****

**Air Traffic Safety Inspector Handbook**

**Version 2.0**

*A Tool for ATS Oversight Organizations*

**FOREWARD**

The mission of an Air Traffic Services (ATS) oversight organization and an Air Traffic Safety Inspector (ATSI) is to continuously improve the safety of the Air Navigation Service Provider (ANSP) and the State airspace system through independent oversight. In support of your dedication to ensuring the highest level of safety for ATS, we would like to offer this handbook as a fully customizable template that may be used by your inspector cadre in performing their safety critical duties.

This ATSI handbook is intended to provide the reader with an informal and relatable understanding of the essential ATSI duties and responsibilities, as well as a deeper understanding of the importance of an ATSI to the Civil Aviation Authority (CAA), the State, and the airspace system.[[1]](#footnote-2)

The Federal Aviation Administration Air Traffic Safety Oversight Service has assembled materials from our own library, International Civil Aviation Organization standards and guidance documents, and available manuals from other CAAs in order to present a well-rounded guide to the work of an ATSI.

It is our desire that this handbook supplements your understanding of the work of an ATSI and assists you in developing or enhancing your ATSI programs. Depending on your organization structure and the responsibilities assigned to ATSIs, it may be useful to expand this handbook to include additional topics, such as:

* Process for mandatory reporting of safety occurrences;
* Process for safety data collection and analysis;
* Safety compliance philosophy;
* Processes for resolving safety concerns, such as non-compliance issues identified during audits; and
* Enforcement policies and procedures.

Safety is everyone’s responsibility. As we improve and strengthen our own airspace systems, we are also able to strengthen aviation globally.

Anthony Ferrante, Director

Air Traffic Safety Oversight Service

Federal Aviation Administration

**Table of Contents**

**1.0 Introduction**

1.1 Executive Summary

1.2 Handbook Purpose

1.3 Handbook References

1.4 Important Concepts

**2.0 Safety Oversight of an Air Navigation Service Provider**

2.1 Critical Elements of Safety Oversight

2.2 The State Safety Programme

2.3 Understanding the Safety Management System

2.4 Essential ATS Oversight Responsibilities

**3.0 Licensing and Approvals**

3.1 Licensing

3.2 Approvals

**4.0 Surveillance of an Air Navigation Service Provider**

4.1 System Monitoring

4.2 Auditing an Air Navigation Service Provider

**5.0 Acronyms and Abbreviations**

**6.0 Works Cited**

**Appendix A: Continuous Monitoring Examples**

**Appendix B: Sample Safety Management System Manual**

**Appendix C: Safety Case Review Checklist**

**Appendix D: Audit Team Lead Checklists**

1. ***Introduction***

**1.1 EXECUTIVE SUMMARY**

This handbook defines and explains the essential functions of an Air Traffic Safety Inspector (ATSI) and includes descriptions and information on all aspects of ATSI responsibilities, such as State safety oversight responsibilities and the functions of an Air Traffic Services (ATS) oversight organization. The handbook also includes information about: Safety Management Systems; licensing and approvals processes; safety performance monitoring; and auditing an Air Navigation Service Provider (ANSP).

**1.2 HANDBOOK PURPOSE**

This handbook is intended to assist ATSIs in providing independent safety oversight of ANSPs as required by Annex 19 to the Convention on International Civil Aviation (Chicago Convention) and detailed in the International Civil Aviation Organization (ICAO) Safety Oversight Manual and Safety Management Manual.

After reading this handbook, you will be able to:

* Describe the responsibilities of an ATS oversight organization and an ATSI;
* Explain an ATSI’s role within the ATS oversight organization;
* Understand State safety management responsibilities
* Describe the SMS framework;
* List requirements for licensing ANSP personnel;
* Explain reviews and approvals of proposed changes to the airspace system; and
* Understand how to perform an audit of an ANSP.

**1.3 HANDBOOK REFERENCES**

1.3.1 Documents referenced throughout this handbook include the following:

|  |  |
| --- | --- |
| Annexes 1, 11 and 19 to the Convention on International Civil Aviation | ICAO Safety Oversight Manual,  Doc 9734-A |
| ICAO Safety Management Manual,  Doc 9859 | ICAO Procedures for Air Traffic Services: Air Traffic Management, Doc 4444 |
| Manual of Aircraft Accident and Incident Investigation, Part IV, Doc 9756 | FAA Order 1100.161, Air Traffic Safety Oversight |
| FAA Order VS 8000.366, Facility Access Identification Credentials for Air Traffic Safety Inspectors | Commission Implementing Regulation (EU) No 1034/2011, ATM/ANS Oversight |
| Commission Implementing Regulation (EU) No 1035/2011, ANS | CAP 670 Air Traffic Services Safety Requirements, UK CAA Safety and Airspace Regulation Group |

**1.4 IMPORTANT CONCEPTS**

1.4.1 Within the context of aviation, **safety** is the state in which the possibility of harm to persons or of property damage is reduced to, and maintained at or below, an *acceptable level* through a continuing process of hazard identification and safety risk management (International Civil Aviation Organization, 2013, pp. 2-1). While the elimination of aircraft accidents and/or serious incidents remains the ultimate goal, it is recognized that the aviation system cannot be completely free of hazards and associated risks. Human activities or human-built systems cannot be guaranteed to be absolutely free from operational errors and their consequences (International Civil Aviation Organization, 2013, pp. 2-1).

1.4.2 The concept of **safety management** evolved to address the dynamic characteristics of the aviation system, whereby safety risks must be continuously mitigated.

1.4.3 States are required to establish and maintain a **State Safety Programme (SSP)** to carry out their safety management responsibilities at an acceptable level of performance, through:

* State safety policy, objectives, and resources;
* State safety risk management (SRM);
* State safety assurance; and
* State safety promotion.

1.4.4 Aviation service providers, such as ANSPs, are required to implement **Safety Management Systems (SMS)**. An SMS is a *systematic* approach to managing safety, including the necessary organizational structures, accountabilities, policies and procedures (International Civil Aviation Organization, 2013, p. xii). An SMS is intended to assist organizations in managing safety by answering the following fundamental questions:

* What will be the next accident?
* How do you know?
* What are you doing about it?
* Is it working?

1.4.5 Through safety policy, SRM, safety assurance, and safety promotion, organizations that have adopted an SMS approach to safety management:

* *Systematically* look for the things that can and do go wrong (hazards) in a system or operation;
* *Find, describe, and track*these hazards, their causes, and inherent risk;
* *Prioritize* the hazards according to risk;
* *Mitigate* the risk(s);
* *Verify and validate* that the mitigations work; and
* *Document* all of the above.

1.4.6 Within the context of air traffic safety oversight, an **ANSP** and the **ATS Oversight Organization** must each meet certain safety management responsibilities.

An ANSP, which is the relevant authority designated by the State responsible for providing ATS (flight information service, alerting service, air traffic advisory service, and air traffic control service) in the airspace concerned (International Civil Aviation Organization, 2001, pp. 1-3), is responsible for safety management and the SMS.

The ATS oversight organization, which is the relevant authority designated by the State to establish safety standards for, and provide independent safety oversight of, ANSPs, is responsible for the **validation and verification** of an ANSP’s safety management and its SMS.[[2]](#footnote-3) Validation is the process of proving that the functions, procedures, controls, and safety standards are correct and the right system is being built (i.e., the requirements are unambiguous, correct, complete, and verifiable). Verification is the process that ensures that the system requirements have been met by the design solution and the system is ready to be used in the operational environment for which it is intended. Validation and verification are independent procedures that are used together.

Within the ATS oversight organization, **ATSIs** perform oversight of ANSP compliance with the applicable SMS, safety standards, directives, and procedures according to a **systems safety approach**. A systems safety approach to oversight is based on the concept of continuous safety improvement. It requires systematically capturing and analyzing safety data for trends and hazards, so that decisions and processes having a negative safety impact can be identified, changed, or eliminated. An ATS oversight organization may accomplish safety oversight in a variety of ways, including, but not limited to:

* Developing and amending regulations and guidance for regulatory oversight and licensing functions;
* Validating and verifying ANSP related processes used for introduction of new separation standards, and modification of existing separation standards;
* Approving new standards, waivers, extension and modification of existing waivers;
* Analyzing and authorizing controls used by ANSPs to mitigate hazards; and
* Providing regulatory oversight of the ANSP SMS.

***2.0 Safety Oversight of an ANSP***

ATS oversight organizations provide aviation safety oversight of ANSPs. **Aviation safety oversight** is the process of ensuring that aviation professionals – such as air traffic controllers, engineering/electronics personnel, and others – perform their functions safely and responsibly (Federal Aviation Administration, 2008, p. ix/x). States are required to ensure, through safety oversight, the effective implementation of safety-related international Standards and Recommended Practices and associated procedures contained in the Annexes to the Convention on International Civil Aviation and related ICAO documents (International Civil Aviation Organization, 2006, pp. 2-1). This “watchful and responsible care” may be carried out through:

* Issuing licenses and approvals;
* Performing surveillance such as:
  + Continuous monitoring activities;
  + Safety performance monitoring;
  + Audits; and
* Cooperating with other aviation safety services/organizations.

ICAO requires ATS oversight organizations to perform safety oversight of the following activities and personnel:

* Air traffic control (ATC) services;
* Safety personnel, such as air traffic controllers;
* Flight Procedures and Flight Inspection;
* Communication, Navigation, and Surveillance services;
* Aeronautical telecommunication services;
* Meteorological services;
* Aeronautical Information Services and Aeronautical Information Management;
* Search and rescue; and
* Cartographic services.

The ANSP(s), not the regulator   
(ATS oversight organization), are responsible for the safe, regular and efficient conduct of operations, including compliance with any laws or regulations. This obligation extends to any contractors that they might use.

***!***

**2.1 Critical Elements of STATE Safety Oversight**

States, in their effort to establish and implement an effective safety oversight system, need to consider the critical elements for safety oversight. Critical elements are essentially the safety defense tools of a safety oversight system and are required for the effective implementation of safety related policy and associated procedures (International Civil Aviation Organization, 2006, pp. 3-1). The **Eight Critical Elements** of a State’s safety oversight system constitute the foundation of an SSP. They are defined in Appendix 1 to Annex 19 and the ICAO Safety Oversight Manual:

* CE 1 – Primary Aviation Legislation
* CE 2 – Specific Operating Regulations
* CE 3 – State Aviation System and Safety Oversight Functions
* CE 4 – Qualified Technical Personnel and Training
* CE 5 – Technical Guidance, Tools, and Provision of Safety Critical Information
* CE 6 – Licensing, Certification, Authorization and Approval Obligations
* CE 7 – Surveillance Obligations
* CE 8 – Resolution of Safety Concerns

While all of the Critical Elements are important to effective aviation safety oversight, CEs 4, 6, and 7 are most closely associated with ATSI responsibilities.

***Why is this important?***

Understanding the framework described by the Critical Elements will help you to understand your responsibilities as an ATSI, your organization’s responsibilities, and ANSP responsibilities. You are encouraged to study the ICAO Safety Oversight Manual to learn more.

***?***

**2.1.1 CE 4: Technical Personnel Qualification and Training**

2.1.1.1 CAAs are required to establish minimum knowledge and experience requirements for the technical personnel performing safety oversight functions – including ATSIs – as well as provide appropriate training to maintain and enhance their competence at the desired level. Such training should include initial and recurrent (periodic) training.

ATSIs in the receive the following training:

2.1.1.2 The must ensure that the ATSI workforce is capable of conducting effective surveillance of air traffic services in a standardized manner. Technical personnel performing ATS safety oversight functions are expected to be at least as qualified as the ANSP personnel to be inspected or supervised to ensure they can adequately assess ANSP performance. Training and qualifications for ATSIs form the basis on which the licenses the inspectorate staff.

2.1.1.3 The activities involved in aviation safety oversight include a wide range of complex evaluations, inspections, analyses, and interventions. The satisfactory execution of the various functions of the depends to a large extent on the qualifications, experience, competence, and dedication of individual inspectors   
(International Civil Aviation Organization, 2006, pp. 3-11). Therefore, an inspector workforce that represents a wide variety of backgrounds (which reflect the disciplines found in the airspace) is useful.

2.1.1.4 As an ATSI, you are expected to:

* Have a high degree of integrity;
* Be impartial in carrying out your tasks;
* Be tactful;
* Possess good communication skills;
* Have a good understanding of human nature;
* Understand data collection; and
* Be methodical and possess analytical skills.

2.1.1.5 ATSIs must also have the skills and knowledge, or competencies, to effectively perform oversight of ANSP SMS. **Competencies** are the integrated knowledge, skills, judgment, and attributes that people need to perform a job effectively (Safety Management International Collaboration Group, 2013). Core SMS competencies include:

* [[3]](#footnote-4)

**2.1.2 CE 6: Licensing, Certification, Authorization and Approval Obligations**

2.1.2.1 Air traffic controllers must meet age, knowledge, experience, medical fitness, and skill requirements. ANSPs must meet operational and safety requirements to provide air navigation services in the airspace system. Therefore, Critical Element 6 calls for the implementation of processes and procedures to ensure that personnel and organizations performing safety critical aviation activities meet the established requirements before they are allowed to exercise the provisions or authorizations of a license, certificate, authorization, and/or approval to conduct the relevant aviation activity (International Civil Aviation Organization, 2006, pp. 3-13).

**2.1.3 CE 7: Surveillance Obligations**

2.1.3.1 A State’s obligation for a safe and orderly civil aviation system does not end with the issuance of licenses, ratings, certificates, or other approvals. Critical Element 7 calls for the establishment of processes, such as inspections and audits, to proactively ensure that aviation license, certificate, authorization, and/or approval holders continue to meet the established requirements and function at the level of competency and safety required by the State to undertake an aviation-related activity for which they have been licensed, certified, authorized, and/or approved to perform. Moreover, Annex 19 to the Convention on International Civil Aviation requires the State to implement documented surveillance processes, by defining and planning inspections, audits, and monitoring activities on a continuous basis, to proactively assure that aviation license, certificate, authorization, and/or approval holders continue to meet the established requirements (International Civil Aviation Organization, 2013, pp. APP 1-2).

2.1.3.2 Surveillance should be accomplished on a continuing basis, performed at specified times or intervals, or conducted in conjunction with the renewal of a license, certificate, or other approval. The standards of an organization’s capability and competence should at all times be equal to or exceed those required at the time of original certification (the baseline). Accordingly, ANSPs must convincingly demonstrate that operations and/or maintenance are being conducted in accordance with requirements (International Civil Aviation Organization, 2006, pp. 3-17).

2.1.3.3 Surveillance is a primary ATSI responsibility. Through performing audits, inspections and continuous monitoring, an ATSI ensures the ANSP proactively addresses safety hazards and risks before they become accidents.

Surveillance of ANSP operations and personnel to verify compliance with regulations, procedures, plans, and policies is critical to an ATSI’s effectiveness.

Auditing the operation to ensure that these standards are being adhered to is our way of validating and verifying that the safety controls the ANSP has developed to mitigate risks and hazards are working effectively –first, by seeing that they are being correctly followed, and second, whether they are having the desired safety effect.

***!***

**2.2 THE STATE SAFETY PROGRAMME**

The objective of the SSP is to achieve an acceptable level of safety of aviation services and products delivered by aviation service providers - aircraft operators, air navigation service providers, airport operators, training and maintenance organizations (SKYbrary, 2013). A successful SSP builds on safety management principles to ensure aviation safety across the spectrum of the State’s aviation system.

2.2.1 Annex 19 to the Chicago Convention contains the requirements for a State to establish an SSP. The SSP framework is described in detail in the ICAO Safety Management Manual.

2.2.2 The primary components of the SSP framework, which align with the components of an SMS, describe the State’s responsibilities for safety management. These responsibilities include, among others: safety regulation; safety oversight; accident investigation; safety data collection, analysis, and exchange; enforcement, and communication of safety information.

***Why is this important?***

ATSIs must understand the role of the State (typically, the CAA) in aviation safety, as well as the responsibilities of individual service providers and the inspector’s place in the safety continuum.

***?***

2.2.3 This SSP also encourages Civil Aviation Authorities (CAAs) to affirm their commitment to safety. Consequently, CAAs around the world have adopted safety policies. The safety policy of the is as follows:[[4]](#footnote-5)

**SAFETY POLICY STATEMENT**

promotes and regulates the safety of aviation in . We are committed to developing and implementing effective strategies, regulatory frameworks and processes to ensure that aviation activities under our oversight achieve the highest practicable level of safety.

To this end we will:

1) Set national standards that are in line with the Standards, Recommended Practices and Procedures of the International Civil Aviation Organization;

2) Adopt a data-driven and performance-based approach to safety regulation and industry oversight activities where appropriate;

3) Identify safety trends within the aviation industry and adopt a risk-based approach to address areas of greater safety concern or need;

4) Monitor and measure the safety performance of our aviation system continuously through the State’s aggregate safety indicators as well as service providers’ safety performance indicators;

5) Collaborate and consult with the aviation industry to address safety matters and continuously enhance aviation safety;

6) Promote good safety practices and a positive organization safety culture within the industry based on sound safety management principles;

7) Encourage safety information collection, analysis and exchange amongst all relevant industry organizations and service providers, with the intent that such information is to be used for safety management purposes only;

8) Allocate sufficient financial and human resources for safety management and oversight; and

9) Equip staff with the proper skills and expertise to discharge their safety oversight and management responsibilities competently.

(Signed) \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

**2.3 UNDERSTANDING THE SMS**

In 2001, ICAO required States to implement formal safety management procedures for their ATS systems. ANSPs are also required to document all activities undertaken in an SMS, and to retain this documentation for such period of time as is specified by the appropriate authority (International Civil Aviation Organization, 2007, pp. 2-1).

2.3.1 An SMS is an integrated collection of processes, procedures, and programs that ensure a formalized and proactive approach to system safety through risk management. Risk assessments are required for all changes to identify safety impacts. The SMS is a closed-loop system ensuring that all changes are documented and all problems or issues are tracked to conclusion.

2.3.2 The four components and twelve elements that comprise the ICAO SMS framework are as follows:

1. Safety policy and objectives

1.1 Management commitment and responsibility

1.2 Safety accountabilities

1.3 Appointment of key safety personnel

1.4 Coordination of emergency response planning

1.5 SMS documentation

2. Safety risk management

2.1 Hazard identification

2.2 Safety risk assessment and mitigation

3. Safety assurance

3.1 Safety performance monitoring and measurement

3.2 The management of change

3.3 Continuous improvement of the SMS

  4. Safety promotion

4.1 Training and education

4.2 Safety communication (International Civil Aviation Organization, 2013, pp. 5-2)

2.3.3 **Safety policy and objectives**, **SRM**, **safety assurance**, and **safety promotion** are collectively known as the “four pillars” (or components) of SMS.

*Safety policy* is the documented organizational policy that defines leadership commitment, responsibility, and accountability for safety. Safety policy also identifies and assigns responsibilities to key safety personnel.

*SRM* is a process within the SMS composed of describing the system; identifying the hazards; and analyzing, assessing, and controlling risk. SRM includes processes to define strategies for monitoring the safety risk of the airspace system. SRM complements safety assurance.

*Safety assurance* is a set of processes within the SMS that verify that the organization meets or exceeds its safety performance objectives and that function systematically to determine the effectiveness of safety risk controls through the collection, analysis, and assessment of information.

*Safety promotion* refers to the communication and distribution of information to improve the safety culture and the development and implementation of programs and/or processes that support the integration and continuous improvement of the SMS within the ANSP. Safety promotion allows the ANSP to share and provide evidence of successes and lessons learned.

2.3.4 Successful safety management processes identify hazards with the potential to adversely affect safety. These processes also provide effective and objective mechanisms to assess the risk presented by hazards and implement ways to eliminate these hazards or mitigate the risks associated with them. The result of these processes is to facilitate achievement of an acceptable level of safety while balancing the allocation of resources between production and protection (International Civil Aviation Organization, 2013, pp. 2-13).

2.3.5 Safety management processes are documented in a top-level SMS manual, which serves to communicate the organization’s SMS framework internally and externally (International Civil Aviation Organization, 2013, pp. 5-APP 4-1). An SMS manual should inform ANSP employees and contractors about the goal of the SMS, describe the interrelationship among the four components of the SMS, and instruct readers on the process of identifying safety hazards and mitigating risk in the airspace system.[[5]](#footnote-6)

2.3.6 SRM encompasses the assessment and mitigation of safety risks. **Safety risk** is the projected likelihood and severity of the consequence or outcome from an existing hazard or situation (International Civil Aviation Organization, 2013, pp. 2-27). The objective of SRM is to assess the risks associated with identified hazards and develop and implement effective and appropriate mitigations (International Civil Aviation Organization, 2013, pp. 2-30). An ANSP is responsible for conducting risk assessments in accordance with the provisions of Annex 19 to the Convention on International Civil Aviation and its SMS manual.

2.3.7 Safety risks are conceptually assessed as acceptable, tolerable, or intolerable. Safety risk assessment techniques may range from formal statistical modeling, to dynamic simulations, to qualitative judgments from content experts. The ANSP(s) must conduct the analysis at the appropriate level of complexity and rigor for the scope and immediacy of the potential hazard (International Civil Aviation Organization, 2013, pp. 2-30).

Safety risks assessed as initially falling in the *acceptable* region are acceptable as they currently stand and require no action to bring or keep the probability and/or severity of the consequences of hazards under organizational control (International Civil Aviation Organization, 2013, pp. 2-30).

Safety risks assessed in the *tolerable* region are acceptable provided that appropriate mitigation strategies are implemented by the organization. A safety risk initially assessed as intolerable may be mitigated and subsequently moved into the tolerable region provided that such risks remain controlled by appropriate mitigation strategies   
(International Civil Aviation Organization, 2013, pp. 2-30).

Risks assessed as initially falling in the *intolerable* region are unacceptable under any circumstances. The probability and/or severity of the consequences of the hazards are of such a magnitude, and the damaging potential of the hazard poses such a threat to safety, that immediate mitigation action is required (International Civil Aviation Organization, 2013, pp. 2-30).

***Why is this important?***

An understanding of SMS and SRM is crucial to the work of an ATSI because SMS is at the core of many surveillance efforts and compliance determinations. Understanding the SMS framework will guide you in knowing what to expect from an ANSP. You are encouraged to study the ICAO Safety Management Manual to learn more about SMS and SRM.

***?***

2.3.8 An ANSP providing ATS for the airspace system must:

* Develop and maintain an SMS and submit it, and any changes thereto, to the for approval;
* Maintain an organization with the competent personnel, procedures, facilities, and equipment necessary to develop, operate, and support the SMS;
* Provide employees with all appropriate training, including SRM training to all personnel executing the SMS, and ensure personnel qualifications through testing proficiency;
* Establish a safety service, organizationally independent from the service delivery portion of the ANSP, responsible for developing and maintaining the SMS;
* Comply with the approved SMS;
* Assess the effectiveness of the SMS in affecting the safety of the airspace system. This can be done through collecting, tracking, and analyzing safety data, to include:
  + Air traffic control operational error rates;
  + Runway incursion rates (at controlled airports);
  + Operational deviation rates;
  + Pilot deviations (air traffic control contributed);
  + Near midair collisions (air traffic control contributed);
  + ANSP-related accident rates;
  + Missed equipment preventative maintenance;
  + Expired equipment certifications;
  + Failure to mitigate high-risk hazards identified as part of a safety risk assessment; and
  + Results of ANSP internal audits and surveys conducted in the ANSP’s internal oversight, evaluation, and quality assurance programs;
* Identify additional safety indicators to demonstrate that it is meeting SMS safety objectives;
* Mitigate safety concerns identified by the safety indicators and perform ongoing analysis to assess the effectiveness of those mitigations;
* Communicate the results of SMS operations throughout its internal organization and to the ; and
* Provide access to any and all records that the believes are useful in determining ANSP compliance with the safety standards and the SMS.

2.3.9 The has the following responsibilities regarding safety oversight of an ANSP SMS:

* Establish the requirements for the SMS in accordance with Annexes 11 and 19 to the Convention on International Civil Aviation, and ICAO Document 4444 (ATM/501), Procedures for Air Navigation Services, Air Traffic Management;
* Approve the ANSP SMS manual and any changes to the SMS manual;
* Monitor compliance with safety standards and the SMS, including:
  + Requiring the ANSP to provide reporting, as requested, of the status of the SMS, including information on safety occurrences/data; and
  + Monitoring corrective actions taken by the ANSP to assure resolution of identified safety hazards.

If the SMS is not effectively dealing with hazards, it is your job as an ATSI to identify that a formal audit needs to be performed to assess the cause, and the results reported to the ANSP for appropriate corrective action. It’s also your responsibility to perform audits to make sure the SMS requirements are being complied with and monitored for effectiveness, and if not – that corrective action is being taken. It is the responsibility of the ANSP(s) providing ATS for the airspace system to develop and implement safety minimum safety standards and mitigations, and then track their effectiveness.

***!***

**2.4 Essential ATS OVERSIGHT Responsibilities**

2.4.1 The ATS oversight organization supports the State in implementing its SSP. The essential safety oversight responsibilities of an ATS oversight organization include:

* Establishing State safety standards and approving ANSP SMS(s);
* Monitoring compliance with safety standards and SMS through routinely and objectively auditing and inspecting ANSPs, including their functions, personnel, safety risk management, and safety assurance;
* Putting systems in place to license/certify/approve/rate ANSP personnel (including ATS, ATM, and electronics/engineering (ATSEP) personnel) and ATS oversight organization technical personnel;
* Establishing, inspecting, and periodically renewing all ATS licenses, certifications, approvals, and ratings; and
* Monitoring ANSP corrective actions and continuous safety improvement.

2.4.2 An ATSI’s essential responsibility is to perform oversight of ANSP compliance with its SMS, as well as applicable standards and procedures. This includes:[[6]](#footnote-7)

* Reviewing proposed changes to ATS systems and procedures, including safety assessments and changes to ANSP SMS manual(s);
* Continuously monitoring the airspace system;
* Analyzing safety data for trends or hazards; and
* Participating in audits and inspections of ANSPs.

***3.0 Licensing and Approvals (Critical Element 6)***

**3.1 Licensing**

Licenses permit aviation personnel to perform certain critical safety functions, such as providing air traffic control services. The ICAO Safety Oversight Manual describes the following essential licensing functions:

* Writing and amending rules related to the training and licensing of aviation personnel;
* Assessment and approval of applications for licenses and ratings and the issue of licenses and ratings;
* Application of medical fitness assessments relating to license requirements;
* Approval, designation, and supervision of individuals or organizations; and delegated to perform specific tasks on behalf of the personnel licensing office.

ICAO requires the following details to appear on personnel licenses:

* Name of State
* Title of license
* Serial number of license
* Name of holder in full
* Date of birth
* Nationality of holder
* Signature of holder
* Authority and, where necessary, conditions under which the license is issued
* Certification concerning validity and authorization for holder to exercise privileges appropriate to license
* Signature of officer issuing the license and the date of such issue
* Seal or stamp of authority issuing the license
* Ratings
* Remarks, i.e. special endorsements relating to limitations and endorsements for privileges, including an endorsement of language proficiency (International Civil Aviation Organization, 2011)

The issues licenses to both ANSP safety personnel and to ATSIs.

***Why is this important?***

As an ATSI, you will be involved in the safety oversight of licenses issued to ANSP personnel. You may conduct audits related to ANSP compliance with licensing requirements, as well as suspend, revoke, or reinstate licenses.

***?***

**3.1.1 ANSP Personnel**

3.1.1.1 The ANSP is responsible for maintaining an organization with competent personnel, procedures, facilities and equipment that are necessary for the provision of ATS and the development of instrument flight procedures and aeronautical charts.

3.1.1.2 The issues licenses to ANSP personnel providing direct safety-related services, including:

* Air traffic controllers
* ATSEP[[7]](#footnote-8)
* Aeronautical Information Specialists

3.1.1.3 Licenses are valid for limited duration and must be renewed

.

3.1.1.4 The licensing program for ANSP personnel includes:

* Training validation
* Proficiency assessment and qualification (skills check)
* Medical evaluation
* Specific ratings/endorsements for the following functions
  + Air traffic controller
    - Aerodrome control rating
    - Approach control procedural rating
    - Approach control surveillance rating
    - Approach precision radar control rating
    - Area control procedural rating
    - Area control surveillance rating
  + ATSEP[[8]](#footnote-9)
    - Communication
    - Navigation Aid
    - Surveillance
    - Environmental
    - Automation
  + Aeronautical Information Specialist[[9]](#footnote-10)
    - Graphic Design
    - Aeronautical Information Publication Management
    - Aeronautical Information Processing
    - Digital Terminal Design
    - Procedure Design
    - Vertical Obstruction
    - Airport Mapping

3.1.1.5 The may suspend, revoke, or re-instate licenses.

**3.1.2 ATSIs**

3.1.2.1 A license authorizes an ATSI to perform inspections, investigations and audits to determine ANSP compliance with requirements.

3.1.2.2 The license requires an ANSP to provide you with free and uninterrupted access to facilities, records, data, and restricted areas.

3.1.2.3 In order to receive and maintain your ATSI license, you must:

* Satisfactorily complete initial and recurrent training;
* Participate in at least one audit per year;

**3.2 APPROVALS**

3.2.1 In addition to licensing ANSP safety personnel and ATSIs, the responsibilities include establishing, approving, and accepting safety standards for ATS, as well as monitoring ANSP compliance with established safety standards and the approved SMS. The following section of this handbook contains information about the role in reviewing and approving changes to various aspects of the airspace system as may be proposed by an ANSP.

3.2.2 An **approval** is the formal act of approving a change submitted by a requesting organization. This action is required *prior* to the proposed change being implemented. The following changes require approval[[10]](#footnote-11) by the :

3.2.3 The has established a process to review and approve or disapprove changes to the airspace system, air traffic control separations standards, ANSP SMS manual(s), and ANSP training and proficiency standards. ANSPs must document proposed changes to the airspace system in a safety assessment, or safety case. A **safety case**:

* Proposes a change to the aviation system;
* Presents a rationale justifying why the change should be approved
* Is evidence-based; and
* Must comply with the approved SMS manual.

3.2.4 According to the ICAO Safety Management Manual, an ANSP’s safety assessment documentation should include:

* Hazard descriptions;
* Related consequences;
* Assessed likelihood and severity of safety risks; and
* Required safety risk controls.

3.2.5 Documentation reviews will be conducted in a standardized manner to ensure approvals to changes are done the same way every time. Reviews may be conducted by an individual ATSI for simple and/or straightforward changes, or a team of subject matter experts may be required for more complex changes.

3.2.6 The approval process includes:

**Preliminary Review**

During the preliminary review, an ATSI will:

* Determine if the ANSP request for review contains enough information to complete a full evaluation; and
* Determine resources needed to complete the review.

**Evaluation**

During the evaluation, an ATSI will:

* Thoroughly review all documents;
* Research the request;
  + Research may include, but is not limited to:
    - Attempting to validate any qualitative or quantitative assessments, if provided;
    - Reviewing any previous evaluations of the request;
    - Related or similar issues;
    - Data from ongoing monitoring;
* Document research that you believe will be useful in evaluating the proposed change;
* Contact other CAA offices when proposed changes involve their oversight responsibilities;
* Evaluate the request against standards in the ANSP SMS manual;
* Perform in-depth analysis of the ANSP’s SRM, including, at a minimum, evaluation of the safety case components:
  + System description;
  + Hazard identification;
  + Risk analysis;
  + Risk assessments;
  + Treatment and monitoring;
  + Document the results of the analysis;
* Recommend approval or disapproval of the proposed change; and
* Document whether each member of the review team agrees with the recommendation.

A checklist for evaluating ANSP safety cases is included at Appendix C to this handbook.

**Decision**

In the Decision phase of the approvals process, leadership will review the results of the evaluation phase and recommend approval, disapproval, or other action.

**Response to ANSP**

The approvals process is concluded once the decision is communicated to the ANSP.

**3.2.1 System Changes**

3.2.1. The will review and approve the ANSP safety implementation actions, risk assessment techniques, and risk management strategies for any changes, including those at the local level, before the ANSP can implement changes to the airspace system.

3.2.1.2 An ANSP must develop and implement a safety status reporting program consistent with its internal review of programs to provide the insight into airspace system changes. In addition, the will review and approve ANSP safety risk management strategies for future systems.

**3.2.2 Air Traffic Separation Standards**

3.2.1.1 The will also review and approve proposed changes to air traffic separation standards. As part of this process, safety data should be compared to past baselines.

**3.2.3 SMS Changes**

The approved the existing ANSP SMS(s) and associated manual(s). Accordingly, safety oversight efforts are focused on changes to and deviation from the existing SMS.

3.2.2.2 An ANSP must conduct risk assessments in accordance with the provisions of the SMS manual. Risk assessments must include a plan to evaluate identified safety critical parameters during initial operational implementation and after it is complete.

If a high initial or residual risk hazard is identified in the safety risk assessment the ANSP must mitigate it under controls approved by the . The will also approve the ANSP’s process for mitigation of medium and low-risk hazards.

**3.2.4 Acceptance**

**Acceptance** is the process whereby the ATS oversight organization has delegated the authority to the ANSP to make changes within the confines of approved standards and only requires the ANSP to notify the regulator of those changes within 30 days. Changes made by the ANSP in accordance with their delegated authority can be made without prior approval by the ATS oversight organization.

Medium-risk hazards may be accepted under the condition that the ANSP will track identified hazards in a database that the can continuously access.

**3.2.5 Training and Proficiency Standards for ANSP Personnel**

3.2.5.1 An ANSP may not use any person or provider to perform direct safety-related air traffic control services unless the person performing the work is appropriately qualified, properly trained, certificated, and authorized to do so in accordance with the ANSP’s policies, manuals, and any oversight programs. Additionally, an ANSP is responsible for providing any appropriate training (including providing facilities, materials and instructors) needed for personnel to be fully informed on procedures, techniques, and new equipment in use.

3.2.5.2 The will approve changes the ANSP makes to training and proficiency of its personnel related to air traffic control functions.

3.2.5.3 All ANSP(s) operations must be performed in accordance with appropriate manuals and directives.

3.2.5.4 An ANSP is expected to prepare and keep current materials on procedures, standards, and processes for the provision of air traffic control services. The ANSP is delegated the authority to make changes to those materials, within existing standards, after initial approval by the .

**2.6 Navigation Systems and Aeronautical Information Services**

3.2.6.1 ANSP decisions to acquire or implement new systems or new/changed services must be in accordance with the and the ANSP SMS manual. If a proposed change is found to be in accordance, the ANSP must validate and verify the safety requirements identified during the SRM process before deployment and full operational use. Any new systems must also be evaluated by the ANSP in the case of hazard or system failure.

3.2.6.2 All new or changed procedures are to be developed in accordance with appropriate policies and the SMS. Changes will be approved by the .

As an ATSI, you will participate in reviews of system changes proposed by the ANSP(s). It is important to follow established processes for conducting reviews.

***!***

***4.0 Surveillance of an ANSP (Critical Element 7)***

As described in Critical Element 7, **surveillance** is the collection of activities conducted by the regulator to meet its oversight responsibilities.[[11]](#footnote-12) Surveillance includes regular monitoring of the airspace system in combination with safety audits.

**4.1 System Monitoring**

Continuous monitoring of ANSP(s) operations allows you, as an ATSI, to maintain awareness of the overall fitness of that operation. By continuously analyzing the data provided by the ANSP(s) about operations system-wide as well as at a specific location, you will be able see trends, identify potential risks, find potential audit topics, and notify the ANSP(s) of real or potential risks.

4.1.1 ATSIs monitor and verify that the ANSP(s) is following requirements and that operating systems achieve intended results. They also monitor the ANSP(s) to evaluate compliance with ATS requirements. Monitored items include:[[12]](#footnote-13)



4.1.2

EXAMPLES:

**Organization.** An ANSP, in performing ATS operations and maintenance of equipment and systems, must have an organization to perform the work and must maintain necessary competent personnel, procedures, facilities, and equipment.

**Equipment Maintenance and Availability.** An ANSP will have an overall airspace system equipment availability program. This program will define the required availability of all safety-critical airspace system equipment used in the provision of ATS and the methods to measure and report on achieved availability on a regular basis.

**Maintenance Operations and Technical Manuals.** An ANSP is expected to prepare and keep current materials on procedures, standards, and processes for equipment and facility maintenance and the management of its technical personnel in conducting its operations.

**Personnel and Training.** An ANSP is only permitted to use a person or provider for direct safety-related maintenance or inspections/evaluations if the person or provider is appropriately qualified, trained, certificated, and authorized to do so in accordance with ANSP policies and programs. Additionally, an ANSP is responsible for providing any appropriate maintenance-training program (including providing facilities, materials, systems, and instructors) needed for personnel to be fully informed on procedures, techniques, and new equipment in use.

4.1.3 Additional monitoring items are included at Appendix A to this handbook.

4.1.4 In addition to monitoring ANSP operations for compliance, ATSIs also monitor occurrence reporting data to identify trends that may indicate system-level risks. It is mandatory for ANSPs to report the following occurrences:[[13]](#footnote-14)

* Any ANS/CNS-related equipment or system defect/malfunction/damage discovered during operation or equipment maintenance which could possibly lead to an aircraft operational accident or serious incident;
* Unauthorized penetration of airspace;
* Aircraft near Controlled Flight Into Terrain;
* Significant level bust incidents;
* Loss of separation incidents;
* Runway incursion (involving ATC communication);
* Runway excursion/overshoot (involving ATC communication); and
* Any other ANS-related deficiency/defect/malfunction as reported to (and verified by) the ANS/CNS operator and which is deemed to have an impact on the safety of air navigation.

4.1.5 ATSIs will monitor whether involvement is necessary before, during, or after the ANSP’s internal occurrence investigation process, and coordinate with the ANSP to ensure timely follow-up and closure of any required follow-up action or investigation, as appropriate. (International Civil Aviation Organization, 2013)

**4.1.6 Safety Performance Monitoring**

**Safety performance monitoring** and measurement includes selecting safety monitoring indicators and setting alerts and targets relevant for the aviation system. Targets define long-term safety performance objectives. (International Civil Aviation Organization, 2013, pp. 4-12) Safety performance monitoring enables you, as an ATSI, to evaluate system performance against a set of established targets. This monitoring assists in developing and focusing audits of ANSPs.

4.1.6.1 The has established the following performance indicators:[[14]](#footnote-15)

* Number of hull loss events;
* Losses of separation;
* Number of Airborne Collision Avoidance System (ACAS) Resolution Advisory (RA) events;
* Number of minutes spent away from ATC cleared route;
* Number of Large Height Deviation (LHD) events involving data link equipped aircraft;
* Number of LHD events involving non data link equipped aircraft;
* Number of minutes that data link equipped aircraft spend at the wrong flight level;
* Performance in the vertical dimension against the Target Level of Safety (TLS);
* Performance in the lateral dimension against the TLS;
* Number of Gross Navigation Error (GNE) events involving data link equipped aircraft; and
* Number of GNE events involving non data link equipped aircraft.

4.1.6.2 To ensure continued effectiveness, safety performance indicators will be reviewed periodically to determine if any modifications or additions to existing indicators, targets or alerts are needed (International Civil Aviation Organization, 2013, pp. 4-13).

**4.2 AUDITING AN ANSP**

An **audit** is a systematic, independent, and documented process for obtaining and analyzing objective evidence to determine the extent to which certain criteria are met. Audits enable the ATS oversight organization to verify and validate that the preventive controls established by an ANSP to mitigate risks are effective. In basic SMS terms, ATS oversight organizations use audits to answer the question, “Is it working?” Audits may be systemic or targeted to specific facilities or airspace sectors, and may be conducted on-site or virtually, through the review of documents, records, and other data provided by the ANSP.

Safety audits conducted by the :

* Provide and other authorities with evidence of ANSP compliance with applicable safety processes, regulatory requirements, and implementation arrangements, and attempt to identify the need for improvement or corrective action;
* Are independent of ANSP internal auditing activities undertaken as part of its safety, quality control, quality assurance, and/or quality management systems;
* Are conducted by qualified ATSIs; and
* Lead to the correction of any identified non-compliance issues.

The audit program:

* + Audits areas of potential safety concern with the highest identified risk, or with a focus on those areas where problems have been identified;
  + Covers all the functions within ANSP organizations, services, and network, operating under the supervision of the ;
  + Ensures that audits are conducted in a manner commensurate to the level of risk posed by the ANSP organizations’ activities;
  + Ensures that sufficient audits are conducted on a consistent basis, to check the compliance of all ANSP organizations, as pertains to applicable safety processes, and regulatory requirements in all the relevant areas of the functional system; and
  + Conducts follow-up activities to ensure effective implementation of corrective actions.

The may decide to modify the scope of pre-planned audits and to include additional audits, wherever that need arises. Audit observations and identified non-conformities are documented and provided to the ANSP(s). Non-compliance issues must be supported by evidence, and identified in terms of the applicable safety requirements against which the audit has been conducted. An audit report, including the details of any non-compliance issues, must be prepared at the conclusion of each audit and provided to the ANSP (European Union, 2011, p. Article 7). Audit reports should indicate whether the inspection and surveillance system and procedures employed by the ATS oversight organization are effective in determining the ANSP’s competence, record of compliance, and overall capability (International Civil Aviation Organization, 2006, pp. 3-18).

***Why is this important?***

Auditing is one of the primary methods of verifying ANSP compliance with requirements. As an ATSI, you will participate in multiple audits during the year.

***?***

**4.2.1 Audit Team Personnel**

**Executive Sponsor / Approver.** Member of leadership who serves as the patron or “champion” of the specific audit project.

**Audit Team Lead.** Acts as the bridge between the Executive Sponsor and the audit team members. The audit team lead:

* Oversees the audit and ensures completion of all phases of the audit;
* Acts as the primary point of contact ANSP(s) and/or facilities;
* Keeps Executive Sponsor, Team Members, and other stakeholders informed of audit progress;
* Resolves conflicts that arise during the audit; and
* Reports audit results.

Checklists for the Audit Team Lead are included at Appendix D to this handbook.

**Audit Team Members.** Licensed ATSIs and subject matter experts assigned to plan and conduct audits. Team members must work collaboratively to support the efforts of the Audit Team Lead by conducting research and collecting and analyzing data.

All audit team personnel must become highly versed with the audit details, including:

* Objective and scope of the audit;
* Questions that the audit should answer; and
* Requirements related to the audit topic.

**4.2.2 Topic Identification**

4.2.2.1 Audit topic identification is an ongoing effort. Potential audit topics may be derived from numerous sources (see Appendix A for potential audit topics), including, but not limited to the following:

* + Aircraft accidents and incidents including both surface and airborne events;
  + Routine surveillance of the ANSP; and
  + Leadership requests.

4.2.2.2 Audit topics are selected based on risk and organized on an annual audit schedule. Ideally, all audits are determined and scheduled before the start of the ensuing year, but often audit topics will arise throughout the year based on circumstantial events (International Civil Aviation Organization, 2013).

**4.2.3 Pre-Audit Activities**

Audit preparation is the most time-consuming, complex, and critical phase of any audit. The success of the audit will largely depend on how well you plan for it. Planning includes assembling expertise, building an effective team, preparing a strategy for determining compliance, coordinating logistics, training team members to use the checklists, and setting up an efficient schedule.

**Audit Timeline**

Audits may be scheduled, which requires notification to the ANSP(s), or unscheduled. The audit schedule (timeline) will provide the dates for the following:

* Written communication to officially notify the ANSP(s) (not applicable to unscheduled audits) of:
  + Facilities/locations to be visited (location selection should be based, if available, on data-driven risk prioritization)
  + Dates for onsite ANSP facility visits for observations and data collection;
* Audit start date;
* Audit end date;
* Estimated validation date (a standard number of days that elapse from the official end of the audit in which the collected data is analyzed, findings are composed, and validated, and briefed to the leadership); and
* Final report due (a standard number of days from the validation end date) to ANSP.

**Audit Research**

Throughout the audit preparation process, audit team members should thoroughly research the audit topic to ensure that all applicable requirements have been captured, and that they have not changed. Requirements may be found in ICAO standards as well as standards and directives, standard operating procedures, corrective action plans, etc.

Important research questions include:

* What initiated the audit?
* What are the results of any past audits on the topic?
* Are there enforcement actions against the ANSP(s) related to this topic?
* Which requirements are applicable to this topic?

***Why is this important?***

Thorough research produces relevant audits. Audits are researched and developed by asking questions. As an ATSI, it is important to always ask questions throughout the audit process, such as:

* What is the problem? Why might the problem exist?
* What are the risks to the airspace system?
* Are there any indicators to give us direction in the audit?
* What does the initial data tell us?

***?***

**Objective, Scope, and Focus Areas**

The research and development of an audit topic should result in the presentation of three elements: objective, scope, and focus areas (International Civil Aviation Organization, 2013).

**Choosing Facilities**

When identifying facilities and/or airspace sectors to visit during an audit it is essential to ask the following questions:

* When was the location’s last audit? (consider eliminating if the facility was recently audited)
* Does the facility or airspace sector use or maintain the system or procedures being audited?
* What is the risk (likelihood and severity) of accidents or incidents associated with the system or procedure?
* How many incidents have been reported that are related to the system or procedure?
* Is weather an important variable in this audit? How does the weather at this facility/location affect the audit topic?
* How does the facility or sector location affect the audit? Can audits of multiple facilities/sectors be accomplished in a single visit?

**Audit Checklists**

Checklists are important to ensure that audit results are tied to the objective, scope, and focus areas. Checklists also reduce inadvertent errors and help to standardize results when the “human factor” causes variation. Steps to develop effective checklists:

* Determine the relevant safety and operational requirements applicable to the ANSP(s)
  + The requirements should be as narrow and as focused as possible
* Turn the requirements into questions
  + The questions should be answerable in a “YES/NO” format

The audit team will use the checklist(s) during the audit to record data regarding each of the audited facilities/sectors.

**4.2.4 Conducting an Audit**

4.2.4.1 Audit teams are expected to conduct an opening meeting with facility management, collect data, analyze collected data and verify that analysis, record findings, conduct team briefings, and conduct a closing meeting with facility management while visiting facilities/sectors during on-site audits (see Appendix C for additional details).

4.2.4.2 The following techniques and resources may be used during an audit:

* Interview(s)
* Should be directed at management
* Observation of Operations/Maintenance Activities
* Specific to issues that were the catalyst for the inspection
* Records review
  + Local (individual facility) orders, directives, management records, training records, etc.
* ICAO Universal Safety Oversight Audit Program Protocol Questions

4.2.4.3 Audit team members should not take original documents from the audited facilities. Auditors may take notes or make photocopies to capture information contained in original documents.

4.2.4.4 Should auditors observe a significant safety risk while visiting a facility or airspace sector, the observer is to immediately notify his/her Audit Team Lead and/or Executive Sponsor for appropriate action.

4.2.4.5 If non-compliance is discovered during an audit, the audit team should make the facility manager aware of the possible non-compliance in a non-confrontational, informal manner.

**4.2.5 Post-Audit Activities**

4.2.5.1 Post audit activities include: conducting post-audit meetings, collating and analyzing data collected from all of the audited facilities, validating observations, writing and submitting an audit report, archiving audit records, and follow-up with the ANSP(s).

4.2.5.2 Audit teams conduct a post-audit meeting to consolidate and analyze data. Once conclusions have been drawn, audit teams are expected to conduct a validation meeting with leadership, and finally to complete and submit an audit report to the ANSP(s).

4.2.5.3 Audit teams are expected to track and follow-up on ANSP responses to the audit report, as well as any corrective actions.

4.2.5.4 Audit records should be archived .

**Writing the Audit Report**

Audit reports explain the relevance of the audit to the ANSP(s), and present observations based on objective evidence collected during the audit. An audit report should consist of the following elements:

* Executive Summary;
* Background;
* Objective;
* Scope and Focus Areas;
* Audited Locations;
* Audit Requirements;
* Methodology;
* Audit Results; and
* Comments.

**4.2.6 Post-Audit Compliance Monitoring**

An ATSI’s auditing responsibilities do not end when the audit report is transmitted to the ANSP(s). The ANSP(s) may choose to respond to audit reports to document corrective actions, whether or not such actions are requested or required by . However, it is important to monitor those corrective actions that the ANSP(s) is *required* to complete in response to non-compliance issues identified through audits.

4.2.6.1 ANSPs must determine the corrective actions deemed necessary to correct non-compliance issues and the time frame for their implementation.

4.2.6.2 The will assess the corrective actions as well as their implementation as determined by audited organizations and accept them if the assessment concludes that they are sufficient to address the non-compliance issues.

4.2.6.3 The may assign a completion date to the corrective actions. The may also accept the time period developed by the ANSP(s). In either case, the corrective actions must be completed within the time period accepted by the (European Union, 2011).

***5.0 Acronyms and Abbreviations***

The following abbreviations and acronyms are used throughout the handbook:

|  |  |
| --- | --- |
| ACAS | Airborne Collision Avoidance System |
| ANS | Air Navigation Services |
| ANSP | Air Navigation Service Provider |
| ATC | Air Traffic Control |
| ATM | Air Traffic Management |
| ATS | Air Traffic Services |
| ATSEP | Air Traffic Safety Electronics Personnel *or* Air Traffic Safety Engineering Personnel |
| ATSI | Air Traffic Safety Inspector |
| CAA | Civil Aviation Authority |
| CNS | Communications, Navigation and Surveillance |
| FAA | United States Federal Aviation Administration |
| GNE | Gross Navigation Error |
| ICAO | International Civil Aviation Organization |
| LHD | Large Height Deviation |
| NA | Not Applicable |
| POC | Point of Contact |
| RA | Resolution Advisory |
| SMM | ICAO Safety Management Manual,  Doc 9859 |
| SMS | Safety Management System |
| SRM | Safety Risk Management |
| SSP | State Safety Programme |
| TLS | Target Level of Safety |

***6.0 Works Cited***

European Union. (2011, October 17). *Commission Implementing Regulation (EU) No 1034/2011, ATM/ANS Oversight.* Retrieved from http://www.easa.europa.eu/document-library/regulations/commission-implementing-regulation-eu-no-10342011-atm-ans-oversight

Federal Aviation Administration. (2008, July). *DOT/FAA/AR-08/39 History of Aviation Safety Oversight in the United States.* Retrieved from History of Aviation Safety Oversight in the United States

International Civil Aviation Organization. (2001, July). Annex 11 to the Convention on International Civil Aviation: Air Traffic Services, Thirteenth Edition.

International Civil Aviation Organization. (2006). Safety Oversight Manual, Part A: The Establishment and Management of a State's Safety Oversight System, Second Edition.

International Civil Aviation Organization. (2007). Procedures for Air Navigation Services: Air Traffic Management (Doc 4444), Fifteenth Edition.

International Civil Aviation Organization. (2011). Annex 1 to the Convention on International Aviation: Personnel Licensing, Eleventh Edition.

International Civil Aviation Organization. (2013). Annex 19 to the Convention on International Civil Aviation: Safety Management, First Edition.

International Civil Aviation Organization. (2013). Safety Management Manual (SMM), Third Edition.

Safety Management International Collaboration Group. (2013, December 5). *SM ICG Safety Management System Inspector Competency Guidance.* Retrieved from http://www.skybrary.aero/bookshelf/books/3117.pdf

SKYbrary. (2013, September 13). *State Safety Programme.* Retrieved from http://www.skybrary.aero/index.php/State\_Safety\_Programme

**Appendix A**

Continuous monitoring of the following issues (International Civil Aviation Organization, 2007, pp. 2-2) may assist ATSIs in maintaining awareness of the fitness of ANSP operations.

ATSIs may monitor *regulatory issues* to ensure that:

* ATS operations manuals, ATS unit instructions, and ATC coordination procedures are complete, concise and up-to-date;
* the ATS route structure, where applicable, provides for:
  + adequate route spacing; and
  + crossing points for ATS routes located so as to reduce the need for controller intervention and for inter- and intra-unit coordination;
* the separation minima used in the airspace or at the aerodrome are appropriate and all the provisions applicable to those minima are being complied with;
* appropriate procedures for low visibility aerodrome operations are in place;
* traffic volumes and associated controller workloads do not exceed defined, safe levels and that procedures are in place for regulating traffic volumes whenever necessary;
* procedures to be applied in the event of failures or degradations of ATS systems, including communications, navigation, and surveillance systems, are practicable and will provide for an acceptable level of safety; and
* procedures for the reporting of incidents and other safety-related occurrences are implemented, that the reporting of incidents is encouraged and that such reports are reviewed to identify the need for any remedial action.

ATSIs may monitor *operational and technical issues* to ensure that:

* automation systems generate and display flight plan, control and coordination data in a timely, accurate and easily recognizable manner and in accordance with Human Factors principles;
* equipment, including input/output devices for automation systems, are designed and positioned in the working position in accordance with implementation arrangement;
* communications, navigation, surveillance, and other safety significant systems and equipment:
  + are tested for normal operations on a routine basis;
  + meet the required level of reliability and availability as defined by the State authority;
  + provide for the timely and appropriate detection and warning of system failures and degradations;
  + include documentation on the consequences of system, subsystem, and equipment failures and degradations;
  + include measures to control the probability of failures and degradations;
  + include adequate backup facilities and/or procedures in the event of a system failure or degradation; and
* detailed records of systems and equipment serviceability are kept and periodically reviewed.

Note.— In the context above, the terms reliability and availability have the following meanings:

* 1. Reliability. The probability that a device or system will function without failure over a specified time period or amount of usage; and
  2. Availability. The ratio of percentage of the time that a system is operating correctly to the total time in that period.

ATSIs may monitor *licensing and training issues* to ensure that:

* controllers are adequately trained and properly licensed with valid ratings;
* controller competency is maintained by adequate and appropriate refresher training, including the handling of aircraft emergencies and operations under conditions with failed and degraded facilities and systems;
* controllers, where the ATC unit/control sector is staffed by teams, are provided relevant and adequate training in order to ensure efficient teamwork;
* the implementation of new or amended procedures, and new or updated communications, surveillance, and other safety significant systems and equipment is preceded by appropriate training and instruction;
* controller competency in the English language is satisfactory in relation to providing ATS to international air traffic; and
* standard phraseology is used.

**Pre-Audit Team Briefing**

|  |  |
| --- | --- |
|  | **YES NO NA** |
| 1. Confirm audit objective, scope, focus areas, dates, and locations. | □ □ □ |
| 2. Confirm transportation, lodging, and logistics. | □ □ □ |
| 3. Identify estimated timetables for the opening and closing Meetings with the facilities. | □ □ □ |
| 4. Confirm plans for first contact with facility managers. | □ □ □ |
| 5. Confirm team members’ roles, responsibilities, and audit techniques. | □ □ □ |
| 6. Ensure that audit work documents and team folders are complete. | □ □ □ |
| 7. Discuss how to handle conflict resolution:   * + Present issues to team lead   + Team lead makes final decision and communicates to all concerned | □ □ □ |
| 8. Ensure that all team members are aware of the following:   * proper auditor conduct and ethical considerations * care in handling facility-supplied materials * storage and protection of audit materials * issues of confidentiality * issues involving conflict of interest * appropriate dress, cell phone usage (turn off or set vibrate during the audit), and responding to inquiries | □ □ □ |
| 9. Remind auditors to bring:   * team folder * Identification and ATSI credential (if auditor has one) * notebook and pen | □ □ □ |

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| Audit Team Lead: | |  | |  | Date: |  |
| Audit Number: | \_\_\_\_\_\_ - \_\_\_\_\_\_ | |

**Initial Telephone Meeting Checklist (Virtual Audit Only)**

Most virtual audits will include discussions with facility/location management. The Audit Team Lead is responsible for leading the initial contact and accomplishing the following:

|  |  |  |  |
| --- | --- | --- | --- |
|  | | **YES NO NA** | |
| 1. Introduce audit team members to the audited party (if included in the meeting). | | □ □ □ | |
| 2. State the audit objective, scope, and focus areas. Inform the audited party that the scope may be expanded if warranted. | | □ □ □ | |
| 3. Discuss how the audit will be conducted – examples include the following:   * Review records/documentation/etc. requested in the Audit Notification; and * Interview/question management or designees by telephone/email. | | □ □ □ | |
| 4. Provide your contact information and advise that questions are welcome anytime. | | □ □ □ | |
| 5. Discuss how information will be exchanged (phone/email/etc.) and any point(s) of contact if the manager elects to delegate communications. | | □ □ □ | |
| 6. Explain that information from all audit locations will be consolidated (system audit) and rolled up into a final report. | | □ □ □ | |
| 7. Explain that the final report will be distributed to the ANSP safety office and to each facility/location manager.   * Facility/location specific observation information will be provided to each facility/location; and * An opportunity to provide feedback will also be included. | | □ □ □ | |
| 8. Confirm audit timetables and other logistics:   * Confirm times and dates of any future telephone meetings; and * Ensure that personnel are available for all tasks. | | □ □ □ | |
| 9. Reiterate any additional information needed from the facility/location. | | □ □ □ | |
| 10. Record attendees on the attendance sheet. | | □ □ □ | |

Audit Team Lead: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ Date: \_\_\_\_\_\_\_\_\_\_\_\_\_\_

Audit Number: \_\_\_\_\_\_ - \_\_\_\_\_\_\_ Facility/Location: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

**Initial Communication with Point of Contact Checklist (On-Site Only)**

A phone/email meeting will be held with the audited party’s Point of Contact (POC), prior to the audit start date. The Audit Team Lead should relay and gather the following information/requests to the POC:

**Yes No N/A**

1. Relay the following audit information:

* Estimated On-Site Arrival Time □ □ □
* Estimated Opening and Closing Meeting Times □ □ □
* Estimated Monitoring Time □ □ □

1. Relay the following audit requests:

* Conference Room w/ Telephone and Internet access □ □ □
* Other Needs (Headsets, scope for monitoring, etc.) □ □ □

1. Gather the following information:

* Directions to Facility and for Facility Access □ □ □
* On-site POC, if different (POC for facility access, etc.) □ □ □

For questions by the POC about specifics of the audit, answer questions via information in the Notification.

Audit Team Lead: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ Date: \_\_\_\_\_\_\_\_\_\_\_\_\_\_

Audit Number: \_\_\_\_\_\_ - \_\_\_\_\_\_ Facility/Location: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

**Opening Meeting (On-Site Only)**

An opening meeting will be held with facility/location management and/or those responsible for the requirements or procedures to be audited. The Audit Team Lead is responsible for leading the opening meeting and accomplishing the following:

|  |  |
| --- | --- |
|  | **YES NO NA** |
| 1. Introduce audit team members to the audited party. | □ □ □ |
| 2. State the audit objective, scope, and focus areas. Inform the audited party that the scope may be expanded if warranted. | □ □ □ |
| 3. Discuss how the audit will be conducted ‑ Auditors will:   * Review requirements, records, and interview management; * Observe operational procedures and personnel; and/or * Take notes and gather/document objective evidence. | □ □ □ |
| 4. Inform that location-specific audit results will be provided verbally at the closing meeting. | □ □ □ |
| 5. Confirm audit timetables and other logistics:   * Confirm times and dates of briefings and closing meeting; * Ensure that personnel are available for all tasks; and * Ensure a conference room or area with telephone and internet access is provided for the audit team’s use during the audit. | □ □ □ |
| 6. Identify audited party’s point(s) of contact. | □ □ □ |
| 7. Inquire about on-site safety, emergency, and security procedures. | □ □ □ |
| 8. Ensure that everyone at the meeting signs the attendance sheet. | □ □ □ |

Audit Team Lead: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ Date: \_\_\_\_\_\_\_\_\_\_\_\_\_\_

Audit Number: \_\_\_\_\_\_ - \_\_\_\_\_\_\_ Facility/Location: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

**Closing Meeting (On-Site or Virtual)**

Closing meeting attendees should include management personnel and those invited by management personnel. Explain the results of the audit simply and concisely. Make sure the audited party understands.

|  |  |
| --- | --- |
|  | **YES NO NA** |
| 1. Express appreciation to the facility personnel for their cooperation and assistance. | □ □ □ |
| 2. Reiterate the audit objective, scope, and focus areas. | □ □ □ |
| 3. Describe the verification methods used during the audit. | □ □ □ |
| 1. Review the results of the audit. For example, explain:    * the positive aspects of the audit;    * observations;    * location-specific noncompliance and safety critical issues; and    * that data from all audited locations will be consolidated (system audit). | □ □ □ |
| 1. Explain that the final report will be distributed to the ANSP safety office and to each facility/location manager. The ANSP will be notified if additional information is needed. | □ □ □ |
| 6. Close out any logistics and security matters. | □ □ □ |
| 7. Ensure everyone at the meeting signs the attendance sheet, or record attendees when conducting closing meeting for a virtual audit. | □ □ □ |

Audit Team Lead: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ Date: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

Audit Number: \_\_\_\_\_\_ - \_\_\_\_\_\_ Facility/Location: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

**Opening and Closing Meeting Attendance**

Opening Meeting: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ Closing Meeting: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

Audit Number: \_\_\_\_\_\_ - \_\_\_\_\_\_ Facility/Location: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

| **Name** | **Organization** | **Contact Number** | **Opening**  **Meeting** | **Closing**  **Meeting** |
| --- | --- | --- | --- | --- |
|  |  |  |  |  |
|  |  |  |  |  |
|  |  |  |  |  |
|  |  |  |  |  |
|  |  |  |  |  |
|  |  |  |  |  |
|  |  |  |  |  |
|  |  |  |  |  |
|  |  |  |  |  |
|  |  |  |  |  |
|  |  |  |  |  |
|  |  |  |  |  |
|  |  |  |  |  |

**USE SEPARATE SHEET FOR EACH FACILITY/LOCATION VISITED**

1. This handbook is structured according to International Civil Aviation Organization standards and recommended practices, as well as concepts currently used by the U.S. Federal Aviation Administration Air Traffic Safety Oversight Service to provide independent safety oversight of Air Navigation Service Providers. Adoption or use of this handbook does not guarantee compliance with any international standards. [↑](#footnote-ref-2)
2. The ATS oversight organization may be part of a larger Civil Aviation Authority, or it may be an independent entity. [↑](#footnote-ref-3)
3. The Safety Management International Collaboration Group has developed SMS Inspector Competency Guidance, which may be useful to ATS oversight organization in determining important SMS competencies for inspectors and developing a competency framework. [↑](#footnote-ref-4)
4. The Safety Policy Statement included in this handbook is excerpted from the ICAO Safety Oversight Manual (Doc 9859). [↑](#footnote-ref-5)
5. An example SMS manual is available at Appendix B to this handbook. [↑](#footnote-ref-6)
6. This list of responsibilities should be amended to reflect the responsibilities assigned to ATSIs in individual ATS oversight organizations. Additional responsibilities may include, for example, safety data collection and analysis. [↑](#footnote-ref-7)
7. Annex 1 to the Convention on International Civil Aviation does not establish International Standards and Recommended Practices for licensing ATSEP or Aeronautical Information Specialists. However, the U.S. Federal Aviation Administration (FAA) issues licenses to both ATSEP and Aeronautical Information Specialists and they are included here as examples that may be customized as appropriate for the aviation system. [↑](#footnote-ref-8)
8. See footnote 7, above. The FAA includes the above list of ratings in its ATSEP licensing program for Airway Transportation Systems Specialists. [↑](#footnote-ref-9)
9. See footnote 7, above. The FAA includes the above list of ratings in its licensing program for Aeronautical Information Specialists. [↑](#footnote-ref-10)
10. ATS oversight organizations may want to review and approve, at a minimum, the following: general ANSP risk assessment techniques and risk management strategies; proposed changes to air traffic separation standards; ANSP risk management strategies for future systems; controls for initial high-risk hazards and mitigations for medium and low-risk hazards; changes to ANSP training standards for ATC functions; and new or changed procedures. [↑](#footnote-ref-11)
11. This handbook suggests that ATS oversight organizations utilize, where possible, a performance-based, risk-focused, data-supported system of oversight to ensure that the ANSP(s) follows operational requirements. [↑](#footnote-ref-12)
12. Potential monitoring items include, but are not limited to: ANSP organization, equipment maintenance and availability, maintenance and ATS operation and technical manuals, and personnel and training. [↑](#footnote-ref-13)
13. This example list of reportable occurrences is excerpted from the ICAO Safety Oversight Manual (Doc 9859). [↑](#footnote-ref-14)
14. The above list of performance indicators was developed and agreed for oceanic airspace by the ICAO North Atlantic region. Indicators should be selected based on the characteristics, such as maturity and complexity, of the airspace system. Other possible safety performance indicators include, but are not limited to: missed approaches and runway overruns. [↑](#footnote-ref-15)