safe landing.

<u>Explanation</u>:

The helicopter operator's IFR flight planning processes must include specific requirements for carrying enough fuel and oil for the planned flight, with considerations for whether or not an alternate landing site is required.

a. If an alternate is not required in accordance with 13.2.4.1.a, the operator's plan must allow the helicopter to fly from the point of departure to the planned destination with sufficient fuel to fly an additional 30 minutes in a holding pattern over the planned destination and with additional fuel to allow for any potential, foreseeable contingencies the operator has identified and that comply with regulatory requirements. Such contingencies could include a delay in receiving a takeoff clearance, the need to hold for traffic enroute or at the destination, or the need to divert to an unplanned alternate landing area. Operators should complete an assessment of their specific operations and determine those contingencies that are applicable to their operations. This could be accomplished through a risk assessment.

b. If an alternate is required, the helicopter must be able to fly from the point of departure to the planned destination, conduct a missed approach and then fly to the designated alternate, hold for 30 minutes at 1,500' over the alternate (planning for standard temperature conditions) and approach and land. Additional fuel must be carried to allow for those potential, foreseeable contingencies as noted above that the operator has identified and that comply with regulatory requirements.

c. Where no alternate heliport or other landing location is available (in accordance with 13.2.4.1.a.ii) and the destination is isolated, then the operator must plan for fuel sufficient to fly to the intended destination and then to another location that will make for a suitable landing area, given the surrounding terrain and environmental conditions.

Assessment criteria:

Preaudit:

1. Review flight planning process for IFR fuel and oil requirements to ensure conformance with the standard.

Onsite:

2. Review flight planning documents for evidence of complying with the process for a sample of relevant operations.
3. Interview staff to ensure understanding and conformance with the process.

13.2.6.4 (H) The operator shall establish policies and procedures to ensure the pilot-in-command continually confirms that the amount of usable fuel remaining onboard is adequate for safe completion of the flight with planned final reserve fuel upon landing.

Explanation:

Although in-flight fuel management might be taken for granted, accidents still occur to remind us of its importance. The helicopter industry is not exempt from fuel-related hazards and significant risks (e.g. exhaustion, leaks, imbalance). The frequency of the fuel checks will naturally be determined by the duration of the flight, and must allow the pilot to have an ongoing awareness of the remaining useable fuel and recognize discrepancies in expected remaining fuel quantity. The operator's policies and procedures should reflect the unique needs of their operations and equipment. Note that IS-BAO does not require recording of the fuel checks although this may be required by the regulations of specific airspaces and/or State of the operator.

Assessment criteria:

Preaudit:

1. Ensure proper documentation of the pertinent policies and procedures to complete the task and to ensure that these are in accordance with applicable regulatory requirements.

Onsite:

2. Review post-flight records, as available, to assist in verifying implementation;
3. Implementation could also be evidenced through interview(s).

***13.2.6.5 (H)* Operators should determine one final reserve fuel value (gallons / litres / percent / etc., as applicable) for each helicopter type and variant in their fleet rounded up to an easily recalled figure. (Recommended Practice)**

Explanation:

Although many operators use the final reserve fuel value computed at planning stage, a conservative rounded figure that covers most, if not all flight conditions could be a valuable addition to avoid landing below that value or running out of fuel.

Assessment criteria:

Preaudit:

1. *If the operator decided to implement this Recommended Practice, ensure proper documentation of the fixed final reserve fuel for all types and variants concerned by the decision;*

Onsite:

2. *Implementation could be evidenced through interview(s) and ideally by witnessing how the activity is being done in daily operations (e.g. with an actual or hypothetical example flight).*

13.2.7 Oxygen Supply Requirements

13.2.7.1 The operator shall establish policies and procedures to ensure that a flight is not commenced unless a sufficient quantity of stored breathing oxygen is carried to supply all crew members and passengers in accordance with the national regulations of the State of Registry.

Explanation:

The standard covers both pressurized airplanes and unpressurized airplanes flown at altitudes requiring the use of oxygen. In either case, the values used for altitude-dependent actions may vary from one regulatory framework to the other (e.g. some authorities require that mountainous terrain escape routes be flown at 13’000 feet, others at 14’000 feet). Therefore, operators are expected to correctly identify and comply with the applicable requirements.

Depending on the aircraft type and configuration, the quantity of breathable oxygen that is either stored and/or that will be chemically generated in an emergency may limit the passenger capacity on a specific flight. Depending on the route (e.g. primarily over central Asia or South America), it may not be safe or possible to descend to 10’000 feet or even 14’000 feet for a prolonged period of time, as the Minimum En-Route Altitude (MEA), Minimum Sector Altitude (MSA), Minimum Obstacle Clearance Altitude (MOCA) and Minimum Off-Route Altitude (MORA) may well exceed these values.

Moreover, the oxygen consumption by all occupants may even compete with the fuel consumption. For instance, in case of a rapid/slow decompression on a long oceanic flight, the operator must obviously avoid running out of breathable oxygen before being able to descend and maintain a lower altitude where oxygen is no longer needed, while at same time avoiding emptying the fuel tanks before reaching a suitable aerodrome. Depending on the aircraft type and cabin configuration, the only way to accommodate both considerations may be to limit the passenger/baggage load.

When building scenarios and considering the feasibility of a flight, operators should not assume 100% reliability from the aircraft systems and equipment. Although rare (e.g. much rarer than portable ELT malfunctions), there have been instances of inoperative oxygen generators. In such case, even built-in safety margins (i.e. oxygen generators typically provide nearly twice the minimum duration/quantity of oxygen required) are unusable and cannot be taken for granted. Mitigations for these situations will depend on the circumstances of each flight and the operator's risk assessment.

Assessment criteria:

Preaudit:

1. Ensure proper documentation of the policies and procedures to determine the minimum sufficient quantity of breathable oxygen for a flight, and to ensure that no flight is commenced unless that quantity is carried,
2. Verify that the operator's documentation complies with the national regulations of the State of Registry,

Onsite:

3. Implementation would typically be evidenced through review of records of training and interview(s), although some flight planning solutions may integrate the typical quantity of breathable oxygen and the expected number of passengers in the flight plan when computing potential routes.

13.2.8 (A) Extended Diversion Time Operations (EDTO)

13.2.8.1 (A) Operators of turbine-powered multiengine airplanes used in extended diversion time operations (EDTO) over water or Polar regions should establish operational and maintenance procedures for those operations. (Recommended Practice)

Note: EDTO may be referred to as ETOPS in some documents.

Explanation:

The EDTO regime replaces the original Extended Range Twin Engine Operations (ETOPS) requirements and guidance last revised in the 1980s (based on regulations dating to the 1930s).

However, some authorities continue to use the previous terminology and ETOPS acronyms despite using the new regime, which may create confusion.

National EDTO requirements and approval processes flow from ICAO Annex 6 Part I, and particularly Attachment D. An EDTO approval is typically reserved for commercial operators using transport category airplanes with two or more turbine engines. Depending on the number of engines, the extent of the EDTO standards may impact the certification, maintenance and/or operational requirements.

In general, OEMs collect sufficient data on the reliability of their equipment and systems to guide non-commercial operators on the maximum distance to the nearest suitable aerodrome (e.g., expressed in minutes of flight time) that should be used when planning and performing a flight.

Assessment criteria:

This recommended practice applies only to operators conducting EDTO operations.

Preaudit:

1. *While reviewing the operator's documents (e.g. certificates, manuals, operational specifications), ensure proper documentation of pertinent operational and maintenance procedures for both EDTO and non-EDTO flights;*
2. *Verify that the operator's documentation complies with the national regulations of the State of Registry and/or Operator, as applicable;*

Onsite:

3. *Implementation would typically be evidenced through interview(s), checking training records and sampling of maintenance and flight records, as applicable.*

13.2.9 Aircraft Performance

In applying the Standards of this section, the operator shall take into account all factors that significantly affect the performance of the aircraft, such as mass, operating procedures, the pressure altitude appropriate to the elevation of the aerodrome or heliport, temperature and wind, as well as:

a. For landplanes: runway gradient and condition of runway, i.e., presence of slush, water and/or ice;
b. For seaplanes: water surface condition; and
c. For helicopters: sand, gravel, snow or ice on the operating surface.

Such factors shall be taken into account directly as operational parameters or indirectly by means of allowances or margins which may be provided:

a. in the scheduling of performance data; or

b. in the comprehensive and detailed code of performance in accordance with which the aircraft is being operated.

13.2.9.1 The operator shall establish a process to ensure the operation of each aircraft within the approved operating limitations contained in its flight manual and in compliance with the terms of its certificate of airworthiness.

Note: The operator should give consideration to exceptions listed in the CofA, additional limitations listed in the applicable Type Certificate Data Sheet (TCDS), and other operational supplements.

Explanation:

Aircraft are to be operated within the approved operating limitations and the relevant certificate of airworthiness. The operator's process for flight planning and conduct of the flight must include a preflight determination that the planned flight can be conducted within the limits established by the aircraft flight manual and the certificate of airworthiness. This determination must be made prior to releasing a flight. If there are any exceptions or additional limitations applicable to a specific aircraft, these must be accounted for in the determination that a flight can be conducted within those restrictions. For example, if an aircraft has additional equipment installed and the aircraft supplement materials for that equipment have a weight and balance that is applicable only if that equipment is installed, that must be taken into account in the flight release process.

Note Explanation: It is possible that an aircraft may have operating requirements or limits that are noted in the certificate of airworthiness or the type certificate data sheet and operators should have a process to ensure that their flights adhere to those requirements, which may or may not be included in the flight manual.

Assessment criteria:

Preaudit:

1. Review flight and performance planning forms and documents to ensure that these address the operational limitations of the operator's aircraft and flight operations and that they are relevant to the aircraft flown and take into account any additional limits for installed equipment.

Onsite:

2. Review completed flight and performance planning forms and/or documents to verify use of the process.
3. Inspect a sampling of aircraft to verify that installed equipment is considered in relevant flight planning documents.
4. Interview staff involved in flight operations and performance planning to confirm understanding of the process.
5. If possible, observe personnel completing the flight planning process.

<u>13.2.9.2 (A)</u> The operator shall establish policies and procedures to ensure that the pilot-in-command determines that aircraft performance will permit the safe execution of all phases of flight.

a. For Single-Engine Aeroplanes, these procedures shall ensure that:

i. Take-off. The aircraft performance will allow for a safe take-off within the runway distance available, compliance with necessary climb gradients and clearance of all obstacles along the flight path by a margin that would satisfy any applicable regulatory requirements;

ii. En route. The aircraft performance will allow for maintaining the minimum required altitudes throughout the route;

iii. Landing. The aeroplane shall, at the aerodrome of intended landing and at any alternate aerodrome, after clearing all obstacles in the approach path by a margin that would satisfy any applicable regulatory requirements, be able to land, with assurance that it can come to a stop or, for a seaplane, slow to a satisfactorily low speed, within the landing distance available. Allowance shall be made for expected variations in the approach and landing techniques, if such allowance has not been made in the scheduling of performance data;

iv. The PIC mitigates risks related to potential power plant failures during take-off and while en route and landing to an acceptable level by careful and continuous planning; en route and landing considerations shall include vigilance at all times for forced landing areas in the event of a power plant failure; and

v. For operations across water, the PIC identifies any additional hazards and manages the associated risks.

b. For Multi-Engine Aeroplanes, these procedures shall ensure that:

i. Take-off.

<u>All Engines Operating</u> - The aircraft performance will allow for a safe take-off within the runway distance available, compliance with required climb gradients and clearance of all obstacles along the flight path by a margin that would satisfy any applicable regulatory requirements;

<u>One Engine Inoperative</u> - The aeroplane shall be able to, in the event of a critical engine failing at any point in the take-off, either discontinue the take-off and stop within either the accelerate-stop distance available or the runway available, or continue the take-off and comply with required climb gradients and clear all obstacles along the flight path by a margin that would satisfy any applicable regulatory requirements until the aeroplane is in a position to comply with 13.2.9.2(A).b.ii;

A. In determining the length of the runway available, the computations shall take into account the loss, if any, of runway length due to alignment of the aeroplane prior to take-off;

ii. En route. All Engines Operating - The aircraft performance will allow for maintaining the minimum required altitudes throughout the route; One Engine Inoperative - The aeroplane will be able, in the event of the critical engine becoming inoperative at any point along the route or planned diversions from, to continue the flight to an aerodrome at which the Standard of 13.2.9.2(A).b.iii can be met, without flying below the minimum obstacle clearance altitude at any point;

iii. Landing. The aeroplane will, at the aerodrome of intended landing and at any alternate aerodrome, after clearing all obstacles in the approach path by a safe margin, be able to land, with assurance that it can come to a stop or, for a seaplane, slow to a satisfactorily low speed, within the landing distance available. Allowance shall be made for expected variations in the approach and landing techniques, if such allowance has not been made in the scheduling of performance data.

Explanation:

Sometimes taken for granted, aircraft performance calculations remain a vital element of every flight preparation and even - perhaps especially? - during routine operations. Airworthiness considerations, surrounding terrain, and atmospheric conditions need to be carefully taken into account, both before and after getting airborne, since they're all susceptible to change. Considering the variety of aircraft models and types active in business aviation, the method(s) to verify whether an aircraft will indeed safely complete the intended mission will also vary. Assumptions based on experience may "sound right", but only proper training, tools, and procedures will provide sufficient reassurance that flights will likely be properly planned and safely executed and completed. Typical questions that need to be positively answered through up-to-date and readily available data include:

- Will the aircraft clear any and all obstacle(s), especially in case of engine failure(s)?
- For aeroplanes, is the available runway distance sufficient? Can the aircraft also safely depart from an intersection if offered at the last minute by ATC? Can the aircraft safely stop on the runway if the ATS facility suddenly reports a worsening surface condition?
- Have all pertinent 'environmental' considerations been factored into the performance calculation, such as airport elevation, temperature, winds, runway surface condition, surrounding terrain, reduced thrust, local noise abatement procedures, etc.?
- Are operator personnel familiar with the ICAO Global Reporting Format (GRF) for runway surface conditions? (see: https://www.icao.int/safety/Pages/GRF.aspx)

Technology (e.g., tablets, software, Flight Management Systems, Electronic Flight Bags) greatly improved the availability, precision and user-friendliness of the tools used in aircraft performance calculations. It also created new and/or different paths to calculation errors that can

pose significant risks, without necessarily eliminating all the old ones (e.g., improper mass and balance, improper aircraft configuration). The true scale of the issue is difficult to establish, and especially when performance degradation is subtle, goes unnoticed or unreported. Unfortunately, accident databases are filled with events where the performance of the aircraft did not exactly match what the pilot(s) anticipated, or where a safe outcome was simply impossible to achieve. Even though performance events have been the subject of dedicated, concerted efforts for close to 50 years, few products are currently available and certified to solve erroneous performance calculations and decisions.

When designing and implementing routines to ensure safe flight, operators are expected to essentially ensure that up-to-date correct information is correctly processed by alert pilots every single time, using the correct tool or method, while giving great attention to detail. This obviously applies to both paper and electronic means of computing aircraft performance, as each method offers unique ways of inserting errors into the systems and decision-making processes.

Although good SOPs are essential, they remain fragile safety barriers that can be severely weakened by poor equipment design, cognitive impairment such as fatigue or a lack of guidance. Operators designing or evaluating SOPs should pay particular attention to the number and complexity of the interfaces involved in performance calculations (e.g., when using a separate EFB before updating the aircraft's FMS, when multiple screens or pages need to be displayed, when all the relevant information cannot be seen and cross-checked at a glance, etc.). Input errors (e.g., incorrect temperature selected for a de-rated takeoff, mass errors by 10 or 100 tons) are easier to make and more difficult to catch if the information is scattered and/or graphically presented in different ways, no matter how good the SOPs are, how faithfully the pilots observe them, and how well-rested they are. Therefore, operators should consider the possibility that current SOPs will not be sufficient to avoid incorrect calculations and decisions, and continuously explore additional mitigation measures as much as practical.

Assessment criteria:

Preaudit:

1. Ensure that, for all phases of flight and for normal/abnormal/emergency situations, appropriate performance data and/or IT tools to generate this data are present, accurate, complete, up-to-date, and distributed to staff;
2. Assess how relevant personnel receive training and/or instructions on the retrieval, generation and use of performance data;

Onsite:

3. Review performance planning forms and documents to ensure that these meet the content requirements for performance planning.
4. Review completed performance planning forms and/or documents to confirm use of the process.
5. Interview pilots and other relevant personnel involved in performance planning to confirm understanding and use of the procedures.

6. Assess whether the operator regularly validates the quality of the data received from external entities.
7. When assessing conformance with the standard and/or compliance with any applicable regulatory requirement, auditors should bear in mind the wide variety of aircraft and of aircraft performance calculation methods. An operator's method and/or tool that is not familiar to the auditor(s) is not necessarily a non-conformity, but it may reveal a safety issue that hadn't been spotted until then, which could eventually lead to a non-conformity. Therefore, should expectations not be met, auditor(s) and operator personnel need to carefully and jointly walk through the process or procedure in question to fully understand it.

13.2.9.3 (H) The operator shall establish policies and procedures to ensure that the pilot-in-command determines that aircraft performance will permit all phases of flight to be carried out safely.

a. For Single-Engine Helicopters, these procedures shall ensure that:

i. The PIC mitigates risks related to potential power plant failures during take-off and while en route and landing to an acceptable level by careful and continuous planning;

ii. Take-off considerations include selecting multiple rejected take-off areas if possible;

iii. En route and landing considerations include vigilance at all times for forced landing areas in the event of a power plant failure; and

iv. For operations across water, the PIC identifies any additional hazards and manages the associated risks.

b. For Multiengine Helicopters, these procedures shall ensure the conduct of operations in accordance with the Category A or B requirements, as appropriate, and the application of considerations so as to achieve a safe and successful outcome after a critical power plant failure in the take-off, en route and landing phases.

Explanation:

The operator's policies and procedures must incorporate a requirement that, prior to flight, performance plans are completed that take into account mitigations for the risks associated with the various phases of the planned flight. Factors that impact performance include wind, weight and balance, density altitude, and the impacts of these on normal and autorotational performance.

Single engine helicopter operators must include procedures that include plans to mitigate the unique risks associated with a power plant failure at all phases of the planned flight. This includes planning for a rejected takeoff, identifying forced landing areas along the route of flight, and considering any additional hazards associated with flight over water and managing those risks. Operational considerations will vary depending on the type of flights being conducted. For example, helicopter medical evacuation flights may come with additional pressure due to the perceived urgency of the patient condition, especially when weather conditions are marginal. Acquiring as much information about the conditions along the route of flight, inquiring as to

whether the flight had been rejected by another company, and other risk assessment and management techniques should be in place to ensure a safe outcome. For utility work, firefighting, flightseeing and other types of operations, the considerations and information available will vary depending on location, resources available, and time considerations, but the need still exists for a thorough consideration of forced landing areas along the route of flight.

Multiengine helicopters must also have performance planning procedures that ensure that the Class A or B performance criteria are considered in order to ensure that, in the event of one engine becoming inoperative at any phase of flight, a successful landing can be accomplished. For Class A helicopters, performance data should allow for the calculation of one engine inoperative (OEI) obstacle clearance for takeoff to climb to cruise to land. For Class B, since the helicopter will not be able to maintain altitude but will have some powered flight performance, considerations must include performance limitations applicable to the helicopter flown for arriving safely with one engine inoperative at the forced landing area.

These considerations can vary widely depending on the type and location of the helicopter operation and the operator should take applicable factors into account as relevant to their operation. For example, for operations in remote terrain, the forced landing areas may have unique risks such as uneven terrain, forests, glaciers, mountainous areas, desert, and lack of communications, among others. Operations in urban areas face challenges with the availability of forced landing areas, the presence of vehicles, pedestrians, and power lines, among others. In addition, multi-engine helicopter operators will have to plan for obstacle avoidance in the event of an engine failure and the degraded performance flying with one engine inoperative.

Assessment criteria:

Preaudit:

1. Ensure that, for all phases of flight and for normal/abnormal/emergency situations, appropriate performance data and/or IT tools to generate this data are present, accurate, complete, up-to-date, and distributed to staff;
2. Assess how relevant personnel receive training and/or instructions on the retrieval, generation and use of performance data;

Onsite:

3. Review performance planning forms and documents to ensure that these meet the content requirements for performance planning.
4. Review completed performance planning forms and/or documents to confirm use of the process.
5. Interview pilots and other relevant personnel involved in performance planning to confirm understanding and use of the procedures.
6. Assess whether the operator regularly validates the quality of the data received from external entities.
7. When assessing conformance with the standard and/or compliance with any applicable regulatory requirement, auditors should bear in mind the wide variety of aircraft and of aircraft performance calculation methods. An operator's method and/or tool that is not

familiar to the auditor(s) is not necessarily a non-conformity, but it may reveal a safety issue that hadn't been spotted until then, which could eventually lead to a non-conformity. Therefore, should expectations not be met, auditor(s) and operator personnel need to carefully and jointly walk through the process or procedure in question to fully understand it.

13.2.10 Noise Abatement

13.2.10.1 The operator shall have a process to identify, before departure, any existing noise abatement restrictions along the route, and to ensure that the aircraft adheres to all published noise abatement procedures consistent with safety.

Explanation:

Care should be taken to minimize noise impacts from aircraft operations, especially in noise sensitive areas and at night and early morning. Preflight planning processes must include identification of noise abatement procedures at the airport or heliport for both departure and arrival. This can include use of preferred runways or landing zones, and approach/arrival paths, curfews, ramp procedures, etc. Some noise sensitive environments (for example New York City, Santa Monica, California, Las Vegas, Nevada, Madrid Barajas Airport, Cannes Mandelieu) have extensive noise abatement requirements and routes that must be complied with. While noise abatement restrictions are to be considered by the crew before and during the flight, note that compliance with such restrictions does not have priority over flight safety or ATC considerations. An essential component of adherence to published noise abatement procedures includes crew briefings pre-departure and pre-arrival to ensure safety of flight. Operators must also take into account any performance considerations for their aircraft when flying in highly prescribed airspace and route structures.

Assessment criteria:

Preaudit:

1. Review operator noise abatement process and procedures.

Onsite:

2. Review flight planning documents to ensure conformance with the noise abatement processes.
3. Interview staff involved with preflight planning and conformance with noise abatement procedures to ensure conformance.
4. If possible, observe flight operation at the airport or local area (depending on the operation), to confirm conformance to the process.

13.2.11 Communications, Navigation and Surveillance (CNS) Requirements and Approvals

<u>13.2.11.1</u> Prior to operations in airspace where specific CNS requirements exist, such as PBN, HLA, RVSM, CPDLC or ADS B/C, an operator shall have a process to ensure:

a. The aircraft and operator have been authorized by the State of Registry and, if required, the State of Operations;
b. The aircraft meets the aircraft system and operational requirements for the operations concerned;
c. Flight crews engaged in operations in such airspace are qualified and authorized to conduct such operations; and
d. Compliance with continuing RVSM height monitoring requirements.

<u>Explanation</u>:

CNS regroups many different and constantly evolving technologies and the flurry of acronyms that go with them. Considering the range of topics covered, the diversity of equipment available and their pace of development, this IG does not have the ambition to be the primary source of detailed information about all CNS solutions. Operators must also ensure they continuously hold the proper authorization/approval/certification for the equipment they intend to use, and therefore have implemented appropriate policies, processes and/or procedures to do so.

The operators' attention and efforts must ensure that both normal and non-normal situations are covered. For instance, CNS equipment may fail. Operators therefore need to have processes in place to ensure equipment serviceability before flight(s) in areas where this equipment is legally required. The impact of any unserviceability also needs to be considered and documented ahead of the event, in order to assist operator staff in taking the right decision in the interest of safety and to speed up the implementation of alternative plans.

Regarding continuing RVSM height monitoring specifically, a number of countries have acquired automatic monitoring equipment. In others, the monitoring check will still require some level of coordination with the ATS, monitoring facility or vendors. Irrespective of the method used to monitor height, it must be repeated at regular intervals known, planned and followed by the operator, and in accordance with any regulatory requirements. Monitoring reports must validate that aircraft equipment remains within limits, or corrective actions will have to be taken.

<u>Assessment criteria</u>:

Preaudit:

1. Gather pertinent documentation indicating which approvals are currently being held by the operator and if any limitation applies (e.g. Operational Specifications).
2. Ensure proper documentation of the necessary procedures and dedicated training programmes for all personnel concerned (e.g. flight crew, dispatch, maintenance, as applicable) and all aircraft concerned;

Onsite:

3. Implementation would typically be evidenced through interview(s) and document review(s). Records to be reviewed would include logbooks (e.g., for checks of the transponder and pitot/static systems), height monitoring reports, operational approvals in LOAs, operations specifications, etc.

13.2.12 Travel Health Issues

13.2.12.1 ***Operators should develop a process and procedures for assessment of public health risks at their destinations and a response plan should passengers and/or crew be exposed to serious infectious disease or significant health risks. (Recommended Practice)***

Explanation:

Many diseases are well known by healthcare professionals and can be prevented with relatively simple proactive measures, whereas others will emerge and/or pose significant challenges that require closer attention and short reaction times. Operators should focus on prevention and training, and should deploy their mitigation strategies and resources using the following principles:

- *Proactive review of reliable sources of information dealing with public health issues, ideally through a variety of sources from both the public and private sectors;*
- *Deference to (medical) expertise (i.e., there is no substitute for knowledge);*
- *Preparation of crisis scenarios and their response, including contingency plans, ideally by involving subject matter experts;*
- *Strict compliance with relevant instructions and legal requirements, both at home and abroad;*
- *Resolute efforts to continually assess and update their understanding of the whole situation, especially when new information comes in (i.e., no fixation on the initial plan);*
- *Retro-planning that gives ample time to implement any preventive/proactive measure (e.g., vaccination, purchase of equipment);*
- *Clear, open and reliable communication channels, both within the organization and with external entities.*

Assessment criteria:

Preaudit:

1. *Ensure the processes and procedures realistically address health issues the operator is likely to encounter and that sufficient training is provided;*
2. *Assess the appropriateness of the process(es) to gather external information (e.g., from health organizations, governments, external entities).*

Onsite:

3. *Implementation would typically be evidenced through interview(s) although in some operations post-flight records might also be available (e.g., medevac).*

13.3 Ground Operations

13.3.1 Refuelling with Passengers Onboard

13.3.1.1 There shall be a policy stating whether the operator will or will not allow refuelling of the aircraft while passengers are embarking, onboard or disembarking.

Explanation:

Operators must have a documented policy that states whether or not they allow aircraft refuelling with passengers onboard the aircraft, or while embarking or disembarking. There are numerous risks that must be assessed in order to determine whether or not the operator wants to allow refuelling with passengers embarking, onboard or disembarking. These include unintended ignition of fuel vapor from a spark, static discharge from the movement of the fuel during refueling, or accumulation of static charge. A risk assessment should be undertaken in order for the operator to determine whether or not they want to take on these risks.

That said, there are some instances where it may not be possible to move passengers away from the aircraft for refueling, for example medical patients, those passengers with limited mobility, and the location or availability of the refueling service. Regardless of the reasons passengers are allowed to stay on or near the aircraft while refueling, operators whose policy allows for refuelling of the aircraft while passengers are embarking, onboard or disembarking should take into consideration and mitigate the associated specific risks per 13.3.1.2.

Assessment criteria:

Preaudit:

1. Review aircraft refuelling policy.

Onsite:

2. Interview personnel about the refuelling process to confirm understanding of the policy.
3. If possible, observe refuelling operations to verify conformity with the policy.

<u>13.3.1.2</u> If the operator allows for the aircraft to be refuelled when passengers are embarking, onboard or disembarking, it shall develop procedures to ensure, during this operation:

a. Compliance with all fuelling safety procedures;
b. The aircraft is attended by qualified personnel ready to initiate and direct an evacuation of the aircraft by the most practical and expeditious means available; and
c. Two-way communication is maintained by the aircraft's intercom system or other suitable means, between personnel conducting the refuelling and the qualified personnel attending the aircraft referred to in (b).

<u>Explanation</u>:

Where an operator's policy allows for the refuelling of aircraft with passengers embarking, onboard and/or disembarking, additional considerations are required to mitigate the associated risks of having people onboard or near the aircraft while refueling.

The operator's refuelling procedures must:

a. follow all applicable aircraft refuelling safety requirements,
b. include oversight and control by qualified personnel who are trained and prepared to oversee all phases of an evacuation of all occupants of the aircraft and area by the most expeditious means possible; and
c. ensure that two-way communication by intercom or other suitable means is maintained between the personnel conducting the refuelling and the qualified personnel in charge.

These risks may warrant additional planning and procedures which include, among others, procedures to:

- inform occupants that refuelling will take place while they are onboard, either over the PA system or verbally if the aircraft is small enough for all to hear unamplified,
- enable rapid evacuation of all occupants, including those with impaired mobility,
- reduce ignition risks,
- ensure seatbelts are off,
- arming of doors,
- two-way communication requirements,
- ensure electrical bonding, adding a static dissipator if not already present in the fuel, and eliminating potential spark sources,
- and any other actions to conform with applicable regulatory requirements.

Where potential ignition risks exist, the operator should assess and manage that risk. For example, if smoking on board while refuelling is not prohibited by law, the operator should consider establishing its own policy regarding when and how this is allowed or prohibited, and if it is allowed, what mitigating actions are required to be followed.

Reference: https://www.skybrary.aero/index.php/Refuelling_with_Passengers_on_Board

Assessment criteria:

Preaudit:

1. Review the operator's written refuelling procedures to verify conformance with these requirements.

Onsite:

2. Interview staff involved with refuelling procedures to confirm understanding of those procedures.
3. If possible, observe the refuelling process to confirm that the procedures are being followed.

13.3.1.3 The operator should establish a policy prohibiting fuelling with the engines running (hot fuelling) when passengers are embarking, onboard or disembarking. (Recommended Practice)

Explanation:

Refuelling an aircraft with the engines running creates a higher level of ignition risk and it is recommended that operators prohibit hot refuelling while passengers are embarking, onboard or disembarking the aircraft. That said, there are situations in which it may be necessary for operators to allow hot fuelling, such as an inoperative APU which has been deferred per the MEL requiring continued operation of at least one engine if suitable ground equipment is not available.

Assessment criteria:

Preaudit:

1. *Review fuelling policy documents regarding hot refueling to determine whether the operator has made a clear statement prohibiting hot refueling in their operations.*

Onsite:

2. *Observe refuelling procedures to ensure that the policy is being complied with.*
3. *Interview staff to determine their understanding of the policy, the risks associated with hot refuelling, and the procedures in place at their operation.*

13.3.2 Surface Contamination

<u>13.3.2.1</u> The operator shall develop policies and procedures to ensure that an aircraft does not take off or attempt to take off with frost, ice or snow adhering to any critical surface.

> *Note: These policies may allow for take-off with frost under the wing in the area of the fuel tanks if such operations are conducted in accordance with the aircraft manufactures instructions and authorized by the CAA.*

<u>Explanation</u>:

The presence of surface contaminants, in even the smallest amounts, can present a potentially dangerous loss of aircraft performance, a change in aircraft weight and balance, reduced stability and visibility, and can reduce the predictability of aircraft flight characteristics. There have been tragic accidents in all types of flight operations due to the failure to remove such surface contaminants. ICAO document 9640 provides guidance material for aircraft ground deicing/anti-icing operations.

The operator must develop policies and procedures for their operation in order to ensure that an aircraft does not depart with surface contaminants such as frost, ice or snow. Removal of surface contaminants can be achieved by a number of different processes, one of which is to wait until the contaminant is melted off. This may, in some remote operations, be the only option. In other operations, there may be availability of deicing and anti-ice fluids to use to remove the surface contaminants and prevent re-accumulation prior to takeoff. The operator should have updated and specific guidance available about the types of deicing/anti-icing fluids and corresponding holdover times in order to ensure that the process to remove surface contaminants is effective. Fluid characteristics and holdover timetables may be specific to each fluid and change every year. Operators need to remain vigilant that the latest applicable information is obtained, disseminated and put to good use in daily operations.

<u>Assessment criteria</u>:

Preaudit:

1. Review the operator's manuals to determine if they include a documented policy and procedure regarding not taking off if surface contamination is found adhering to any critical surface.

Onsite:

2. Interview staff to ensure understanding of the policy and procedures.
3. Interview staff about weather monitoring in the preflight planning process.
4. If weather allows, observe the predeparture procedures with regard to surface contamination to ensure conformance with the procedures.
5. If available, review prior flight records where surface contamination could have been an issue for the flight.

13.3.3 Cabin Baggage

13.3.3.1 The operator shall specify procedures to ensure adequate and secure stowage of all baggage carried onto an aircraft and transported in the passenger cabin.

Explanation:

When an aircraft encounters turbulence, loose objects on board an aircraft become potential projectiles. Issues that can arise from this situation include shifting of loads if not properly secured, blockage of exits, injury to persons or property, as well as a potential for center of gravity shift. In order to prevent this, operators must develop documented procedures to ensure that any items carried on to an aircraft and transported in the passenger cabin are securely stowed or contained. Aircraft crew must be trained in the securing of carryon items as well as recognizing what items should not be carried in the cabin. Briefing passengers ahead of the flight is recommended to help expedite the loading process and ensuring safe containment of carryon items.

Assessment criteria:

Preaudit:

1. Review the operator's manuals to ensure that they have carryon procedures that ensure adequate and secure stowage of the baggage and other items carried on to the aircraft and carried in the passenger cabin.

Onsite:

2. Interview staff to ensure understanding of the procedure.
3. If possible, observe loading of passengers and securing of carryon items prior to flight, or ask for a demonstration.
4. Review hazard reports for instances of unrestrained carryon items.

13.3.4 (A) Personnel Qualified to Taxi Aeroplane

13.3.4.1 (A) The operator shall have a process to ensure that no individual will taxi an aeroplane unless he/she is either a pilot appropriately qualified to operate that aeroplane, or a person duly authorized by the operator and trained to competency on all aerodrome operating procedures and aeroplane normal, abnormal and emergency operations related to taxiing the aeroplane.

Explanation:

There are many instances where an aircraft needs to be taxied from one location on an airfield to another. Whether it's an aircraft change for a flight or repositioning for maintenance, it's critical that the person taxiing the aircraft is trained for that operation in order to understand the potential risks and hazards and be able to respond. Pilots qualified to operate a specific airplane undergo extensive training in all phases of flight, including taxi. Other personnel, especially

maintenance, may have a need to move an aircraft when a qualified pilot is not available. If the operator permits taxi by non-pilot personnel, they must have a process to identify those personnel who are authorized to taxi aircraft. For non-pilot personnel who are authorized, the process must include training to competency for the taxi operation. Records should reflect training that meets the requirement of this Standard.

Assessment criteria:

Preaudit:

1. Review the operator's manuals to determine if they allow taxi procedures to be conducted by non-pilots.
2. Review the operator's manuals to ensure that there is a written process describing specifically who is authorized to taxi an aeroplane and what the competency requirements are for maintaining that authorization.

Onsite:

3. If applicable, review training records for qualifying non-pilots to taxi an operator's aeroplane to ensure conformance with this requirement.
4. Interview staff to ensure understanding of the requirements for who can taxi an aeroplane.

13.3.5 (H) Helicopter Rotor Turning under Power

13.3.5.1 (H) The operator shall have a procedure to ensure that a qualified individual will be at the controls of the helicopter whenever the rotor is turning under power.

Explanation:

It is common that a helicopter may be at a ramp or other landing area with its rotors turning under power while passengers embark or disembark, while the aircraft is being refueled, while cargo is being loaded or unloaded, etc. In this circumstance, a pilot or other qualified individual must be at the controls of the helicopter in order to be able to respond to non-normal situations or activities that may occur around or near the helicopter. For example, if a wind gust changes the path of the rotor disc, or an unusual engine issue or vibration arises, the person at the controls needs to be able to respond immediately, including having to takeoff to a hover or shut down the aircraft. For this reason, helicopter operators are required to have a procedure that ensures that a qualified individual must be at the controls of a helicopter with rotors turning under power and that defines who the qualified individuals may be. It's possible that an operator would only allow qualified pilots to be at the controls in this operating condition and prohibit all non-pilot personnel. However, if the operator does permit non-pilot personnel to be at the controls of a helicopter with rotors turning under power, then the procedure should clearly define who can be authorized as well as the requirements for that authorization, as discussed below in 13.3.5.2.

Assessment criteria:

Preaudit:

1. Review the operator's manuals to ensure that there is a written procedure describing specifically who is authorized to be at the controls of a helicopter when the rotors are turning under power as well as the requirements for that authorization.

Onsite:

2. Interview staff to ensure understanding of the requirements for who is authorized to be at the controls of a helicopter with rotors turning under power.

13.3.5.2 (H) The operator shall provide appropriately specific training and procedures for all personnel, other than qualified pilots, who are likely to carry out the turning of a rotor under power.

Explanation:

When a helicopter is running while at a landing site or ramp with the rotors turning, the operator must ensure that only qualified individuals are at the controls – either qualified pilots or, if allowed, non-pilot personnel. If the operator allows non-pilot personnel to conduct such actions, the operator must have a training program as well as procedures that are specific to this operation. Some examples include doing a maintenance engine check, or if the rotor was being tracked and balanced, or passengers/cargo are being loaded/unloaded. It is critical that the person at the controls when the rotor is turning under power is trained and qualified for that operation because they must understand the potential risks and hazards and be able to respond in the event of an abnormal situation.

If the operator has a written policy/procedure that prohibits anyone other than qualified pilots to be at the controls of a running helicopter, then this section is not applicable.

Assessment criteria:

Preaudit:

1. Review training manuals and procedures for qualifying non-pilots to be at the controls of a helicopter with rotors turning under power.

Onsite:

2. Review training records for qualifying non-pilots to be at the controls of a helicopter with its rotor turning under power to ensure conformance with this requirement.
3. Interview staff to ensure understanding of who is qualified to be at the controls of a helicopter with rotors turning under power.

13.3.6 Disposal of International Garbage

13.3.6.1 The operator shall have a process to identify any existing restrictions on disposal of international garbage and to ensure compliance with such restrictions.

Explanation:

When conducting international flights, an operator must consider how to handle waste that has been carried from one country to be disposed in another. The concerns about properly disposing of such waste include considerations of ensuring that animal and plant diseases are not spread from country to country, and to ensure that such waste is correctly categorized by the operator. Countries will have their own rules on how waste is classified and how it is to be handled. Therefore, international operators must develop a process that allows them to identify and comply with the requirements and/or restrictions for their destinations about how to dispose of international garbage.

If an operator is involved in international operations but has the FBO at their destinations handle the international garbage, they must still have a documented process that addresses how the crew will coordinate with the FBO on the collection and disposal of the international garbage.

This Standard is not applicable only when the operator never does international flights.

Assessment criteria:

Preaudit:

1. Review manuals on international travel to ensure that it includes a process for the operator to identify the existing restrictions for disposing of international garbage.

Onsite:

2. Interview staff about the requirements and processes related to disposal of international garbage to ensure that they understand and comply with them.
3. If possible, observe a demonstration of how the operator handles international garbage.

13.4 Flight Release and Flight Following

13.4.1 An operator shall establish a documented flight release process that meets the operation's needs considering the complexity and area of operations. The flight release process shall ensure:

a. Identification of the person responsible for release of the flight;
b. Compliance with all operating requirements specified in this standard and required by State of Registry and State of Operation regulations;
c. Operation of the aircraft within weight/mass and balance limits;
d. Accomplishment of technical dispatch procedures listed in IS-BAO 15.1.9, and indication of the next required inspection to the person responsible for the flight release; and

e. Verification of aircraft equipment and software compliance with the requirements specified by the State and/or airspace where operations are to be conducted, according to the processes indicated in IS-BAO 14.1.2;

Explanation:

This item in the standard requires a final check is made prior to departure to ensure all requirements for the flight are being met, considering the complexity and area of operations. The operator's flight release process must ensure that:

a. There is someone responsible for releasing the flight and that person is clearly identified;
b. This process ensures that the flight will be operated throughout all phases of flight within the requirements of applicable regulations and other requirements, including the IS-BAO standards. Note that requirements may come from the State of Registry, but there may also be requirements specific to the area of operations which may vary from place to place (e.g., an EASA authorization for Third Country Operators). The operator must have a process to assess all aspects of the operation for flight release;
c. The aircraft will be within weight/mass and balance limits for the duration of the flight;
d. The aircraft is airworthy in accordance with the operator's maintenance requirements and applicable regulations from both the State of registry and the area of operations. This ties in with the technical dispatch processes required in IS-BAO 15.1.9, and requires that flight release is only accomplished after it has been verified that the aircraft is airworthy. Additionally, as part of this process the person responsible for the flight release must receive indication of the next required maintenance inspection for the aircraft, so as to appropriately ensure that the aircraft will complete the sequence of flights planned for before maintenance becomes due; and
e. The aircraft configuration is in compliance with any additional aircraft equipment and/or software required by applicable regulations from both the State of registry and the area of operations. This ties in with the processes required in IS-BAO 14.1.2, since that process typically requires coordination between flight operations (who knows where the aircraft will fly to) and maintenance (who knows the details of the equipment installed onboard the aircraft).

Assessment criteria:

Preaudit:

1. Review documents related to flight release and flight following to ensure that the operator has a written process that addresses the specific needs and concerns of their operations that ensures conformance with this Standard.

Onsite:

2. Review flight release documents where available for past flights to ensure all elements of this protocol have been addressed.
3. Observe a demonstration of the flight release process, or, if possible, observe the flight release process for a flight during the audit.

4. Interview staff to ensure understanding of the process and their roles in that process.

<u>13.4.2</u> As part of the flight release process, the operator shall establish a documented crew member scheduling process that ensures:

a. The operator designates a pilot-in-command for each flight and, where the crew includes two pilots, a second-in-command;

b. The operator assigns additional flight crew members to each flight as necessary to satisfy the minimum number of qualified flight crew as specified in the aircraft flight manual or other documents associated with the certificate of airworthiness;

c. The operator assigns a number of cabin crew members to each flight in accordance with national requirements as well as any requirements specified in the aircraft flight manual or other documents associated with the certificate of airworthiness; and

d. The proper qualification, training and authorization of assigned crew members for the operations to be conducted. In determining this, the operator shall ensure that all crew members:

i. Hold the licence, medical certificate and ratings (including radiotelephony licence unless it is included in the pilot licence) required by national regulations, as well as those specified in ICAO Annex 1 for operations conducted outside the national airspace of the State of issue of the flight crew licence;

ii. Meet all recency requirements of the national regulations;

iii. Have successfully fulfilled the requirements of the operator's ground and flight training programme as well as the proficiency requirements specified Chapter 8 for that type of aircraft; and

iv. Can demonstrate the capability to speak and understand the language used for aeronautical radiotelephony communications as specified in ICAO Annex 1, as required by regulations for the assigned operations;

Note: Cabin crew and other crew members assigned to perform duties onboard are responsible to the pilot-in-command to carry out specified safety duties in the event of an onboard emergency. The operator shall determine the requirement for cabin crew for each type of aircraft, in accordance with national regulations, based on seating capacity or the number of passengers carried, in order to effect a safe and expeditious evacuation of the aircraft as well as the necessary functions in an emergency or a situation requiring emergency evacuation.

<u>Explanation</u>:

Crew scheduling encompasses a number of different criteria that must be addressed in order to ensure the safe conduct of a flight. This standard requires a scheduling process that fulfills two needs: ensuring there will be sufficient crewmembers for the flight (in the flight deck and cabin),

and that the assigned crewmembers have the necessary license, training (including IS-BAO training) and language skills for non-native English speakers engaged in international operations.

The crew scheduling process is an integral part of the flight release process and must include the following elements:

a. Each flight must have a designated pilot-in-command, and for two pilot crews, the second-in-command must be designated as well.
b. If required by the aircraft type, flight manual or any other airworthiness documents, the operator must have a process to assign additional flight crew per those requirements.
c. Cabin crew assignments must align with any regulatory requirements as well as aircraft documents such as the flight manual and the certificate of airworthiness.
d. In order for a flight to be conducted, all personnel assigned for the flight must meet all qualification requirements, including training and other authorizations, such as, for example age limitations or crew pairing requirements based on experience. The operator must therefore have a process to ensure that assigned crew members are properly qualified. This process must include:
    i. Licenses, medical certificates and ratings;
    ii. Recency requirements;
    iii. Training and proficiency requirements met;
    iv. Language skills.

Assessment criteria:

Preaudit:

1. Review crew scheduling manuals/documents to ensure the documented process conforms to this section.

Onsite:

2. Review flight release logs, where available, to ensure that qualified crew are assigned to flights.
3. Observe a demonstration of the flight release process, or, if possible, observe the flight release process for a flight during the audit.
4. Interview personnel to ensure understanding of the elements required by this item.

13.4.3 As part of the flight release process, the operator should establish procedures for ensuring that the pilot-in-command has access to appropriate information concerning the search and rescue services in the area over which the aircraft will operate. (Recommended Practice)

Explanation:

Regardless of where an organization operates, it is recommended that they establish procedures to have search and rescue information readily available to the pilot-in-command in order to expedite the PIC's ability to contact them if needed and if able. There are many external entities

who can provide this service, such as flight planning service or aeronautical chart providers, but operators may also develop their own internal procedures in collaboration with local search and rescue organizations. The scope of this information will reflect the type of operation being conducted. For international flights, this information should include the areas along the route of flight, taking into consideration the various State airspaces through which the aircraft flight is planned. For those organizations operating within a more confined region, they should ensure that this information is gathered from the various organizations who participate in search and rescue activities. This could include local airport rescue, police, fire fighters, search and rescue organizations, as well as medical providers.

Assessment criteria:

Preaudit:

1. *Review applicable procedures for information provided to the PIC about search and rescue services available for the area of operation.*

Onsite:

2. *Interview personnel about the organization's procedures for providing the PIC with appropriate search and rescue information.*
3. *Review records for coverage of availability of search and rescue services.*

13.4.4 The operator shall establish documented flight following procedures that:
a. Specify when the pilot must advise the operator of the aircraft's departure and arrival and the associated procedures;
b. Ensure the names of persons onboard the aircraft are recorded or otherwise known by the operator; and
c. Ensure the notification of search and rescue authorities on a timely basis, should an aircraft be overdue or missing.

Explanation:

Flight following procedures must include specific attention to notification about departures and arrivals, a procedure to record or otherwise be apprised of persons carried onboard, and response requirements for notification to search and rescue authorities in the event an aircraft is overdue or missing. These services can be outsourced to external entities or this information can be assembled in-house.

The procedures in either case must be documented to include:

a. When the pilot must notify the operator about departure and arrival times, as well as any associated procedures for the flight. Some operators aircraft have the capability of automatically notifying takeoffs and landings, while other operators may need to do this manually. There must also be some means of monitoring the progress of a flight, whether it is a person designated by the operator or an outsourced service provider or other arrangement. For some operators, this may mean designating an employee or even

a non-employee to be the point of contact for notifying search and rescue should the flight become missing or overdue.

b. Ensuring that the operator has a procedure to record or otherwise be apprised of the names of those persons onboard the flight. This procedure should account for the possibility of last-minute changes to who actually boards the flight or not, so that the operator knows who is actually on board and can notify SAR in a complete and timely manner. For those operators carrying VIPs, a security plan should also be put in place to protect the identity of those onboard.

c. Timely notification of search and rescue personnel in the event an aircraft is overdue or missing. This item will relate to the operator's emergency response plan (reference chapter 4 guidance).

Assessment criteria:

Preaudit:

1. Review manuals/documents for procedures for:
    a. when an operator is notified about departures and arrivals and any associated procedures;
    b. the means used for the operator to be aware of the names of the persons carried onboard the aircraft; and
    c. information related to notification of search and rescue if an aircraft is overdue or missing.

Onsite:

2. Interview personnel, including those with the responsibility of flight following and notifying SAR, regarding these procedures to ensure understanding and conformance.
3. Where available, review flight records or logs for information to confirm conformance with these procedures.

13.5 Weather Minima

13.5.1 An operator shall have a process to determine safe aerodrome or heliport operating minima to be observed, taking into account the following aspects:

a. Any minima specified in instrument procedures (departure or approach) published for that aerodrome, considering any performance limitations associated with the minima;

b. Any criteria specified by the State of Registry, to include equipment, training, operating and regulatory requirements;

c. Operating minima lower than those established for that aerodrome or heliport, by the State in which it is located, shall not be used except with the specific approval of that State; and

d. The operator shall conduct a risk analysis where no take-off minima are specified by regulations or published procedures.

Note: Operational credits based on the use of systems such as HUD, EVS, SVS, CVS must be authorized by the State of Registry and the State of Operations.

Explanation:

For some operators, such as those flying solely VFR, the determination of the operating minima for the flight operation can be a very straight forward process, based on regulatory minimum requirements. For VFR operations, subparagraph "a" will not be applicable, however subparagraphs "b", "c" and "d" do apply, as appropriate for the operation. For operations conducted outside of the airport environment, using for instance float planes, ski planes, and helicopters, the operator is required by this item to have a process in place to address the specific risks and needs of the operation to be flown, including the risk analysis in those situations where there are no regulations or other requirements. Operators, whether fixed or rotor wing, who fly IFR or some combination of IFR and VFR, may need to consider various aspects depending on their area and type of operations, as discussed below.

Operating minima provide criteria to define limits of usability for takeoff and/or landing at an aerodrome or heliport. Depending on the phase of flight considered, those criteria relate to the visibility (and/or Runway Visual Range, RVR), to a Minimum Descent Altitude/Height (MDA/MDH), to a Decision Altitude/Height (DA/DH), and/or to the height reached by the base of the clouds. This does not include meteorological conditions, nor the type of flight plan used, if any.

Most countries use standards from the ICAO Procedures for Air Navigation Services (i.e., Doc 8168 PANS-OPS) to establish departure/arrival procedures and associated criteria for each runway to ensure safe separation with known obstacles. However, other locations, such as the United States, Canada, Korea, Saudi Arabia, or Taiwan, have adopted the FAA's U.S. Standard for Terminal Instrument Procedures (US-TERPS). Despite many similarities between the two, pilots must be aware of differences in obstacle clearance criteria, and particularly for Circling Approaches (e.g., the minimum obstacle clearance and assumed radius of turn are significantly different, leading to markedly lower safety margins when using TERPS).

In most cases, a national competent authority will supply the necessary information for operators to calculate the Aerodrome Operating Minima (AOM) of a given runway, typically through its Aeronautical Information Publications (AIP). Many operators find it more convenient to obtain this information through external entities but the actual values these companies publish should be identical to the ones found in the AIP. In any case, States will likely require operators consider a range of factors when establishing their AOM, including but not limited to:

- Aircraft performance and handling characteristics (including in case of engine failure),
- Obstacles in the flight path for departure or approach,
- Characteristics and dimensions of the runway,
- On-board navigation and flight path management equipment, as applicable,
- Visual and non-visual ground aids,
- Flight crew composition, competence and experience, and

- Other factors as appropriate.

An operator wishing to use an AOM that is lower than the minima published by the competent authority for that aerodrome or heliport must obtain prior approval. Similarly, on-board technology such as HUD, vision systems (e.g., EVS, SVS, CVS) and hybrid systems (e.g., EVS combined with a HUD) can assist in obtaining credits to conduct operations in poor meteorological conditions where they would normally not be possible. Operators wishing to conduct such operations will need to obtain certain approvals (see Annex 6, Part I, 4.2.8.1.1 and 6.23, and the corresponding requirements in Annex 6, Parts II and III). The extent of the approvals will depend on the intended operation and the complexity of the equipment.

Such operational credits related to visibility/RVR can be given using at least 3 concepts:

- The first concept is to reduce the required RVR, which will allow the aircraft to continue the approach beyond the approach ban point with a reported RVR lower than what was established for the approach procedure.
- Where a minimum visibility is prescribed, a second concept to grant operational credit may be used. In this case, the required minimum visibility is kept unchanged, but it is satisfied by means of onboard equipment, typically an EVS. The result of both these concepts is that operations are allowed in meteorological conditions where they would not be possible otherwise.
- A third concept is to give operational credit by allowing operations in visibility/RVR that are not lower than those established for the approach procedure, but the approach operation is conducted with fewer facilities on the ground. One example of the latter is to allow Category II operations without touchdown and/or centre line lights, compensated by additional onboard equipment (e.g., a HUD).

In addition to the operational credit that HUD, vision systems and hybrid systems are able to provide, these systems will also provide an operational and safety advantage through improved ‘situational awareness’, earlier acquisition of visual references and smoother transition to references by natural vision.

For 13.5.1.d, which applies to those situations where there are no take-off minima specified either by regulations or published procedures, the operator must do a risk analysis for the operation. This risk analysis does not necessarily need to be performed before every flight provided no significant change has occurred at the airport (including the landing area, each runway to be used and/or nearby obstacles) since the last risk analysis.

Assessment criteria:

Preaudit:

1. Gather pertinent documentation indicating which approvals or authorizations are currently being held by the operator and if any limitation applies (e.g. Operational Specifications).

2. Ensure proper documentation of applicable process(es) and compliance with relevant approvals or authorizations;

Onsite:

3. Implementation would typically be evidenced through interview(s) with flight crews, management and scheduling/dispatch personnel, and/or observation of the flight planning process.

13.5.2 The operator shall have a policy prohibiting continuation of a flight toward the aerodrome or heliport of intended landing unless the latest available meteorological information indicates that conditions at that aerodrome or heliport, or at least one destination alternate aerodrome or heliport, will, at the estimated time of arrival, be at or above the specified aerodrome or heliport operating minima.

Explanation:

The primary concern addressed by this standard is to prevent the possibility that the crew of an aircraft in flight will press on towards its intended destination, or alternate, despite knowing that bad weather is present or at least forecasted at the time of conducting the approach and landing. "Get-there-itis" or "get-home-itis" is a multifactor syndrome that unfortunately continues to contribute to aircraft accidents. To proactively mitigate that risk, operators must establish a policy that sets a clear boundary beyond which no flight crew member can continue a flight towards "the most desirable destination", regardless if it is performed under VFR or IFR, but instead sets course towards "the most reasonable destination" where operating minima won't be infringed, and a safe landing will be much more likely.

Assessment criteria:

Preaudit:

1. Ensure proper documentation of the pertinent policy;

Onsite:

2. Implementation would typically be evidenced through interview(s).

13.5.3 Aerodrome Operating Minima

a. Unless permitted by both the State of Registry and State of Operation, the operator shall ensure that an instrument approach is not continued below 300 m (1000 ft.) above the aerodrome elevation or into the final approach segment unless the reported visibility or controlling RVR is at or above the aerodrome operating minima;

b. If, after entering the final approach segment or after descending below 300 m (1000 ft.) above the aerodrome/heliport elevation, the reported visibility or controlling RVR falls below the specified minimum, the approach may be continued

to DA/H or MDA/H. In any case, an aircraft shall not continue its approach to land beyond a point at which the limits of the aerodrome/heliport operating minima would be infringed;
c. When the State of Registry and the State of Operation permit and the operator chooses to conduct the operation described in (a), the operator should have a policy, based on the operator's company risk assessment, describing the conditions under which it would authorize such an approach. (Recommended Practice)

Explanation:

Sometimes referred to as the 'approach ban' provision (e.g., in ICAO Annex 6), this standard complements 13.5.1 and 13.5.2 by focusing on IFR approaches and by clarifying at which point they must be discontinued. 'Approach bans' essentially attempt to prevent the continuation of approaches in marginal to poor weather despite the flight crew knowing even before reaching the MDA/H or DA/H that the visibility/RVR is below the aerodrome operating minima (AOM). Moreover, enforcing approach bans can defuse potentially tricky situations, such as confusion among the flight crew and/or "get-there-it is" syndrome at the MDA/H or DA/H leading to minima infringements, or initiating go-arounds at (very) low altitude, with abrupt changes in configuration and power settings, in combination with high workload and cognitive demands, potentially resulting in an aircraft upset.

Operators are of course free to choose a higher value than 300 m or 1000 ft, but they cannot use a lower one. Avoiding a duplication of decision points or 'gates' along the approach may be one of the considerations when designing an 'approach ban' provision.

As stated by the recommended practice in item (c), some States have not included the 'approach ban' in their national regulations, therefore allowing operators to continue their instrument approach 'as published' without the additional safety margin offered by the 'ban'. It is recommended that IS-BAO operators allowing approaches to continue below 300 m or 1,000 feet when weather is reported below minimums perform a risk assessment and formally define conditions when "ban-less" approaches are authorized."

Assessment criteria:

Preaudit:

1. As a first step, identify whether the State of Registry enforces the 'approach ban' or not.
2. As applicable, ensure proper documentation of a policy,

Onsite:

3. Implementation would typically be evidenced through interview(s) with flight crews;
4. *For item (c) specifically, if applicable, assess the appropriateness of both the company risk assessment and operator policy.*

<u>13.5.4</u> If the operator has authorization from the civil aviation authority in the State of Registry to conduct Category II or III operations, the operator shall have a process to ensure compliance with all minimum requirements for such operations, to include:

a. Approved Category II or III operating procedures in the company operations manual;

b. Training and certification of flight crew conducting Category II or III instrument approaches;

c. Proper equipment, approval and maintenance of aircraft for Category II or III operations; and

d. Authorization from the civil aviation authority of the State of Operation for CAT II or III operations, as applicable.

<u>Explanation</u>:

Precision instrument approaches such as CAT II or CAT III have safely guided aircraft through murky weather for decades. However, these countless success stories are the result of a combination of factors and relentless efforts (not to mention significant resources!). The absence or malfunctioning of any of those individual elements could immediately undermine the integrity of the system and the safety of the operation.

Airports and their respective authorities also have a crucial role to play by maintaining the integrity and accuracy of ground equipment (e.g., secondary power supplies, visual aids, markings, lighting, etc.). As far as air operators are concerned, they must continually provide their flight crew members with the right equipment, the right training, and the right operational procedures covering taxi, takeoff, and landing in low visibility. All of this must naturally be approved by the competent authority and remain in compliance with all applicable regulatory requirements. There's therefore a premium for conducting such 'all weather operations' through more stringent requirements on the aircraft, crew, maintenance programme, crew training programme, etc.; and CATII/III operations should be supported by cost-benefit analyses.

It is also the operator's responsibility to ensure that low visibility procedures have been established and are being enforced at destinations where CATII/III operations are envisaged and any specific requirements at that location are complied with. By the same token, flight crew members need to notify ATC if they wish to conduct an autoland outside of low visibility procedures for training or recency purposes. In some states, the hours where practice autolands are permitted are published in the AIP.

<u>Assessment criteria</u>:

Preaudit:

1. Gather pertinent documentation detailing any approval currently held by the operator and any limitation.
2. Ensure proper documentation of applicable policies and procedures, including on training, as well as compliance with the approval;

Onsite:

3. Implementation would typically be evidenced through interview(s) and document reviews in flight operations (e.g., post-flight records), training and maintenance areas (equipment and approval).

13.5.5 The operator shall establish policies and procedures to ensure that crews will not commence a flight in known or expected icing conditions unless the aircraft is certificated and equipped for such conditions.

Explanation:

As accident records show, icing continues to represent a considerable risk and even to aircraft certified for flight in icing conditions. If initial ice build-ups usually start in predictable areas of an aircraft (e.g., wing leading edges), the subsequent accretion processes are much more complex and less predictable due to the number of variables that can come into play. Contrary to past knowledge, the effects of icing are not cumulative in any linear or proportional sense. Moreover, research repeatedly showed that very little ice is needed to have drastic, adverse effects, often with no warning before a departure from normal aerodynamic performance.

It is therefore essential that aircraft not certificated for icing conditions stay away from them or exit them immediately if encountered inadvertently. Clear instructions must therefore be provided. When it comes to the operation of aircraft certificated for icing conditions, operators must ensure the proper functioning of any required system or method prior to entering icing conditions. Since a technical malfunction is always a possibility (before departure or in flight), operators must also provide staff with instructions to adapt their plans and routing, to avoid those icing conditions or to exit them immediately. Up-to-date training is also important, especially if incorrect knowledge from the past still forms the basis of decision-making. This is dealt with in IS-BAO chapter 8.

On a related topic, operators conducting flight operations in icing conditions should obviously ensure their staff is knowledgeable about de/anti-icing procedures and therefore provide them with up-to-date information (e.g., types of fluids, hold-over tables, etc.). The training element will be covered in the dedicated chapter.

Assessment criteria:

Preaudit:

1. Identify which aircraft in the fleet is/are certificated for icing conditions and assess the relevance of this standard against the operations that are audited,
2. Ensure proper documentation of pertinent policies and procedures from both flight operations and airworthiness perspectives (e.g., effects of system malfunction on flight planning, notification of crew members, etc.),

Onsite:

3. Implementation would typically be evidenced through interview(s).

<u>13.5.6 (H)</u> VFR Helicopter Operations. The operator shall have a process to establish VFR weather limits for both day and night operations where standard VFR weather limits are not appropriate to the nature of the operations and/or the operating environment.

> ***Note: Regulatory minimum requirements established by the State may not be sufficient to support a particular operation or suitable for best and safe practices. Operators/owners have the opportunity to establish meaningful weather minimums to aid the pilot in conducting safe operations.***

<u>Explanation</u>:

This standard requires the operator to assess their operations and operating environment to determine whether standard VFR weather limits provide sufficient safety margins. Helicopters have the unique capability of flying low and slow, which has sometimes meant flying in conditions where visibility and cloud clearances are compromised in certain terrain conditions. In uncontrolled airspace, helicopter VFR weather minimums can be as low as merely staying clear of clouds. In 2014, the Federal Aviation Administration published a rule adding a visibility requirement of at least a ½ mile and clear of clouds during the day in Class G airspace ((Docket No.: FAA–2010–0982; Amdt. Nos. 91–330; 120–2; 135–129). This kind of regulatory latitude is the minimum standard and operators must assess the unique nature of their operations and accomplish a risk assessment regarding acceptable VFR weather limits that ensures an acceptable level of safety.

Helicopter emergency medical services operators may operate in both familiar and unfamiliar areas where the low weather allowances for helicopter operations may not provide sufficient margins for safe decision making during a medevac flight. Because of high accident rates in this industry, which are attributable in large part due to deteriorating weather and subsequent controlled flight into terrain, regulatory agencies have increased the requirements for these types of operations. In spite of these requirements, CFIT accidents still happen due to a lack of "comprehensive preflight weather evaluation" as was discussed by the NTSB about the crash of a medevac helicopter in the early morning hours near Zaleski, Ohio. Night visual meteorological conditions existed at the time of the departure, however a pilot coming on duty took the flight without completing their own preflight process. Weather conditions along the route of flight indicated snow showers and areas of instrument meteorological conditions. The pilot encountered conditions requiring a return to base but was unable to maintain control of the aircraft in icing conditions (NTSB/AAR-20/01; Helicopter Air Ambulance Collision with Terrain Survival Flight Inc. Bell 407 Helicopter, N191SF; https://www.ntsb.gov/investigations/AccidentReports/Pages/AAR2001.aspx).

For other types of helicopter operations, such as utility work, heli-skiing, firefighting and VIP charter work, there is also a need to assess the appropriate weather minimums. For example, for

an air tour flight, it may be legal to fly in low weather conditions, but if the objective is to see the sights, then the operator should consider raising their weather minimums in order to ensure appropriate clearance from clouds and terrain. This has the added benefit of ensuring that passengers will be able to see the sights and that noise abatement criteria can be followed as well.

Assessment criteria:

Preaudit:

1. Review manuals and documents for minimum VFR weather limits to determine if they are suitable for the organization's operations.
2. Review incident or accident reports related to VFR weather minimums, if available.

Onsite:

3. Interview personnel regarding operational policies and processes for VFR weather requirements for their operations.
4. Where available, review flight planning documents for weather and operational planning and flight outcomes.
5. Observe preflight planning and weather decision making, as well as flight operations if possible, to ensure conformance.

13.6 En Route Operations

13.6.1 Use of Oxygen

13.6.1.1 The operator shall establish policies and procedures to ensure that whenever the cabin pressure altitude is above 10,000 ft. (700 hPa) but not exceeding 13,000 ft. (620 hPa), each crew member shall wear an oxygen mask and use supplemental oxygen for any part of the flight at those altitudes that is more than 30 minutes in duration.

> ***Note: IS-BAO Standards 13.6.1.1 and 13.6.1.2 apply to pressurized aircraft under abnormal or emergency situations as well as unpressurized aircraft.***

Explanation:

Since a hypoxic brain is a serious threat to health and safety, this standard is of particular importance for the operation of unpressurized aircraft at altitudes nearing or exceeding 10,000 ft. That said, this standard addresses the operation of unpressurized aircraft above 10,000 ft but also the loss of cabin pressure in pressurized aircraft flying above that altitude.

Although the provision of supplemental/emergency oxygen mitigates the physiological effects of high-altitude operations in unpressurized aircraft, operators need to also consider the variability of the crew and passengers. Health condition, age, smoking habits, personal medical history, etc. all influence the altitude at which oxygen must imperatively be provided to support both

cognitive and vital functions (operators might consider the use of pulse oximetry in flight to ensure sufficient oxygen saturation for all occupants). Many forms of hypoxia exist in the general population without even leaving the ground. Depending on the individual, oxygen may be required well before 10,000 feet. To make matters perhaps even more complicated, a person may not disclose or even know that physiological reality before flight. Proper equipment in serviceable condition and regular staff training are therefore imperative for an adequate and timely response to potentially life-threatening situations.

Assessment criteria:

Preaudit:

1. Ensure relevant procedures are properly documented;

Onsite:

2. Implementation would typically be evidenced through interview(s), although post-flight records might be available to demonstrate the use and refill of oxygen tanks as per company/OEM procedures.

13.6.1.2 The operator shall establish policies and procedures to ensure that whenever the cabin pressure altitude is above 13,000 ft. (620 hPa), each person onboard the aircraft shall wear an oxygen mask and use supplemental oxygen for the duration of the flight at those altitudes.

Note: IS-BAO Standards 13.6.1.1 and 13.6.1.2 apply to pressurized aircraft under abnormal or emergency situations as well as unpressurized aircraft.

Explanation:

In line with 13.6.1.1, this standard addresses the operation of unpressurized aircraft above 13,000 ft but also the loss of cabin pressure in pressurized aircraft flying above that altitude.

Although operators of pressurized aircraft will normally avoid this kind of situation, they should nevertheless be prepared to respond to a loss of cabin pressure at high altitude. This standard obviously covers the equipment to provide sufficient oxygen until the aircraft descends to a safer altitude. It also includes the necessary procedures for its operation, crew training and passenger information.

As national regulatory requirements may vary, operators need to ensure they also meet the oxygen requirements applicable in the airspace they will use.

Note: in those rare cases where an aircraft operates to/from an airport at or above 13’000 ft (e.g., China, Bolivia, Peru), this will most likely affect many processes and procedures related to flight operations, training, airworthiness and maintenance (control). Although they will deviate from

the standard it is acceptable to report the operator as conforming with this item, provided those flights are adequately risk assessed and managed.

Assessment criteria:

Preaudit:

1. Ensure relevant policies and procedures are properly documented and trained;

Onsite:

2. Since a demonstration of implementation would require a prior full-scale emergency situation, interview(s) should focus on staffs' knowledge of the appropriate procedures.

13.6.1.3 For aircraft that are not equipped with quick-donning oxygen masks, the operator shall have a policy stating that the pilot at the flight controls shall don an oxygen mask when operating at or above FL 250.

Explanation:

According to research, the Time of Useful Consciousness (TUC) or Effective Performance Time at FL 250 is between 3 and 5 minutes. However, those numbers are likely to be halved in case of an explosive decompression, due to the sudden outflow of oxygen from the occupants' tissues.

Should the aircraft not be equipped with 'quick-donning' masks (which can usually be donned single-handedly, in 5 seconds or less), it is important to mitigate the potential of a rapid decompression by having at least one of the pilots on oxygen.

This item can be reported as 'Not applicable' if every aircraft in the operator's fleet, with a ceiling above 25,000 ft, is equipped with quick-donning oxygen masks.

Assessment criteria:

Preaudit:

1. Ensure relevant policies and procedures are properly documented and trained;

Onsite:

2. Since a demonstration of implementation would require a prior full-scale emergency situation, interview(s) should focus on staffs' knowledge of the appropriate procedures.

<u>13.6.1.4</u> The operator should have a policy stating that the pilot at the flight controls of an aircraft shall use an oxygen mask if:
a. The aircraft is operated above FL 410; or
b. If one pilot leaves the flight deck for any reason above FL 350. (Recommended Practice)

> ***Note: Specific State requirements may vary in the application of this requirement. Operators must meet the specific requirements of the State of Registry.***

<u>Explanation</u>:

This recommended practice stems simply from the fact that the Time of Useful Consciousness (TUC) or Effective Performance Time at FL410 is of less than 20 seconds, or possibly even half of that in case of an explosive decompression. It is important to mitigate the potential of a rapid decompression by having at least one of the pilots on oxygen.

It is recommended that the pilot at the flight controls use an oxygen mask if the other pilot leaves the flight deck above FL 350.

<u>Assessment criteria</u>:

Preaudit:
1. Ensure relevant policies and procedures are properly documented and trained,

Onsite:
2. Since a demonstration of implementation would require a prior full-scale emergency situation, interview(s) should focus on staffs' knowledge of the appropriate procedures

13.6.2 Aircraft Crew Seating Requirements

<u>13.6.2.1</u> The operator shall establish a policy establishing seating requirements for all flight and cabin crew members that includes the following:

> **a. Take-off and landing. All aircraft crew members shall be at their stations with seatbelts fastened. When safety/shoulder harnesses are provided, all aircraft crew members shall also keep their safety/shoulder harness fastened, except in the case of non-cockpit crew members whose duties would be impeded by the use of the shoulder harness;**
> **b. En route. All flight crew members required to be on flight deck duty shall remain at their stations except when their absence is necessary for the performance of duties in connection with the operation of the aeroplane or for physiological needs;**
> **c. Seat belts. All flight crew members shall keep their seat belts fastened when at their stations. All cabin crew members shall be seated with seat belt or, when provided, safety/shoulder harness fastened whenever the pilot-in-command so directs.**

Note: Safety/shoulder harness includes shoulder strap(s) and a seat belt that may be used independently.

Explanation:

The operator's policy must make it perfectly clear that all crew members have be at their station for takeoff and landing, with their seatbelts (and harnesses, if provided) fastened. Once en-route, flight crew members on duty must avoid leaving the flight deck unless it is related to operational or physiological needs, which possibly include a crew rest period (if allowed by the State(s) of Registry/Operator, and in line with the operator's fatigue management programme).

Although such situation has fortunately become rare, crew members continue to sustain serious or even fatal injuries for not properly wearing their seatbelts. Most cases include encounters with clear air turbulence. However, from time to time incorrectly fastened seatbelts (e.g., where less than the 'five points' are effectively latched) also appear in accident reports as major contributory factors in fatal injuries.

Assessment criteria:

Preaudit:

1. Ensure relevant policies on seating and the use of seatbelts and harnesses are properly documented,

Onsite:

2. Unless an opportunity to observe a flight presents itself, implementation would typically be evidence through interviews.

13.6.3 Microphones and Headsets

13.6.3.1 The operator shall establish a policy directing flight crew members to utilise headsets and communicate through boom microphones to the maximum extent practical to ensure effective communications, and at all times during critical phases of flight.

Explanation:

The use of headsets with boom microphones provides the flight crew with a much clearer communication process that can only enhance situational awareness and crew resource management. Headsets shield the wearer from excess noise, provides adjustable volumes and allows for more accurate transmission of communications via the boom microphone. Headsets today are made of lighter materials, include noise cancelling technology and provide clean transmission and better reception. While some aircraft have reasonably good noise insulation, smaller airplanes and helicopters may have too much noise while running to allow for communications without headsets. In many of those aircraft, a headset is required for the pilots and there is no option to fly without one. Other aircraft may allow for operation without a

headset, but this item requires the operator to establish a policy directing the flight crews to utilize this technology wherever practical and at all times during critical phases of flight.

Assessment criteria:

Preaudit:

1. Review manuals/documents for the operator's policy for use of headsets with boom microphones.

Onsite:

2. Observe use of headsets during operations if possible.
3. Interview pilots and relevant personnel regarding their use of headsets to ensure conformance with the policy.

13.6.4 Flight Data Recorders and Cockpit Voice Recorders

13.6.4.1 The operator shall establish a policy stating that flight data and cockpit voice recorders shall not be disabled during flight time.

Explanation:

Nowadays, crash-protected recorders comprise one or more of the following systems: flight data recorders (FDR), cockpit voice recorders (CVR), airborne image recorder (AIR), or datalink recorder (DLR). In some cases, the same 'black box' may record both flight data and cockpit audio (a.k.a. combination recorders). With advances in technology, lightweight flight recorders with essentially identical capabilities as crash-protected recorders are also becoming increasingly widespread.

Flight recorders must record data and/or voice prior to the aircraft moving under its own power, and continuously until the aircraft is no longer capable of moving under its own power. In case of an occurrence, they provide accident investigators with invaluable insights into the sequence of events. Considering all the efforts that have been put into the design, testing, manufacturing, installation, and maintenance of such recorders to ensure both their crashworthiness and the protection of the data they contain, air operators are expected to also play their part in the continuous improvement of aviation safety by ensuring that flight recorders won't be disabled during flight time.

Assessment criteria:

Preaudit:

1. Ensure a relevant policy is properly documented,

Onsite:

2. Since very few operators will have gone through a formal incident/accident investigation in the recent past, implementation will mostly likely be inferred through interviews rather than demonstrated.

13.6.5 Discretionary Landing Authority

<u>13.6.5.1 (H)</u> The operator shall have a policy clearly stating their support for any flight crew personnel that makes the decision to land the helicopter with due care if the continued safety of the flight is ever in question for any reason.

<u>Explanation:</u>

Helicopters have the unique capability of being able to slow down and make a precautionary landing, under power, in non-airport environments and smaller, unimproved areas. A quick search of the aviation accident databases will show a number of helicopter accidents that may have been avoided had the pilot chosen to land instead of continuing the flight. Spatial disorientation, fuel exhaustion, continued flight into worsening visibility, and just plain get-home-itis, among other human factors, have all been part of a chain of decision making that resulted in an accident. The policy required by this item provides clear guidance for the PIC that the precautionary landing is a valid option at any point during a flight. It also recognizes that even with good planning, things can change during a flight and that a successful operation might mean performing a precautionary landing instead of continuing the flight just because the pilot is fixated on getting to the destination. The policy supports recognition of the various human factors involved and the ability of humans to rationalize continued flight in worsening conditions, including "my boss will kill me if we're late" or "we're almost there" or "the fuel light isn't anything to worry about" or "if I can just get under/through/over this fog layer" or "I've done this a million times…". As noted in the Helicopter Association International's "Land & Live" information, explicit support for "precautionary landings as a safety measure will assure your flight crews that they can use the maneuver without fear of retribution." https://rotor.org/safety/land-and-live-resources/

<u>Assessment criteria</u>:

Preaudit:

1. Ensure a relevant policy is properly documented,

Onsite:

2. Interview management and pilots regarding their understanding of and conformance with the policy.

13.7 Approach

<u>13.7.1 (A)</u> The operator shall have a policy that defines stabilized approach criteria and requires the flight crew to execute a go-around or missed-approach if the aircraft deviates from these criteria unless the crew has previously planned and briefed an operationally required deviation.

<u>Explanation</u>:

In a 2017 study, Flight Safety Foundation estimated that 54% of *all* accidents in commercial aviation since 2000 would likely have been prevented by going around instead of continuing the approach. Although unstable approaches are a contributing factor in only half of the runway excursions that occurred on landing, they can also contribute to a loss of control in flight. Since it is commonly acknowledged that approximately 3% of unstable approaches result in a go-around, more resolute efforts must therefore be undertaken to increase compliance with go-around policies. Valuable guidance material and dozens of practical recommendations are already available to assist operators:

- ICAO: Runway Safety Programme – Global Runway Safety Action Plan (November 2017)
- Flight Safety Foundation: Go-around decision-making and execution project (March 2017)
- Flight Safety Foundation: A practical guide for improving flight path monitoring (November 2014)
- Eurocontrol & Flight Safety Foundation: Global Action Plan for the Prevention of Runway Excursions (2021)

Regarding the criteria for stable approaches, operators are also encouraged to consider existing documentation and to stay abreast of future updates, as the phenomenon of go-around non-compliance is more complex than meets the eye and as there is no ‘one size fits all’ mitigation strategy to reduce it. For instance, generic criteria may not suit every single type of operation, especially if those criteria come primarily from airline operational experience. By the same token, care must be taken when defining SOP, callouts and training programmes.

With regard to those operations where a deviation is required to conduct the operation, the operator must plan and brief the operation prior to conducting it. For those operators who regularly operate under circumstances that require regular operations that are outside of the “normal” flight profiles, for example scientific research flights for weather (storm chasers) or wildlife (animal tagging and tracking), this policy can be adapted to their operational needs.

To illustrate the need for nuance, consider how unstable approaches and go-arounds are addressed in an organization. Should pilots report them? Current guidance would recommend considering go-arounds as normal procedures almost equal to a normal landing, based on the rationale that mandating reports on go-arounds might suggest some form of trouble to pilots who perform them, possibly only due to the extra costs incurred, which would likely be counterproductive from a safety perspective (e.g., as the saying goes, “leaders who don’t listen

end up being surrounded by people who have nothing to say"). On the other hand, an unstable approach may originate from external factors on which the crew has little to no influence (e.g., ATC keeping aircraft too high before final approach, inducing both high descent rates and high speeds close to the runway). Should this be a recurring situation at a particular airport, it would be interesting to collect some data and to have the matter discussed by the safety managers of the operator and of the airport and/or ATC facility. The need to report a go-around due to an unstable approach should therefore be minimized unless another significant event was either a contributing factor or a direct consequence (e.g., exceeding a structural limitation). Conversely, operators should consider unstable approaches followed by a landing as a mandatory reporting event.

Assessment criteria:

Preaudit:

1. Ensure a policy is properly documented,

Onsite:

2. SMS records (e.g., reports, hazard log/register, risk assessments, etc.) and insights from Flight Data Analysis, if available, should provide sufficient evidence of implementation. However, it may be valuable to complement this by interview(s), and particularly if very little objective data is available.

13.7.2 (A) The operator should have a policy requiring flight crews to utilize approaches with a constant glide path to landing to the maximum extent practical. (Recommended Practice)

Explanation:

Approaches with a constant glide path to landing provide a safe alternative to non-precision approaches by removing the traditional step-down fix(es) to the Minimum Descent Altitude or Height (MDA/MDH). This technique typically yields significant safety benefits

Continuous Descent Final Approaches (CDFA) should not be confused with continuous descent arrivals which are used by some approved airports. This operating technique also reduces aircraft noise, fuel consumption and emissions, but doesn't have a strong focus on safety improvements. It may be initiated and coordinated with ATC during arrival or even before reaching the top of descent. Depending on the region, different names may be used (e.g. CDA or Continuous Descent Arrival in Europe, ODP or Optimized Descent Profile in the US).

Assessment criteria:

Preaudit:

1. *Ensure proper documentation of the policy and related flight procedure(s),*

Onsite:

2. *Implementation would typically be evidenced through interview(s) with crew members.*

13.7.3 The operator shall have policies and/or procedures to address the specific risks for aircraft on IFR flight plans transitioning to visual flight references, including circle-to-land procedures.

Explanation:

Numerous deadly accidents, wrong surface landings, and even landings at the wrong airport are associated with aircraft on IFR flights attempting landings using a "Visual Approach" clearance or "Circle to Land" in visual conditions. The "Cleared for the Visual Approach" clearance allows the crew to stay clear of clouds, and determine their own path to the runway (or taxiway, or wrong airport, or nearby road that looks like a runway.) Even though the aircraft is "IFR" and ATC continues to provide traffic separation, it becomes "VFR" in terms of terrain. The "Circling" approach clearance is similar, although slightly more well defined. The crew becomes responsible for visually avoiding terrain. Numerous deaths and mishaps fall into this not quite VFR category, and must be mitigated by every operator. Some operators as a matter of policy prohibit these types of operations while others allow them under certain conditions and specify the procedures to be followed. For example, if "Cleared for the visual," some operators still require flight crew to follow all requirements of an approved IFR approach procedure.

Not all airports are the same or have the same risks. Therefore, crew awareness of the airport and terrain environment is a critical element during the approach transition. Flight crew must continually stay ahead of the aircraft and coordinate actions prior to the commencement of any approach. Actions to perform while transitioning to visual flight references should not be made at the last minute and should include examination of IFR/VFR charts, aerial imagery, traffic pattern procedures and thorough review of missed approach procedures. These can assist flight crew in the analysis of specific risks and mitigation techniques. Additionally, if a straight in approach is not an option, circle-to-land procedures should be thoroughly reviewed. Many operators and airlines prohibit circle-to-land approaches as they are not often performed, can be demanding and require understanding and proficiency in both IFR and VFR skills. Flight crew should consider weather, winds, runway specifications, terrain, aircraft automation setup, aircraft configuration, approach category, visual cues and any other risk factors determined appropriate to the destination airfield.

Assessment criteria:

Preaudit:

1. Review manuals or other materials on the standard arrival briefing to ensure conformance with this section.

Onsite:

2. Interview personnel to ensure understanding of and conformance with the requirements of this section.

13.7.4 The operator shall have a policy that defines criteria for continuing an approach to a landing and that requires the flight crew to execute a go-around or missed approach if the aircraft deviates from these criteria unless the crew has previously planned and briefed an operationally required deviation.

Explanation:

Regardless of the type of aircraft or operation (VFR, IFR, with use of NVG or other visual aids), approach and landing are statistically the highest risk phase of flight. The policy required by this item addresses factors that affect decision making during the last phases of approach, before a go-around or missed approach becomes an unavailable option. These factors will vary widely depending on the operation. This standard should be read as it applies to the operation. It applies to both IFR and VFR fixed wing and rotorcraft operations and it will apply differently to these different types of operations. The decision-making processes used on approach to determine if it can be flown to completion are the key to ensuring the approach is proceeding as planned and, if needed, using the established criteria to initiate a go-around maneuver in a timely manner.

For fixed wing operators, this decision making process will generally involve conditions at an airport as well as the circumstances of the flight. Some factors to consider include winds, terrain, runway contamination, inoperative navaids, visual illusions, unique approach procedures and weather below minimums prior to commencement of the approach. Operators should consider these factors and if determined appropriate, apply a set of criteria that if not met require the flight crew to execute a go-around or missed approach.

The differences in how this standard applies to rotorcraft flow from the flight capabilities of the aircraft and the reasons why a rotorcraft pilot might choose to go-around. The go-around would be accomplished because the pilot determines that conditions are not appropriate for continuing the approach. These considerations could include wind shifts, changing power requirements, obstacles, a determination that the landing site is inappropriate for the operation, lack of forced landing areas, or something else that changes during the approach that makes the approach configuration (angle, power, rate of descent, traffic, etc.) no longer appropriate and therefore requires a go-around. Going back to initial helicopter flight instruction, the student is taught to

> *"recognize the need for a go- around early in the approach instead of waiting until the last moment. The safety of the aircraft and its occupants is the first consideration, and a go-around should be executed at the first indication of an unsatisfactory approach or any unsafe conditions on the intended landing point."*

(See Helicopter Instructor's Handbook, FAA-H-8083-4, p. 10-9). This fundamental approach remains applicable for all helicopter flights and operators must have a policy in place that fits

their operational needs. For example, due to the (relatively speaking) more predictable nature of a helicopter executive transport service or flightseeing operation, these operators would have very different considerations for their policy than would a utility, medevac or firefighting operator which inherently have more unpredictable circumstances.

The key to this specific IS-BAO standard, for auditors and operators alike, is to remember to focus on the operation being conducted. For example, IFR flights, whether fixed or rotor wing, will be flying instrument approaches and utilizing the elements of the IFR system. In another example, a VFR operator that only flies to and from established airports or heliports, such as bank transfer or corporate flights, could have a defined approach criteria policy for each of the landing zones and criteria for a go-around maneuver. Further afield from instrument flight, the utility or heli-ski helicopter operator, or a ski- or float-plane operator, for example, would likely have varied landing zones that change regularly and which have differing considerations that could change from day to day or even from flight to flight for making a safe approach and landing. For these latter types of operations, the policy would define when a go-around is necessary. In other words, that the pilot makes the determination that something about the approach is unacceptable and it must be aborted. This could be known in the company as a 'balked' or 'aborted' or 'rejected' landing policy and procedure. An element of this policy would be that the pilot makes a timely decision (that is, prior to a point where a powered recovery could not be accomplished) to abort the approach. This could be reflected in the company's training course outline and/or maneuver guidance for example.

Due to the unique nature of helicopter operations which may be located at unimproved landing sites, many operators may find that they have already incorporated the criteria for those types of operations and that these can be considered "previously planned and briefed for an operationally required deviation." The same considerations could be applicable to float and/or ski plane operations.

Assessment criteria:

Preaudit:

1. Ensure a policy is properly documented,

Onsite:

2. Interview personnel to ensure understanding of and conformance with the requirements of this standard.

13.8 Passengers

13.8.1 Passenger Safety Briefing

<u>13.8.1.1</u> The operator shall establish a policy stating that passengers shall receive a safety briefing appropriate to the passengers' needs, which covers at least the items specified in this section as applicable for the type of operation. The policy shall address:

a. The standard safety briefing shall be performed for every flight; however, if applicable regulations allow, the operator may establish and document criteria for the conditions under which the pilot-in-command may modify or omit the standard briefing;

b. Where the standard safety briefing is insufficient for a passenger because of that passenger's physical, sensory or comprehension limitations or because that passenger is responsible for the care of another person onboard the aircraft, the pilot-in-command shall ensure that the passenger receives an individual safety briefing that meets that individual's needs.

<u>Explanation</u>:

In order for passengers to be aware of their surroundings in an aircraft, it is important that they be informed about the specific setup of the aircraft in which they are flying. This will enhance their awareness of their surroundings under normal circumstances as well as their reaction in the event of an emergency. The operator must establish a written policy requiring passengers to receive a safety briefing that is relevant both to the type of operation being conducted and any specific needs the passenger(s) may have. This policy must address the following items.

a. The general rule is that the operator (and pilot-in-command once passengers are onboard) must ensure that the standard safety briefing is given to passengers prior to flight. The standard preflight safety briefing should be designed to provide passengers with essential information to ensure their safety such as location of exits, emergency escape routes and lighting, operation of seat belts, location and use of any available emergency equipment, recommended brace position, and other items as relevant for the specific aircraft and operation. For example, in some organizations, the passenger safety briefing is provided by ground crew while the passengers are seated in a waiting area and the pilot in command is tasked with ensuring that the passengers received that briefing and if they have any questions. This kind of briefing may allow passengers to hear the briefing in a quiet environment with few distractions This is discussed in more depth in 13.8.1.2.

   If State regulations permit, the operator can establish the circumstances under which the pilot in command may modify or omit this briefing. State regulations may also permit for a modified passenger safety briefing, for example in cases where the operator has people onboard who have specific tasks in-flight, such as medics on medevac flights, or passengers who fly frequently.

b. In instances where a passenger has limitations, including physical, cognitive, or sensory challenges, or where a passenger is tasked with the care of another person onboard, the pilot-in-command is required to ensure that an individualized safety briefing addressing the passenger's specific needs is provided. For example, if a passenger has mobility challenges, whether because of physical limitations or the need to care for another person onboard, the individual safety briefing could include addressing specific egress procedures for that person, among other things.

Assessment criteria:

Preaudit:

1. Review the operator's written policy for passenger safety briefings to ensure it conforms to the requirements of this item.
2. Review relevant manuals or documents for information on whether any modifications to the standard safety briefing are allowed or not.

Onsite:

3. Interview personnel about the passenger safety briefing policy to ensure understanding and conformance.
4. If possible, observe the passenger safety briefing for conformance.

13.8.1.2 Standard Safety Briefing - The operator shall establish a process to ensure that, except under the conditions specified in 13.8.1.1.a or 13.8.1.1.b, passengers receive a standard safety briefing including at least the following items:

a. Prior to loading passengers, the safest direction and most hazard-free route for passenger movement to the aircraft and any dangers associated with the aircraft type such as pitot tube locations, propellers, main and tail rotor blades, or engine intakes;

b. Prior to take-off:

i. When, where, why and how carry-on baggage is required to be stowed;

ii. The fastening, unfastening, tightening and general use of safety belts or safety/shoulder harnesses;

iii. When seat backs must be secured in the upright position and seats and tables must be stowed;

iv. The location and operation of emergency exits;

v. The location and use of the passenger oxygen system and masks;

vi. The location, purpose of, and advisability of reading the passenger safety briefing card;

vii. The requirement to obey crew instructions regarding safety belts, and no smoking or fasten seat belt signs, and the location of these signs;

viii. The location of any emergency equipment the passenger may have a need for in an emergency situation, such as the Emergency Location Transmitter, fire extinguisher, survival equipment (including the means to

access if in a locked compartment), first aid kit, life preserver or flotation device and life raft;

ix. The operator's procedures regarding the use of portable electronic devices; and

x. Other considerations based on the configuration of the aircraft cabin and equipment.

c. After take-off, if not included in the pretake-off briefing:

i. On flights where smoking is permitted, when and where smoking is permitted onboard the aircraft; and

ii. The advisability of using safety belts or safety/shoulder harnesses during flight;

d. In-flight when the Fasten Seat Belt sign has been turned on for reasons of turbulence:

i. When the use of seat belts is required; and

ii. The requirement to stow carry-on baggage;

e. Prior to passenger disembarking, the safest direction and most hazard-free route for passenger movement away from the aircraft following deplaning as well as any dangers associated with the aircraft type such as pitot tube locations, propellers, main and tail rotor blades, or engine intakes.

Explanation:

In order to ensure that passengers are provided with information about normal and emergency procedures in the aircraft in which they are traveling, the operator shall establish a process for providing them with standard passenger safety briefing information. This process should also address when the provisions of 13.8.1.1.a and b can be utilized, if at all, for their operations.

The standard safety briefing is required to include at least the following items. Operators should consider additional items as required by their aircraft or specific operational needs.

a. Prior to loading passengers:
   i. The operator must provide passengers information about how to safely access the aircraft for boarding. This should include the safest route to the aircraft and whether it is marked, as well as where obstacles or other dangers may be located, such as pitot tubes, rotor or propeller blades, engine intakes, and other items as applicable. The information should also take into account any unique environmental concerns. For example, unimproved terrain for helicopter off airport landing sites, the water environment for float planes, or airport parking areas impacted by weather or construction.
b. Prior to take-off:
   i. If the operator allows carryon baggage, then this briefing must provide the passengers with information about what kind of baggage (size, weight, content, etc.) is allowed onboard, where it can be stowed, why it may or may not be allowed (for example, hazardous materials), and how to stow it. Different aircraft have very different options for carryon baggage, so this briefing must address those specific criteria. For example, some aircraft, such as helicopters, may have

cargo holds that are not in the main cabin area, or the storage area in the cabin may have limited access.

ii. Safety restraints must also be addressed in this briefing and how to use safety belts, harnesses and/or shoulder straps as applicable. This includes how to fasten, unfasten, tighten or loosen the restraint.

iii. If the aircraft has seats that can move or recline, and/or tables that can be stored, the briefing must state when these items are required to be in their stored positions. Some examples include, among others: inform passengers when seats that recline must be in their upright position if other adjustments to the seat must be made or when tables must be secured in their storage area.

iv. Passengers must be informed as to the location of the emergency exits. This allows the passengers greater awareness of their nearest exit along with the route leading to those exits. The briefing must also include how and when to operate the emergency exit. This may include an instruction to do so only at the direction of a crew member.

v. If the aircraft has an oxygen system installed, then the briefing must include directions on where oxygen masks are located and when and how to use them. This should include information on how to don the mask, what to do if the passenger is responsible for another person, such as a child, and when and how the masks become available for use.

vi. Safety briefing cards can provide a wealth of information in pictorial form in addition to any written instructions. The safety briefing must inform passengers of the location of such briefing cards, why they are provided and why it is recommended that the passenger take a moment to review its content. This additional information can provide passengers with a visual instruction that reinforces the information in an oral or video briefing. The safety briefing card must match the aircraft configuration and accurately reflect the available safety equipment and locations on the aircraft being flown.

vii. The safety briefing must include the requirement that passengers obey all crew member instructions, including those related to use of seat belts and whether smoking is permitted onboard. These instructions must include information about the signs for no smoking and fasten seat belts, where those signs are located and that these must be complied with as well.

viii. This briefing is also the time to notify passengers about any emergency equipment onboard the aircraft and where it is located. This includes the location and use of the following:

- the emergency locator transmitter (ELT);
- fire extinguishers;
- survival equipment and instructions on how to access it if it is located in a locked compartment or in an area outside of the main cabin;
- first aid kit;
- life preservers or flotation devices and/or life rafts; and
- any other emergency equipment carried by the operator.

ix. Passengers must be informed as to the operator's policy on the use of personal electronic devices, including whether and when they need to be in airplane mode or turned off, and when it is allowed to use them.

x. The briefing must also provide information about any applicable considerations the passengers need to be aware of given the type of aircraft or operation.

c. <u>After take-off</u>: In the event the pre-take-off briefing does not address smoking and/or seat belt use inflight, the following items must be addressed in a post-take-off briefing:

i. If smoking is allowed on the flight, then this is the time to notify the passengers where and when smoking can take place onboard.

ii. Although passengers may have the opportunity to unfasten their seatbelts while in cruise flight, the post-take-off briefing is a time to remind passengers that it is advisable to keep seat belts fastened even when the seat belt light is not illuminated. In some aircraft, it may be required by the operator to keep seat belts and shoulder harnesses fastened at all times and passengers should be reminded of this.

d. <u>Inflight briefing when seatbelt fastened light is illuminated</u>:

i. If turbulence is encountered in-flight in aircraft equipped with lighted 'fasten seat belt' signs, and these signs are illuminated, then the passengers should be briefed that:

- They are required to fasten their seat belts until further notice, and
- Loose items such as carryon baggage that has been removed from the stowage area should be secured to prevent these items from being affected by turbulence.

e. <u>Prior to disembarking the aircraft</u>:

i. Similar to the briefing prior to embarking the aircraft, the operator must provide passengers information about how to safely deplane and move away from the aircraft. This should include the safest route away from the aircraft, and whether it is marked, as well as where obstacles or other dangers may be located, such as pitot tubes, rotor or propeller blades, engine intakes, and other items as applicable. The information should also take into account any unique environmental concerns. For example, this may be necessary for unimproved terrain for helicopter off airport landing sites, the water environment for float planes, or airport parking areas impacted by weather or construction.

<u>Assessment criteria</u>:

Preaudit:

1. Review manuals or other materials on the standard safety briefing to ensure conformance with this section.

Onsite:

2. Interview personnel to ensure understanding of and conformance with the requirements of this section.
3. If available, observe the standard passenger briefing process for conformance with the requirements.

<u>13.8.1.3</u> Emergency Operations - The operator shall have a policy stating that the PIC shall ensure that, in the event of an emergency, all passengers are given an emergency briefing, where circumstances permit, covering the following items:

a. Safety belts or safety/shoulder harnesses;
b. Seat backs, seats and tables;
c. Carry-on baggage;
d. Passenger safety briefing cards;
e. Brace position (when to assume, how long to remain) and considerations for side-facing seats;
f. Evacuation procedures;
g. If applicable, life preservers; flotation devices and life rafts; and
h. If applicable, evacuation procedures for an occupant of a child restraint system.

<u>Explanation</u>:

The operator must have a policy regarding the requirement that the pilot provide passengers a specific emergency briefing should an emergency arise. This briefing is intended to remind passengers of actions to take, or not, during the course of the emergency. It is understood that the pilot's first obligation is to fly the aircraft, therefore the emergency briefing should include as many of the items listed as is possible under the circumstances. It may be that not all items are relevant or that there is not time to cover all of them in the course of the emergency procedures.

The items that should be covered by this policy in the briefing include use of seat belts and restraints, position of seat backs, seats and tables, reference to passenger briefing card, instructions on when and how to brace depending on the type of seats occupied, evacuation procedures, use of any flotation devices if applicable, and considerations for evacuating a child in a child seat restraint system.

<u>Assessment criteria</u>:

Preaudit:

1. Review operator's documents for emergency passenger briefing policy to ensure conformance with this requirement.

Onsite:

2. Interview personnel to ensure understanding of the policy and corresponding actions required by that policy.

<u>13.8.2</u> Passenger Safety Briefing Card - The operator shall establish a process to make readily available to each passenger a passenger safety briefing card that contains, in printed and/or pictographic form, information on at least the following safety features of the aircraft:

a. The location and operation of emergency exits;
b. The location and use of the passenger oxygen system (when installed);
c. The location of life jackets and life rafts (when onboard); and
d. The location of other emergency equipment onboard the aircraft.

<u>Explanation</u>:

In addition to the passenger briefing requirements noted in this section, the operator is required to have a printed version of the passenger briefing that contains certain minimum information so that the passengers can review this information after hearing the briefing. This printed and/or pictographic briefing card must include essential information about the safety features of the aircraft. At a minimum, this includes information about where the emergency exits are located and how to operate them; if installed, the location and information about how to use passenger oxygen; the location of life jackets and/or life rafts if installed, and the location of any other emergency equipment onboard the aircraft.

<u>Assessment criteria</u>:

Preaudit:

1. Review safety briefing materials in relevant documents and/or manuals.

Onsite:

2. Inspect a representative number of aircraft to ensure that: passenger safety briefing cards are located in a place that is readily available to all passengers; that it contains at least the required elements listed in this section, as appropriate; and that there are a sufficient number of briefing cards available for the seating configuration of the aircraft.
3. If the passenger briefing card information is located in company manuals and/or documents, ensure that the briefing cards on board the aircraft match the information in those documents.

<u>13.8.3</u> The operator shall establish a policy on use of seat belts by passengers that:

a. Requires the PIC to instruct passengers to fasten their seatbelts for take-off and landing;
b. Directs when the pilot in command shall notify passengers to fasten their seatbelts for turbulence or any other reason that may impact safety while en route; and
c. Where cabin crew members are available, requires cabin crew members to ensure passenger seatbelts are fastened provided the safety of cabin crew is not compromised.

Explanation:

Seat belt use on an aircraft is determined both by regulation and operator policy. This standard reflects the need to ensure that the pilot-in-command informs passengers about when they are required to fasten their seat belts. The operator's policy should include, at a minimum, the following elements:

a. That the PIC instruct passengers to fasten seat belts for take-off and landing;
b. Directions to the PIC on when to notify the passengers that they must fasten their seat belts for turbulence or other safety reasons; and
c. That the cabin crew, if present and they can do so safely, must check to make sure that passengers are actually wearing their fastened seat belts as directed by the PIC.

Assessment criteria:

Preaudit:

1. Review seat belt policy in relevant manuals and/or documents.

Onsite:

2. Interview personnel regarding conformance with the operator's seat belt policy.

13.8.4 For international operations, the aircraft operator shall establish procedures for disembarking passengers and crew members from the time they leave the aircraft until they are accepted for examination for entry into a State.

Explanation:

When operating to international destinations, the operator is required to develop procedures for both passengers and crew that covers the time from when they disembark the aircraft through the point where they are accepted into an area for examination for entry into the destination State. These procedures will vary depending on the operation and location and operators should take into account the unique elements of their operational destinations. The procedures should include identification of who will oversee the transition from the aircraft to the immigration area, the responsibilities of the various parties involved in this process (for example, ground handling service providers), and coordination between the crew and any external entities. Consideration should be given to formalized agreements regarding the transfer of responsibility from the operator to another party.

Assessment criteria:

Preaudit:

1. Review relevant manuals/documents regarding arrival procedures at international destinations to ensure they include procedures for the passengers and crew to follow from disembarking the aircraft until they are at the immigration area for examination for entry into the destination.

Onsite:

2. Interview personnel to ensure understanding and conformance with the international arrival procedures.
3. Review any documentation (if available) recording conformance with these procedures.

13.9 Maintenance Check Flights

13.9.1 ***The operator should establish a process for the conduct of Maintenance Check Flights that address:***

a. Selection and training of involved personnel;
b. Task planning and preparation procedures;
c. Conditions and procedures for execution of the maintenance check flight; and
d. Contingency procedures for inflight abnormalities or emergencies.
(Recommended Practice)

Explanation:

Maintenance check flights are usually conducted after the completion of some kind of work on an aircraft and require an approach that is different from a revenue flight because the objective is to test the functionality of the aircraft in flight. These types of flights therefore present a different set of risks that each operator should assess and analyze in order to create a process and set of procedures to ensure successful outcomes for these flights.

The processes should include several steps that address the specific nature of the operator's equipment, operations and personnel. In some organizations, there may be enough resources to have a dedicated maintenance check flight staff, while others will utilize pilots and others as they are available. In either case, the operator should develop the following processes:

a. *The operator should determine how they will select and train personnel involved in maintenance check flights. This includes identifying the types of flights that will be required, what specialized knowledge or skills are required, how to identify the appropriate personnel in the organization, and then developing the training appropriate to those requirements.*
b. *Just as maintenance actions have specific procedures to complete work, maintenance check flights should also include a process for pre-check-flight planning and preparation for each specific type of check flight conducted by that organization.*
c. *The operator should compile information that informs those participating in the check flight about acceptable conditions and procedures to be followed during the conduct of the check flight. This may involve minimum equipment parameters, weather requirements, altitude requirements, procedural steps, etc. which allows the check flight personnel to assess the risks associated with the flight and to make their go/no-go decision. The operator should also identify which personnel are permitted to be on board*

an aircraft during a maintenance check flight. It is recommended that the operator only allow personnel on board who are essential to the check flight being conducted.

d. *The processes should also include contingency procedures should any inflight abnormalities or emergencies be encountered. This could include, for example, ensuring there is access to alternate landing areas, designated flight altitudes and/or routes for the check flight to allow for sufficient response time in the event of an emergency, and any appropriate operator specific actions necessary for their functional check flights.*

Assessment criteria:

Preaudit:

1. *Review manuals for maintenance check flight processes that incorporate the elements of this standard.*

Onsite:

2. *Interview personnel involved with maintenance check flights to ensure understanding and training of these elements.*
3. *Where available, review maintenance records for conformance to the established procedures and this standard.*

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14 Aircraft Equipment Requirements

14.1 General

14.1.1 The operator shall have a process to ensure that all aircraft are equipped in accordance with the applicable requirements and corresponding technical specifications prescribed by the State of Registry.

Explanation:

The State of Registry CAA requirements vary by location, aircraft type and type of operations conducted. The operator must have a process to determine what requirements apply to their aircraft and operations and make sure that they are in compliance with all requirements and specifications.

Additionally, these requirements change over time as new requirements come into place such as TCAS Software version or ADS-B out, for example. The operator has to have a process to ensure that they remain aware of new requirements and remain in compliance with them.

Many commercial operators perform a conformity inspection on an aircraft when it is introduced to the fleet. This inspection is one way of ensuring that the aircraft conforms to requirements when introduced to the fleet however, it does not ensure on going conformity as requirements change. Such a conformity inspection is a very important part of this process but it does not meet the intent of the Standard by itself.

Assessment criteria:

Preaudit:

1. Review the operator's manuals to determine if they have a documented process to ensure aircraft are appropriately equipped in accordance with State of Registry requirements and specifications when the aircraft is first introduced to the fleet.
2. Review the operator's manuals to determine if they have a documented process to monitor new requirements and ensure that they remain in compliance as long as the aircraft continues to be operated.

Onsite:

3. Interview staff to ensure that the documented process is clearly understood and utilized in the organization.
4. Review records of the documented process being used to assess aircraft introduced to the fleet.
5. Review records of any new State of Registry requirements being monitored and compliance ensured.
6. Review aircraft records for modifications made to aircraft in order to comply with any changing regulations.
7. Sample aircraft for compliance with requirements.

<u>14.1.2</u> The operator shall have a process to ensure compliance with any additional equipment requirements specified by the State and/or airspace where operations are conducted.

<u>Explanation</u>:

Aircraft equipment requirements vary from one State of Registry to another. Before operating in airspace that falls under the jurisdiction of a different CAA, operators must ensure that their aircraft is in compliance with the requirements of that CAA.

Operators must avoid the trap of believing that because their aircraft is a modern aircraft and equipped in accordance with the manufacturer's Type Certificate Data Sheet, that they are by default in compliance with the equipment requirements for all airspace. This is not true. Manufacturers equip new aircraft in the production process to be in compliance with the State of Registry to which the aircraft is going to be delivered. This does not guarantee compliance for other areas of operation.

For instance, aircraft that have 9 or less passenger seats are not required to have a FDR or CVR under FAA regulations however, EASA regulations do not differentiate by the number of passenger seats but rather by maximum certificated take-off mass (MCTOM) and year of certification of the aircraft. As a result, many U.S. registered aircraft are not in compliance with CAA equipment requirements for FDR and CVR requirements when traveling internationally. This is just one example of differing requirements. There are many more and the operator must have a process to ensure they identify these regulatory differences and comply with them or request permission from the appropriate CAA for permission to operate in their airspace without the required equipment prior to entering the airspace in question.

In some organizations, this is accomplished in the maintenance department however, other organizations choose to assign this responsibility to someone on the operations side of the house or have the responsibility shared between member of both departments. For instance, this may be a duty of the PIC during the trip planning.

<u>Assessment criteria</u>:

Preaudit:

1. Review the operator's manuals to determine if they have a documented process to ensure aircraft are appropriately equipped in accordance with the CAA requirements for the airspace in which they will operate.

Onsite:

2. Interview staff to ensure that the process is clear to all involved and is being complied with. This may include staff in both operations and maintenance departments.
3. Review records of the operator having utilized their process in the past.
4. Check aircraft records for aircraft that might operate in an airspace where the aircraft may be susceptible to an equipment shortcoming.

Alternative ways to achieve this:

Many operators choose to use trip planning providers to help them ensure that they are aware of the equipment requirements of the various airspaces in which they operate. These service providers can help identify what aircraft equipment is required so the operator can ensure it is in fact installed on the aircraft.

An operator that wishes to perform this check for themselves can reference the ICAO Aeronautical Information Publication (AIP) for information on the particular requirements of a given area.

14.2 Operational Information and Documentation

14.2.1 The operator shall have a process to ensure that valid and current revisions of the following documentation and information (in written or electronic form) are carried onboard the aircraft, and the operational information shall be accessible on the flight deck:

a. Pertinent aeronautical charts;
b. Pertinent en route, terminal area, and instrument approach procedure charts;
c. Aircraft performance data;
d. Aircraft checklists;
e. The Company Operations Manual;
f. Standard Operating Procedures, where an SOP has been established for the aircraft;
g. The aircraft flight manual;
h. Documentary proof attesting noise certification of the aircraft, when such a document has been issued;
i. The aircraft minimum equipment list (MEL) for aircraft being operated in accordance with an MEL;
j. Aircraft certificate of airworthiness or other flight authority and Certificate of Registration;
k. Aircraft radio licence;
l. Insurance certificate;
m. Other documents required of the area of operation;
n. (A) For aeroplanes, procedures for pilots-in-command of intercepted aircraft and visual signals for use by intercepting and intercepted aircraft, as contained in ICAO Annex 2; and
o. For international commercial air transport operations, a certified true copy of the air operator certificate including the authorizations, conditions and limitations relevant to the aircraft type.

Explanation:

An operator must have a process to make sure that all of the listed documents and publications are on board the aircraft, in current revision status and available to the flight deck. The documents may be provided in paper or electronic format as permitted by the State of Registry requirements and approvals.

Assessment criteria:

Preaudit:

1. Review the operator's manuals to ensure that they have documented process to ensure that the required documents and publications are available and current on board the aircraft.

Onsite:

2. Interview staff to ensure that the process is clear to all involved and adhered to.
3. Inspect the documents on board an aircraft to ensure all are present and in current revision status.
4. Sample a few manufacturer publications to ensure that the revision on board the aircraft is listed as the current revision on the manufacturer's website. This can be confirmed via the operator's login to the website.

14.3 Aircraft Systems Data Management

14.3.1 The operator shall have a process to ensure that all applicable aircraft systems databases (e.g., navigation databases, GPWS/TAWS databases for aircraft equipped with ground proximity warning systems with predictive terrain hazard warning, etc.) are current.

Explanation:

The operator must have a process which specifies how the various aircraft systems databases are kept current. This would include, among others, databases for GPS Navigation, GPWS, electronic checklists and charts, etc.

For most databases, the manufacturer issues revisions at a regularly scheduled interval. Navigation database revisions, for example, are issued every 28 days in most cases. This makes the updating of the database easy to track in an online maintenance tracking program. However, some databases, such as some GPWS, is only issued when necessary as the result of a change to the terrain in the area such as the construction of a high rise building. These updates are sporadic and difficult to track or anticipate.

The operator must have a process to ensure that they are aware of all revisions issued to these systems and make sure they keep the systems in current revision status in a timely fashion.

Assessment criteria:

Preaudit:

1. Review the operator's manuals to ensure that they have documented a process to ensure aircraft systems databases are kept current.

Onsite:

2. Interview staff to ensure that the process is clear to all involved and is being utilized.
3. Sample some systems on board the aircraft to ensure that they are in current revision status. This can be verified via the operator's login to the database provider's website.
4. If the operator tracks updates in their online maintenance tracking program, review a sample in the tracking program.

Alternative ways to achieve this:

In order to ensure that systems databases remain in current status, some operators track the regularly scheduled updates in their online maintenance tracking program. Others choose to put the updates that do not take place on a regular schedule on a periodic inspection interval and enter this inspection into the online maintenance tracking program.

Some operators have an agreement with the system manufacturer which provides them with notification of the release of new revisions.

14.4 Minimum Equipment List

14.4.1 Where a master minimum equipment list (MMEL) is established for the aircraft type, the operator shall provide a minimum equipment list (MEL), which will enable the pilot-in-command to determine whether a flight may be commenced or continued from any intermediate stop, should any instrument, equipment or systems become inoperative. The MEL shall:

a. Be approved by the State of Registry of the aircraft and, if applicable, acceptable to the State of Operations;
b. Be appropriate to the specific configuration of the operator's aircraft; and
c. Contain any maintenance and operational procedures that may be required by the corresponding MMEL.

Explanation:

A MMEL that is provided by an aircraft manufacturer is a generic document which:

- encompasses all aircraft of that type that were manufactured; that is, the MMEL is not specifically customized to the aircraft equipment configuration on a given serial number aircraft;

- in general, does not take into account the specific requirements of different operational regulations throughout the world, so that it can be applied by operators around the globe; and
- determines which items require operator-developed operational or maintenance procedures, in addition to the MMEL remarks, to ensure an adequate level of safety when the aircraft is dispatched with those items inoperative or missing.

As a result, most States, in line with ICAO guidance, require operators to establish (and obtain approval for) a customized MEL which:

1. reflects the accurate aircraft configuration for the aircraft they are operating – MMELs will show several items which are optional (non-standard configuration), which do not identify the number installed in the aircraft because aircraft of that type in the worldwide fleet may have varying configurations (for instance, aircraft with different numbers of VHF systems, GPS, etc.), or which have different dispatch reliefs based on a specific equipment part number or whether a specific modification / STC was installed, etc. Some configuration items are easy to be determined, but others not as much. For example, if equipment fails shortly before flight, it may be difficult for the operator to properly identify if a given MEL item applies to their aircraft or not. That, together with the pressure to solve the issue to release the flight could compromise operational safety if the operator does not take the time to consider the implications of the inoperative equipment. That is the importance of previously configuring the MEL according to the aircraft's specific configuration;
2. incorporates the equipment requirements of their applicable operating regulations – MMELs occasionally allow operation without equipment which are required for operation by the State of Registry's operating regulations. Those need to be identified beforehand so that the use of the MEL does not inadvertently direct the operator to violate their State of Registry regulations; and
3. incorporates the operator-developed operational and maintenance procedures for the items for which the MMEL requires such procedures – here as well, some procedures are simple, but others may be very complex and require thoughtful consideration. If not previously established, the operator may find themselves in a situation in which they need to establish such a procedure in a hurry to dispatch the aircraft, which in turn may introduce additional risks to the operation.

Regarding the operational and maintenance procedures, it is important to note that some MMELs (typically for rotorcraft) have the procedures published by the aircraft manufacturer in the MMEL itself. Many others do not, rather they only list the procedures that must be developed by the operator. In some of these cases, the aircraft manufacturer publishes a dedicated manual with their recommended procedures (M&O manuals, MMOPs, DDPMs, DDPGs, etc.), which can then be used by the operator to incorporate into their MEL. It is important to note, however, that even those manuals can occasionally simply direct the operator to develop their own procedures rather than providing a manufacturer recommended one. And in some other cases, the manufacturer does not publish any guidance for the M&O procedures, and their development is left entirely up to the operator.

The 3 aspects listed above are directly related to the 3 sub-items of this Standard, and it is important that they are well understood by the operator as they apply to their own fleet and regulatory environment.

Unless State of Registry requirements dictate otherwise, the MEL can be specific to a given serial number or, in the case of an operator that has multiple aircraft of the same type in their fleet, aircraft model specific, identifying any configuration differences among the aircraft in the fleet.

The MEL that is established does not have to be published in the Operations Manual and may be a separate publication.

As indicated above, most States require the operator to obtain approval from the CAA for their MEL. In areas where MELs require State of Registry approval, the operator must have this approval. In addition, the MEL must also conform to the regulatory requirements of the State of Operations.

Despite the above, in some regions, it is acceptable for non-commercial operators to operate using the MMEL with State of Registry approval. Typically, this approval still requires the operator to adapt the MMEL to their specific aircraft configuration and develop the M&O procedures required by the MMEL. However, the configuration customization and the M&O procedures do not need to be approved by the State but the M&O procedures must still be carried with the MMEL along with the State approval to use the MMEL as the MEL. Many operators who hold such an approval fail to accomplish these additional steps, and there are States of Operation that will not accept the use of an MMEL by an operator if they have not established the M&O procedures and/or customized the MMEL to their aircraft's configuration.

Once the MEL has been established and approved, it must still be maintained current with the corresponding MMEL. As such, when a new version of the MMEL is published, the operator must update their MEL accordingly. Some States determine maximum intervals for the operator to develop and present their MEL to the authority following the issue of a new revision to the MMEL.

Some additional considerations on this Standard:

1. The item applies when a MMEL has been published for the aircraft type operated. In such cases, the operator must develop their MEL and obtain approval from their State of Registry, or obtain approval to use the MMEL as their MEL considering the aspects discussed above.
   Note: it is important to note that the FAA has a Single Engine MMEL that applies to all single engine aircraft for which there are no model-specific FAA MMELs
2. If the operator has a policy strictly prohibiting operation with any equipment missing or inoperative and abides by it, and the State of Registry regulations approve that, this standard can be N/A to the operator based on that policy.

Assessment criteria:

Preaudit:

1. Review the operator's manuals to ensure that they have a documented process to ensure that aircraft in their fleet will have an approved and current MEL that is acceptable to the State of Registry and States of Operation, and that conforms to 14.4.1.a through 14.4.1.c.

Onsite:

2. Interview staff to ensure that the process is clear to all involved and is followed.
3. Sample an aircraft to ensure that the MEL is present, in current revision status, and approved as required by the State of Registry,
4. Check the MEL for a given aircraft to ensure it contains the necessary M&O procedures

   (Note: for operators authorized by the State of Registry to use the MMEL as their MEL, the M&O procedures may be included in the pages of the MEL or in an external document which must be kept together with the MMEL as required by their State of Registry's authorization).).
5. Check the MEL for a given aircraft to ensure it accurately reflects the configuration of the aircraft.

14.5 Electronic Flight Bag (EFB) Equipment

14.5.1 If the operator uses any type of EFBs, the operator shall:
a. Assess the safety risk(s) associated with each EFB function;
b. Establish the procedures for the use of the device and each EFB function; and
c. Ensure that, in the event of an EFB failure, sufficient information is readily available to the flight crew for the safe conduct of the flight.

Explanation:

Electronic Flight Bags are a convenient way to provide manuals and documentation to flight crew members. Any device that is used for this purpose is considered an EFB. This includes iPads or other personal electronic devices that are used to provide access to flight information, documents, charts, manuals, etc. A device does not have to be built into the aircraft systems to be considered an EFB.

If the operator uses any type of EFB, they must have proof that they have assessed the safety risk(s) associated with each EFB function. For example, if the operator used iPads mounted on the yoke of the aircraft or in another location on the flight deck, some considerations might be: have they made sure that the EFB will not interfere with the proper operation of the flight controls or block the pilot's visibility of the instruments; have they ensured that the installation will not interfere with the proper operation of other electrical avionics systems on board the aircraft; have they prepared for the possibility of a fire from the battery of the device; etc.

Additionally, an operator must establish documented procedures for the use of the EFB by the flight crew. Questions to ask can include items such as:

- who is responsible for the charging of the devices?
- Is there any restriction as to when the crew members can be referencing the devices or if both crew members can be utilizing the devices at the same time?
- Etc.

Finally, the operator must have some way to ensure that if the EFB fails, the flight crew will still have sufficient information available to them to safely conduct the flight. Examples include having multiple devices available or providing backup documents in paper copy.

Assessment criteria:

Preaudit:

1. Review the operator's manuals to ensure that they have a process documented that includes all the elements of this EFB item in the Standard.

Onsite:

2. Interview staff to ensure that the process is clear to all involved and is followed.
3. Review documentation of the process being implemented to assess EFB function and usage in the aircraft.
4. Sample an aircraft to ensure that the EFB contains the required information and can be utilized by the flight crew without causing interference to the operation of the aircraft of safe conduct of the flight.

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15 Aircraft Maintenance Requirements

15.1 Aircraft Maintenance Control / Aircraft Maintenance Management

Every aircraft operator shall establish a system to control the maintenance of its aircraft which will ensure compliance with their State of Registry regulations, equipment configuration and maintenance requirements for selected airspace operations. For the purposes of this chapter, this system is referred to as the Maintenance Control System, and its minimum elements are listed in this Section 15.1.

15.1.1 Maintenance Control System Documentation

15.1.1.1 The operator shall have a documented maintenance control system that includes all items listed in Section 15.1 of the IS-BAO.

Explanation:

A maintenance control system is the system in which the operator establishes how they will perform, document, record, manage, track and control maintenance on their aircraft. This includes both scheduled and unscheduled maintenance. This system must be thoroughly documented in the company manuals and must include all of the elements that follow in Section 15.1. Additionally, the maintenance control system must meet all local regulations related to maintenance control.

- Maintenance Control System vs. Maintenance Inspection Program vs. Maintenance Tracking Program:
  - **MX Control System** is the ***method*** of documentation, tracking, scheduling and recording of the performance of maintenance.
  - **MX Inspection Program** is the ***schedule*** of maintenance to be performed in order to ensure that the aircraft remains airworthy. This is usually based upon the manufacturer's recommended maintenance program.
  - **Maintenance Tracking Program:** computerized software ***tool utilized to track and schedule*** the tasks and inspections required in the maintenance inspection program
    - CAMP; Flight Docs; Traxxall; Ramco; HeliTrack

Assessment criteria:

Preaudit:

1. Check if the maintenance control system is documented in the operator's manual (or manual belonging to the approved organization to which the maintenance control system has been outsourced, if applicable.)
2. Check if the operator's maintenance control system contains all of the elements listed in the IS-BAO Section 15.1.

Onsite:

3. Check if the operator's maintenance control system is in line with any applicable local regulation, and is approved or accepted by the State of Registry if required.
4. If the maintenance control system is outsourced to an approved organization, check that the operator has a documented system of oversight in their manuals to ensure that the approved organization is meeting the intent of the operator's manuals IS-BAO Standard on their behalf. Reference 15.3.1.1 for additional information.

   Note: In several regions, regulatory frameworks allow for the approval of organizations by the competent authority specifically for the provision of maintenance control services (e.g. Continuing Airworthiness Management Organizations – CAMOs). An operator/owner/lessor may entirely or partly (sub)contract the maintenance control system for its aircraft to such approved organizations, provided the approved organization's processes conform to the corresponding standards and recommended practices of this Section. For the specific tasks that are under the responsibility of an approved organization, the operator/owner/lessor may then refer to the approved organization's documentation (e.g., Continuing Airworthiness Management Exposition – CAME) to demonstrate conformance to this Section.

15.1.2 Maintenance Programme

<u>15.1.2.1</u> The operator shall document the maintenance schedule/inspection programme to which compliance will be sustained as authorized by the State of Registry. The maintenance schedule/inspection programme shall be based on information made available by the State of Design, Type Certificate Holder/Supplemental Type Certificate Holder or by the organization responsible for the current approved type design and equipment configuration.

<u>Explanation</u>:

A maintenance schedule/inspection programme is the list of required tasks and inspections and the intervals at which they are required to be performed in the aircraft. This can be contained in a stand alone manual or can be a section of the operator's manual. It is the basis for developement and maintenance of the tracking system but it is not the tracking program itself. Please reference 15.1.1.1 IG Explanation material and 15.1.5.

Local State of Registry regulations may set requirements for the type of maintenance schedule/inspection programme that must be used by the operator. For instance, comercial operators of aircraft with 10+ passenger seats might be required by the State of Registry to develop a maintenance schedule/inspection programme that is approved by the authority for that particular operator. Noncommercial operators are usually not required to have a State-approved maintenance schedule/inspection programme, but can use the manufacturer's recommended maintenance schedule/inspection programme plus any applicable ICAs and regulatory

requirements (e.g., aircraft weighing requirements, RVSM checks, annual avionics checks, transponder checks, etc.), as applicable.

A first step is, therefore, to identify what local regulations apply to the operator in terms of the maintenance schedule/inspection programme that needs to be used for the aircraft in their fleet. In any case, the maintenance schedule/inspection programme to be used must be based on information made available by the State of Design, Type Certificate Holder/Supplemental Type Certificate Holder or by the organization responsible for the current approved type design and equipment configuration.

In some cases, the aircraft manufacturer may provide several alternative maintenance schedule/inspection programme (e.g. Hard time or On condition maintenance, Progressive Schedules, Low time utilization schedules, etc.). In these cases, the operator must select the one that is appropriate for that organization and, if required by the local regulation, document it in the technical logbook.

The operator must select the maintenance schedule/inspection programme that is to be used for the maintenance of its aircraft, taking into account the considerations above, and ensuring that any applicable State regulations are complied with. The selected maintenance schedule/inspection programme for each aircraft in the operator's fleet must be documented in the operator's manual.

Assessment criteria:

Preaudit:

1. Check if the maintenance schedule/inspection programme to be used for each aircraft in the operator's fleet is documented in the operator's manual.

Onsite:

2. Check if the operator's maintenance schedule/inspection programme is in line with any applicable local regulation, and is approved by the State of Registry if required.
3. Check if the operator's maintenance schedule/inspection programme is based on the manufacturer's recommended maintenance programme.
4. Check if the maintenance schedule/inspection programme includes applicable ICAs and regulatory requirements.
5. If the manufacturer publishes multiple alternative maintenance schedule/inspection programme, check if the operator has identified which one is to be used to maintain their aircraft, and if required by regulations, if this selection is documented in the aircraft's technical logbook.

***15.1.2.2* The operator should have a process to assess the performance of their maintenance control system and incorporate changes necessary to improve compliance, reliability and efficiency, and to reduce the risks related to maintenance activities. (Recommended Practice)**

Explanation:
The operator should have a process of oversight of their maintenance control system to identify areas of weakness or opportunities for improvement. This would include identifying repeat mechanical discrepancies, technical and documentation errors, failures in the control system, deviations to the established system, either approved or unapproved, maintenance deferral rates, etc. This can be accomplished many ways including an internal audit system, Continuing Analysis and Surveillance Systems, etc.

The system should include root cause analysis, corrective action and follow up on corrective action to validate effectiveness.

A system of this type may be required by regulations in some States of Registry. In some States of Registry, it is only required for aircraft engaged in commercial operations or of certain passenger capacities. If the operator is to be considered in comformity with this recommended practice, the system should be applied to all aircraft in the fleet regardless of any regulatory exemption from the requirement.

Assessment criteria:

Preaudit:

1. *Check if the operator has a process to assess the performance of their maintenance control system which includes root cause analysis, corrective action and follow up on corrective action to validate effectiveness documented in their manuals.*

Onsite:

2. *Check if there is evidence that the operator has incorporated changes necessary to improve compliance, reliability and efficiency, and to reduce the risks related to maintenance activities.*
3. *If the operator is utilizing the Continuing Analysis and Surveillance System to meet the intent of this recommended practice, check that it is being applied to all aircraft in the fleet.*
4. *If the operator has made adjustments to the maintenance schedule/inspection programme, check that these adjustments have the appropriate manufacture and/or regulatory approvals as appropriate.*

   Note: The use of Continuing Analysis and Surveillance Systems and industry reliability programme models may be used to collect data necessary to optimize maintenance schedules, supported by CAA approval when required.

<u>15.1.2.3</u> The operator shall have a process to monitor, review and assess revisions in the manufacturer's/Type Certificate Holder's (TCH's) Instructions for Continued Airworthiness (ICA's) and/or regulatory requirements to ensure all current requirements are identified, and to incorporate such revisions in a timely manner.

<u>Explanation</u>:

Instructions for Continued Airworthiness (ICAs) are mainteance tasks or inspections established by Type Certificate Holders for the conitnued airworthiness of the aircraft. These requiremetns are established in the manufacturer's recommended maintenance schedule/inspection programme.

Supplemental Type Certificate Holders for major repairs and/or alterations to an aircraft may establish additional ICAs. In some cases, these alterations are made in the original production of the aircraft to incorporate specific systems/options desired by the entity purchasing the aircraft from the manufacturer. In other cases, the repair or alteration may be made by a maintenance provider after delivery of the aircraft to the owner.

Alterations resulting in ICAs vary widely between aircraft types but some common examples include avionics suite installations/upgrades, winglet installations, auxilliary fuel tank installations, cabin interior and/or equipment installations, emergency equipment installations, etc.

Major repairs may be performed on an aircraft as a result of aircraft damage either in production or after delivery of the aircraft.

When a major repair or alteration is performed on an aircraft, regardless of whether it is done by the manufacturer or another maintenance provider,records must be provided to the aircraft owner/operator which includes information on the repair or alteration and any new ICAs that apply to the aircraft as a result of that repair or alteration. It is responsibility of the owner/operator to ensure that they have a process to ensure that they incorporate these ICAs requirements into their maintenance and tracking programmes and ensure that they are accomplished per the requirements.

Regulatory requirements may impose maintenance and/or inspection tasks in addition to those required by the aircraft manufacturer's recommended maintenance inspection programme. The operator must have a documented process to be aware of these additional regulatory requirements and incorporate them in their maintenance inspection and tracking programmes.

The owner/operator of the aircraft must also have a documented process to stay aware of and incorporate any revisions to these maintenance requirements whether they are issued by the aircraft manufacturer, Supplemental Type Certificate Holder or the CAA.

Assessment criteria:

Preaudit:

1. Check that the operator has a documented process in their manuals to identify all applicable ICAs and regulatory requirements in excess of their maintenance/ inspection programme and to add them to their maintenance inspection and tracking programmes.
2. Check that the operator has a process documented in their manuals to remain aware of revisions to ICAs and regulatory requirements and incorporate them into their maintenance/ inspection and tracking programmes.

Onsite:

3. Check if there is evidence that tracking programmes contain ICAs and regulatory requirements.
4. Confirm through interviews that this process is implemented.

Note: Instructions for Continued Airworthiness (ICA's) may be documented in information such as scheduled maintenance task lists, maintenance manuals, illustrated parts manuals, fault isolation manuals, wiring diagrams, etc.

15.1.3 Manufacturer Service Information and CAA Airworthiness Directives

15.1.3.1 The operator shall establish a process to identify, assess and determine the requirements to implement newly issued aircraft service information and CAA Airworthiness Directives, as well as schedule incorporation/compliance in a timely manner.

Explanation:

CAAs and aircraft manufacturer's issue aircraft service information in the form of Airworthiness Directives (ADs), Service Bulletins (SBs) Service Letters (SL) among others. An operator must establish a process for their organization to be aware of the issuance of new service information. They must also determine how that information will be assessed for applicability to their fleet, research the action required to be taken to bring the aircraft into compliance with the service information, determine if the status of the information is mandatory or optional and schedule accomplishment of the required action within the required time frame. They must also determine if the action required is a one-time action or recurring requirement. This process must include planning for the accomplishment of the required action including checking availability of parts, tooling, facilities and other resources required to accomplish the required action in a timely manner. All elements of this process must be documented in the operator's manuals.

Assessment criteria:

Preaudit:

1. Review the operator's manuals to determine if they have a documented process that describes who is responsible for the oversight of new aircraft information issued by CAA

or aircraft manufacturers, how they will assess this information for applicability, determine action required as well as compliance status of the information. This process must include the maintenance planning and scheduling of any required action within the required timeframe.

Onsite:

2. Interview staff to ensure that the process is clear to all involved.
3. Review any notification methods used by the operator to remain aware of newly issued service information.
4. Review records of ADs and service information that has been assessed and incorporated.
5. Review online maintenance tracking programs to ensure that required maintenance actions are being appropriately scheduled and accomplished in a timely fashion.
6. Ensure that online maintenance tracking programs include tracking of recurring maintenance requirements resulting from service information.

Alternative ways to achieve this:

There are various ways to remain aware of the issuance of aircraft service information issued by CAAs and aircraft manufacturer's. Some operators rely upon the electronic maintenance tracking system provider or the aircraft manufacturer to notify them when information affecting their aircraft is issued. Others have a system of checking the CAA website on a set interval to check for new ADs or receive notifications directly from their CAA.

15.1.4 Basic Empty Weight (BEW)

15.1.4.1 The operator shall establish a procedure to ensure that the Basic Empty Weight (BEW) of an aircraft is maintained, current and properly documented.

Explanation:

Knowledge of an accurate Basic Empty Weight (BEW) for each aircraft is critical to safe operations. BEW must be established for each aircraft and then adjusted when changes are made to the aircraft or equipment carried on board. The operator must document the title of the person in the organization which is responsible to monitor BEW of the aircraft, under what circumstances it needs to be revised and how it will be documented.

BEW of an aircraft can be determined either by performing an actual physical weigh of the aircraft or by calculations based upon the equipment changes and the previously established BEW for the aircraft. In some circumstances, the CAA may impose a requirement for a periodic physical weigh of an aircraft depending upon the type of operations conducted (i.e. commercial operations, etc.). Even if such a requirement does not apply to an operator, they must establish a requirement to perform a physical weigh of the aircraft after any major repair or alteration affecting the BEW, per local regulatory guidance including the repainting of the complete aircraft.

The operator must also describe the process to ensure that the revised BEW is correctly documented and entered into all required records and flight management software systems.

Assessment criteria:

Preaudit:

1. Review the documented procedure in the operator's manuals to ensure that it clearly indicates the job title in the organization responsible for this function, under what circumstances it required to be done and how it will be documented.

Onsite:

2. Interview staff to ensure that the process is clear to all involved.

3. Review Weight and Balance documentation on board aircraft and in aircraft technical logbooks.
4. Check electronic maintenance tracking systems for records of periodic physical aircraft weighs as applicable.

15.1.4.2 The operator shall establish a process to ensure that any changes to the BEW of an aircraft are updated in all other documents, publications, software, avionics systems, and any other tools that are used for aircraft performance calculations.

Explanation:

When the BEW of an aircraft is changed for any reason, it is critical that this information is documented and reflected in all systems affected by that change. This includes aircraft records, Flight Management Systems, Weight and Balance Manuals, Load Sheets/Manifests as well as performance documents and weight and balance information or forms utilized to calculate weight and balance, etc. This may require coordination between the operations and maintenance departments to ensure that all elements of the weight and balance information gets updated.

The operator must document the process to describe who in the organization will be responsible for this and include all of the different publications and systems that need to be updated.

Assessment criteria:

Preaudit:

1. Review the documented procedure in the operator's manuals to ensure that it clearly indicates job title in the organization responsible for this function and indicates all documents, publication, software, avionics system, etc. that need to be updated.

Onsite:

2. Interview staff to ensure that the process is clear to all involved.

3. Review applicable publications, documents, load manifests, weight and balance calculation forms, software and avionics systems, etc. to ensure the updates to the BEW are being properly documented.

15.1.5 Maintenance Tracking and Scheduling

<u>15.1.5.1</u> The operator shall establish and maintain a maintenance tracking system/document for each specific aircraft it operates. The maintenance requirements within this system/document may be provided by the TCH, CAA, approved Engineering Authority, Equipment Supplier or operator, but in all cases, they shall include, at a minimum:

a. Any maintenance tasks required by the maintenance schedule/inspection programme;
b. Status of Life limited/TBO components;
c. Status of Airworthiness directives;
d. Aircraft modification or repair Instructions for Continued Airworthiness (ICA);
e. Any specific maintenance tasks required by the State of Registry operating regulations;
f. Any task required for the management or rectification of a deferred defect;
g. Any additional maintenance tasks that may be required for operation in specific flight operations environments or the conduct of specific types of operation; and
h. Any additional maintenance tasks that may apply as a result of changes made to the aircraft configuration to satisfy equipment/configuration requirements from the State of Operation.

<u>Explanation</u>:

The tasks included in the Maintenance schedule/inspection programme for each aircraft must be tracked in some manner. Depending upon the complexity of the aircraft and the requirements, this can be done manually using a document like an Excel spreadsheet but in most cases an electronic maintenance tracking programme is utilized. Some examples of this type of programme are CAMP Systems, Sikorski Helotrak, Flight Docs and Traxall.

Items listed below may be tracked in a variety of different tracking systems elements. For example, MEL deferrals may be tracked in a different manner than the routine inspections and tasks tracked in the main tracking programme.

All of these tracking systems are required to include the following at a minimum:

a. Any maintenance tasks required by the maintenance schedule/inspection programme; These are the individual maintenance tasks and inspections outlined in the maintenance schedule/inspection programme.
b. Status of Life Limited/TBO components; Some parts on an aircraft have limits to the maximum number of flight hours/cycles/calendar days that they can be operated before

they must be removed from service permanently (life limited) or overhauled (TBO). The operator must be tracking these parts accordingly.
c. Status of Airworthiness directives; AD issued by the CAA must be entered into the tracking system and monitored for timely accomplishment and also for recurrent accomplishment if applicable.
d. Aircraft modification or repair Instructions for Continued Airworthiness (ICA); Modifications made to the aircraft either in production/completion or after market can impose additional maintenance and inspection requirements. Repairs made to fix damage to aircraft can also require additional maintenance and inspection requirements. The operator must have these additional tasks, called Instructions for Continued Airworthiness, or ICAs, added to the tracking programme.
e. Any specific maintenance tasks required by the State of Registry operating regulations; In some States of Registry, the CAA imposes additional maintenance tasks based upon the regulations and the types of operations conducted. For instance, Strobe Light Intensity Checks or Annual Avionics Checks for Commercial Operations. These items must be included in the tracking system as appropriate.
f. Any task required for the management or rectification of a deferred defect; If an item is deferred in accordance with the MEL, the operator must have a means of tracking the deferral to ensure timely correction.
g. Any additional maintenance tasks that may be required for operation in specific flight operations environments or the conduct of specific types of operation; These items would include things like transponder checks required for operations in RVSM airspace or additional maintenance tasks imposed for EDTO or CAT II and III operations. These items must also be added to the tracking system.
And;
h. Any additional maintenance tasks that may apply as a result of changes made to the aircraft configuration to satisfy equipment/configuration requirements from the State of Operation. This last item is a catch all to cover anything required in any State of Registry that is not covered by the items listed above.

Assessment criteria:

Preaudit:

1. Review operator manuals to ensure that they have documented a process by which they track their maintenance task requirements and what items will be included in that tracking programme.

Onsite:

2. Ask the operator to demonstrate their tracking programme and ensure that the required items listed above are included.
3. Ask the operator to show an example of a recurrent AD being tracked for repeated accomplishment.
4. Sample the tracking system for tasks required by local regulations or for specific types of operations.

5. Sample the tracking system to ensure any modifications to the operator's aircraft requiring ICAs are included and tracked.
6. If there have been deferrals by the MEL, ask the operator to show how the corresponding item was tracked for timely completion within the limits specified by the MEL.
7. Check that aircraft are demonstrating to be in airworthy condition in the tracking programme.

Note: This maintenance tracking system/document constitutes the maintenance planning document for that particular aircraft. The maintenance planning document data may be in paper format, or in an electronic format (which can range from a simple spreadsheet to specific software tools provided by various vendors, or by the aircraft manufacturer itself). The operator shall ensure that the maintenance planning document is readily accessible to the person responsible for compliance and maintenance tracking.

15.1.5.2 The operator shall have a process to ensure that its maintenance tracking system/document is current with the current Type Certificate Holder's scheduled maintenance inspection requirements.

Explanation:

Maintenance schedule/inspection programmes are based upon the requirements established by the Type Certificate Holder. From time to time, the Type Certificate Holder will make revisions to the requirements which will impact the maintenance schedule/inspection programme requirements. The operator must have a process in place to remain aware of these changes and incorporate the revisions into their maintenance tracking system/document.

Assessment criteria:

Preaudit:
1. Confirm that the operator has documented a process to accomplish this in their manual.

Onsite:
2. Ask the operator to show you how they do this and share an example of a recent revision to the TCH maintenance inspection/schedule programme and the resulting change in the tracking system/document.
3. Confirm through interviews that the process documented in the manual is implemented and clearly understood by staff.

15.1.5.3 The operator shall establish documented procedures to track and schedule the required maintenance for each specific aircraft it operates.

Explanation:

The tasks and inspections included in the Maintenance schedule/inspection programme for each aircraft must be tracked in some manner. Depending upon the complexity of the aircraft and the requirements, this can be done manually using a document like an Excel spreadsheet but in most cases an online maintenance tracking programme is utilized. Some examples of this type of programme are CAMP Systems, Sikorski Helotrak, Flight Docs and Traxall.

Regardless of the method used, it is important to note that the tracking system is just that – a method. The operator must periodically review it to identify any tasks that might be approaching their time limit, and based on that information, the operator must plan for a maintenance stop and schedule it with the AMO that will accomplish the required tasks, to ensure these are completed within the applicable limits.

The operator's procedures required by this standard must clearly indicate the job title that is responsible for monitoring the tracking system and ensuring that maintenance interventions are planned and scheduled with the AMO to ensure that it can be accomplished in a timely manner. Procedures must also describe how and when this is accomplished, and using what resources, equipment and devices. All details of the procedure must be documented to the extent that these procedures could be followed by any authorized and qualified person without the pitfalls of tribal knowledge communication failures.

Assessment criteria:

Preaudit:

1. Review manuals for the documented procedures that include all elements listed above.

Onsite:

2. Confirm via interviews that the procedures documented in the manuals are implemented and clearly understood by operator personnel involved.
3. Ask the responsible party to demonstrate the procedure for you.
4. Review documents used by the operator for the identification, planning and scheduling, with the AMOs, of the tasks to be accomplished (e.g. work orders, due lists, exchange of communications between the operator and the AMOs for scheduling maintenance interventions, etc.).
5. Check tracking documents/systems to ensure that required maintenance tasks are being accomplished in a timely manner.

15.1.6 Maintenance Agreements

15.1.6.1 The operator shall establish policies and processes to ensure that no person or organisation performs maintenance on an aircraft unless the person is an employee of the operator or has been authorized to perform the work under the terms of a written maintenance agreement or other form of authorization specified by the operator.

Explanation:

The operator must establish a policy on who can work on its aircraft; that could include properly trained and certificated company personnel, if available; certified repair stations / AMOs; or individual contract technicians, where acceptable by the State of Registry regulations. Additionally, the operator must have a procedure to authorize non-company maintenance technicians or AMOs to perform maintenance on company aircraft in a formalized method. The operator is free to establish what this method will consist of, but they must document it in the company manuals and implement it in day to day operations.

Assessment criteria:

Preaudit:

1. Review operator manuals to ensure that they have documented a policy on who can work on its aircraft and a process of formal authorization prior to the conduct of maintenance by non-company employees.

Onsite:

2. Confirm via interviews that the process documented in the manuals is implemented and clearly understood by operator personnel involved.
3. Ask the responsible party to demonstrate the procedure for you.
4. Ask to see written authorizations used to grant authority to perform maintenance in the past.

15.1.6.2 The operator shall establish a procedure to provide a copy of the relevant manual section that details the maintenance control system requirements, or relevant portions thereof, to each person or organisation that performs or certifies work. For unscheduled work, temporary copies of the relevant portions of the manual section that details the maintenance control system, or any incorporated reference, may be sent electronically.

Explanation:

When maintenance is conducted upon an aircraft, it is essential for the maintainer to have access to both the Type Certificate Holder's technical manuals and to the section of the operator's manuals that documents the maintenance control system. Without this information, the

maintainer cannot ensure that they will perform maintenance correctly or in accordance with the operator's methods of documenting and signing off maintenance activities.

Operators that insist that they only use AMOs that have the ratings and capabilities for their aircraft type should be reminded that they may, on some occasions, have to have maintenance performed at a facility that is not on their list of preferred providers due to mechanical failure on the road. In this case, they may need to be able to provide the Type Certificate Holder's technical manuals to the maintainer.

Assessment criteria:

Preaudit

1. Review operator manuals for a documented procedure that addresses this issue.

Onsite:

2. Confirm via interviews that the procedure documented in the manuals is implemented and clearly understood by operator personnel involved.
3. Ask the responsible party to demonstrate the procedure for you.

15.1.6.3 The operator shall include procedures in the company operations manual for flight crew to obtain and qualify aircraft maintenance services when away from home base.

Explanation:

Aircraft encounter mechanical failures away from home base and an operator must have procedures to determine the actions of the flight crews in this circumstance. These procedures must ensure that qualified maintainers are selected, and that the use of a given selected maintainer is in accordance with any applicable State of Registry requirements. This procedure may also require the flight crew to communicate with the person responsible for the maintenance of the aircraft to be given direction on how to proceed, but that is left to the discretion of the operator.

It is important to note that this standard requires information be provided to flight crew. Many operators have procedures detailed in their maintenance management manual, or their CAME. If these documents are used by the operator to conform with this standard, the operator must ensure that flight crew have access to, and are trained on, the applicable section(s) of that manual. Alternatively, the operator might include a specific section in their operations manual used by their flight crew.

Assessment criteria:

Preaudit

1. Review operator manuals for a documented process that addresses this issue.

Onsite:

2. Confirm via interviews with both flight crews and maintenance personnel that the process documented in the manuals is implemented and clearly understood by operator personnel involved.
3. Ask the operator to show you documented evidence of the process being used in the past.

Note: These procedures shall ensure that any person contracted to perform maintenance services on the operator's aircraft when away from home base are properly qualified and have the facilities, personnel competency, tools and equipment necessary to perform the required service. These procedures shall also include the review of the maintenance and related records to ensure the operator's technical dispatch requirements are met.

15.1.7 Parts and Materials

15.1.7.1 The operator shall establish procedures to ensure that only parts and materials that meet the CAA's regulatory requirements and manufacturers' specifications are used in the performance of maintenance and elementary work/preventive maintenance or servicing.

Explanation:

It is essential to ensure that only approved and serviceable parts and materials are utilized to maintain the aircraft. The operator must establish procedures that document how they will ensure this in their organization. This includes parts and materials used at home base as well as during outsourced maintenance.

Assessment criteria:

Preaudit

1. Review operator manuals for a documented procedures that addresses this issue.

Onsite:

2. Confirm via interviews that the procedures documented in the manuals is implemented and clearly understood by operator personnel involved.
3. Ask the responsible person to demonstrate the procedure for you.
4. Ask to see documentation that proves past usage of approved parts in maintenance.

15.1.7.2 If the operator procures spare parts and/or materials for use or inventory, it shall establish procedures to:

a. Ensure all parts and materials are inspected upon receipt to verify serviceability and documentation validating traceability to approved sources;
b. Monitor the expiration dates of shelf-life limited materials and discard expired items;
c. Properly dispose unserviceable parts and materials;
d. Segregate serviceable and unserviceable parts and materials; and
e. Ensure compliance with any handling and special environmental storage requirements applicable to the part or material (e.g. sealants, paints, resins, rubber, flammable items such as lubricants, etc.).

Explanation:

The operator must have parts and material procedures to ensure that all items used in aircraft maintenance are approved and in serviceable condition. In order to ensure this, these procedures must include at a minimum:

a. A receiving inspection procedure including review of proper documentation (serviceable parts tag from the manufacturer, CAA Parts Authorization, etc.) and general conditions of the part
b. A procedure to monitor expiration dates of any material subject to shelf life limits and purge expired items from stores and/or other maintenance facility storage.
c. A parts scrap program that renders unserviceable parts that are beyond economic repair unusable prior to disposal to prevent unauthorized use of these parts by other parties.
d. A procedure to physically separate serviceable and unserviceable parts to prevent the inadvertent usage of an unserviceable part on aircraft.
e. Procedures to ensure that parts and materials are handled appropriately including electro-static discharge equipment for sensitive avionics components, appropriate climate controlled storage for sensitive materials such as sealants, resins, etc., appropriate environmental storage in original packaging as required by the manufacturer for items such as rubber o-rings, etc., dark rooms for unpacked rubber materials and tires, flammable storage cabinets for flammable materials, among others. All manufacturer storage and handling instructions must be complied with.

Note: Aircraft tires have specific storage conditions and recommendations that are often overlooked. It is important to verify the tire manufacturer's recommendations, which usually address protection from light, ozone, moisture and other contaminants, as well as other storage conditions (e.g. vertical vs. horizontal, stacking limits, need for periodic rotation, etc.). The following materials can be consulted as examples:
Goodyear aircraft tire care & maintenance – chapter 2:
https://www.goodyearaviation.com/resources/pdf/aviation_tire_care_3_2017.pdf

Michelin aircraft tire care & service manual – chapter 3: *https://www.faasafety.gov/files/gslac/courses/content/269/1100/4222_12Mair_CSM_Interactive.pdf*

Assessment criteria:

Preaudit:

1. Review the manuals to determine if the operator has documented procedures to address all of the topics listed above.

Onsite:

2. Confirm via interviews that the procedure documented in the manuals is implemented and clearly understood by operator personnel involved.
3. Ask the responsible person to demonstrate the process for you.
4. Spot check flammable cabinets for proper storage.
5. Sample parts and materials for expiration dates to ensure no expired or unserviceable items are present in the maintenance environment both in stores areas and in the hangar or other maintenance areas.
6. Inspect stores areas for proper part segregation, parts tagging processes, compliance with special environmental storage requirements applicable to the stored parts, etc.

15.1.8 Aircraft Records

15.1.8.1 The owner, operator or lessee of an aircraft shall:

a. Keep the following records for each aircraft operated:

i. The total time in service (hours, calendar time and cycles, as appropriate) of the aircraft and all life-limited components;

ii. The current status of compliance with all applicable mandatory continuing airworthiness mandates, including life-limited and time-controlled components for each aircraft;

iii. Appropriate details of modifications and repairs to the aircraft;

iv. The time in service (hours, calendar time and cycles, as appropriate) since the last overhaul of components subject to a mandatory overhaul life, to include certified airworthiness release documents; and

v. The status of the aircraft's compliance with the maintenance programme identified in the operator's maintenance records; and

b. Keep detailed maintenance records to show compliance with all requirements for the signing of a maintenance release are for a minimum period of one year after the signing of the maintenance release, or until the work to which it relates is repeated or superseded, whichever is longer.

c. Keep the records in section 15.1.8.1.a for a minimum period of 90 days after the permanent withdrawal from service of the unit to which they refer;

d. In the event of a temporary change of operator, make the records available to the temporary owner. In the event of a permanent change of operator, transfer the records to the new operator; and

e. Keep continuing airworthiness records in a form and format that ensures the readability, security and integrity of the records at all times. The form and format of the records may include, for example, paper records, film records, electronic records or any combination thereof. The form, format and content of the continuing airworthiness records for an aircraft must be acceptable to the State of Registry of the aircraft.

Explanation:

The operator must maintain all of the aircraft records listed above for all aircraft they are operating. Additionally, for any aircraft that they have retired from service, for a minimum of an additional 90 days after the aircraft is removed from service. In most cases, an operator will maintain the maintenance records for considerably longer than required by the Standard but they must document their procedure to ensure that this minimum time limit is observed. This documented procedure must contain all of the items listed above.

The reference to the aircraft being "permanently withdrawn from service" refers to retirement of an aircraft, unit or component when it reaches the end of its usable life or is beyond economic repair.

In the event that the aircraft, unit or component is temporarily being operated by another operator, the operator must provide the temporary operator access to the records. If the aircraft, unit or components are sold to a new owner, the operator must transfer the records to the new owner.

Continuing airworthiness records may be maintained in a variety of formats including paper or electronic copies. Some operators will maintain paper logbooks and back them up with electronic copies for safety and security of those records. Records must be protected from the environment and kept in a secure location. Regulatory requirements for maintaining these records will vary depending upon the State of Registry and the operator must ensure that their record keeping procedures are in accordance with applicable regulations.

Assessment criteria:

Preaudit:

1. Review company manuals to ensure that the operator has documented their maintenance records procedures to include all items listed above with a minimum retention as indicated above.

Onsite:

2. Confirm via interviews that the process documented in the manuals is implemented and clearly understood by operator personnel involved.
3. Ask the responsible person to demonstrate the process for you.
4. Review aircraft logbooks to ensure that processes are being followed as indicated in the manuals.

5. Review tracking programs that are utilized to meet any of the above requirements to ensure they are being used as described in the manuals.
6. Inspect airworthiness records storage to ensure it is secure and protected from the environment.
7. Confirm that the airworthiness records for any aircraft, component or unit that has been sold have been transferred to the new owner.

15.1.9 Aircraft Technical Dispatch

15.1.9.1 The operator shall establish technical dispatch procedures to ensure that an aircraft is not operated unless:

a. The aircraft is:

i. Compliant with its maintenance control system;

ii. In an airworthy condition for the intended use;

iii. Appropriately equipped, configured and serviced for the intended use; and

iv. Maintained in accordance with the authorized maintenance programme;

b. The aircraft's required records are complete per CAA and the operator's maintenance control system;

c. All MEL procedures are followed and documentation requirements met;

d. The requirements of the State of Registry civil aviation regulations and standards are met; and

e. A maintenance release is completed and signed, as prescribed by the State of Registry, to certify that the maintenance work has been performed in accordance with the maintenance programme or other data and procedures required by the State of Registry.

Explanation:

The purpose of this item in the Standard is to ensure that no aircraft is operated unless it is in an airworthy condition and appropriately configured for the intended flight. For that, the operator must have a procedures to ensure, prior to dispatch, that all the aspects listed in this standard have been complied with:

"a. *The aircraft is:*

i. Compliant with its maintenance control system;" - In other words, all the required processes and procedures in the MCS have been followed and all documentation is completed as required.

"ii. *In an airworthy condition for the intended use*;" - There are no outstanding routine or deferred maintenance requirements that render the aircraft inappropriate for the trip planned.

"*iii. Appropriately equipped, configured and serviced for the intended use;"* - All requirements for the trip and the airspace of operation have been reviewed and the aircraft is appropriately equipped for the trip. This could include, for instance:

- Ensuring that specific equipment required for the flight is installed and operative; e.g. in smaller aircraft which do not carry life rafts and vests in usual operations but occasionally fly over water, the operator might need to ensure that this equipment is installed in the aircraft prior to flights over water (and if applicable, ensure the corresponding information on this emergency equipment is kept for notification to authorities in case of need, iaw standard 14.2.1A) (equipped);
- appropriately modifying the aircraft cabin configuration for the intended flight, for aircraft with multiple approved interior configurations (configured);
- ensuring the aircraft has adequate tire pressure, levels of oil, oxygen, etc. (serviced).

"*iv. Maintained in accordance with the authorized maintenance programme;"* - There are no outstanding or overdue maintenance requirements of any kind and the aircraft will be able to complete the planned trip without overflying any maintenance requirement deadlines.

"*b. The aircraft's required records are complete per CAA and the operator's maintenance control system;"* - If any maintenance has been accomplished, all required records and documentation is complete and accurate prior to dispatch of the aircraft.

"*c. All MEL procedures are followed and documentation requirements met*;" - If there are any items that are deferred or need to be deferred in accordance with the MEL:

- Deferral is within the applicable time limits specified by the MEL, as appropriate;
- Any (M) and/or (O) procedures required by the MEL/MMEL have been accomplished by appropriately qualified personnel;
- Any restrictions on the operation of the aircraft are understood and complied with; and
- The defect deferral has been recorded as required.

"*d. The requirements of the State of Registry civil aviation regulations and standards are met;*" - The aircraft is in compliance with any State of Registry CAA regulations and standards, including airworthiness directives and other regulatory requirements applicable to the operator.

"*e. A maintenance release is completed and signed, as prescribed by the State of Registry, to certify that the maintenance work has been performed in accordance with the maintenance programme or other data and procedures required by the State of Registry."* - If any maintenance has been accomplished, the required maintenance release record has been completed and signed, and verified by the operator or their delegate.

<u>Assessment criteria</u>:

Preaudit:

1. Review operator manuals to ensure that they have documented procedures that meet the above criteria.

Onsite:

2. Confirm via interviews that the process documented in the manuals is implemented and clearly understood by operator personnel involved.
3. Ask the responsible person to demonstrate the process for you.
4. Review aircraft release records to verify implementation of the procedures described in the manuals.

15.1.10 Aircraft Defects

15.1.10.1 The operator shall establish procedures for:

a. Recording aircraft defects;

b. Ensuring the rectification of defects in accordance with regulatory requirements and manufacturer's specifications; and

c. Detecting defects that recur and tracking those defects as recurring defects.

Explanation:

This item in the Standard sets out the requirements for how the operator manages defects on their aircraft.

A defect can typically be identified by pilots during preparation or conduct of aircraft operations, or by technicians working on the aircraft. The operator must have clear procedures for recording of any aircraft defect that might be identified, regardless of who identifies it, that ensure the aircraft is not released for flight before that defect has been appropriately managed.

Once a defect has been identified, the operator must of course ensure it is repaired – either prior to the next flight, or within the maximum period of deferral for that item (if it can be deferred as per the MEL). The operator must have procedures in place to ensure that the repair will be conducted within the appropriate timeframe and in accordance with the applicable regulatory requirements and manufacturer's specifications.

The third item of this standard requires an operator to have procedures to be aware of and track any maintenance defects that are repetitive or frequently require deferral in accordance with the MEL. Repetitive defects may be an indication that the root cause for the defect might be related to another aircraft system, inadequate utilization, inappropriate procedures used for repairing or manufacturing the part (in house or by an external entity), among other issues. Identifying these defects as recurring and investigating the causes of this repetition is therefore important for the operator to identify potential underlying issues that might have more negative impacts if not treated. Sometimes it is easy to note a repetitive defect, especially if it reoccurs in short intervals. However, in other situations this might not be so evident – for instance, when intervals are larger, or if there is staff turnover, etc. – and repetition might be missed unless there is a formal procedure to look for repetitive defects as required by this standard.

This might be accomplished by fleet wide statistical analyses, especially in the case of larger operators – and this might even be a regulatory requirement for some types of operators in some countries.

For smaller operators, however, this is often not possible as not much data is available. However, even simple procedures focused on evaluating whether defects that occurred in the past – such as periodic reviews of past defect records looking for similar issues, for instance – have proved to allow operators to uncover and solve issues that might have been overlooked otherwise, and can be sufficient to conform with this standard if appropriate to the size and nature of the operator.

It might also be helpful for operators to take into account information that might be provided or published by the manufacturer or other industry organizations (e.g. advisory groups) regarding common issues with other operators of the same aircraft type.

Assessment criteria:

Preaudit:

1. Review operator manuals to ensure that they have documented procedures that describe how maintenance defects will be documented, rectified and signed off.
2. Review operator manuals to ensure they have procedures related to identifying and tracking recurrent discrepancies or frequent deferrals.

Onsite:

3. Confirm via interviews that the procedures documented in the manuals are implemented and clearly understood by operator personnel involved.
4. Ask the responsible person to demonstrate the procedures for you.
5. Review maintenance records to ensure that documented procedures are being followed.
6. Review records of recurring discrepancies or frequent deferrals for adherence to procedures.

Note: Operators in the United States may put forward their Continuing Analysis and Surveillance System (CASS) as their method of tracking recurrent discrepancies as this is a facet of a CASS program. However, FAA regulations only require the use of CASS for commercially operated aircraft with seating capacities for 10 or more passengers. If the operator has any aircraft that are operated non-commercially or seat 9 or less passengers, they must have a procedure to accomplish this for those aircraft that are not included in the CASS. Some operators voluntarily include all aircraft in the CASS which is an acceptable means of conformity with this item however the operator must document this voluntary inclusion in their manuals.

15.1.11 Communications with the CAA

15.1.11.1 An operator of an aeroplane of a maximum certificated take-off mass in excess of 5 700 kg, or helicopter with a maximum certificated take-off mass in excess of 3 175kg, shall, as prescribed by the State of Registry, establish a procedure to ensure the transmission of information resulting from maintenance and operational experience with respect to continuing airworthiness to the State of Registry, as required.

Explanation:

This item in the Standard requires the operator to document the procedures to comply with any State of Registry regulatory requirements to let the CAA know when they experience any operational disturbances or incidents or any lessons learned through the maintenance or operations of their aircraft. These CAA requirements are often applicable to some types of operation but not others (e.g. Part 135 operators vs. Part 91), and where applicable they usually list events that must be communicated to the CAA as a minimum, and specify maximum periods or intervals for submission of this information.

If this is not required by the State of Registry regulations, this item can be marked "N/A."

Assessment criteria:

Preaudit:

1. Familiarize yourself with the State of Registry Requirements regarding this topic to verify whether this item applies to the operator, and if so, to which aircraft it applies, what events must be communicated, and any regulatory deadlines or intervals for submitting that information to the CAA.
2. If the item applies, review operator manuals to ensure that they have documented procedures that meet the intent of the above Standard.

Onsite:

3. Confirm via interviews that the process documented in the manuals is implemented and clearly understood by operator personnel involved.
4. Ask the responsible person to demonstrate the process for you.
5. Review any available records of communications submitted to the CAA to meet the intent of this item of the Standard.

15.1.11.2 The operator shall identify the person(s) eligible to apply for a special flight permit or authorization for the operator's aircraft.

Explanation:

The operator must indicate in their manual who has the authority to apply for a special fight permit or authorization when necessary. This can be one or more individuals or job positions

identified in the organization, at the discretion of the operator. However, this selection should be based upon the knowledge, qualifications and licenses (if applicable) necessary to be able to appropriately consider any safety risks that might relate to the maintenance status of the aircraft.

Assessment criteria:

Preaudit:

1. Review operator manuals to ensure that they identify the position /person(s) eligible to apply for a special flight permit or authorization for the operator's aircraft.

Onsite:

2. Confirm via interviews that involved operator personnel understands who has the authority to apply for a special flight permit or authorization for the operator's aircraft, and whether this has been exercised in the past.
3. If the operator has applied for a special flight permit or authorization, review any available records of that application and verify this was handled by the appropriate personnel.

15.1.12 Management Control

15.1.12.1 The operator shall authorize the person who is responsible for its maintenance control system to remove an aircraft from operation, where the removal is justified because of noncompliance with the requirements of national regulations or because of a threat to the safety of the aircraft, persons or property.

Explanation:

It is essential that the person responsible for the maintenance control in the organization has the authority to ground an aircraft when necessary for reasons of airworthiness or other safety concern. Although this may seem straightforward, experience shows that this is not always observed in some organizations, in which other staff members may overrule the person responsible for the maintenance control and may release flights even if the person responsible for the maintenance control expresses airworthiness or safety concerns – situations which can, of course, represent significant safety risks.

The operator must state the authority required by this standard in their manuals, and make sure that this authority is indeed granted and procedurally followed in their operations.

Assessment criteria:

Preaudit:

1. Review operator manuals to ensure that they have documented this authority as granted to the person responsible for maintenance control in their organization.

Onsite:

2. Confirm via interviews that the authority documented in the manuals is respected and clearly understood by operator personnel involved.
3. Ask the responsible person to give you an example of any time this might have occurred in the past.

15.2 Performance of Aircraft Maintenance Inspections and Tasks

15.2.1 Elementary Work or Preventive Maintenance

<u>15.2.1.1</u> For elementary work or preventive maintenance and aircraft servicing, the operator shall:

a. Identify those standards or maintenance data instructions (aircraft manufacturer, civil aviation authority, vendor, supplier or other) to be used;
b. Establish procedures to confirm the use of regulatory information and technical data appropriate to the work performed; and
c. Document the methods used to record the maintenance, elementary work/preventive maintenance or servicing performed, and to ensure the recording of any defects in the aircraft technical record.

<u>Explanation</u>:

In some regions, operators are permitted to train and/or certify individuals (to include non-technicians/pilots) or organizations to perform minor maintenance or servicing tasks. This item in the standard is related to that practice. If this is permitted by local regulations and operator chooses to do this, they must document and implement procedures to meet all of the required items listed above.

<u>Assessment criteria</u>:

Preaudit:

1. Review operator manuals to ensure that they have documented the procedures for elementary maintenance and servicing in accordance with the Standard.

Onsite:

2. Confirm via interviews with maintenance and other personnel involved in elementary work understand the procedures and requirements of this programme.
3. Review technical records to ensure that elementary work and servicing is being recorded in accordance with the operator's procedures as documented in their manuals.

Note: Elementary work or preventive maintenance means simple or minor maintenance operations and the replacement of small standard parts not involving complex assembly.

15.2.2 Tools and Foreign Objects

15.2.2.1 The operator shall establish procedures to ensure the use of only properly calibrated tools in the performance of maintenance, elementary work/preventive maintenance or servicing.

Explanation:

The operator must establish a procedure to make sure that any tools used to maintain or service their aircraft that require calibration are calibrated as required. This includes tools owned by the operator, the maintenance employees or the employees of an AMO. They must maintain records of the tool calibration including the certification of the organization performing the calibration. Items that normally require calibration that the operator elects to not maintain in a calibrated state will be identified as being for reference only or segregated from the calibrated tools and tagged accordingly. For instance, pressure gauges installed on oxygen and nitrogen servicing carts are often marked "for reference only" and not calibrated.

If the operator does not use any tools, this item may be N/A however calibrated tools should still be part of the oversight process for AMOs required in 15.3.2.1.

Assessment criteria:

Preaudit:

1. Review operator manuals to ensure that they have documented the procedures for tool calibration or for ensuring that an AMO that performs work on their aircraft has an appropriate tool calibration programme.

Onsite:

2. Confirm via interviews that the calibration programme procedures are clearly understood and followed.
3. Inspect a sampling of calibrated tools in the operator's facility for evidence proper calibration.
4. Review calibration certificates for compliant calibration and certification of the organization that performed the calibration.
5. Examine any system used for tracking or scheduling of calibration of tools.
6. Check to make sure that if employee owned tools are permitted to be used, that they are included in the calibration programme.
7. Check for identification of items that are out of calibration and being used for reference only, if applicable.
8. If maintenance is outsourced to an AMO, verify that the operator has a procedure for ensuring the use of only properly calibrated tools on their aircraft. Reference 15.3.2.1 for more information regarding outsourcing of maintenance.

15.2.2.2 The operator shall establish procedures for a tool control programme designed to ensure tools, supplies, and test equipment are accounted for following maintenance performed on an aircraft.

Explanation:

It is essential that the operator have a system by which they ensure that all tools used during maintenance on the aircraft are accounted for following maintenance before returning the aircraft to service. Tools that are inadvertently left behind during the performance of maintenance can create the possibility of aircraft damage, electrical shorts or inability to operate the aircraft as intended.
For example, flashlights propped up to enable a technician to work with both hands are sometimes get left behind and can interfere with the movement of aircraft control surfaces or landing gear. Items left in an engine intake can cause serious damage to the engine if ingested. Tools, hardware or metal shavings left in avionics compartments can cause damage and electrical shorting of equipment. Rags left in fuel tanks have been known to be ingested into the fuel pump thereby effectively cutting off the fuel supply to the engine. It is essential to ensure that all items are removed from the aircraft in order to prevent damage.

If the operator does not perform maintenance in house, this item may be N/A however tool control should still be part of the oversight process for AMOs required in 15.3.2.1.

Assessment criteria:

Preaudit:

1. Review operator manuals to ensure that they have documented the procedures for tool control or for ensuring that an AMO that performs work on their aircraft has an appropriate tool control programme.

Onsite:

2. Confirm via interviews that the tool control programme procedures are clearly understood and followed.
3. Examine any method used for tool control such as shadowed toolboxes, inventory sheets, inspection procedures, tool check out processes, etc.
4. Observe the hangar area to determine if tools, equipment and supplies are stored in a manner that would allow tool control to be effective. A hangar with poor housekeeping may make tool control very difficult.
5. If maintenance is outsourced to an AMO, verify that the operator has a procedure for ensuring that the AMO has an appropriate tool control program. Reference 15.3.2.1 for more information regarding outsourcing of maintenance.

15.2.2.3 The operator shall establish procedures to assess for Foreign Object Damage (FOD) or accidental damage following maintenance performed on the aircraft.

Explanation:

During maintenance the potential for Foreign Object Damage (FOD) or other accidental damage is quite high. This can include hitting the aircraft with stands, lifts, servicing carts or other equipment, dropping tools onto aircraft surfaces, damaging aircraft during aircraft ground movement or other damage to the aircraft. It is therefore important that the operator establishes procedures to assess, following maintenance performed on the aircraft, for any FOD or accidental damage that might have occurred.

Assessment criteria:

Preaudit:

1. Review operator manuals to ensure that they have documented the procedures for detecting FOD or other accidental damage following both in-house and outsourced maintenance activities.

Onsite:

2. Confirm via interviews that the FOD and accidental damage detection procedures are clearly understood and followed.
3. Ask the someone that is involved in the procedure to demonstrate it for you.
4. Examine any applicable records of these procedures being utilized.

15.2.3 Maintenance Personnel

15.2.3.1 If the operator performs any maintenance or servicing tasks, it shall have a process to ensure that aircraft maintenance or servicing personnel:

a. Are certificated as specified in the State of Registry or State of Operator's regulations, as appropriate for the aircraft on which the person does work; and
b. Are trained and approved by the operator for the specific maintenance or servicing task.

Explanation:

Operators must establish procedures to ensure that the maintenance and servicing personnel that they utilize are appropriately qualified as required by the applicable regulations for State of Registry and Operation of the aircraft. This would include aircraft type specific certifications and ratings where applicable.

Additionally, the operator must establish a procedure to ensure that these same personnel receive appropriate training and approval from the operator on the work that they will be performing on

the aircraft. This would include training not only the task itself but also any specialized equipment, tools or safety devices that would be used during the task performance.

Assessment criteria:

Preaudit:

1. Review operator manuals to ensure that they have documented the procedures for identifying the regulatory requirements that apply to them and selecting maintenance and servicing personnel that meet those requirements.
2. Review operator manuals to ensure they have documented procedures to ensure that these personnel have the appropriate training for all facets of the task to be performed.
3. Review that the operator has a documented procedure to approve personnel that work on their aircraft.

Onsite:

4. Confirm via interviews that the personnel selection procedures are clearly understood and followed.
5. Ask someone that is involved in the procedure to demonstrate it for you.
6. Examine records of training and qualifications of maintenance and/or servicing personnel as well as the company approval for them to perform work on the aircraft.

15.2.3.2 If the operator performs any maintenance or servicing tasks, it shall establish policies and a process to ensure that no person signs a maintenance release unless, within the preceding 24 months, that person has had at least six months' experience in the inspection, servicing or maintenance of an aircraft or system in accordance with the privileges granted by the licence held.

Explanation:

In order to ensure that maintenance personnel remain current and familiar with the aircraft and/or systems for which they sign a maintenance release, the operator must establish processes to make sure that anyone that releases an aircraft into service must have recent experience working on aircraft.

Assessment criteria:

Preaudit:

1. Review operator manuals to ensure that they have documented the policy establishing the requirement for recent aircraft maintenance experience and a procedure for validating it.

Onsite:

2. Confirm via interviews that the recency requirements are clearly understood and followed.
3. Ask someone that is involved in the procedure of validation to demonstrate it for you.

4. Examine any applicable records of this process being utilized.

15.3 Contracted Activities

15.3.1 Outsourcing of the Maintenance Control System

15.3.1.1 Operators have a number of options to conduct maintenance control. They may establish an internal system or even set-up a wholly owned subsidiary for that specific purpose. Alternatively, they may also partially or totally outsource the maintenance control tasks to an external entity. This external entity could be an approved organisation (e.g., a CAMO), an individual, or an organization that does not require a specific approval from the competent authority. In any case, the operator remains accountable for the airworthiness of its aircraft. Regardless of the option chosen, the operator shall establish procedures to ensure adequate oversight of the maintenance control system through its compliance monitoring system.

Explanation:

A maintenance control system is the method in which the operator establishes how they will perform, document, record, manage, track and control maintenance on their aircraft. This includes both scheduled and unscheduled maintenance. This system must be thoroughly documented in the manuals and must include all of the elements in Section 15.1. Additionally, the maintenance control system must meet all local regulations related to maintenance control.

If an operator chooses to, they can have the maintenance of their aircraft overseen by someone outside of their flight department. Depending upon regulations, that could be a CAMO, an AMO or an individual. If a CAMO is utilized for this purpose, the maintenance control system may be, but is not always, documented in the CAME manual belonging to the CAMO. If this is the case, document references to the CAME in the IS-BAO audit are acceptable to IBAC.

Regardless of whether maintenance control has been outsourced, the operator remains accountable for the airworthiness of the aircraft. Therefore, the operator must have policies and procedures for the oversight of maintenance control functions in order to ensure that the maintenance control is being done correctly on their behalf.

Assessment criteria:

Preaudit:

1. Review operator manuals to ensure that they have documented the procedures and policies related to oversight of any maintenance control functions that have been outsourced.

Onsite:

2. Confirm via interviews that the procedures are clearly understood and followed.

3. Examine any applicable records of these procedures being utilized.

15.3.2 Outsourcing of Aircraft Maintenance Inspections / Tasks

15.3.2.1 Many operators subcontract the actual execution of some or all maintenance inspections/tasks to Approved Maintenance Organizations (AMOs). However, the accountability for aircraft airworthiness remains with the operator. Therefore, in such cases, the operator shall establish procedures for proper oversight to ensure that the AMO conforms to the standards and recommended practices of Sections 8.1.7, 8.2, 12.1 and 15.2, and in areas where they do not conform, to identify these gaps and manage the associated risks in the operator's SMS.

Explanation:

When aircraft maintenance is performed in house by an IS-BAO registered operator, it is required to be done in accordance with the IS-BAO Standard. This provides the operator with the industry best practices to help mitigate to the lowest practical level the risks inherent to aircraft maintenance and the maintenance environment. However, when an IS-BAO operator outsources the performance of their aircraft maintenance to an individual or AMO, those risks controls provided by the IS-BAO Standard may not be in place with the maintenance provider.

Whenever an operator has maintenance performed by an AMO, they must verify if the AMO is meeting the intent of the IS-BAO Standard on their behalf and establish procedures to identify any areas in which the AMO does not meet the Standard. If areas are identified in which the AMO falls short of meeting the Standard, the operator should use their SMS to determine if the risk of using that AMO is acceptable to the Operator and potentially identify action that the operator can take to mitigate the risk. If it is determined that the risk cannot be mitigated to an acceptable level, the operator may elect to use a different maintenance provider.

For example, if the operator wanted to use an AMO that utilized some uncertificated technicians to perform some aircraft maintenance tasks, (which would not be in conformity with 15.2.3.1,) the operator might decide that they would still use the AMO but would specify in the work agreement that only certificated technicians be allowed to work on their aircraft. If the AMO refused this requirement and the operator still wants to use that AMO, the operator would have to find another way to mitigate the risk such as a secondary inspection or operator supervision of the performance of maintenance or some other mitigating action.

Assessment criteria:

Preaudit:

1. Review operator manuals to ensure that they have documented the procedures and policies related to AMO oversight.

Onsite:

2. Confirm via interviews that the procedures are clearly understood and followed.
3. Examine any applicable records of these procedures being utilized. For instance, if vendor audits are conducted, examine completed audits and look for follow up on findings.
4. Review any SMS records of risk assessments performed on AMO shortcomings.