SMS Manual

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Control Page

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Reissue

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10/1/2019

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Record of Revisions and Changes

When necessary, the ***STAR** Flight* Safety Officer will develop changes or revisions to the ***STAR** Flight* Safety Management System manual. When a change or revision is posted it will be recorded on the Record of Revisions and Changes data sheet below. If a change, the "change front page" will be posted immediately behind this record:

Revision #	Rev. Effective Date	Change #	Change Effective Date	Inserted By
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Distribution List

Copy #	Copy Location	Date Issued
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2	Program Director	10/01/19 (electronic)
3	Director of Operations	10/01/19 (electronic)
4	Director of Maintenance	10/01/19 (electronic)
5	Chief Pilot	10/01/19 (electronic)
6	Maintenance Tech Office	10/01/19 (electronic)
7	Flt Ops – DSMC	10/01/19
8	Flt Ops – Hangar	10/01/19
9	Flt Ops - DCMC	10/01/19
10	Chief Medical Supervisor	10/01/19 (electronic)
11	Chief Clinical Supervisor	10/01/19 (electronic)
12	Safety Board	10/01/19

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SMS MANUAL INTRODUCTION

1. GENERAL INFORMATION

A. BACKGROUND

Travis County ***STAR*** *Flight's* transition to a Safety Management System (SMS) provides a new way of approaching our business. Top management has dictated that the policies contained in this manual will be incorporated into our daily operations. This SMS will permeate all facets and departments of our organization.

Travis County ***STAR*** *Flight* transitioned to organized official SMS program in 2008. Development of this SMS format and its content began in 2012 in an attempt to meet the FAA format of 2010 and enter the voluntary SMS project certification program.

The goal of our SMS is to establish a level of safety in our organization that goes beyond the traditional regulatory minimums. The policies documented in this manual have been carefully planned to produce this result. These policies and their associated outputs will be documented, monitored, measured, and analyzed to ensure that we achieve our safety targets and goals. All organizational departments, both managers and employees, will be held accountable for the implementation of the policies contained in this manual.

B. SMS MANUAL AND SUPPORTING PROGRAMS

This SMS Manual sets forth instructions and guidance to all personnel regarding their responsibilities, authorities and the proper performance of duties as they pertain to the company's Safety Management System. Additional programs which support the SMS are hereby incorporated by reference, and are maintained and revised under separate cover or as an appendix to this SMS Manual:

- Risk Management Program
- Internal Evaluation Program
- Event Investigation Program
- Emergency Response Plan
- Laser Exposure Guide
- Fatigue Management and Sleep Deprivation Program
- Safety Stand Down Program

C. INTERGRATED SAFETY AND QUALITY MANAGEMENT

STAR *Flight's* Safety Management System contains an integrated Quality Management Program. Through clear statements of safety and quality policy, employee training and open reporting, systems of safety

management and quality management are integrated with a common interface. With this approach, both safety and quality issues may be managed, tracked, and reported on for purposes of trend analysis and continuous improvement.

2. SMS FRAMEWORK

A. STRUCTURE

Section titles and numbers of this SMS Manual correspond to the SMS components of the FAA's SMS Framework Guide. Paragraphs and numbers also correspond to the SMS Framework Guide's elements and numbers, and sub-paragraphs correspond to the Guide's processes. The structure of this SMS Manual produces a user-friendly, auditable and standardized format, in alignment with both ICAO and FAA Frameworks.

B. SAFETY ATTRIBUTES

System Safety Attributes have been incorporated into the SMS Manual to ensure process outcomes and address SMS process interrelationships. Safety attributes include those of Responsibility and Authority. Procedures specify how an activity or process is accomplished. Controls help to ensure that procedures are followed and processes are satisfactorily completed. Many of these controls are contained in the ***STAR*** *Flight* Hazard ID/Occurrence Report database (ARGUS/PRISM). Process measures permit management to see how well various systems and processes are functioning, and to measure their success. Interfaces define input-output relationships between the activities of various processes, which include procedures, documentation, and flows of authority/responsibility/communication. These interfaces may involve lines of authority between departments, interactions between employees, departments and contractors, and consistency of procedures contained in written guidance. With regard to SMS activities, interfaces are the "Inputs" and "Outputs" of the process.

3. OVERVIEW OF SMS PROCESSES

SMS processes are performed under the components of Safety Risk Management, Safety Assurance, and Safety Promotion. The following descriptions of SMS processes within each component provide an overview of the ***STAR*** *Flight* Safety Management System, and how it's designed to operate.

A. SAFETY RISK MANAGEMENT

System design (and existing system analysis) – The first step in Safety Risk Management (SRM) is to develop system and task descriptions for analysis. Here, the analysis needs to be only as extensive as needed to understand the processes in enough detail to:

- Develop procedures;
- Design appropriate training curricula;

- Identify hazards; and
- Measure performance.

Hazard identification – Next, operational processes are examined and Hazard Identification Tools are utilized to determine what could go wrong with operational processes (under normal and abnormal operational conditions) that could be considered hazardous. This is how hazards are identified. Hazard ID tools may be found in the ***STAR*** *Flight* Risk Management Program.

Risk analysis – When hazards are identified, they are then analyzed for their injury and damage potentials. Each hazard is analyzed in terms of likelihood of occurrence, and severity of resulting consequences. Exposure may also be considered, in terms of time, cycles, distance, and number of people or number of aircraft involved. This process is performed using the ***STAR*** *Flight* Risk Management Program.

Risk assessment – Risk assessment is a decision step based on combined levels of severity and likelihood (and exposure, if desired). Is the risk acceptable? If so, the overall level of risk is recorded and operations commence, resume, or continue. If the level of risk is unacceptable, risk controls and/or corrective actions may be needed, in order to bring risk down to an acceptable level.

Risk control – If one or more risks are unacceptable, risk controls and corrective actions must be developed and implemented. Most often, these entail either new processes or equipment, or changes to existing ones. Corrective actions typically eliminate or transfer risk in such a way that monitoring is not required. Risk controls typically require monitoring to ensure they are effective. The system is then evaluated with the proposed controls in place to see if the level of risk is now acceptable – this is called residual risk. Initial monitoring and a follow-up audit of each specific control are then performed, until it is determined that all identified risks for the proposed operation, change, etc... have been either accepted or mitigated to acceptable levels. The processes are also performed by managers using the ***STAR*** *Flight* Risk Management Program.

If initial monitoring and a follow-up audit of each specific risk control indicate conformance and effectiveness of the control, Safety Risk Management processes are complete and the system is ready for operation.

NOTE: Related system documentation may need to be updated to reflect the risk controls that have been put in place.

From here, Safety Assurance (SA) processes are performed that include continuous monitoring, internal audits, external audits, internal evaluations, and management reviews. These processes determine regulatory compliance, conformity, and effectiveness of all risk controls. They also measure the performance of processes, and of the SMS itself.

B. SAFETY ASSURANCE

System operation – During system operation, monitoring and measurements of risk controls are critical to maintaining the high level of safety established by Safety Risk Management activities. This monitoring, measurement, and management of information and data acquired is accomplished using the safety assurance processes described below.

Data acquisition – Data is obtained from continuous monitoring of operational processes (e.g. dispatch procedures, observance of training activities, maintenance performed), internal audits, internal evaluations, and employee reports. Data is also obtained from event investigations. This data is needed to confirm regulatory compliance, and to test and confirm conformance with, and the effectiveness of, risk controls.

Analysis of data – As in Safety Risk Management, data must be analyzed in terms of performance objectives, and to determine the root causes of any shortfalls. Managers must also remain vigilant for any new conditions (hazards) that haven't appeared before, as well as unexpected results of system performance. Analysis of data produces outputs of identified hazards and root causes of deficiencies.

System assessment – The assessment process is one in which decisions are made. If assessment results are satisfactory, then monitoring, measurement and analysis of data continues and management continuously affirms that operational processes, as well as SMS processes, are producing desired results. If assessment results reveal risk control or system deficiencies, those deficiencies and non-conforming or ineffective risk controls go back into Safety Risk Management for correction.

Preventive/Corrective action – When system assessment indicates that a system or operational process is not in conformance with established risk controls, corrections must be made to eliminate the causes of nonconformance. This does not require the same level of detail used in initial design. Often the corrective action needed is straightforward. If an existing risk control is not conforming or performing properly, it is "reopened" in the Hazard ID/Occurrence database for correction or improvement. If new hazards are found, they are recorded in the database and managed through Safety Risk Management processes. If a system needs to be changed, the Program Director or appropriate supervisor implements the necessary change with the assistance of the Safety Officer/Safety Risk Management Committee (SRMC).

Management review – The management review process looks at outputs of various quality management, safety risk management, safety assurance, and safety promotion activities. These SMS process outputs are specified for each process in Component 1 – Safety Policy and Objectives of this SMS Manual, and provide objective evidence of SMS performance. Top management uses the results of these reviews to determine whether any improvements are needed to SMS processes, and/or to operational processes within the organization.

NOTE: Sometimes, despite the efforts of all personnel and proper performance of their duties, risk is still not adequately being controlled (conditions may have changed so that the original control no longer is

appropriate). This can occur due to changes in contracts, changes to airports, new equipment, changing demographics of employee hiring pools, or a variety of new conditions. At any rate, when new and/or uncontrolled hazards are identified, the SRM process is again used to re-design system aspects (e.g. new procedures, training, etc.), or develop new risk controls.

C. SAFETY PROMOTION

Safety Promotion processes and activities provide support for all other SMS processes through clear communications of safety and quality policy, and management's commitment to safety. Visible demonstration of this commitment to the SMS is also necessary in order to develop and improve the organization's positive safety culture. Safety promotion includes establishing competency requirements for safety-related positions, and training and qualification for personnel. This training aids personnel in understanding the SMS and its importance to safety and efficiency. Conveyance of lessons learned also keeps personnel informed and enhances overall organizational safety.

D. SAFETY CULTURE

Safety culture has been defined as: "An organization's values, beliefs, legends, rituals, mission goals, performance measures, and sense of responsibility to its employees, customers, and the community." Our culture consists of psychological (how people think), behavioral (how people act), and organizational elements.

It is the intention of top management to institute a positive safety culture in our organization. In order to accomplish this all staff must be responsible for, and consider the impact of, safety on everything they do. This way of thinking must be so deep-rooted that it truly becomes our "corporate culture." All decisions, whether by the Program Director or a new-hire employee, must consider the implications on safety. This culture will set the boundaries for acceptable behavior in our organization. Every person associated with this organization must understand that, "This is how we do things here!"

The SMS policies in this manual have been designed to promote a positive safety culture in the four areas discussed below. Any observed deviations from these cultural norms should be reported to Management and the Safety Officer.

a. **Informed culture**. Management intends to foster a culture where people understand the hazards and risks inherent in their areas of operation. Personnel are provided with the necessary knowledge, skills and job experience to work safely, and they are encouraged to identify the threats to their safety and to seek the changes necessary to overcome them.

b. **Learning culture**. Learning in this organization is seen as more than a requirement for initial

skills training; rather it is valued as a lifetime process. People are encouraged to develop and apply their own skills and knowledge to enhance organizational safety. Staff are updated on

safety issues by management, and safety reports are fed back to staff so that everyone can learn the pertinent safety lessons.

c. **Reporting culture**. Managers and operational personnel freely share critical safety information without the threat of punitive action. Personnel are able to report hazards or safety concerns as they become aware of them, without fear of sanction or embarrassment.

d. **Just culture.** While a non-punitive environment is fundamental for a good reporting culture, all employees must know what is acceptable and what unacceptable behavior is. Negligence or deliberate violations will not be tolerated in this organization, even in our non-punitive environment. Our just culture recognizes that, in certain circumstances, there may be a need for punitive action and management will define the line between acceptable and unacceptable actions or activities.

Our safety culture is the product of our personal dedication and accountability to our employees. Individual efforts alone do not necessarily result in the desired outcome. Our organization realizes that a positive safety culture only develops with an aggregate attitude that is manifested by a pervasive type of safety thinking. This type of organizational thinking will permit our employees to have an inherently questioning attitude, a resistance to complacency, a commitment to excellence, and a sense of personal accountability. Our top management provides a vibrant, encouraging atmosphere in which individual growth is recognized and rewarded.

4. SCOPE OF SAFETY AND QUALITY MANAGEMENT

Our organization is dedicated to the principles of quality management, quality assurance and the continuous improvement cycle. In much the same way that SMS facilitates continuous improvements in safety, quality assurance ensures process control and regulatory compliance through constant verification and upgrading of the system. These objectives are achieved through the application of similar tools: Internal and external audits, strict document controls and on-going monitoring of correctives.

To a large extent, controls are built into the design of a Safety Management System. The internal evaluation function of the safety assurance component calls for evaluations “at

planned intervals" of SMS conformance to objectives and expectations. Each of the outputs also has a method of measurement specified by the organization; "SMS processes will be…measured…" measures need not be quantitative where this is not practical. All that should

be expected is some method of providing objective evidence of the attainment of the expectation.

Note that there is a relationship between controls and process measures. That is, the internal evaluation process is the method of controlling the processes, through the associated data collection, analysis, assessment, and corrective action processes. The individual outputs are the content of the measures.

Finally, management reviews are the means of making sure that the appropriate levels of responsibility and authority are brought into the process and that management can be accountable in a proactive way, rather than an after-the-fact attribution.

***STAR** Flight* provides both safety and quality management covering the complete scope and life cycle of all systems and operational processes, including:

- Flight Operations;
- Operational Control (Dispatch / Flight Following);
- Maintenance and Inspection; including
- Parts/materials;
- Resource management;
- Technical data;
- Quality control;
- Records management;
- Contract maintenance;
- Cabin Safety;
- Security;
- Ground Handling and Servicing;
- Cargo Handling;
- Training of all Personnel.

Within each of these systems, operational processes are documented, monitored, measured and analyzed. ***STAR** Flight* provides all personnel and managers with procedures, instructions, guidance and training in order to perform these operational processes with the highest degree of safety.

5. *STAR FLIGHT* HAZARD ID/OCCURRENCE REPORT DATABASE

Many of ***STAR** Flight's* Safety Risk Management and Safety Assurance processes are performed using the ***STAR** Flight* Hazard ID/Occurrence Report database (located as a tool within the ARGUS/PRISM SMS application) and this SMS Manual and supporting programs. This database is used by managers to document quality escapes identified in all operational processes, and to perform, document and track quality management activities which result in continuous

improvement. The database also serves as an Employee Reporting System (ERS) for the reporting of errors and quality escapes, in addition to safety-related reports of hazards, events, and other safety or quality concerns. ***STAR** Flight* managers use the database to record, track and manage hazards identified through system/task analysis and the management of change. The database is also used to analyze, assess, control and manage safety risks (including substitute and residual risk), document responsibilities for the monitoring of risk controls, and to manage audit findings and internal/external evaluation findings. Other tasks performed using the database include development of corrective action plans (CAP), development of processes (for both quality and safety issues), CAP acceptance by the appropriate risk-decision authority, and assignment of individual risk controls and corrective actions to specific individuals.

6. TECHNICAL MANAGEMENT SYSTEM

A. OVERVIEW

STAR** Flight's* Technical Management System (TMS) provides a method of managing controlled documents, manuals, and programs, in order to ensure the availability and use of current and revised policies and procedures. The Technical Management System also ensures a minimum standard of compliance with applicable rules, regulations and requirements for the conduct of all ***STAR Flight aviation activities. This includes identification and tracking of all applicable laws, regulations and standards, including approvals, authorizations, exemptions and permitted deviations.

B. RESPONSIBILITIES FOR TECHNICAL MANAGEMENT

***STAR** Flight* managers are responsible and accountable for ensuring compliance with all applicable laws and regulations which apply to the operational processes they own. This includes the accomplishment of:

- Safety management processes and recordkeeping;
- Specific sections of the ***STAR** Flight* Statement of Compliance (SOC);
- Assignment/availability of manuals, programs and other technical information which comprise the ***STAR** Flight* manual system.

Managers are further responsible and accountable for ensuring that all personnel are provided with easily accessible written guidance and technical publications, and for the continued revision and control of all documents within their respective areas.

C. APPLICABLE LAWS & REGULATIONS

The following documents and sources of information specify applicable regulations with which ***STAR** Flight* must comply:

- Manual System - The ***STAR** Flight* manual system contains references to regulations with which ***STAR** Flight* must comply.
- Operations Specifications - ***STAR** Flight* Operations Specifications (Ops Specs) as issued by FAA also require full compliance as part of ***STAR** Flight's* minimum standard. Operations Specifications are included in the manual system.
- Contractual Requirements - Contract requirements and specifications are considered minimum standards for ***STAR** Flight's* contractual operations, which are incorporated into written guidance.
- Standards & Best Practices - ***STAR** Flight* utilizes ICAO Standards and recommended practices as guidance for the development of policies, procedures, standards and best practices. These internationally accepted standards are incorporated throughout the ***STAR** Flight* manual system and other written guidance.
- OSHA Requirements - Occupational Health and Safety requirements are used as a guide for minimum standards for worker safety and facility requirements.
- Statement of Compliance - ***STAR** Flight* maintains a Statement of Compliance (SOC) as its primary means of identifying and documenting all current applicable regulations with which it must comply.

The Statement of Compliance may be divided into sections (such as Federal Aviation Regulations), and each of these sections may be further divided into those rules for which each department is responsible. For example, under the Federal Aviation Regulations, the Director of Operations is responsible for ensuring compliance with applicable FARs pertaining to flight operations and dispatch/flight following. Likewise, the Director of Maintenance is responsible for compliance with applicable FARs that pertain to aircraft maintenance and continued airworthiness.

D. MANUAL SYSTEM

***STAR** Flight's* manual system contains general policies, regulatory requirements, aircraft operating instructions and maintenance procedures. Technical data such as manufacturers' manuals and other aeronautical information is also incorporated into the manual system by

reference. Department managers are responsible for accomplishing their respective portions of the ***STAR*** *Flight* manual system, as specified in each manager's duties and responsibilities.

E. OPERATIONS MANUALS & INFORMATION

The Director of Operations is responsible for accomplishment of all manuals, programs, aeronautical information and other documents relating to flight operations.

F. MAINTENANCE MANUALS & INFORMATION

The Director of Maintenance is responsible for the accomplishment of all manuals, programs, technical data and information related to the performance of maintenance and continued airworthiness of all ***STAR Flight*** aircraft.

G. SMS MANUAL, SUPPORTING PROGRAMS & INFORMATION

The safety officer is responsible for accomplishment of the SMS manual and supporting programs. The safety officer makes current versions of all relevant documents available at locations where operations essential to the effective functioning of the SMS are performed, and obsolete documents are promptly removed from all points of use. Each page of this SMS Manual and all supporting programs and forms contain controls at the bottom of each page to ensure against use of obsolete information. Obsolete documents and forms are removed from service and destroyed, to prevent unintentional use.

NOTE: *Accomplishment* refers to management, administration and revision of documents. This is not to be confused with the various duties and responsibilities of managers regarding ***STAR*** *Flight's* Safety Management System.

H. DOCUMENT ASSIGNMENT

Control of manual assignment and distribution is provided by means of a dedicated filing system. All printed copies of controlled ***STAR Flight*** manuals, programs and documents have their own unique serial numbers as shown on each document's Cover Page. Department managers are responsible for maintaining their respective Document Custody and Revision Control Files. These files are located in the offices of the ***STAR Flight*** principal base of operations. Each person assigned a controlled document is responsible for the continued revision, safekeeping and availability of that document.

NOTE: If a manager desires to make a controlled document available to all personnel within his/her department, that manager is responsible for the continued revision, safekeeping and availability of the document to all applicable personnel within the department.

I. PROPOSED CHANGES

The Safety Risk Management Committee (SRMC) conducts regular meetings to review all proposed changes to the ***STAR** Flight* manual system. Those proposals that are deemed practical and worthy of incorporation are further evaluated for any potential conflicts between processes and interfaces with other manuals. Changes which the SRMC accepts are assigned to appropriate managers for formal revision.

Constructive changes to the manual system are welcomed. Managers should encourage change proposals from all employees, vendors, and FAA personnel. Change proposals may be

submitted to any manager or the safety officer. When a change proposal is received, managers/safety officer shall:

- Promptly review all proposed changes for general familiarization, and to determine if a safety issue exists;
- Retain and file each proposed change received;
- Bring all proposed changes to each SRMC meeting for evaluation;
- When a manager receives a proposed change, if initial review reveals a potential regulatory or safety issue, that manager is authorized to: Contact one or more other knowledgeable managers for a second opinion, regulatory research or additional information;
- Convene an emergency meeting of the SRMC, if necessary.

If a regulatory issue does not pose an immediate hazard (for example, an incorrect regulatory reference), and can be corrected by manual revision, the SRMC may hold the change until the next program revision. If however a safety issue exists, the SRMC shall take any immediate actions required in the interest of safety and thereafter perform Safety Risk Management using the Hazard ID/Occurrence database.

NOTE: Unless a regulatory or safety issue exists, proposed changes are often held for incorporation into the next revision of a manual or program.

All proposed changes should be retained by department managers for no less than one year. As a courtesy, all proposed changes that are not accepted by the SRMC should be copied and returned (if possible) to the person who proposed the change, with a brief reason as to why the change was not accepted.

J. REVISION CONSIDERATIONS

Revisions to ***STAR** Flight* manuals, programs and other documents may be necessary whenever:

- Changes occur in management structure and/or staff;
- Changes occur in address, facility location(s), contact phone numbers or email addresses;
- Changes occur in Emergency Response Plan contact information;
- The organization adds different aircraft types, equipment or geographic areas of operation;
- Regulatory changes necessitate a revision, including:
- FAA Regulations
- Regulations of Foreign Authorities

K. REVISION INTERFACES

Department managers present drafts of all proposed manual revisions to appropriate SRMC members for review and comment. Revision coordination is necessary to ensure that written guidance remains consistent and accurate between other programs and manuals within the ***STAR*** *Flight* manual system. Email, individual consultation or SRMC meeting may accomplish this coordination. Appropriate managers should review the draft, and are responsible for ensuring that the proposed revision:

- Does not conflict with other policies and procedures under that manager's areas of responsibility.
- Does not require revision to other manuals or programs that are accomplished by that manager.

In the event a conflict exists, either the proposed revision will be modified or the other affected manuals and/or programs within the manual system shall be corrected. Should the proposed revision prompt or dictate a revision to other manuals or programs within the ***STAR Flight*** manual system, the SRMC member responsible for accomplishment of such manuals or programs shall promptly make such required revisions using the same review process. Upon satisfactory review and coordination by appropriate SRMC members, revisions will be formalized and distributed.

7. DEFINITIONS

The following terms are used throughout this SMS Manual and supporting programs:

Accident – an unplanned event or series of events that results in death, injury, occupational illness, damage to or loss of equipment or property, or damage to the environment.

Accident / Incident (Ground) – An occurrence that involves damage to ***STAR*** *Flight* aircraft, property, or personnel when no intent for flight exists. This can be damage or injury incurred while towing an aircraft, driving a vehicle, or falling down stairs, but is not limited to these events.

Aircraft Accident (NTSB 830.2 definition) means an occurrence associated with the operation of an aircraft which takes place between the time any person boards the aircraft with the intention of flight and all such persons have disembarked, and in which any person suffers death or serious injury, or in which the aircraft receives substantial damage.

Aircraft Incident (NTSB 830.2 definition) means an occurrence other than an accident, associated with the operation of an aircraft, which affects or could affect the safety of operations.

Aircraft (reportable) means an accident that must be reported to NTSB.

Analysis – the process of identifying a question or issue to be addressed, modeling the issue, investigating model results, interpreting the results, and possibly making a recommendation. Analysis may involve using scientific or mathematical methods for evaluation.

Assessment – process of measuring or judging the value or level of something.

- Risk Assessment – a quantifiable measurement of risk based on variables of exposure, severity and likelihood.
- System Assessment – a safety assurance process in which the performance of safety-related functions of operational processes area assessed against the objectives and expectations of those processes, and in which the performance of the SMS is assessed against its objectives and expectations.
- External Assessment – refers to an external audit by an oversight organization (e.g., FAA).
- Attributes (System Safety) – first applied in the Air Transportation Oversight System (ATOS), System Safety Attributes, or System Attributes, are design criteria for written guidance, intended to ensure process outcomes. They form the basis for many SMS expectations.
- Responsibility – who is accountable for management and overall quality of a process (planning, organizing, directing, controlling) and its ultimate accomplishment.
- Authority – who can direct, control, or change the process, as well as who can make key decisions such as risk acceptance. This attribute also includes fiscal authority and the concept of empowerment.
- Procedures – documented activities to accomplish various processes. ISO-9000-2000 defines procedure as “a specified way to carry out an activity or a process”. Procedures translate the “what” in goals and objectives into “how” in practical activities (things people do).
- Controls – checks and restraints designed into a process to ensure a desired result. Safety assurance activities of continuous monitoring, internal audits, internal evaluations, and management reviews, are examples of SMS controls.

- Other practices such as documentation, process reviews, and data tracking are also considered controls with respect to specific elements and processes.
- Process Measures – quantitative or qualitative measurements of process outputs, for the purpose of measuring the effectiveness of such processes. With regard to SMS, internal evaluations (which measure SMS process outputs) and management reviews are good examples of process measures.
- Interfaces – input-output relationships between the activities of various processes, which include procedures, documentation, and flows of authority / responsibility / communication. These interfaces may involve lines of authority between departments, interactions between employees, different departments and contractors, and consistency of procedures within written guidance. With regard to SMS activities, interfaces are the "Inputs" and "Outputs" of a process.

Audit – scheduled, formal reviews and verifications to evaluate compliance with policy, standards, regulations, and/or contractual requirements. The starting point for an audit is the management and operations of the organization, and it moves outward to the organization's activities and products/services.

- Internal audit – an audit conducted internally, by the organization being audited. In the context of this SMS Manual and supporting programs, internal audits are also referred to as departmental audits, wherein departments (e.g., flight operations, maintenance) audit themselves internally for regulatory compliance and other criteria.
- External audit – an audit conducted by an entity outside of the organization being audited. External audits by oversight organizations such as FAA are referred to as an assessment.
- Vendor audit – an audit performed to assure the quality of products and services received from a vendor or contractor.
- Follow-up audit – an audit conducted to determine the effectiveness of a risk control or corrective action that has been implemented.

Aviation system – the functional operation/production system used by an organization to produce a product or service. A "system" includes equipment, technology, personnel, managers and the working environment.

Causes - causes may be natural or man-made, active or passive, initiating or permitting, obvious or hidden. Those causes that lead immediately to an effect or outcome are often called direct causes. Direct causes often result from another set of causes, which could be called intermediate causes, and these may be the result of still other causes. When a chain of cause and effect is followed from a known effect or outcome, back to an origin or starting point, *Root Causes* are found. The process used to find root causes is called *Root Cause Analysis*.

Complete – nothing has been omitted and the attributes stated are essential and appropriate to the level of detail.

Conformity – fulfillment of a requirement (ref. ISO 9000-2000). This includes but is not limited to compliance with Federal regulations. It also includes company requirements, requirements of operator developed risk controls or operator specified policies and procedures.

Continual improvement – implementation of carefully analyzed corrective actions, and process measurement of those actions to ensure satisfactory process outputs; communication of lessons learned and further application of corrective actions to further improve processes and their outputs.

Continuous monitoring – uninterrupted watchfulness over the system.

Controls – are checks and restraints designed into a process to ensure a desired result.

Correct – accurately reflects the item with an absence of ambiguity or error in its attributes.

Corrective action – action to eliminate or mitigate the cause or reduce the effects of a detected nonconformity or other undesirable situation.

Corrective Action Plan (CAP) – one or more risk controls and/or corrective actions, which include follow-up inspection(s) and may include communication of lessons learned, which are documented and accepted by the appropriate risk decision authority, and implemented by persons who are assigned responsibility and accountability for their proper implementation.

Criteria – an accepted standard used in making a decision or judgment about something.

Documentation – information or meaningful data and its supporting medium (e.g., paper, electronic, etc.). In this context it is distinct from records because it includes the written description of policies, processes, procedures, objectives, requirements, authorities, responsibilities, or work instructions.

Evaluation – [ref. AC 120-59A] a functionally independent review of policies, procedures, and systems. The term is synonymous with ***assessment.*** If accomplished by the company itself (*internal evaluation*), the evaluation should be done by an element of the company other than the one performing the function being evaluated. With regard to this SMS Manual and supporting programs, internal evaluations are performed by the safety officer on operational departments, in order to measure the quality of SMS process outputs. The evaluation process builds on the concepts of auditing and inspection. An evaluation is an anticipatory process, and is designed to identify and correct potential findings before they occur. See: *Audit.*

Event – An accident, incident, mishap, irregularity, near-accident, "near-miss", act, error, or other occurrence.

Expectations – are what an SMS component, element, or process is expected to accomplish or produce. This includes performance objectives, system outcomes, and process outputs.

- Performance Objectives represent the objective outcomes of a particular element or process.
- Process Expectations are the outputs a particular process is expected to produce, such as completed forms, data, records, etc.

Exposure - The amount of time, number of cycles, number of people involved, and/or amount of equipment involved in a given event, expressed in time, proximity, volume, or repetition.

FAA – Federal Aviation Administration

Fatal injury (NTSB 830.2 definition) **–** means any injury which results in death within 30 days of the accident.

Finding – a conclusion reached after examination or investigation. As applied to audits and evaluations, evidence of non-compliance with policy, standards, regulations, and/or contractual requirements.

Hazard – any existing or potential condition that can lead to injury, illness, or death to people; damage to or loss of a system, equipment, or property; or damage to the environment. A hazard is a condition that is prerequisite to an accident or incident.

Incident – a near-miss or minor-damage episode with minor consequences that could have resulted in greater loss; an unplanned event that could have resulted in an accident, or did result in minor damage, and indicates the existence of (though may not define) a hazard or hazardous condition(s).

Incident, Aircraft (NTSB 830.2 definition) **-** means an occurrence other than an accident, associated with the operation of an aircraft, which affects or could affect the safety of operations.

Injury, Fatal (NTSB 830.2 definition) **-** means any injury which results in death within 30 days of the accident.

Investigation – a structured, detailed and systematic inquiry and examination into an event (such as an accident, incident or injury) that attempts to reveal causes and contributing factors, including organizational or systemic deficiencies, which are also known as *latent conditions.*

Latent conditions – Weaknesses or deficiencies in a system that can contribute to an incident or accident but that will not, by themselves, cause an incident or accident to occur.

Lessons learned – knowledge or understanding gained by experience, which may be positive, such as a successful test or mission, or negative, such as a mishap or failure. Lessons learned should be developed from information obtained from within, as well as outside of, the organization and/or industry.

Likelihood – the estimated probability or frequency, in quantitative or qualitative terms, of an occurrence related to the hazard.

Line management – management structure that operates the aviation system.

Minor occurrence – Minor aircraft damage or a minor injury that should be reported to management, but does not require reporting to NTSB.

- Minor injury – Minor cuts or bruises, minor first degree burns over less than 5% of the body, or minor fractures of fingers, toes or nose.
- Minor aircraft damage – Includes engine failure or damage limited to an engine if only one engine fails or is damaged, bent cowling or fairing, dented skin, small puncture holes in the skin, ground damage to propeller blades, damage to the landing gear, wheels, tires, flaps, engine accessories, brakes, or wingtips.

Mishap – An undesirable event that includes an aircraft accident / incident, personal injury, or damage to facilities, assets or other equipment.

Missing aircraft – An aircraft is considered to be missing when its position is unknown, and with the supply of fuel normally carried, can no longer be airborne.

Near accident – A narrow escape from an actual accident; as used in the context of this manual, an event or situation which could have become an incident or accident that was narrowly averted.

Nonconformity – non-fulfillment of a requirement (ref. ISO 9000-2000). This includes but is not limited to noncompliance with Federal regulations. It also includes company requirements, requirements of company developed risk controls or company-specified policies and procedures.

Objective – the desired state or performance target of a process. An objective is usually the final state of a process and contains the results and outputs used to obtain the objective (see also *Safety objectives*).

Operational life cycle – period of time from implementation of a product/service until it is no longer in use.

Operational processes – (sometimes referred to as *systems*) are separate and distinct parts of an organization's aviation activities, such as flight operations; operational control (dispatch/flight following); maintenance and inspection; cabin safety; ground handling and servicing; cargo handling; and training.

Operational Risk Management (ORM) - A continuous, systematic process of identifying and controlling risks in all activities according to a set of pre-conceived parameters by applying appropriate management policies and procedures. This process includes detecting hazards, assessing and analyzing risks, and implementing and monitoring risk controls to support effective, risk-based decision-making.

Outputs – The product of an SMS process, which is capable of being recorded, monitored, measured, and analyzed. Outputs are the minimum expectation for the content of each process area and the input for the next process in succession. Each of the outputs of a process should have a method of measurement specified by the service provider. Measures need not be quantitative where this is not practical, however some method of providing objective evidence of the attainment of the expectation is expected. The individual outputs of a process are the content of the measures.

Overdue aircraft - An aircraft is considered to be overdue when an ATC agency reports it as such, or when no information about the aircraft has been received by ATC or ***STAR Flight*** (1) for 30 minutes after its last notified estimated time of arrival (ETA); (2) for 5 minutes after the estimated time of landing, after having landing clearance; or within 10 minutes after takeoff.

Oversight – a function that ensures the effective promulgation and implementation of the safety-related standards, requirements, regulations, and associated procedures. Safety oversight also ensures that the acceptable level of safety risk is not exceeded in the air transportation system. Safety oversight in the context of this SMS Manual is conducted by an outside regulatory agency, such as the FAA.

Preventive action – action to eliminate or mitigate the cause or reduce the effects of a potential nonconformity or other undesirable situation.

Probability - The likelihood an event will occur.

Procedure – specified way to carry out an activity or a process.

Process – set of interrelated or interacting activities which transforms inputs into outputs.

Process Measures – see Attributes (Process Measures).

Process Outputs – The expectations of a particular process in terms of measurable criteria.

Product/service – anything that might satisfy a want or need, which is offered in, or can be purchased in, the air transportation system.

Product/service provider – any entity that offers or sells a product/service to satisfy a want or need in the air transportation system. Examples of product/service providers include: aircraft and aircraft parts manufacturers; aircraft operators; providers of fueling and de-icing services; maintainers of aircraft, avionics, and air traffic control equipment; educators in the air transportation system; etc. (Note: any entity that is a direct consumer of air navigation services and or operates in the U.S. airspace is included in this classification; examples include: general aviation, military aviation, and public use aircraft operators.)

Quality Escape – any process output that does not conform (or contains a non-conformity), to specified standards. Quality escapes are typically identified through continuous monitoring and/or audits, but may also be identified by front-line employees at any time during the course of an operational process.

RMR – Risk Management Record: a record created in the Hazard ID/Occurrence database.

Records – evidence of results achieved or activities performed. In this context it is distinct from documentation because records are the documentation of SMS outputs.

Residual risk – the remaining safety risk that exists after all control techniques have been implemented or exhausted, and all controls have been verified. Only verified controls can be used for the assessment of residual safety risk.

Risk Assessment - The systematic process of evaluating various risk levels for specific hazards identified with a particular task or operation, in terms of exposure, severity and likelihood.

Risk Control – refers to steps taken to eliminate hazards or to mitigate their effects by reducing severity, likelihood or exposure of risk associated with those hazards.

Risk level – The composite of predicted exposure, severity and likelihood of the potential effect of a hazard in the worst credible system state. Measured as High (unacceptable), Moderate (may be acceptable if mitigated), and Low (acceptable).

Root cause(s) – one or more basic initiating cause(s) which, either individually or combined, can lead to an undesirable outcome (such as an incident or accident).

Safety Assurance – processes within the SMS which include activities of continuous monitoring, internal audits, internal evaluations, external audits, data analysis, system assessment and management review, together which systematically provide confidence that organizational products/services meet or exceed safety requirements.

Safety Attributes – see Attributes

Safety culture – An organization's values, beliefs, legends, rituals, mission goals, performance measures, and sense of responsibility to its employees, customers, and the community. Organizations with a positive safety culture are characterized by communications founded on mutual trust, by shared perceptions of the importance of safety, and by confidence in the efficacy of preventive measures.

Safety Management System (SMS) – the formal, top-down business-like approach to managing safety risk. It includes systematic procedures, practices, and policies for the management of safety (as described in this document) as well as support services, safety assurance and safety promotion).

- Product/Service Provider Safety Management System (SMS-P) – the SMS owned and operated by a product/service provider; in other words, this organization's Safety Management System.
- Oversight Safety Management System (SMS-O) – the SMS owned and operated by an oversight entity, such as FAA, Transport Canada or EASA.

SMS Manual – written guidance containing policies, procedures, roles, responsibilities, sub-programs and forms necessary for the formalized application of the Safety Management System.

Safety objectives – something sought or aimed for, related to safety.

- Safety objectives are generally based on the organization's safety policy.
- Safety objectives are generally specified for relevant functions and levels in the organization.

Safety planning – part of safety management focused on setting safety objectives and specifying necessary operational processes and related resources to fulfill quality objectives (i.e., assure the quality of operational process outputs).

Safety risk – the composite of predicted exposure, severity and likelihood of the potential effect of a hazard.

Safety risk control – anything that reduces or mitigates the safety risk of a hazard. Safety risk controls must be measurable and monitored to ensure effectiveness.

Safety Risk Management (SRM) – processes within the SMS composed of describing and analyzing a system or task, identifying hazards, and assessing, analyzing, and controlling risk. These processes are embedded in the operational processes used to provide the product/service; they are not separate/distinct processes.

Safety-Risk Profile – also known as a Significant Safety Issue List, or SIL, the safety-risk profile lists the top ten or twelve potential hazards to which an organization is exposed. These areas of higher risk require increased vigilance and risk controls to ensure an accident, incident or injury does not occur.
Safety promotion – a combination of safety culture, training, and data sharing activities that support the implementation and operation of an SMS in an organization.

Serious Injury (NTSB 830.2 definition) means any injury which; (1) requires hospitalization for more than 48 hours, commencing within 7 days from the date the injury was received; (2) results in a fracture of any bone (except simple fractures of fingers, toes, or nose); (3) causes severe hemorrhages, nerve, muscle, or tendon damage; (4) involves any internal organ; or (5) involves second or third degree bums, or any bums affecting more than 5 percent of the body surface.

Severity - the consequence or impact of a hazard or event, in terms of degree of damage, injury, loss or harm.

Significant Event – An event where one or more fatal or serious injuries occurs, an aircraft receives substantial damage, or facilities / property are substantially damaged.

Substantial Damage (NTSB 830.2 definition) means damage or failure which adversely affects the structural strength, performance or flight characteristics of the aircraft, and which would normally require major repair or replacement of the affected component. Engine failure or damage limited to an engine if only one engine fails or
is damaged, bent fairings or cowling, dented skin, small punctured holes in the skin or fabric, ground damage to rotor or propeller blades, and damage to landing gear, wheels, tires, flaps, engine accessories, brakes, or wingtips are not considered substantial damage for the purpose of this part.

Substitute risk – risk unintentionally created as a consequence of safety risk control(s).

System – an integrated set of constituent elements that are combined in an operational or support environment to accomplish a defined objective. These elements include people,

hardware, software, firmware, information, procedures, facilities, services, and other support facets.

System Safety Attributes – see Attributes

Senior management **–** see Top management.

Top management – the person or group of people who direct(s) and control(s) an organization.

Voluntary disclosure – (or self-disclosure, or Voluntary Disclosure Reporting Program (VDRP)) – a formal report or reporting program whereby an operator discloses a potential instance of regulatory non-compliance to FAA or CAA inspectors, together with a "comprehensive fix" (Corrective Action Plan) to prevent reoccurrence.
Inadvertent errors, timeliness of reports, follow-through with the CAP, and other requirements may prevent or preclude civil penalties and/or certificate action against the operator.

1.0 SAFETY POLICY AND OBJECTIVES

OVERVIEW

***STAR** Flight* conveys its safety policy in the organization's integrated Safety & Quality Policy Statement, signed by the Program Director. It is published and visible to all staff and responsible parties. Additional statements of both safety policy and quality policy may be found throughout this and other organizational documents. ***STAR** Flight* policies are to be considered mandates by all staff and vendors. If a policy cannot be complied with for any reason, or if instructions or procedures are lacking that make policy compliance difficult, bring these issues to the attention of top management. Immediate notification should be used for issues that are of an urgent nature.

1.1 SAFETY POLICY

1.1.1 GOALS

One goal of our SMS is to establish a level of safety in our organization that goes beyond the traditional regulatory minimums. The policies documented in this manual have been carefully planned to produce this result. These policies and their associated outputs will be documented, monitored, measured, and analyzed to ensure that we achieve our safety targets and goals. All organizational departments, both managers and staff, will be held accountable for the implementation of the policies contained in this manual.

A second goal is to achieve the highest level of safety possible by managing both safety and quality, thereby reducing accidents, incidents and injuries, while at the same time increasing operational efficiency and providing a safe, high quality work environment for all personnel.

1.1.2 VISION

Our vision, which includes attainment of strategic objectives, is accomplished through diligent and continued application of the company's SMS. ***STAR** Flight* continually supports and promotes a positive safety culture among all personnel by emphasizing the importance of both safety and quality in all activities, and the responsibility of each individual to continually apply Operational Risk management techniques. ***STAR** Flight* provides the environment, tools, support, training and other resources necessary to achieve all strategic objectives.

1.1.3 DEDICATION TO SAFETY

***STAR** Flight* regards the safety of flight operations, crew members, passengers and associated ground and medical operations as the most important consideration in all activities. This dedication to safety is made with the realization that risks must often be taken in the conduct of daily operations, and that all personnel must accept the inherent risks associated with maintenance, flight operations, medical operations and aviation in general. All personnel must

remain devoted to quality, duty, good judgment, sound operational planning, and efficient use of available resources.

1.1.4 REGULATORY COMPLIANCE

Principal elements governing the conduct of all operations are safety, regulatory compliance and strict observance of all company policies, standards and best practices. Adherence to ***STAR** Flight* standards and best practices assures the quality of all process outputs, in addition to both regulatory compliance and a minimum level of safety. As a basic premise to safety, all activities conducted by flight, ground, and maintenance personnel shall be conducted in accordance with all applicable FAA regulations, medical governing bodies, and all state and local laws. It is important for all personnel to view regulatory compliance as a minimum standard.

1.1.5 STANDARDS AND BEST PRACTICES

Standards & Best Practices are policies, procedures, methods and processes that have been developed by ***STAR** Flight* to establish and maintain the highest level of safety possible. These standards and best practices are incorporated into the ***STAR** Flight* manual system and written guidance, and shall be treated by all personnel as mandates. All standards and best practices, in addition to regulatory compliance, shall be followed at all times (except when necessary to deviate in case of emergency), and are an essential component of system safety. ***STAR** Flight* will continue to investigate, pursue and adopt new safety standards and best practices that are commensurate with the highest levels of safety in the aviation and medical industry.

1.1.6 OCCUPATIONAL HEALTH, SAFETY AND ENVIRONMENTAL PROTECTION

***STAR** Flight* will comply with all applicable governmental regulations concerning the safety and health of all personnel. Core SMS processes of Safety Risk Management and Safety Assurance are applied equally to occupational, environmental and system safety alike. The health and safety of all personnel, the public and our environment, will remain continuing strategic objectives of ***STAR** Flight*.

1.1.7 QUALITY MANAGEMENT AND SAFETY ASSURANCE

***STAR** Flight* managers will ensure that the products, services, systems and technologies it uses, whether developed internally or acquired externally, meet appropriate and specified standards. All quality management and assurance processes, including continuous monitoring, vendor audits, follow-up audits, departmental audits, internal / external evaluations, and management reviews, shall remain consistent with ***STAR** Flight's* primary focus on quality and safety risk management, and shall assure that intended process outputs conform with all regulatory and safety standards and best practices. All safety and quality policies will be periodically reviewed to ensure they remain relevant and appropriate to the size, scope and types of activities conducted by ***STAR** Flight*.

1.1.8 REPORTING OF UNSAFE CONDITIONS

Each employee is encouraged to report and bring to the attention of management any action, conduct, event, observation, practice or operating principle that may lead to an unsafe condition; without fear of reprisal and fully confident of a Just Culture in a self-reporting incident. ***STAR** Flight* personnel will be acknowledged and rewarded when they bring these issues to the attention of management. This will permit ***STAR** Flight* to systematically identify and eliminate or control hazards, thus ensuring the highest possible degree of safety, quality of service and public protection.

1.1.9 ACCEPTING RISK IN SYSTEM AND TASK DESIGN

Utilizing procedures as set forth in the Risk Management Program, ***STAR** Flight* determines the acceptability of safety-risks for each identified hazard prior to implementing:

- New system designs;
- Changes to existing system designs;
- New operations/procedures; and
- Modified operations/procedures.

For each identified hazard, a Risk Assessment is created in the Hazard ID/Occurrence database and safety risk management processes are performed.

1.1.10 TRAINING AND QUALIFICATION OF PERSONNEL

Formal personnel training programs and competency certifications are accomplished in accordance with applicable regulations and best practices as specified in the ***STAR** Flight* manual system. This includes documentation and assurance of qualifications, skills, competencies, training, equipment and tools necessary for all personnel to enable them to discharge their duties and responsibilities in a safe manner. Refer to Appendix G of this SMS Manual for details.

1.1.11 POSITIVE SAFETY CULTURE

***STAR** Flight* is dedicated to and fully supports a positive safety culture amongst management and staff. An effective, positive safety culture is one in which all personnel and managers can identify and report safety issues, including unintentional errors, without fear of reprisal. It is the therefore the policy of ***STAR** Flight* to encourage and positively recognize employees for their reporting of hazards, errors and other safety concerns, and to educate managers and supervisors who may need assistance in moving away from apportioning blame, in order to create a climate of open communication and trust. Senior management advocates and

promotes the growth of this positive safety culture as an essential component of safety management.
The SMS policies in this manual have been designed to promote a positive safety culture in the four areas discussed below. Any observed deviations from these cultural norms should be reported to management and the Safety Officer.

A. **Informed culture**. Management intends to foster a culture where people understand the hazards and risks inherent in their areas of operation. Personnel are provided with the necessary knowledge, skills and job experience to work safely, and they are encouraged to identify the threats to their safety and to seek the changes necessary to overcome them.

B. **Learning culture**. Learning in this organization is seen as more than a requirement for initial skills training; rather it is valued as a lifetime process. People are encouraged to develop and apply their own skills and knowledge to enhance organizational safety. Staff are updated on safety issues by management, and safety reports are fed back to staff so that everyone can learn the pertinent safety lessons.

C. **Reporting culture**. Managers and operational personnel freely share critical safety information without the threat of punitive action. Personnel are able to report hazards or safety concerns as they become aware of them, without fear of sanction or embarrassment.

D. **Just culture**. While a non-punitive environment is fundamental for a good reporting culture, all employees must know what is acceptable and what unacceptable behavior is. Negligence or deliberate violations will not be tolerated in this organization, even in our non-punitive environment. Our just culture recognizes that, in certain circumstances, there may be a need for punitive action and management will define the line between acceptable and unacceptable actions or activities.

Our safety culture is the product of our personal dedication and accountability to our employees. Individual efforts alone do not necessarily result in the desired outcome. Our organization realizes that a positive safety culture only develops with an aggregate attitude that is manifested by a pervasive type of safety thinking. This type of organizational thinking will permit our employees to have an inherently questioning attitude, a resistance to complacency, a commitment to excellence, and a sense of personal accountability. Our top management provides a vibrant, encouraging atmosphere in which individual growth is recognized and rewarded.

1.1.12 PROGRAM DIRECTOR'S SAFETY AND QUALITY POLICY STATEMENT

At STAR Flight, safety is our number one core value. We are uncompromising in our commitment to the health and safety of our employees and community. We will continually improve our processes, demonstrate leadership, and promote comprehensive safety. We will require individual accountability, expect all employees to adhere to our safety standards, and actively participate in and support the advancement of our health and safety practices. Safety is the responsibility of all employees, including both top management and the individual line staff employee. Everyone is responsible for achieving zero serious accidents or injuries resulting in a SAFE day, a SAFE tomorrow, a SAFE year, and a SAFE career.

Providing safety leadership is a fundamental part of our organization and we will require individual accountability. STAR Flight is committed to being a leader in safety training and keeping our employees informed about the safety and health of our work as well as current safety issues, rules, and regulations.

It is the policy of STAR Flight to:

•Maintain a safe and healthy workplace for all employees in compliance with all applicable laws and regulations.

•Promote a positive attitude towards safety.

•Establish safety and health objectives for all levels of management and employees.

•Commit appropriate and sufficient resources to protect and support STAR Flight safety efforts including providing technical support for our crews.

•Provide management leadership and require all employees to take responsibility and ownership for safety, including bringing the attitude that "I am individually responsible for safety" to the job each and every day.

•Ensure that each employee understands that they have the obligation to stop a job/task to prevent an unsafe incident from occurring.

•Assure compliance with all STAR Flight safety, health, and security programs and practices.

•To provide industry leading training to our employees to better educate them how to comply with those policies as well as promote a culture of continuous improvement and commitment to safety and training.

•Regularly review and evaluate safety, health, and security programs, procedures, and practices to assure that they are effective and up to date.

•Assure timely and thorough reporting and investigation of all incidents including the identification of causal factors and the establishment of effective corrective actions.

STAR Flight is committed to setting a new standard for our industry and being the safest, most stable, and most rewarding place to work for the benefit of all of our employees and the communities in which we live and work. Together, we will THINK, COMMUNICATE, and WORK SAFELY, every minute, every hour, and every day.

Chuck Spangler
Program Director
Travis County STAR Flight

1.2 MANAGEMENT COMMITMENT AND SAFETY ACCOUNTABILITIES

1.2.1 COMMITMENTS OF TOP MANAGEMENT (Program Director, Director of Operations, Director of Maintenance)

All individuals listed as "top management" and "manager" have full authority to determine safety risk acceptance decisions described in other sections of this manual.

The top management at ***STAR** Flight* are responsible for the continued support of the Safety Management System, and for providing the necessary resources in order for the SMS to function effectively. All levels of management within ***STAR** Flight* are committed to and accountable for the quality of all process outputs, and for our safety performance. Top management holds themselves and all employees accountable for safety performance.

Safety performance is also an important part of our management / employee evaluation system. ***STAR** Flight* recognizes and rewards both individual and group safety performance. Management is committed to making everyone aware of all safety rules and processes, as well as each individual's personal responsibility to observe them.

***STAR** Flight* top management is committed to providing all resources necessary to attain the strategic safety objectives set forth herein. Top management is accountable for the diligent application of the company's Safety Management System and for its continued quality assurance, in order to achieve the highest level of safety in all aviation activities.

1.2.2 COMMITMENTS OF MANAGERS (Chief Medical Supervisor, Chief Clinical Supervisor, Chief Pilot)

All levels of management support and actively engage in the core process of safety assurance, designed to discover latent conditions, non-compliance with all rules and regulations, and conformance with controls and expectations. All managers are committed to diligent continuous monitoring of operational processes and the establishment of performance indicators, which will help us evaluate our operational and safety performance.

Individual managers are committed to the integration of the company's Safety Management System into the training of all persons they supervise, and each assigned manager will actively communicate with and seek guidance/recommendations from the safety committee. In addition, they will assign employees to actively participate as a member of the Safety Risk Management (SRM) Committee during periodic meetings.

***STAR** Flight's* management welcomes input from all interested persons regarding the policies, procedures, standards and best practices contained herein. Utilizing this input, we will constantly improve the quality of our products and services, and further enhance the safety, reliability and professionalism of air transportation services provided by ***STAR** Flight*.

1.2.3 COMMITMENTS TO SYSTEM SAFETY

All personnel, from top management to line personnel and office personnel, must be committed to System Safety. First conceived by visionary safety professionals in 1962, the System Safety Society defines system safety as follows:

"The system safety concept is the application of special technical and managerial skills to the systematic identification and elimination or control of hazards throughout the life-cycle of a system."

System safety encompasses every aspect of all ***STAR*** *Flight* activities, and involves all personnel and vendors. ***STAR*** *Flight* has therefore developed a comprehensive system-safety policy which includes the application of Operational Risk Management. ORM enables all personnel to identify hazards and manage risk by applying good judgment, sound operational planning, and efficient use of available resources at all times.

All management personnel will support the company's commitment to system safety by applying ORM to all aspects of clinical operations, maintenance operations, flight operations and training. All ***STAR*** *Flight* aircraft, equipment, facilities and records will be maintained to the highest standards of condition, safety and best practices.

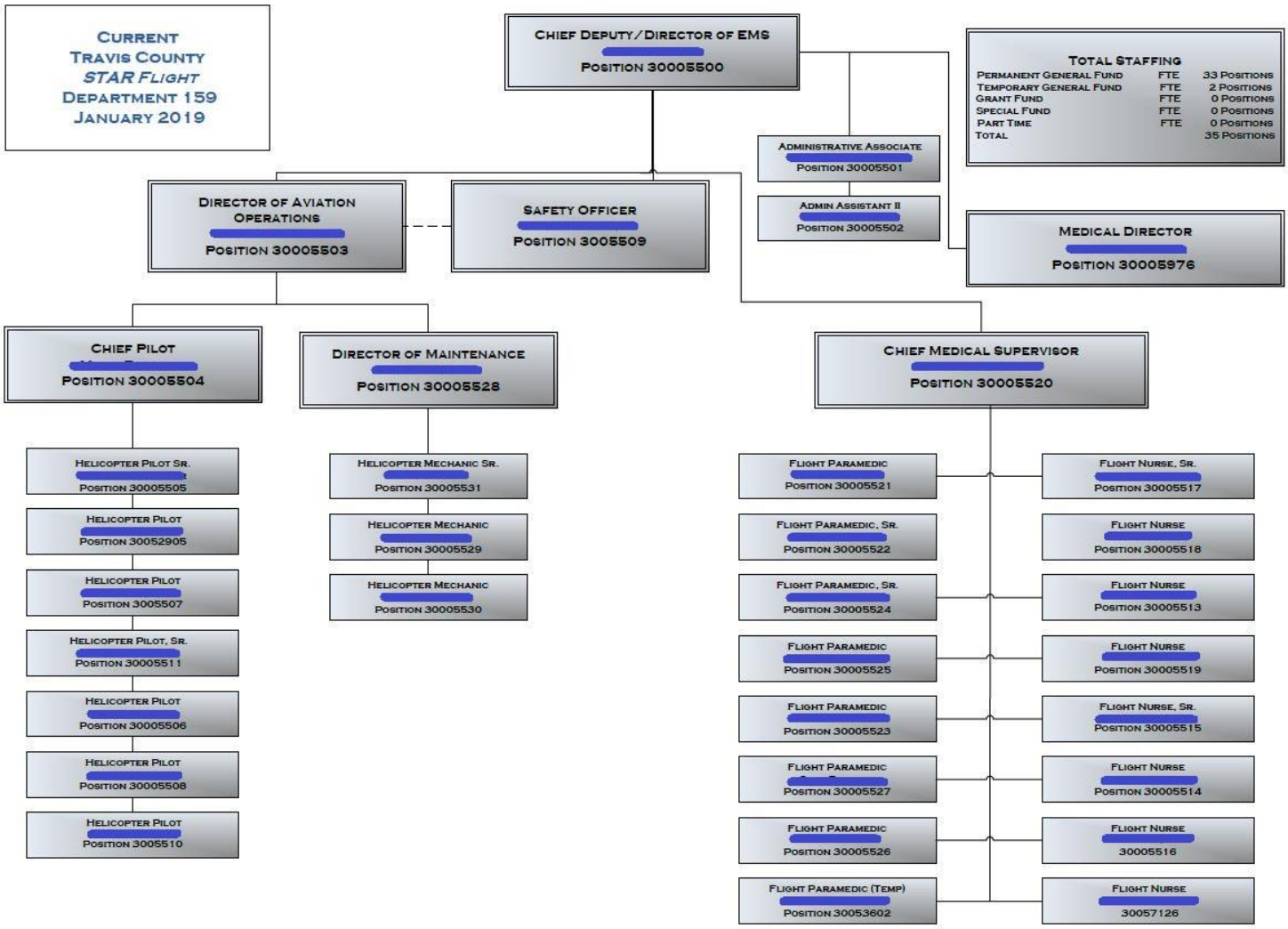
1.2.4 ROLES, RESPONSIBILITIES AND AUTHORITIES

This SMS Manual documents and defines the roles, responsibilities and relationships of all ***STAR*** *Flight* personnel, including top management, managers, and employees. These and/or other safety-related positions, responsibilities, and authorities are communicated throughout ***STAR*** *Flight* via policy, directives, the ***STAR*** *Flight* manual system, and during safety training. All personnel, both individually and as a group, have a shared responsibility to uphold the highest standards of safety.

1.2.5 ORGANIZATIONAL STRUCTURE AND ORGANIZATIONAL CHART

Our organization is composed of many types of employees who all contribute to our success. Each employee interacts with the safety in some way, but the degree of SMS involvement varies for each position. Employees who have more direct contact with safety management have greater responsibilities with the SMS; while employees who are involved in more technical areas will have fewer responsibilities in the SMS.

ORGANIZATIONAL CHART



1.3 KEY SAFETY PERSONNEL

1.3.1 PROGRAM DIRECTOR

Safety Accountability: The Program Director is accountable to the Travis County Executive Manager – Emergency Services for safe operations, practices, and proper use of Travis County assets to benefit the citizens of the County. The Program Director of this organization has ultimate responsibility for the SMS and will provide the resources necessary to implement and maintain the SMS. The responsibility and authority to accomplish many of the required SMS functions and tasks have been assigned to some of the persons discussed below. However, ultimate accountability for the SMS is still retained by the Program Director.

Safety Responsibility: In discharging this accountability, the Program Director is responsible for:

- Defining the SMS policies and objectives;
- Ensuring a Safety Management System is implemented at ***STAR** Flight*;
- Fostering a strong safety culture within ***STAR** Flight*;
- Communicating ***STAR** Flight's* commitment to safety;
- Provides the leadership to ensure commitment throughout the organization, particularly at senior management level, to the safety management policy intent and safety management system requirements;
- Ensuring that ***STAR** Flight* management and staff are aware and held accountable for their safety performance;
- Ensuring that ***STAR** Flight's* SMS operational performance are evaluated for effectiveness and relevance on a regular basis.

1.3.2 DIRECTOR OF OPERATIONS AND CHIEF PILOT

Safety Accountability: The Director of Aviation Operations (DO) is accountable to the Program Director for the safe and efficient operational management of aviation operations and training.

Safety Responsibility: In discharging these accountabilities, the DAO is responsible for:

- Uppermost responsibility for aviation safety management at ***STAR** Flight*;
- Ensuring adequate resource allocation for design, implementation and administration of a safety management system;
- Providing the leadership role to ensure commitment throughout the aviation operations area to the safety management policy intent and safety management system requirements;
- Ensuring that all staff are aware of safety guidelines and are held accountable for their safety performance;
- Ensuring provision of adequately trained and competent manpower to permit safe operational management of flight operations;

- Ensuring adequate liaison is conducted between various partners and other stake holders including Austin EMS for dedicated dispatch services, Seton and St. David networks for Specialty Team flight crew operations, City and State law enforcement authorities, and federal military authorities for safe operations in the local flight area;
- Make safety risk acceptance decisions within the aviation area.

1.3.3 DIRECTOR OF MAINTENANCE

Safety Accountability: The Director of Maintenance (DOM) is accountable to the DO to provide services and facilities, for ***STAR*** *Flight* line operational personnel and stakeholders, for the purpose of safety, regularity and efficiency of aircraft maintenance operations at the ***STAR*** *Flight* hangar and flight duty locations.

Safety Responsibility: In discharging these accountabilities, the DOM is responsible for:

- Ensuring that safety considerations are given the foremost priority;
- Ensuring the application of the explicit safety management policy and procedures in accordance with the ***STAR*** *Flight* SMS;
- Ensuring acceptance and overview of any residual risks or hazards, and their associated controls that are identified within the ***STAR*** *Flight* risk mitigation system, in accordance with the procedures contained in the ***STAR*** *Flight*'s SMS manual.
- Overseeing the safety and operational performance of maintenance operations;
- Ensuring that all maintenance department staff are aware of, and held accountable for, their safety performance;
- Ensuring that all maintenance staff reporting to him are trained, qualified and competent to discharge their safety related obligations;
- Ensuring that fitness for service, including any necessary safety assessments, has been declared and accepted by the responsible authority, in relations to the development of plans, policies, procedures, processes and maintenance systems at ***STAR*** *Flight*;
- Ensuring that the management of the human resources under his control is appropriate to facilitate safe operations;
- Conduct an ongoing hazard identification process in the maintenance area;
- Conduct risk assessments;
- Develop risk controls.

1.3.4 SAFETY OFFICER

Safety Accountability: The Safety Officer (SO) is accountable to the Program Director for the day-to-day management functions of the SMS. The SO is the responsible individual and focal point for the development and maintenance of an effective SMS. The SO also advises the program director and managers on matters regarding safety management and is responsible for coordinating and communicating safety issues within the organization.

Safety Responsibility: In discharging these accountabilities, the DOS is responsible for:

- Managing the SMS implementation plan on behalf of the Program Director;
- Providing independent advice on safety matters;
- Performing/facilitating hazard identification and safety risk analysis;
- Monitoring corrective actions and evaluating their results;
- Planning and organizing staff safety training;
- Providing periodic reports on the organization's safety performance;
- Establishing industry liaison on safety matters;
- Maintaining records and safety documentation;
- Establishing and communicating adequate safety guidelines to appropriate staff;
- Monitoring the safety management system and evaluating its effectiveness;
- planning and organizing staff safety training;
- Monitoring safety concerns in the aviation industry and their perceived impact on the organization's operations aimed at service delivery;
- Facilitate the Safety Risk Management Committee;
- Make safety risk acceptance decisions;
- Oversee the conduct of safety audits in all departments;
- Monitor the effectiveness of risk controls;
- Interface with other industry safety professionals.

Irrespective of other responsibilities, The SO reports directly to the Program Director who holds the highest level of authority.

1.3.5 ALL STAR FLIGHT EMPLOYEES

Safety Responsibility: All employees are accountable and responsible for safety to each other as peers in this organization. Every employee, whether top management or a new-hire, must consider the safety implications of everything they do. Each individual is responsible for the safety of his or her actions. Each individual has the responsibility to communicate relevant safety-related information and to strive to achieve the highest possible level of safety at ***STAR Flight***. The following list is an example of just some of our expectations:

- To comply with the relevant safety requirements and procedures outlined in the ***STAR*** *Flight* SMS manual and any supplementary manuals;
- To apply system safety measures as required by safety management procedures and instructions;
- To advise their supervisor and the safety officer of any safety occurrence or safety system failure and to identify and report any situation of potential risk or concern affecting system safety;
- Hazard Identification/Occurrence Reports;
- Staff meetings;
- Verbally directly to a supervisor or safety officer;
- Support safety audits as and when they occur;
- Support safety investigations as and when they occur.

1.4 EMERGENCY PREPAREDNESS AND RESPONSE (ERP)

1.4.1 INTRODUCTION

The Emergency Response Plan (ERP, Appendix A to this manual) has been developed to provide a common system in the management of emergencies. ***STAR*** *Flight* recognizes that even the safest organizations can suffer an accident or serious incident. In order to reduce human suffering and/or property damage after an accident or serious incident has occurred, ***STAR*** *Flight* has developed this ERP. The purpose of this ERP is to provide ***STAR*** *Flight* personnel a guide for emergency response actions at any of ***STAR*** *Flight* staff positions. It clearly defines check listed steps, individual responsibilities and interaction between agencies responding to the emergency.

1.4.2 IMPORTANT DEFINITIONS

The following are definitions of different types of emergency conditions. It is important because they define what situations we are talking about:

Disaster - A disaster is an incident or a series of incidents in a short period of time that:

- Cause major injury and/or loss of life;
- Cause major destruction of property;
- Halt or curtails operations for a significant period of time;
- Prevent employees from pursuing their normal duties;
- Cause a substantial reduction of services;
- Bring ***STAR*** *Flight* under scrutiny by media or government.

Crisis - Any event or set of circumstances that significantly affects an organization's ability to carry out its business plan.

Aircraft Emergency – An emergency that:

- Has resulted or may result in the death of or injury to passengers or employees;
- Has resulted or may result in significant damage to or loss of an aircraft;
- Attracts significant media attention that could threaten the public's confidence in ***STAR*** *Flight*.

Accident - An accident is an occurrence associated with the operation of an aircraft and taking place between the time any passengers or crew aboard the aircraft until everyone has disembarked, and in which:

A person is seriously or fatally injured as a result of any the following:

- Being in the aircraft;
- Direct contact with any part of the aircraft, including parts, which become detached from the aircraft;
- Direct contact with any non-aircraft material that has become a hazard due the rotor wash of the aircraft.

This case does not include occurrences where the injuries are from natural causes, self-inflicted or inflicted by other persons.

A serious injury sustained in an accident and which:

- Requires hospitalization for two or more days;
- Results in fracture of a bone (except simple fractures of fingers, toes or nose);
- Involves lacerations which cause severe hemorrhage, or nerve, muscle or tendon damage;
- Involves injury to any internal organ;
- Involves second or third degree burns, or any burns affecting more than five percent of the skin.

The aircraft sustains damage or structural failure which:

1. Adversely affects the structural strength, performance or flight characteristics of the aircraft, and would normally require major repair or replacement of the affected component.

This case does not include engine failure or damage, when it is limited to the engine, its cowlings or accessories, nor damage limited to propellers, wing tips, antennas, tires, brakes, fairings, small dents or holes in the aircraft skin.

The aircraft is missing or is completely inaccessible.

An aircraft is considered to be missing when the official search has been terminated and the

wreckage has not been located.

Non-Flight Emergency - Such events involve deaths, injuries or significant damage to ***STAR*** *Flight* facilities caused by fire, an industrial accident or a natural disaster death, injuries or the endangerment of passengers or employees as a result of criminal acts.

Other Disruptions - Unforeseen events can turn into a crisis, such as cases where the cause of the problem is completely independent of ***STAR*** *Flight* altogether. For example, a crisis can be an occurrence where there are injuries due to natural causes, self-inflected or inflected by others. It could be a passenger giving birth in flight.

The media can also make a crisis out of minor incidents, such as engine failure or damage limited to the engine, its cowlings or accessories, or damage limited to rotor blades, antennas, fairings, small dents or holes in the aircraft skin which do not compromise the safety of the aircraft or flight.

Crisis Mode - "A particular operational state of an organization, following the official crisis signal, where the normal operating practices are largely disrupted because of the crisis handling preoccupation of large numbers of employees."

Crisis mode starts with an official signal put out by one of the authorized crisis management staff. As a result, the internal notification system becomes operational. Some or many of the normal business operations are disrupted as employees abandon their usual tasks to take part in crisis management.

1.4.3 POST ACCIDIDENT INCIDENT PLAN – PAIP (Emergency Response Program)

In the unlikely event of one of our aircraft being involved in a major emergency and/or accident, ***STAR*** *Flight* will activate the emergency Post Accident Incident Plan (PAIP). The PAIP is a guide in check list format for completion of critical actions necessary in time of extremely high stress. The plan presents step-by-step instructions that will result in prompt, decisive action in the event of an accident or incident. This is to ensure prompt rescue and medical attention for accident victims and to assist the families and co-workers of the accident victims.

The PAIP is a separate document to this manual and will be reviewed annually each January for appropriateness and accuracy of procedures, contact names, phone numbers and personnel information.

An exercise/drill will be conducted annually, both day and night, to evaluate the effectiveness of the plan.

1.4.4 *STAR FLIGHT* RESPONSE IN THE AFTERMATH OF AN ACCIDENT

Refer to the Emergency Response Plan Manual located in Appendix A. After an aircraft accident has occurred, ***STAR*** *Flight* management and public affairs personnel must deal with several issues. The first step *always* will be to accommodate fully the family members of those involved in the accident. Next, specific ***STAR*** *Flight* personnel will be prepared to answer questions posed by aviation authorities, the media and/or the general public related to the accident or incident. The type of data most frequently requested by authorities is identified below; ***STAR*** *Flight* will gather and have such information on hand as the investigation unfolds. Please note, however, that ***STAR*** *Flight* personnel should not answer certain questions posed by the media but instead refer them to appropriate authorities.

1.4.4.1 Accommodation of Family Members

STAR *Flight's first and highest responsibility is to the families of those involved in the accident.* We should anticipate and answer their needs first, prior to internal or public comment. Management will take steps immediately to notify the families, offer counseling and other support, make any necessary arrangements and keep them informed. To keep families informed, ***STAR*** *Flight* will assign each of them a liaison in a long-term role.

1.4.4.2 Notification of *STAR Flight* Personnel

Management, staff, legal counsel, human resources and public affairs personnel should be notified of an accident as soon as possible following the incident. After such notification only specifically assigned personnel will communicate with the media regarding the accident. This "sole source" media contact(s) will be identified ***STAR*** *Flight*-wide, reducing the likelihood of uninformed commentary.

1.4.4.3 Notification of Insurance Providers

STAR *Flight's* insurance carrier will be contacted as soon as possible after an accident. Additionally, since some insurance providers have their own accident response procedures, management personnel will request such information from the provider and use it in conjunction with this plan.

1.4.4.4 Probable Cause of an Accident

Do not speculate about the cause of any accident at any time. ***STAR*** *Flight* personnel should make no comment regarding the "probable cause" of an accident. Moreover, not only should they not comment on the probable cause, but they should not comment on the investigation at all, i.e., what was or was not found.

By federal statute, the jurisdiction of investigation and the finding of a probable cause for accidents involving aircraft of U.S. registry is the responsibility of the National Transportation

Safety Board. Management should refer all inquiries regarding the probable cause of an accident to the Office of Public Affairs at the NTSB.

Accidents involving loss of life often will involve the dispatch of an NTSB "Go Team," which will travel rapidly to the site to direct the accident investigation. Aside from immediate public safety concerns at the crash site, the NTSB alone has the jurisdiction and authority to command an accident investigation and issue a probable cause finding. No other agency or authority – federal, state, municipal or local – should or can comment responsibly on the probable cause of an accident.

For accidents that the Board investigates, all questions regarding the aircraft and its contents, crew, passengers, air traffic control personnel, local weather conditions at the time of the accident, or any additional issues relevant to an accident eventually will be commented upon officially by the NTSB.

At the Board's discretion, some accidents involving only property damage will not have an NTSB investigator travel to the accident scene. Although FAA investigators may go to the accident site, these accident investigations are still under the oversight of the NTSB and, therefore, questions concerning these accidents should be directed to the appropriate NTSB regional or field office.

No ***STAR*** *Flight* personnel should comment on the probable cause of an aircraft accident for several reasons. First, the jurisdiction for determining probable cause is the NTSB's alone. Second, speculation may adversely affect ***STAR*** *Flight's* legal liability with regard to the accident. Third, accidents typically are complex events *not completely understood until after at least several months of analysis are completed,* if then. ***STAR*** *Flight* personnel are not qualified accident investigators, a unique specialization. Consequently, initial comments and conclusions by accident observers frequently are in error, typically confusing the issue or worse.

1.4.4.5 Scheduling Media Statements

Although the pressures for instant answers in the wake of an aviation accident can be extreme and from many quarters, accurate information seldom is available early or at the media's convenience. ***STAR*** *Flight* will move as quickly as possible regarding the accommodation of family members, and as prudently as possible regarding the media. Respect for reporter deadlines must be tempered by consideration for the families and the ability to respond professionally and with accuracy. When in doubt, and when possible, it is best to wait and schedule statements and meetings with reporters later rather than earlier.

If the NTSB is investigating the accident, ***STAR*** *Flight* personnel will not speak about the accident investigation. However personnel can release the name of the "single source" media contact and their information.

1.4.4.6 Data Gathering for Investigating Agency

***STAR** Flight* management will be familiar with or know where to find information that relates to their aircraft, examples of which are listed and defined in the following section.

1. Type, Type Designation

Information regarding aircraft identification, including the name of the manufacturer and model number or name of the aircraft. Typically, this information is reported using an official FAA "type designation" – a series of letters and numbers with which the FAA officially designates the aircraft type, such as "Eurocopter BK 117 C-2".

2. Acquisition Date

On what date did the company take control of the aircraft?

3. Engine Data

Engine information includes the number, identity of the manufacturer and model number of the aircraft's engines. Such data often are reported separately and distinctly from the airframe's identification. The number of hours in operation each engine has experienced may be reported. Also, the number of hours in operation since the last major overhaul or major service interval often is reported. Alternately, if maintenance has been performed externally, the vendor for that service should have records including this and other information.

4. "Black Boxes"

Management will notify the appropriate agencies as to the existence of flight data recorders and voice cockpit recorders and their post-accident status/location. However, any comments to the media should be limited as to whether the aircraft had black boxes or not; they should not comment on the recorded data.

5. Performance

All questions related to the expected performance of the aircraft should be referred to the aircraft's manufacturer. Because accidents inherently call into question the performance of the aircraft – issues such as flight characteristics, fuel use, passenger and cargo loads, center of gravity concerns, etc., all can and will be raised – and because these issues often contribute to probable cause findings, ***STAR** Flight* personnel will decline to speculate on the aircraft's expected performance. All aircraft registered in the U.S. have been certified by the FAA and extensively tested to ensure their safe operation under conditions defined in the aircraft's operating manual, a public document.
Performance specifications of the aircraft, as certified by the FAA, are available in the aircraft's operating manual or from the aircraft's manufacturer.

6. Ownership and Management

Specify the entity that holds legal title to the aircraft? Who is the "practical" owner/operator of the aircraft? Reporters typically will be uninterested in the legal nuances and will want to report the aircraft's real-world operator.

7. Age

The age of an aircraft refers to both how old the aircraft is in years and the amount of hours flown, also known as hours "on the airframe." Takeoff and landing or start-up and shut-down "cycles" also sometimes are reported.

8. Maintenance Standards and FAA Inspections

Have at ready disposal the ***STAR*** *Flight's* maintenance philosophy and mission statement regarding the aircraft; to what standards or with what FAA approvals was the aircraft maintained? Where is the aircraft maintained? If the aircraft was maintained in-house, what are the qualifications of the airframe and power plant maintenance technicians? Additionally, information regarding the aircraft's most recent FAA approved inspection should be available.

As part of its investigation, the NTSB will review the maintenance records of the accident aircraft. A proactive approach to maintenance, and the disclosure of maintenance records to authorities, is strongly recommended. However, public comments regarding the maintenance of the accident aircraft should be extremely limited.

Because maintenance records typically are impounded rapidly following an accident, access to them can be limited to preexisting duplicates.

Dispatch Information

It usually is sufficient to provide a general rather than a specific characterization of a dispatch's purpose to the public. The flights' expected departure/arrival dates and times, departure/destination locations and timing normally are reported following an accident.

Passengers

Management should keep information regarding an aircraft's passengers on hand in the event of an accident. Such information includes names, titles, professional association (which network if specialty team).

Crew

Management will always record information regarding an aircraft's crew in the event of an

accident. Such information includes the names and titles of pilot and crew; qualifications of flight crew members, including ratings held, hours of flight experience in aircraft involved and hours of flight experience in general; ***STAR** Flight* training philosophy; and the safety record of ***STAR** Flight* aircraft. Management should, to the best of their ability, expect and preempt aggressive efforts, including invasive inquiries to victims' families, to secure photographs or "stories" about those involved in the accident.

Air Traffic Control

All questions concerning the NTSB's investigation should be referred to the NTSB, including any questions about air traffic control. After an accident occurs, where applicable, the NTSB will obtain air traffic control tapes pertaining to the accident from the FAA and examine them. When the NTSB returns air traffic control tapes to the FAA, typically a couple of weeks after the accident, the FAA will make the tapes public.

Local Weather

Management should refer weather questions to the nearest airport's management office or local weather authorities (the nearest National Weather Service office is a good source), which typically have access to local weather conditions.

1.4.5 INTERNAL ACCIDENT/INCIDENT INVESTIGATION

All work-related accidents, incidents and near misses not serious enough in nature to require the involvement of the NTSB or FAA will be investigated internally and in a timely manner. A proper investigation of any mishap is the first step in preventing a future mishap of a similar nature. Procedures for Investigating Accidents internally:

The Director of Operations, Director of Maintenance, Safety Officer and / or an Independent Investigator appointed by the Program Director, will investigate any accident or incident involving ***STAR** Flight* aircraft or vehicles and report the findings to the Program Director. Where necessary, the Program Director may direct the Safety Officer to investigate circumstances involving safety issues.

Timelines of Investigations: All accidents shall be investigated as promptly as possible. When conducting an investigation, the accident investigator shall:

1. Visit the accident scene as soon as possible: This will ensure that the scene has retained, as closely as possible, the position of all equipment, wreckage and/or debris, switch positions as well as actual witness marks created during the mishap.

2. Save or preserve all physical evidence.

3. Document details graphically using video, photographs, sketches or diagrams wherever

appropriate.

4. Conduct Interviews:

    - When possible, the investigator shall interview the incident employee(s) as soon as they are physically and mentally able;
    - Interview witnesses to the accident either at the scene or as soon possible after the mishap;
    - Obtain signed statements from crew and witnesses.

Prepare and file report: All reports of safety-related investigations will be presented to the Program Director and a copy will be provided to the Safety Officer. Reports will list the specific factual findings, an analysis of the circumstances/cause(s) of the accident or incident and recommendations for action to prevent future mishaps.

1.5 SMS DOCUMENTATION AND RECORDS

1.5.1 GENERAL INFORMATION

***STAR** Flight* maintains all required SMS documentation and records either in paper form or electronic form on Travis County servers or the ARGUS/PRISM SMS application. Safety-related procedures and processes are documented, maintained and revised within this SMS Manual and supporting programs, with personnel responsibilities, authorities and accountabilities described for each safety-related procedure and process. Interfaces between these safety-related procedures and processes are also documented within the SMS Manual and supporting programs, and interactions between managers and vendor POCs are recorded. Paper records are kept in a secure and locked file cabinet, accessible only to the Safety Officer, members of the Safety Committee, and Management.

SMS documentation refers to the safety policies, objectives and expectations as set forth in this SMS Manual and supporting programs.

SMS records are the outputs of SMS processes as specified in the following paragraph titled **SMS Process Outputs.**

1.5.2 RESPONSIBILITY AND AUTHORITY

The Safety Officer is responsible for the quality of all SMS documentation and records. This includes the identification, orderly maintenance, dating (with revision dates) and disposition of all SMS Manuals, supporting programs, and hard-copy records such as Audit finding Reports, completed Management Reviews, and records of SMS training.
The Safety Officer is also responsible for the continued maintenance, security, order and retention of the ARGUS/PRISM, which contains electronic SMS records. This includes

assignment of user names and account authorities for access to, and use of, the ARGUS/PRISM database.

All personnel who complete SMS records, both paper and electronic, are responsible and accountable for ensuring that records are legible, readily identifiable, dated and traceable to the activity involved. Personnel are also responsible for promptly removing from service and destroying all obsolete documents and forms, to prevent unintentional use.

1.5.3 DOCUMENT AVAILABILITY AND CONTROL

The Safety Officer makes current versions of the SMS Manual and supporting programs available and readily locatable at all locations where operations essential to the effective functioning of the SMS are performed, and causes obsolete documents to be promptly removed from all points of use. Each page of the SMS Manual, supporting programs and all forms contain a built-in control (which includes the revision date in the footer of each page) to ensure against use of obsolete information.

1.5.4 RECORDS RETENTION

SMS records are maintained by the Director of Safety so that they are readily retrievable and protected against damage, deterioration or loss. All records generated by the Safety Management System shall be retained for the specified times noted below:

The following SMS records are retained at headquarters:

A. SMS policies and objectives: (retained until updated or changed)

- Original SMS Documents;
- Subsequent Revisions.

B. Outputs of the SMS: (retained 3 years)

- Completed Hazard Reports (risk assessment & associated action plans);
- Aviation Safety Reports (ASR);
- Potential Safety Hazard Reports;
- Voluntary Safety Reports;
- Internal/External Audits;
- Internal Evaluation Program (IEP) Reports;
- Anonymous Reports;
- Safety Committee Minutes;
- Safety Meeting Minutes (one year at hospital quarters);
- Safety Bulletins;

- Annual Safety Report;
- Employee and Customer Feedback.

C. Training: (retained 5 years or as required by the regulator)

- SMS Training Records.

D. Incidents: (retained 10 years)

- Post Incident Reports/Incident Investigation Data;
- If legal action is pending or anticipated incident records will be kept until the legal action has been resolved.

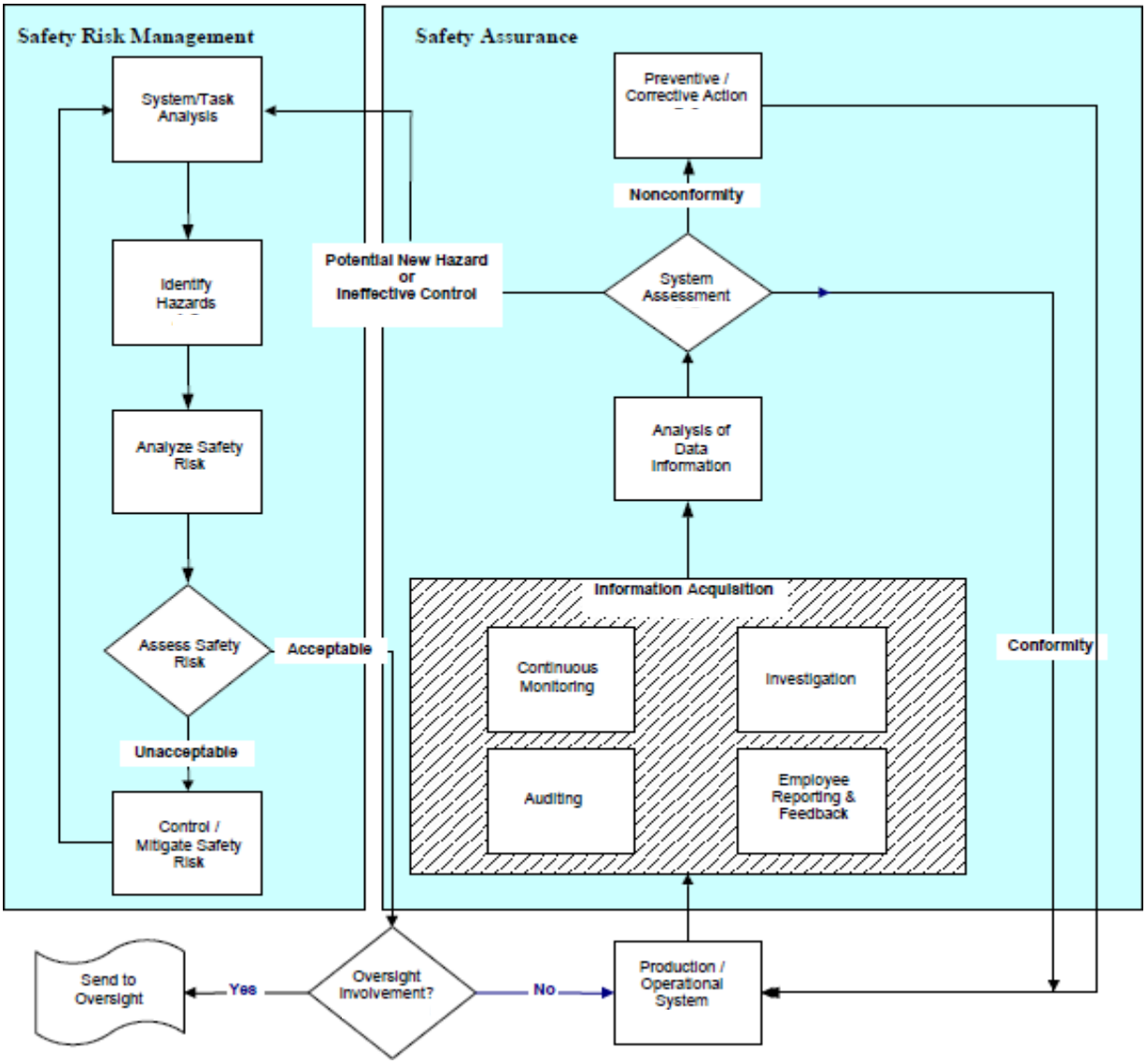
E. Accidents: (Indefinitely)

- Post-accident Reports;
- Accident Investigation Data.

2.0 SAFETY RISK MANAGEMENT (SRM)

OVERVIEW

Safety Risk Management is a formal process that is used to identify hazards associated with our operations, analyze and assess the risks associated with those hazards, and to implement controls, when necessary, to prevent future accidents and incidents. All identified hazards will be put thru the SRM process. Our safety risk management process is both reactive and proactive. The process can also be used to prioritize the resulting process improvements to ensure the best allocation of our resources. Hazard information will be managed through the entire safety risk management process as described in the chart below.



A hazard is a condition, event, or circumstance that could lead to or contribute to an unplanned or undesired event. Risk is an expression of the impact of an undesired event in terms of event severity and event likelihood. Throughout the risk management process, hazards are identified, risks analyzed, assessed, prioritized, and results documented for decision-making. The continuous loop process provides for validation of decisions and evaluation for desired results and/or the need for further action.

***STAR** Flight* SRM is centered on such a systematic approach to hazard identification and risk management; in the interest of minimizing the loss of human life, property damage, and financial, environmental and societal losses.

The SRM at ***STAR** Flight* is comprised of the following focus areas:

a. System design and task analysis;
b. Change management;
c. Hazard identification;
d. Hazard reporting and management; and
e. Validation and control.

Using various techniques described in this section, ***STAR** Flight* has defined acceptable and unacceptable levels of safety risk. Descriptions have been established for severity and likelihood levels, to include authority for safety risk acceptance decisions. These risk decisions may apply in the short-term while safety risk controls/mitigation plans are developed and executed.

Note: The SRM process shall not preclude ***STAR** Flight* employees from taking interim immediate action to eliminate or mitigate existing safety risk when and where it is recognized that urgent action is required.

2.1 HAZARD IDENTIFICATION AND ANALYSIS

2.1.1 IMPORTANT DEFINITIONS

The following are definitions are to give common meaning to varying terms used in the incident/accident arena within the Safety Management System:

- **Occurrence** – Any unplanned safety related event, including accidents and incidents that could impact the safety of ***STAR** Flight* personnel, guest, passengers, equipment, property or the environment;

- **Hazard** – Something that has the potential to cause harm to a person, loss or damage to equipment, property or the environment.

2.1.2 SYSTEM DESIGN AND TASK ANALYSIS

Safety risk management must examine system design. That means looking at what we do and how we do it. System and task evaluations shall be proactively carried out to the level of detail necessary to identify hazards present at ***STAR*** *Flight*.

Whether it is a physical system such as an aircraft or an operational system such as scheduling, flying or maintaining aircraft, it needs to be analyzed. A system or task description should completely explain the interactions among the hardware, software and environment that make up the system in sufficient detail to identify hazards and perform risk analysis. System and task analysis will consider the following, at a minimum:

a. Any interactions with other systems in the air transportation system (e.g. airports, air traffic control);
b. The functional components described in Section 3 of this manual;
c. Required human factors considerations of the system (e.g. cognitive, ergonomic, environmental, occupational health and safety) for operations and maintenance;
d. Hardware components of the system;
e. Software components of the system;
f. Related procedures that define guidance for the operation and use of the system;
g. Training requirements (existing and potential);
h. Ambient environment;
i. Operational environment;
j. Maintenance environment;
k. Contracted and purchased products and services;
l. The interactions between items or issues defined in the list above; and
m. Any assumptions made about the systems, system interactions, and existing safety risk controls/mitigation.

Each responsible manager is required to continually evaluate the systems and processes under their cognizance, measure performance, identify hazards, and assess related risk. Examining the probable threats and areas of common errors in these systems and processes will provide increased clarity into the hazards affecting ***STAR*** *Flight*.

The results of the analysis performed by responsible managers, whether done independently or in conjunction with other SMS activities, will be documented in the PRISM database.

Safety must be designed into all of our policies, procedures and operations. Our existing systems have already been designed and proven safe, but they will be reviewed to determine opportunities for improving their inherent levels of safety.

The first step is to obtain or develop system and task descriptions to the necessary level of detail to allow for proper analysis. These systems consist of the organizational structures,

processes, and procedures, as well as the people, equipment, and facilities used to accomplish the organization's mission.

The system or task descriptions must be comprehensive and must cover all of our organizational processes. The descriptions should completely explain the interactions among the hardware, software, people, and environment that make up the system in sufficient detail to identify hazards and perform risk analyses. Long and excessively detailed system or task descriptions are not necessary as long as they are sufficiently detailed to perform hazard and risk analyses.

While sophisticated process development tools and methods are available, simple brainstorming sessions with managers, supervisors, and other employees are often the most effective means.

Hazards are to be identified considering procedures, human factors, equipment, training and related operational environment aspects. The analysis should also identify the authority, responsibilities, communication interfaces, process measures, and controls, to assure that the operational tasks are accomplished as intended and that all related functions interact properly. PRISM will be used to organize and record the results of this analysis.

2.1.3 HAZARD IDENTIFICATION AND REPORTING

The purpose of hazard identification is to allow for a safety analysis of the risks associated with the hazard and the subsequent elimination of the hazard or the reduction of its risks to an acceptable level. While the identification of every conceivable hazard is impossible, all employees must exercise due diligence to identify hazards related to their operations. These hazards can be actual or foreseeable. All hazards identified will be assigned a unique tracking number in the PRISM system and published for total visibility to employees.

Our organization utilizes both reactive and proactive methods of hazard identification. Our traditional reactive methods of hazard identification will analyze hazards that have been identified or have already contributed to an incident. These reactive processes include the conduct of investigations into accidents, incidents, occurrences, employee reports, and regulatory violations. Our organization also utilizes proactive methods of hazard identification. Proactive methods attempt to identify and analyze hazards before they have resulted in an incident or accident. Our proactive methodologies are discussed below.

- During implementation of our SMS every attempt will be made to analyze existing procedures and operations for risks and risk mitigation.
- All significant changes to our operations will be analyzed (Management of Change; MOC) prior to implementation to foresee new hazards and to revise the proposal to eliminate the hazards or to control the risks to an acceptable level.

- Continuous review of operational data and trend analysis to proactively identify hazards and mitigate hazards.

Reactive Hazard Identification: A Pilot used the PRISM application to report a hazard he identified. Two teenagers were found walking around the helipad at the hospital going through the helicopter.

Proactive Hazard Identification: The Program Director has decided to gate off the helipad. Additionally, surveillance cameras and warning signs were added for enhanced security measures. Hospital security will monitor the cameras 24 hours a day. This will prevent or deter unauthorized personnel from entering into the secured area.

Other examples of hazards are shown in the table below:

Flight Crew	Medical Crew Members	Maintenance
• Weather • System malfunctions • Chip lights • False alarms • Inadvertent IMC • Smoke in the flight deck • Airport construction • Bird strike • Lightning strike • LZ hazards • Wind shear	• Medical Complications • Blood borne pathogens • Smoke in Cabin • Hostile passengers • Intoxicated passengers • Staffing • Equipment malfunctions	• Time pressures to sustain on-time departures • Control of aircraft configurations • Environmental factors (e.g. temperature, lighting and noise) • Lack of parts • Fatigue

Identify Hazards and Consequences: Potential hazards may be identified from a number of internal and external sources. Hazard scenarios may address the following: who, what, where, when, why, and how, regarding the hazard that is causing concern, as well as its potential consequences. This provides an intermediate product that expresses the condition and the consequences that will be used during risk analysis. Hazards shall be identified for the entire scope of the system that is being evaluated, as defined in the system description, and documented using the hazard reporting form. Once a hazard has been identified and

documented, the information shall be tracked and managed as described in the procedures following.

Depending on the severity and probability of the hazard, the appropriate supervisor will complete the process IAW with established timelines. Any hazard mitigated may be filed and kept indefinitely if ***STAR*** *Flight* feels that the historical importance of it will continue to be relevant to accident prevention and education measures.

The following occurrences or hazards must be reported by ***STAR*** *Flight* personnel:

- Any incident, accident/occurrence involving injury to personnel or damage to equipment or facilities;
- Any incident, accident/occurrence involving injury to non-***STAR*** *Flight* personnel or damage to equipment or facilities, resulting from ***STAR*** *Flight* operations;
- Any event or occurrence leading to a PAIP activation;
- Any mitigation action taken due to a perceived threat to personnel or equipment.

2.1.3.1 MANDATORY REPORTING PROGRAMS

By regulation, ***STAR*** *Flight* is required to participate in several mandatory reporting programs. These programs will continue, but will now become incorporated into our SMS. This means that all reports will still be made to the FAA per standard procedures, but copies of the report will also be supplied to the Safety Officer for inclusion into the Safety Risk Management process as appropriate. Items to report include:

- Fires during flight and whether the related fire-warning system functioned properly;
- Fires during flight not protected by related fire-warning system;
- False fire-warning duringflight;
- An aircraft component that causes accumulation or circulation of smoke, vapor, or toxic or noxious fumes in the crew compartment or passenger cabin during flight;
- Engine shutdown during flight because of flameout, foreign object ingestion or for mechanical RFM reasons;
- A fuel system malfunction that affects fuel flow or causes hazardous leakage during flight;
- Aircraft structural damage that requires major repair;
- Cracks, permanent deformation, or corrosion of aircraft structures, if more than the maximum acceptable to the manufacturer or the FAA;

- Aircraft components or systems malfunctions that result in taking emergency actions during flight.

2.1.3.2 EMPLOYEE REPORTING AND FEEDBACK SYSTEM

Proactive safety management depends on a robust and positive reporting culture. It is critical that ***STAR** Flight* instill a culture that provides a means of employee communication that allows for timely submission of reports on safety deficiencies without fear of reprisal The main objective of an employee safety reporting and feedback system is to establish and maintain an environment in which employees can report hazards, issues and concerns, as well as occurrences, incidents, etc., and propose safety solutions and improvements. Employees must be encouraged by ***STAR** Flight* management to use the employee reporting system without fear of reprisals. Data from the safety reporting and feedback system will be monitored to identify emerging hazards. Additionally, data collected in the safety reporting and feedback system will be included in all SMS analysis functions.

2.1.3.3 MANDATORY INCIDENT REPORTING

a. At ***STAR** Flight* it is mandatory to report any incident involving an unsafe, or potentially unsafe, occurrence or condition that could involve injury to persons or damage to property. The report will be submitted as soon as possible after the condition is identified or the occurrence happens. The person reporting may or may not disclose their identity.

b. It is mandatory to report the following occurrences:

- Bird strike
- Failure of navigational/landing aids
- Failure of communication services or equipment
- Incorrect transmissions that could lead to injury
- Collision between ground vehicles or GSE
- Fuel spillage
- Security breaches of aircraft, equipment or quarters
- Any incident jeopardizing passenger safety
- Any incident jeopardizing the safety of third party persons
- Any safety incident that could be of interest to the public or news media

- Laser events
- Any incident where the flight was discontinued (or unplanned landing) due to aircraft malfunction or unsafe condition

2.1.3.4 CONFIDENTIALITY OF REPORTING SYSTEM

At ***STAR** Flight*, confidentiality of the report is guaranteed. If chosen the PRISM reporting tool will not record any identifying information of the incident or hazard. The identity of the reporter will not be disclosed to anyone in the executive or safety chain.

2.1.3.5 HANDLING OF REPORTS

a. The safety reports will be handled, if chosen, with absolute confidentiality. The reports will be transmitted and followed up with a brief investigation report, where applicable. In any case, each report will be investigated, analyzed and automatically recorded in the PRISM database. This will allow trend projection and cause-effect analysis to be carried out and feedback to be transmitted to management and employees.

b. In order to ensure user confidence in the system, it is important to provide feedback to the entire organization on what action, if any, was taken regarding the report. Feedback is even more important when no action is taken since in the absence of visible action, users may lose confidence in the system and stop reporting.

2.1.3.6 SAFETY REPORT SUBMISSION PROCEDURE

Employee's access to the report document will be through the "Favorites" drop down menu on TRAVIS CENTRAL. Under the ***STAR** Flight* links folder you will see the "Prism SMS" icon. Unique usernames will be provided and then you can set up your own password to login. If this link fails to open the application, use the following web address to access the site; https://prism.aviationresearch.com/login. As an alternative to the web-based reporting method, any individual can submit a report via email, paper copy, hand-written or any method desired. The important thing is to get the information to the safety office or your supervisor quickly as possible so that an incident can be prevented.

Employees who work daily in the operational areas of the company are in the best position to be aware of hazards and incidents. Thus, all personnel are strongly encouraged to report all

current or potential hazards, as well as actual incidents where our procedures did not adequately ensure the proper level of safety. Also, reports should be made when procedures were not followed for either inadvertent or intentional reasons.
Reports may be made verbally to your supervisor, but it is preferred that the report is made in writing using the appropriate reports available in the ARGUS/PRISM SMS application. In the report describe fully all related details from which an analysis can be conducted. Supervisors receiving verbal reports will submit a Hazard Report if needed.

The Voluntary Reporting Program is a non-punitive program that does not use the reported information to punish employees, but is instead focused upon developing process improvements to eliminate the identified hazards or control the risks associated with the hazard. It is recognized that the vast majority of incidents and accidents are due to inadequate procedures or the training given to employees about the procedures, so there is no benefit in allocating personal blame in these cases. However, this non-punitive policy does not apply to illegal acts or blatant disregard of regulations or procedures.

- Hazard Report: The Hazard Report is available to all staff to report hazardous conditions or unsafe work practices;
- Occurrence Report: The Occurrence Report is available to all staff to report an actual hazardous event or incident that has occurred;
- Anonymous Reporting System: This The PRISM SMS application allows staff to report safety issues anonymously and allows for feedback to the reporter without identifying them and with total transparency to the entire ***STAR*** *Flight* staff. Staff will be kept apprised of the assessment and resolution to its entirety through the "publishing" function of PRISM.
- Suggestion for Improvement Report: This report should be used by staff to suggest ways to improve processes or to provide feedback from themselves or from customers. This form does not necessarily need to be related strictly for safety issues and should be used for any suggested process improvement.

Reports collected through our voluntary reporting program will be submitted to the Safety Officer directly through the PRISM notification feature. Hazards identified from these reports will be analyzed through the safety risk management process described earlier.

2.1.3.7 *STAR FLIGHT* MANUAL OCCURRENCE AND HAZARD IDENTIFICATION REPORT (IF NEEDED)

Employee/Crewmember please complete items 1 through 12. Click on all "gray boxes" and either check what applies or type in narrative, date etc…….
The purpose is to assure that intervention prevents reoccurrence.

Occurrence Report ☐ Hazard Identification Report ☐

Report Number: (assigned by safety officer)

1. Date: 2. Time: 3. Location:

4. Flight #: Call #:

5. Event or unsafe act(s) observed:

6. Injuries/Illnesses experienced:

7. Corrective action(s) taken:

8. Human Error Factor:

9. AMRM Factor: (If "YES", provide description below)

10. Weather Factor: (If "YES", provide description below)

11. Comments/recommendations:

12. Person submitting Report:

ADMINISTRATIVE FINDINGS

13. Mechanical Findings (DOM):

14. Mechanical Resolution:

15. Parts Cost:

16. Man Hour Cost:

17. Total Cost:

18. Administrative Findings (DAO or Chief Pilot):

19. Supervisor Submitting Information:

20. Occurrence: First ☐ Second ☐ Third ☐ N/A ☐

21. Distribution: Employees ☐ Supervisors ☐ Safety Officer ☐

Date Completed:

2.2 RISK ASSESSMENT AND CONTROL

2.2.1 ANALYZE SAFETY RISK

All incoming reports will first be screened to ensure they are not simple process quality problems that can be handled without risk analysis.

Supervisors, with the assistance of the Safety Officer, will evaluate each identified hazard assigned to them, and the system state(s) in which it exists, to determine what controls to develop and implement prevent or reduce the effect(s) of the hazard. Each hazard will be analyzed to determine its potential to cause damage or harm, known as risk. The SMS RA in PRISM will be used to organize the risk analysis process and record the results.

Each identified hazard has one or more associated risks. It is important for the risk analysis to first identify all reasonable risks arising from each hazard. Each risk can then be defined in terms of its predicted severity and its probability of occurrence.

The severity of each risk is determined by its worst credible outcome. Less severe effects may also need to be included so that they can also receive proper assessment. It is important that the probability of the severity of the effect is not considered at this time. A chart explaining the severity levels is shown in the table below.

The probability of outcomes is determined by statistical analysis or by expert opinion in the absence of other data. A chart explaining the probability definitions is shown in the table below.

Risk determination follows a simple three step process of condition (hazard), consequence (event), and risk (the probability and severity of the event.)

Risk Analysis Examples:

Analysis identified the following components in the hazard:

- Dolly landing with spotter on the left;
- Water often freezes on the ramp in the winter;
- Maintenance while on the dolly using ladders.

All the components are individually analyzed and accessed using the severity and probability of the worst potential effect. The composite of each component analysis is combined to assess the hazard. The conditions were determined to be probable, leading to a hazardous condition in the case of a dolly landing with the spotter on the left.

Analyzing risks is wasted effort unless safety information is extracted from the data collected. ***STAR** Flight* will analyze hazards in a three-step process:

1. Identify the hazard – The goal is to discover the following:

    - What can go wrong?
    - What are the potential consequences?
    - How could the hazard arise?
    - What are the contributing factors?
    - How likely is it that the hazard will cause an injury or accident?

2. Divide the generic hazard into specific hazards or components of a hazard to make the analysis useful. We will document answers to specific questions in a consistent manner. This helps to consistently process the hazard and identify the critical points:

    - Where is the hazard?
    - Who or what is it a hazard to?
    - What precipitates the hazard?
    - The outcome should the hazard become an occurrence;
    - Any other contributing factors identified.

3. Link each specific hazard to a specific potential consequence.

To assist and attempt to discover every possible risk during the analysis, ***STAR** Flight* will involve employees, safety committee, managers, historical data and job reviews. Once analyzed, we move into the assessment process.

2.2.2 ASSESS SAFETY RISK

Risk assessment is the process where you:

- Identify hazards;
- Analyze or evaluate the risk associated with that hazard;
- Determine appropriate ways to eliminate or control the hazard.

In practical terms, a risk assessment is a thorough look at your workplace to identify those things, situations, processes, etc. that may cause harm, particularly to people. After identification is made, you evaluate how likely and severe the risk is, and then decide what measures should be in place to effectively prevent or control the harm from happening.

***STAR** Flight* will use the seven-step assessment process described below:

1. Develop a complete description of the system to be assessed.
2. Identify the hazards.
3. Estimate the likelihood of a hazard becoming an occurrence.
4. Estimate the severity of the consequences if the hazard is not mitigated.
5. Evaluate the risk.
6. Mitigate the risk.
7. Develop safety assessment documentation.

For each hazard identified the risk is calculated based on its severity and frequency:

Probability of occurrences		
Qualitative definition	**Meaning**	**Value**
Frequent	Likely to occur constantly, habitually, or regularly	See chart intersection
Occasional	Likely to occur irregularly or infrequently; now and then	"
Remote	Unlikely, but could occur at far apart intervals	"
Improbable	Very unlikely to occur at any interval	"
Extremely Improbable	So unlikely that it is not anticipated to occur during measurable operational hour	"

Severity of occurrences		
Aviation definition	**Meaning**	**Value**
Catastrophic	Multiple DEATHS, equipment destroyed	See chart intersection
Critical	A large reduction in safety margins, physical distress, workload such that personnel cannot be relied upon to perform assigned tasks safely, serious injury or possibly death	"
Major	Significant reduction in safety margin, conditions impairing efficiency, physical distress, injury or property damage	"
Minor	A slight reduction in safety margins, coping with adverse operating conditions could be difficult, impaired efficiency, minor discomfort	"
Negligible	Nuisance to operating conditions, minor consequences with some limitations to operating conditions	"

To accomplish a risk assessment, our organization will plot the results of each analyzed risk on the Risk Assessment Matrix shown below. This will be accomplished by the appropriate level of

management and facilitated by the Safety Officer. The location of the risk on the matrix will determine the priority of corrective actions.

2.2.2.1 *STAR Flight* - Risk Assessment Matrix

PROBABILITY	SEVERITY				
	A Catastrophic	B Critical	C Major	D Minor	E Negligible
5 Frequent	5A	5B	5C	5D	5E
4 Occasional	4A	4B	4C	4D	4E
3 Remote	3A	3B	3C	3D	3E
2 Improbable	2A	2B	2C	2D	2E
1 Extremely Improbable	1A	1B	1C	1D	1E

2.2.2.2 *STAR Flight* – Risk Tolerability Decision Matrix

COLOR ZONE	RISK LEVEL	SCORE	DECISION REQUIREMENTS
Red	**High**	**5A, 5B, 5C, 4A, 4B**	Unacceptable under the existing circumstances. The action or event must not be undertaken. Imperative that risk be reduced if action or event is to proceed.
Yellow	**Medium**	**5D, 5E, 4C, 3B, 3A, 2A**	The action or event may only proceed with the approval of the accountable executive. This may be a standing approval if associated with a previous risk assessment.
Green	**Low**	**4D, 4E, 3C, 3D, 3E, 2B, 2C, 1A, 1B**	The action or event may only proceed with the approval of management if there is no standing policy or procedure containing existing controls for this action or event.
Blue	**Negligible**	**2D, 2E, 1C, 1D, 1E**	The action or event is always acceptable.

2.2.3 CAUSAL ANALYSIS

Risk analysis should concentrate not only on assigned levels of severity and probability, but on determining why these particular levels were selected. This is often called root cause analysis and is the first step in developing effective controls to reduce risk to lower levels. Discussions with employees, affected personnel and other subject matter experts is often an effective method to find ways to control risk and to involve the personnel who will ultimately be required to implement the controls developed.

2.2.3.1 *STAR Flight* Manual Record of Assessment (if needed)

RECORD OF ASSESSMENT			
Ref. No. (Occurrence or hazard report #):			
Location: , If "Other": write in location: Section/Department:		Type of Risk or Harm: Severity and Probability Matrix #:	
Work Activity:		Injury	
Team:		Damage to environment	
Assessor's Name:	Reviewer's Name:		
Date of Assessment:	Review date:		
Persons at risk:			
If "OTHERS" list here:			
Describe the assessment and mitigation measures here:			
Severity and Probability Matrix # AFTER MITIGATION:			
IF ADDITIONAL CONTROL MEASURES ARE REQUIRED, CAN THEY BE IMPLEMENTED IMMEDIATELY			
SUMMARISE THE ADDITIONAL CONTROL MEASURES BELOW			
Action required:	Target Date	Completed by: (Name & Date)	
Date control measures were implemented:			
Assessment accepted by: (relevant supervisor):			
Title:			
Date:			

2.2.4 CONTROL AND MITIGATE SAFETY RISKS

While the risks inherent throughout ***STAR** Flight* will be continually assessed, managers can implement one or more risk control measures designed to reduce or eliminate the assessed risk. Mitigation measures may include one or more of the following controls:

- Design the hazard out of existence by modifying the system;
- Install physical guards or barriers;
- Issues warnings, advisories, or signals for the hazard;

- Make procedural changes to avoid the hazard or to reduce "probability" and/or "severity" of the hazard;
- Provide training and education.

Every attempt will be made to "assess" the mitigation procedure to identify any "new" hazards that may be introduced unknowingly into the system.

2.2.4.1 RISK ACCEPTANCE AND CONTROLS

After hazards and risk are fully understood from the preceding steps, risk controls must be designed and implemented. These may be additional or changed procedures, new supervisory controls, addition of organizational hardware, or software aids, changes to training, additional, or modified equipment, changes to staffing arrangements, or any of a number of other system changes.

Risk acceptance and control will be accomplished at ***STAR** Flight* using the ARGUS/PRISM SMS database application and will be maintained electronically.

2.2.4.2 HIERARCHY OF CONTROLS

The process of selecting or designing controls will be approached in a structured manner. System safety technology and practice has provided a hierarchy or preferred order of control actions that range from most to least effective. Depending on the hazard under scrutiny and its complexity there may be more than one action or strategy that may be applied. Further, the controls may be applied at different times depending on the immediacy of the required action and the complexity of developing more effective controls. For example, it may be appropriate to post warnings while a more effective elimination of the hazard is developed. The hierarchy of controls is:

a) Design the hazard out – modify the system (this includes hardware/software systems involving physical hazards as well as organizational systems).

b) Physical guards or barriers – reduce exposure to the hazard or reduce the severity of consequences.

c) Warnings, advisories, or signals of the hazard.

d) Procedural changes to avoid the hazard or reduce probability or severity of associated risk

e) Training to avoid the hazard or reduce the probability of an associated risk.

All controls will be clearly and fully documented to allow for further analysis, tracking and post-implementation validation.

2.2.4.3 RESIDUAL AND SUBSTITUTE RISK

It is seldom possible to entirely eliminate risk, even when highly effective controls are used. After these controls are designed but before the system is placed on line, an assessment must be made of whether the controls are likely to be effective and/or if they introduce new hazards to the system. The latter condition is referred to as "substitute risk," a situation where "the cure is worse than the disease."

2.2.4.4 RISK ACCEPTANCE

The approval from Top Management is required for the acceptance of risk that fall into the *Unacceptable Risk Category*. Risks that fall in the *Acceptable with Mitigation* range may be approved by the Safety Officer and mid-level management. All efforts should be made to reduce the risk to as low a level as practicable if it is practical to do so. Risks that fall in the *Acceptable* range may be approved without further action, but efforts should still be made to reduce the risk to as low a level as practicable.

2.2.4.5 RISK CONTROL TRACKING

Risk control tracking will be accomplished in our organization using the ARGUS/PRISM SMS application database. Each hazard is uniquely identified which allows us to validate that our risk controls were fully implemented and that they were found to be effective. The next process, safety assurance, uses auditing, analysis, and review systems to further monitor our risk controls to ensure they continue to be implemented as designed and continue to be effective in our changing operational environment. Any control that is found to be deficient or ineffective will have its associated hazard re-entered into the safety risk management process for the development of more effective controls.

3.0 SAFETY ASSURANCE

OVERVIEW

The primary purpose of our safety assurance process is to assure the performance and effectiveness of our risk controls, identify new hazards and verify regulatory requirements applicable to the SMS. Safety assurance includes safety reviews/meetings, evaluations, audits, and inspections, as well as data tracking and analysis and investigations. Audits and evaluations support the essential function of the SMS by ensuring that safety objectives have been met. Internal audits are carried out within each department by departmental personnel.

Auditing and evaluation are core safety management activities. Similar to financial audits, safety audits provide a means for systematically assessing how well the organization is meeting its safety objectives. Audits and evaluations can be scheduled or unscheduled formal reviews, examinations, and verifications of activities and operations. They improve the quality of processes and services, and provide a means for ensuring compliance with policy and/or customer requirements. Audits also evaluate the effectiveness of the overall program, identify areas in need of improvement, and verify the results of those improvements. The scope of an audit varies with the stage of the program/operation, its maturity, type of safety processes, and level of confidence developed from previous audits. Finally, audits contribute to the identification of negative safety trends, which can lead to the identification and mitigation of hazards.

Assurance Component Description

Safety assurance and evaluation are proactive functions that look for safety issues and hazards that could lead to incidents and accidents. If personnel identify that existing risk controls have not been fully implemented, or are not being properly followed, they work with management to arrive at corrective actions to reinstate the control. In some cases, the resolution or corrective action could constitute a change to established procedures. Such proposed changes must be communicated to the Safety Officer for analysis using the SRM process, prior to implementation. This is accomplished in conjunction with the System and Task Analysis process described in this manual.

The safety assurance objectives for ***STAR*** *Flight* are designed using the following principles and include procedures for monitoring the performance of critical aspects of the organization. The safety assurance objectives shall be comprised of these elements:

a. monitoring of risk and effected controls;
b. internal evaluation and external audits;
c. corrective action requirements;
d. safety performance analysis;
e. Management review.

3.1 SAFETY PERFORMANCE MONITORING AND MEASUREMENT

3.1.1 CONTINOUS MONITORING

Our organization actively seeks the information necessary to confirm the successful operation of our SMS processes. Continuous monitoring involves analysis of operational data as it becomes available. The operational data is continually monitored to discover any pertinent trends. The Safety Officer is responsible to monitor this information and accomplish this review on a monthly basis.

***STAR** Flight* will monitor the effectiveness of implemented risk controls in the following manner:

a. At every SRM committee meeting all new hazards and occurrences will be reviewed to make they have been assigned for proper analysis, assessment, and mitigation;
b. The Quality Management Committee (QM) will review all risk assessments and mitigation control measures at the 2 month and 6 month intervals to evaluate their effectiveness. Current controls will be modified as necessary if it is determined the control measure in place does not meet the full effect intended; and
c. The Safety Officer will monitor control measures daily to determine if any trends develop indicating a control measure is proving ineffective. The SO will notify the accountable manager immediately if any such trend is identified.

3.1.2 INTERNAL AUDITS BY OPERATIONAL DEPARTMENTS

3.1.2.1 INTERNAL EVALUATION PROGRAM (IEP)

Internal auditing is a tool we employ to measure safety margins at ***STAR** Flight*. Internal audit checklists (self-audits) and Safety & Quality Assurance Audit Checklists are provided through the ARGUS/PRISM SMS management application. Functional area checklists are available on the on the web site and dual developed; either by PRISM or generated internally at ***STAR** Flight*. Departmental directors and supervisors will use the respective self-audit checklists to identify events, policies, procedures or practices that may be indicative of safety hazards. This will be accomplished annually.

- Department supervisors will conduct or assist with annual self-inspections in their respective areas of responsibilities utilizing the ***STAR** Flight* Internal Evaluation Program (IEP). The results of these inspections will be documented in PRISM and managed by the Safety Officer.

- Contractors or vendors seeking to provide services to ***STAR** Flight* must first complete a Quality Control Vendor Audit Survey that will be supplied by ***STAR** Flight*. The survey is a self-audit checklist completed internally or can be completed with the assistance of a ***STAR** Flight* employee if needed.

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- Deficiencies, hazards, and associated risks identified by the internal audit process are then alerted to top management for action if needed. Department self-inspections, self-audits and quality control vendor audits can identify problem areas before they result in a mishap and therefore contribute to our *proactive* hazard identification processes.

3.1.2.3 INTERNAL AUDITS AND INTERNAL EVALUATION TARGET AREAS

Under the direction of the Safety Officer, the IEP will include comprehensive evaluations of departments listed herein. These evaluations will focus on the effectiveness of controls and processes, any ongoing evaluations/audits within departments, communication within and between departments, and the effects that company policy and development have on department objectives.

- Operational Management;
- Safety Performance;
- Flight Standards;
- Operations Control Center (OCC)
- Aviation Life Support/Survival Equipment;
- Manuals;
- Personnel;
- Quality Assurance;
- Records;
- Inspection Program;
- Maintenance Training;
- Pilot Hiring Process;
- Drug and Alcohol Program;
- Security and Dangerous Goods;
- Hangar/Facilities.

3.1.2.3 INTERNAL EVALUATION AUDITOR SELECTION CRITERIA

If feasible ***STAR*** *Flight* IEP auditors should have training and/or experience in recognized quality management auditing, systems analysis, root cause analysis, and risk assessment, as well as evaluation principles and techniques.

Each organizational discipline is represented on the SRM Committee. Internal audits will be scheduled and assigned to the appropriate department Director/Supervisor along with SRM Committee members. Results will be forwarded to the Safety Officer for documentation and distribution processes. If necessary, the appropriate Supervisor will initiate resolution plans to address deficiencies discovered.

3.1.3 EXTERNAL AUDITING OF THE SMS

***STAR** Flight* management will attempt to make arrangements to have an external agency carry out an independent safety audit. Audits may be conducted by industry associations or other third parties selected by ***STAR** Flight* after budget approval considerations and coordination agreements with an audit provider. These external audits enhance the internal audit system as well as provide independent oversight.

Regardless of the driving force behind the audit, the activities and output from both internal and external audits are similar. These audits conducted by a safety authority should take a broad view of the safety management procedures of ***STAR** Flight*. The key issues will be:

- ***Surveillance and compliance*** - ensure that national and local standards are complied with;
- ***Areas and degree of risk*** - assess how risks are identified and how any necessary changes are made to ensure that all safety standards are met;
- ***Competence – STAR** Flight* should have adequately trained staff for all safety related positions;
- ***Safety management*** - ensure that ***STAR** Flight's* SMS is based on sound principles and procedures, and that the organization is meeting its safety performance targets.

3.1.4 INVESTIGATION

Our organization investigates accidents and incidents. These investigations are used to facilitate the implementation of more effective risk controls in our operation. These investigations are not intended to be a chase for the guilty party, but rather a move toward effective risk mitigation. This ensures the cooperation of those involved in the event and facilitates discovery of the underlying causes. The short-term expediency of finding someone to blame is detrimental to our long-term goal of preventing future mishaps.

Most incidents do not warrant reporting or investigation by regulatory authorities. Nevertheless, such incidents may be indicative of potentially serious hazards — perhaps systemic problems or latent conditions that will not be revealed unless the occurrence is properly investigated. In our organization, all these events are investigated and then enter our SRM process for hazard identification, tracking, and control.

When a mishap occurs, Top Management will conduct an investigation into the event – assign a person or team to investigate the event using our Accident and Incident Investigation Plan process. Upon conclusion the investigation will document all findings and hazards discovered as well as any risk analysis conducted producing risk mitigation measures.

a. ***STAR** Flight* investigations into "Human Error" incidents will utilize the Maintenance Error Decision Aid (MEDA) checklist or the Human Factors Analysis and Classification System (HFACS) checklist in the attempt to best determine root causal factors for mitigation or elimination of accident or incidents.

b. Should an occasion arise, ***STAR** Flight* will seek Travis County approval to establish an external Incident Review Board (IRB). The purpose of the IRB will be to present an honest, objective and unbiased critique of policies and procedures and to recommend mitigation measures to ***STAR** Flight* top management and appropriate Travis County accountable Executives.

3.1.5 ANALYSIS OF DATA

All safety related incident data, procedural data, GAP analyses of industry accidents or trends will be analyzed to provide ***STAR** Flight* a benchmark to establish safety performance targets. Analysis of the following data sources will be used to evaluate the effectiveness of the ***STAR** Flight* SMS programs:

- Hazard and Occurrence Reports
- Internal and External Audits
- Investigations
- Employee Reporting and feedback system
- GAP analysis of industry incidents

This safety information is used to:

- Identify risks and verify the effectiveness of implemented controls;
- Identify areas in which safety could be improved;
- Contribute to accident and incident prevention;
- Assess the effectiveness of training.

3.1.6 FLIGHT DATA MONITORING (FDM) PROGRAM

The improvement of flight safety is the driving force behind ***STAR** Flight's* Flight Data Monitoring (FDM) program. A FDM program is used to reveal operational situations in which risk is increased in order to enable early corrective action before that risk results in an incident or accident.

The Safety Officer is responsible to analyze safety data to identify adverse trends and to identify indicators of potential safety issues. Over time this data will help identify indicators that point to potential problems in the system. We also use safety data to assess the effectiveness of the SMS by tracking safety metrics.

Data analysis programs are also used for the monitoring and analysis of flight operations and human factors. Flight Data Analysis (FDA) programs are a logical component of our SMS by encouraging adherence to SOPs, deterring non-standard behavior and so enhancing flight safety. They can detect adverse trends in any part of the flight regime and thus facilitate the investigation of events other than those which have had serious consequences.

Flight data analysis is also used to detect flight parameter nonconformity and to identify nonstandard or deficient procedures, weaknesses in the ATC system, and anomalies in aircraft performance. FDA generally monitors various aspects of the flight profile, such as the adherence to the prescribed take-off, climb, cruise, descent, approach and landing SOPs.

Data acquisition and analysis will only be done on a schedule developed by the Safety Officer. Requests for specific events and analysis will be made through the Safety Officer. Unless specifically directed by the Safety Officer, no video, audio, or flight data will be used or released to any party prior approval from the Safety Officer.

3.2 SYSTEM ASSESSMENT

Following the analysis of data the Safety Officer will accomplish a system assessment of our organization's operations. This will be accomplished on an annual basis. The Safety Officer may enlist the assistance of appropriate individuals throughout the organization for this purpose.

The system assessment will be accomplished by conducting a careful evaluation of the data collected by our SMS. The Safety Officer and the Safety Risk Management Committee (SRMC) will render an opinion or judgment of the effectiveness and efficiency of the organization and the maturity of the SMS. These findings will then be compared to our safety performance goals. Action plans will be generated to improve deficient areas.

Whereas the internal audit process is used to obtain objective evidence that existing policy, procedures or requirements have been met, the information obtained through the system assessment will be used to benchmark our performance against our system-wide goals and the best practices of our industry. These results will then be used to improve the performance of our organization.

3.2.1 POTENTIAL NEW HAZARDS OR INEFFECTIVE CONTROLS

Potential new hazards or ineffective controls found during the system assessment will be reintroduced into the safety risk management process. Potential new hazards could be a result of operationally significant changes.

We define an operationally significant change as:

- Initial designs of a systems, organizations, and/or product;
- The development of operational procedures;
- Hazards that are identified in the SA function;
- Planned changes to operational procedures.

3.3 PREVENTION AND CORRECTIVE ACTION

Following each audit cycle or system assessment described, our organization will take action to address identified non-conformances and deficient areas. This response will include both preventive and corrective actions.

Preventive action is taken to eliminate the cause of a potential nonconformity or other undesirable potential situation.

Corrective action is taken to eliminate the cause of a detected nonconformity or other undesirable situation. There can be more than one cause of nonconformity. Corrective action is taken to prevent recurrence whereas preventative action is taken to prevent occurrence.

During the preventive/corrective action process, the Safety Officer will present the observations of the audit or assessment to the management staff. This may be verbal or written as appropriate to the situation. This initial process will be used to solicit additional information and correct any misunderstandings. Dates for issuing interim reports and for receiving comments will be mutually agreed upon.

After the comment period, planned remedial actions will be generated and documented for all identified areas of safety concern. Each manager has the responsibility to develop a corrective action plan setting out the actions to be taken to resolve identified deficiencies or safety shortcomings. Each action item will be assigned an agreed time period for completion.

Implementation of the corrective action plan will be accomplished by the appropriate manager with the assistance of the Safety Officer. Final audit or assessment reports will include these corrective actions taken and detail any follow-up audit action proposed.

The manager of the area being audited is responsible for ensuring the timely implementation of the appropriate corrective actions. Any corrective actions that introduce new procedures or equipment must be submitted to the Safety Officer for introduction into the SRM process prior to implementation.

3.4 MANAGEMENT REVIEWS

Top management shall review the SMS annually to assess the performance and effectiveness of the organization's operational processes and the need for improvement. Management reviews will include assessing the performance and effectiveness of an organization's process designs, the implications of such, and the need for improvements of operational processes and the SMS.

The input to the management reviews shall include, at least, information on:

1. Audits, evaluations, and assessments (outputs of safety assurance);
2. Customer feedback;
3. Hazard/Occurrence reports, and anonymous reports (outputs of safety risk management);
4. Process performance and product conformity;
5. Status of preventive and corrective actions;
6. Follow-up actions from previous management reviews;
7. Changes that could affect the SMS;
8. Recommendations for improvement;
9. Safety Policy.

3.5 CONTINUAL IMPROVEMENT

We are committed to continually improving our SMS and our overall level of safety. Actions that we will take to achieve continual improvement include the following:

1. Analyze and evaluate the existing situation to identify areas for improvement;
2. Establish objectives for improvement from safety lessons learned;
3. Search for solutions to achieve the objectives;
4. Evaluate solutions and make a selection;
5. Implement the selected solution;
6. Measure, verify, analyze and evaluate results of the implementation to determine that the objectives have been met;
7. Formalize changes;
8. Ensure safety lessons learned are communicated to all personnel;
9. Implement Preventive/Corrective Action;
10. Conduct management reviews.

Results of the above processes are reviewed as necessary to determine further opportunities for improvement. In this way, improvement is a continual activity. Feedback from customers and other interested parties, audits and review of the SMS can also be used to identify opportunities for improvement.

4.0 SAFETY PROMOTION

OVERVIEW

Safety Promotion refers to the collection of activities undertaken by our organization to promote a positive safety culture, to communicate the outputs of our SMS, and to ensure the application of safety lessons learned in order to foster the continuous improvement of safety in our operations. Safety Promotion is one of the four pillars of a SMS.

Our organization is committed to ensuring that all personnel are informed about our safety polices and goals, how well we are meeting those goals, results of accident and incident investigations, new safety practices, and other matters dealing with safety.

The safety efforts at ***STAR** Flight* cannot succeed by mandate or strictly through mechanistic implementation of policies. Safety promotion sets the tone that predisposes both individual and organizational behavior and fills in the blank spaces in the organization's policies, procedures and processes, providing a sense of purpose and direction.

Many of the processes and procedures specified in this manual relating to safety policy and objectives, safety risk management, and safety assurance components of ***STAR** Flight's* SMS provide the structural building blocks. However, ***STAR** Flight* must also set in place processes and procedures that allow for communication among employees and with management. ***STAR** Flight* must make every effort to communicate objectives, as well as the current status of SMS activities and significant events. Likewise, ***STAR** Flight* must strive to create and maintain a channel of upward communication in an environment of openness.

Safety promotion at ***STAR** Flight* includes:

a. Training and education, including safety competency;
b. Just Culture;
c. Safety communication.

The Safety Officer has been assigned the responsibility to ensure that the duties of this section are accomplished.

Internal evaluation and audit of the safety promotion functions within our organization will be accomplished annually by the Safety Officer.

4.1 SAFETY CULTURE

Safety is a core value of this organization and we strive for continual improvement. In order to promote the positive safety culture that we desire in our organization, top management has

directed that all employees are responsible for and must consider the impact of safety in everything they do.

It is the stated purpose of ***STAR** Flight* executive leadership to ensure the growth of a positive safety culture throughout our organization. To this end we have established an *informed culture* in our organization where people understand the hazards and risks inherent in their areas of operation. This is accomplished through high quality training, OJT, and continued coaching to ensure that all personnel are provided with the necessary knowledge and skills to work safely. For further information on technical training see the various department training programs. Training specific to our SMS is described in Appendix F of this manual.

Our organization has also established a robust *reporting culture* that encourages every employee to contribute to the ***STAR** Flight* safety knowledge base. The reporting programs that have been implemented in our organization are described in section 2.0 of this manual.

Executive Management has instituted a *just culture* in our organization where all employees are treated fairly and with respect, though still held accountable for their actions.

In order to ensure the growth of a learning culture in our organization, the outputs from our SMS, hazards identified, and safety lessons learned, are communicated to all employees through the methods described in this section. This information is also shared outside our organization with customers, industry partners and the public in accordance with established programs and agreements.

In order to achieve the growth of a positive safety culture, we have implemented the following programs:

1. A formal Program Director Policy Statement has been published in the front of this manual outlining ***STAR** Flight's* commitment to SMS.
2. Executive Management has allocated the resources that are required to operate and maintain our SMS.
3. Safety responsibilities for all ***STAR** Flight* personnel have been specified in Section 1.0 of this manual.
4. All personnel must complete training on our Safety Management System as described in Section 1.0 of this manual.
5. The employee safety feedback system described in Section 2.0 of this manual is in operation 24 hours a day and provides for complete confidentiality.
6. Internal safety audits are completed by all departments on a regular basis.
7. The Director of Safety maintains a database of safety information collected. This data is regularly analyzed, assessed, and applied to improve safety in our organization.
8. Clear channels of communication have been established throughout the company and open, honest communications will be rewarded.

9. Safety issues are discussed at all staff meetings, safety meetings and other gatherings to provide for the open exchange of ideas.
10. A safety newsletter is published monthly to keep all employees current on the status of our organization's activities, the operation of our SMS, hazards identified, safety actions taken, safety lessons learned, and significant events. This newsletter is distributed by email and is available to all employees though PRISM.
11. The company maintains a Safety Bulletin Board at each location of operations where safety information is posted for all employees.

The company safety promotion program will also distribute safety lessons learned from our relevant experiences when appropriate. This information will be completely de-identified and posted in the proper read file in our ARGUS/PRISM application.

4.2 COMMUNICATION AND AWARENESS

Successful Safety Management Systems are marked by good communication between all interested parties. This enhances safety, lifts morale, and improves productivity and efficiency.

Communication failures are commonly identified as a source of problems for most organizations. It is our intent to maintain a focus on improving communication so that we can improve performance on all levels. To achieve this we have utilized the ARGUS/PRISM SMS application and specifically the "Safety Locker" as a consolidated one-stop location to place all important documents or notices for our employees to access. We will periodically measure performance objectives and design expectations of the communication and awareness process.

4.3 SAFETY LESSONS LEARNED

Our organization has established a *learning culture* wherein the information contained in reports, audits, investigations, and other data sources is analyzed to generate safety recommendations which are then implemented in our daily practice. Lessons learned from all sources; audits, employees, suggestions, hazard ID reports and occurrences form the basis of our commitment to continuous improvement. The outputs from our SMS and lessons learned are then disseminated to all employees and made available to anyone in this industry requesting help with SMS development.

4.4 SAFETY RISK MANAGEMENT COMMITTEE MEETINGS (SRMC)

The Safety Risk Management Committee meeting is scheduled on a monthly basis and is mandatory on a quarterly basis. The meeting is conducted by the Safety Officer and is recorded in a standardized format. The meeting minutes are then placed in the ARGUS/PRISM "Safety Locker" as well as posted on all safety bulletin boards.

Guidelines for content:

1. Approval of the last SRMC meeting minutes. All meetings will be conducted with a copy of the previous meeting minutes available along with the agenda for the current meeting being held.

2. Review "old business" from previous meetings that can either still be "open" or "complete". Discuss/review all "Action Officer" items from the previous meeting that are still open or need to be re-addressed to help close the loop and identify if the proper action(s) have been taken and ensures no further attention is necessary.

3. Discuss any "new business" submitted to determine what action(s) might be necessary to properly address issues brought up from ***STAR*** *Flight* employees. If it is identified in the meeting that further action needs to be taken to correct an issue, record who and how it will be followed up in the "Action Officer" section of the new minutes. This leads back to the Old Business section at the next month's meeting.

4. Conduct a review/discussion of the pre-determined month(s) "hazard identifications, occurrences and safety suggestions". The Safety Officer will have the ARGUS/PRISM database open and available for review of same by the SRMC. A brief description of what was reviewed or any changes that have been put in place should be included in the minutes as well.

5. Determine, discuss and assign any "tasking" for the SRMC or individuals on the committee. Document the specific assignment and what "action item" the task is assigned to.

4.5 SMS TRAINING

We will provide SMS training to all employees commensurate with their level of responsibility and their impact on the safety of our product or service. Training consists of initial SMS training and further recurrent training. Aviation safety-related positions, responsibilities and authorities are defined, documented and communicated throughout the organization. To ensure currency, our training program for all levels of SMS training is reviewed and updated periodically.

4.5.1 INTRODUCTION

Successful operation of our organization's SMS is tied to the success of our safety management system training program. All personnel must understand our safety philosophy, policies, procedures and practices. They must understand their roles and responsibilities within that safety management framework. Accordingly, safety training will begin with each employee's initial indoctrination and continue throughout the term of employment.

We are committed through SMS training to provide all of our employees with the skills and competencies to work safely and effectively.

To accomplish this we will:

- Identify skill requirements through SMS training needs and risk assessment.
- Develop SMS training programs in co-operation with employees and work areas.
- Deliver SMS training programs in a timely fashion.
- Maintain training records of all training completed.

The specific SMS training programs utilized at our organization are discussed in the sections below.

4.5.2 PERSONNEL REQUIREMENTS (COMPETENCE)

Competency is the result of knowledge, skills, and abilities that are obtained by education, training, and experience. In order to ensure competency in our organization we have developed minimum qualification standards for all personnel and we will provide training to ensure that each individual meets or exceeds that standard.

Our organization provides initial and recurrent SMS training for all employees. The level of training provided will range from general safety familiarization to a more in-depth knowledge level for line crews and managers. Training will be delivered in accordance with employee's SMS job category listed below.

- Pilots
- Medical Crew
- Management Staff
- Mechanic Staff
- Administrative (Office) Staff
- All Staff

We will provide initial and recurrent SMS training in accordance with these job categories. Details of the SMS specific training are provided on the ***STAR*** *Flight* FYXX Training Record Spreadsheet. This training will be periodically reviewed and updated.

SMS record of training is kept on the ***STAR*** *Flight* FYXX Training Record Spreadsheet located on ***STAR*** *Flight*'s Travis County database servers. During the annual audit cycle training records will be checked for accuracy and compliance with program requirements.

The following items also govern the application of SMS training at our organization:

1. Additional specialized training may also be provided to any employee whenever it is warranted or deemed appropriate.

2. All employees must successfully complete required SMS training prior to release for line assignment.

4.5.3 SAFETY OFFICER

The Safety Officer must be familiar with all aspects of our SMS and its impact on the activities of all personnel. He/She will complete all of the SMS training prescribed for every SMS job category. This will allow him/her to assess the quality of the training provided and to adjust the curriculum accordingly.

Additional technical training may be provided by the or to the Safety Officer and must include at least the items listed below.

1. Familiarization with aircraft, types of operations, routes, etc.;
2. Crisis management and emergency response planning;
3. Accident and incident investigation;
4. Specialized training or familiarization (such as Flight Data Analysis, Safety Audits, Crew Resource Management, or Normal Operations Safety Surveys);
5. Performing safety audits;
6. Analysis of data;
7. Root cause analysis;
8. Decision Making.

4.5.4 TOP MANAGEMENT AND LINE MANAGEMENT

Top Management at our organization include the Program Director, Director of Operations (Aviation) and Director of Maintenance. Line management at our organization includes the Chief Pilot, Chief Medical Supervisor and Chief Clinical Supervisor. These supervisory and leadership personnel must have a thorough understanding of the principles on which our safety management system is based. They must also be aware of their particular SMS responsibilities that are associated with their area of responsibility. Additional training will be provided to these individuals to ensure that they are conversant with their special role in the operation of the SMS. The additional training provided will address at least the items listed below.

1. Specific SMS responsibilities and accountabilities of their position and department;
2. ARGUS/PRISM use at the management level;
3. Analysis of data;
4. Root Cause Analysis;
5. Risk Mitigation and Acceptance;

6. Decision Making;
7. Human Factors and Human Behavior.

In addition to the specialized training discussed above, all employees will receive a basic training course on SMS that includes at least the following items:

- Basic principles of safety management;
- Overview of this SMS manual;
- Proper safety culture;
- Importance of complying with the safety policy and procedures that comprise the SMS;
- Our organization's past safety record, including areas of systemic weakness;
- Our safety goals and objectives;
- Our voluntary and mandatory reporting systems;
- Requirement for ongoing internal assessment of organizational safety performance (e.g. employee surveys, safety audits and assessments);
- Reporting accidents, incidents and perceived hazards;
- Safety promotion and dissemination of company information;
- Human Factors and Organizational Factors;
- Safety audits;
- Familiarization of the layout and operations;
- Emergency procedures, assembly points, and escape routes;
- Fire safety.

4.6 JUST CULTURE

4.6.1 BASIC CONCEPTS OF A JUST CULTURE

Just culture is the process, the concept, of attempting to manage human fallibility through system design and behavioral choices that we have within our organization. Just culture has been successful at a number of different organizations. One airline cut its maintenance errors by 50%, while another airline reduced its ground damage by 50%. A hospital's hand hygiene compliance rate went from 65 % to 95 % and it was attributed directly to the work done around just culture.

One of the results of just culture implementation at an organization is that an employee can admit to a mistake and have the entire staff benefit from it. The ability to learn from our mistakes is our starting point, and it is one that varies from person to person and from event to event. The Federal Aviation Requirements – rules that guide all pilots and mechanics – dictate that no person should operate an aircraft in a careless or reckless manner so as to endanger the life or property of another. We have a sense of reckless, but what is careless?

The NTSB, the safety investigating and recommending body for aviation, defines it as the most basic form of simple human error or omission. It is the simple human mistake. If we say that you cannot

make a mistake and we are going to hold you accountable for your mistakes and punish you, will you raise your hand when you make a mistake?

Healthcare is falling into the same track as aviation did in the past in the sense that we too often hold people accountable by punishing them for human error. That's not going to advance the culture of learning. As an organization, we have to be careful about how we go about investigating an incident and how we are determining accountability. That doesn't mean we can't hold people accountable for human error. Just culture is about the most effective way to hold someone accountable. Punishing someone for a mistake may not be the most effective way to help them to learn from that mistake. Reviewing all the things that occurred to cause the error may further the reliability and the advancement of the organization.

Noncompliance of a policy or procedure is pretty important. But what if we fired or punished every employee for noncompliance? Human resources would be busy and there would certainly be a shortage of pilots, paramedics and nurses! It's not necessarily the wrong way to go, but it is at one end of spectrum - blame the people involved.

Most often the problem is seldom the individual but rather the fault of the system. Change the people without changing the system and the problems will continue. However, sometimes people make bad choices. Just culture attempts to find the most effective way to hold both the people and the system accountable.

Sometimes our systems puts the employee or whoever it might be between a rock and a hard place. It's going to turn out badly either way. Most pick the lesser of two evils. People do not come to work wanting to do a bad job or wanting to have a bad event happen. They come to work wanting to do things right but they drift.
As executives and managers, there are things we can control. We have to decide if we need to make changes to have a greater impact on our human errors and our adverse events. We must balance our input with our output, and decide how we can be proactive. Missed events are a precursor to bad events. It is very important to look at those missed events and examine the system design and behavioral choices that occurred. Risk exists. To err is human. To drift is human. We will all make mistakes.

Risk is everywhere. It can be a perception, it can be an absolute and it is not essentially bad. There are many things that we do that are extremely risky but they are worth it when we manage and support our values. We must also examine the severity of risk versus likelihood of a good outcome. It's a gamble that we face all the time. How we develop policy and procedure to manage that risk is another tough question. Safety is just one of our values. Integrity, collaboration and innovation are all values that must be supported and in some way put on an equal plane.

***STAR** Flight's* resources are not infinite, so we have to make decisions. Is an employee's only concern safety? No, there are other values, such as work conditions and job security. There are a lot

of competing values, and we are accountable across all departments, across all positions and across all behaviors. We are all accountable for human error, at-risk behavior and recklessness. That's what makes the just culture effective.

4.6.2 MANAGING SYSTEM DESIGN

One of the things that we can control is system design. We can manage system reliability by looking at the factors that influence our rate of error. Human factor design is one of them. For instance, the use of red, green and finally blue lights in a helicopter cockpit/cabin is the result of an old military study on humans. It was finally understood that the blue fits best into the human IR spectrum and make detail easier for night vision, so they reduce the human risk factor.

We can also institute barriers that won't even allow the error to occur. Managing human reliability involves examining the rate of human error within the operation, skill and knowledge, perception of risk and qualifications. We also must understand our employee's strengths and weaknesses. Are they book smart, or can they also apply what they've learned?

4.6.3 MANAGING BEHAVIOR

There are three behaviors - human error, at-risk and reckless.

- Human error is when the mistake was not intended;
- At-risk behavior is when a person chooses to do something not knowing or not ascertaining the risk;
- Reckless behavior is substantial, non-justified and conscious disregard.

We can solve these behaviors by keeping our employees informed, coaching them about at-risk behaviors and holding people accountable and taking disciplinary action for reckless behavior.

4.6.4 EVENT INVESTIGATION

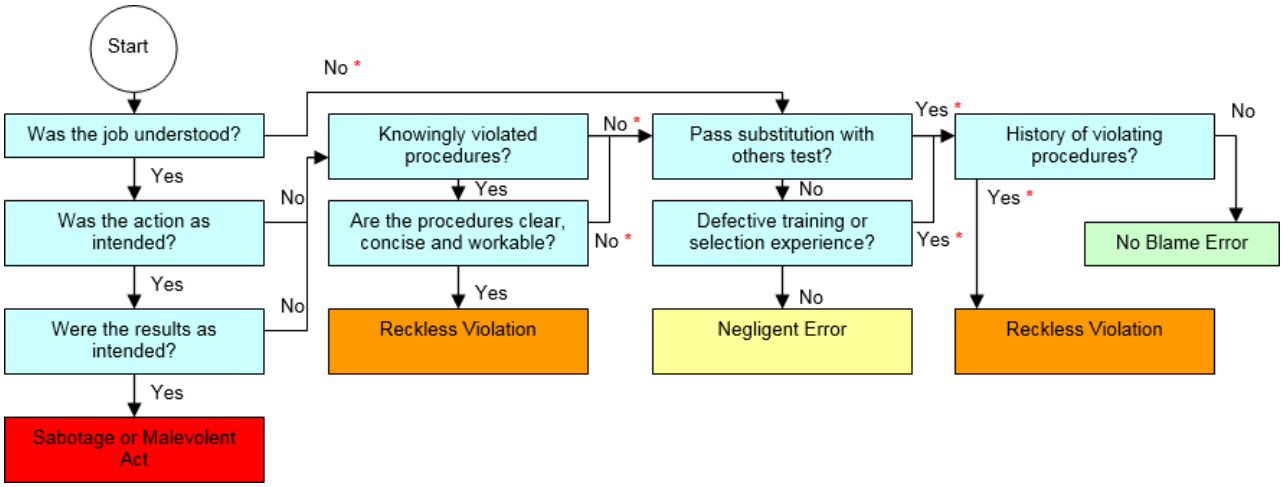
An event investigation is simply a tool that helps us learn about what happened. Normally, that includes a procedure to determine why it happened, what lead to the event, what were the causes and what was our system design in play at the time?

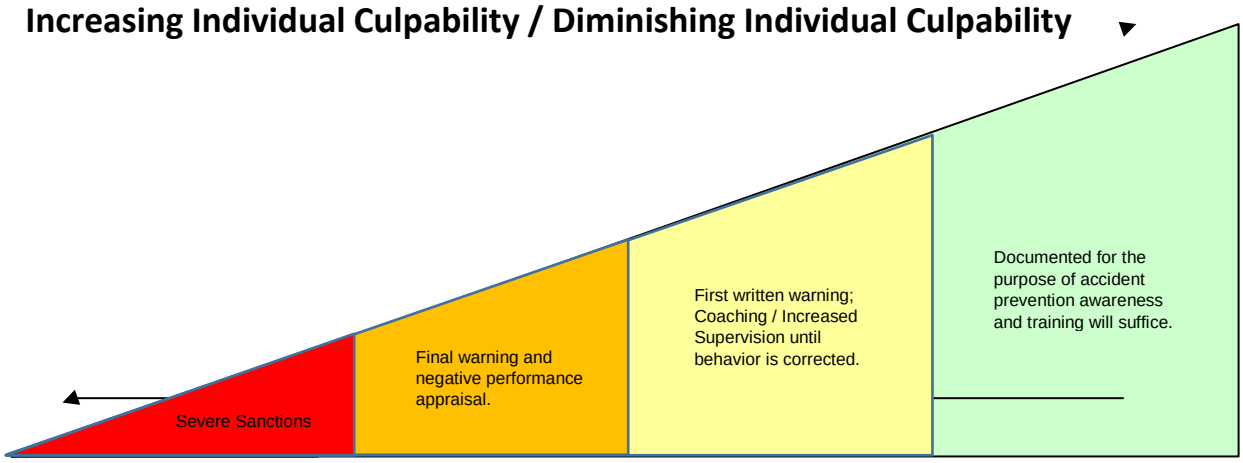
As you ask these questions, you gain more value to your investigation. You can determine the cause-and-effect relationship, explain every human error, and explain at- risk behavior and the procedural deviation. Learn from the event. Form your own risk model. Don't just be a firefighter who runs around all day putting out fires without learning why the fires are occurring.

Just culture is a journey. Its point is not to go from A to Z, but rather a journey on which if we take three steps forward, we might take one step back. We measure our outcomes, measure our systems, measure our choices, measure our bad outcomes and try to make improvements. It's

about that continuous process of measuring. This is the core tool in just culture. Just culture is about ***STAR** Flight's* executive commitment for values and system design and behavior choices. It's a partnership with every employee and it's about the doing the right thing.

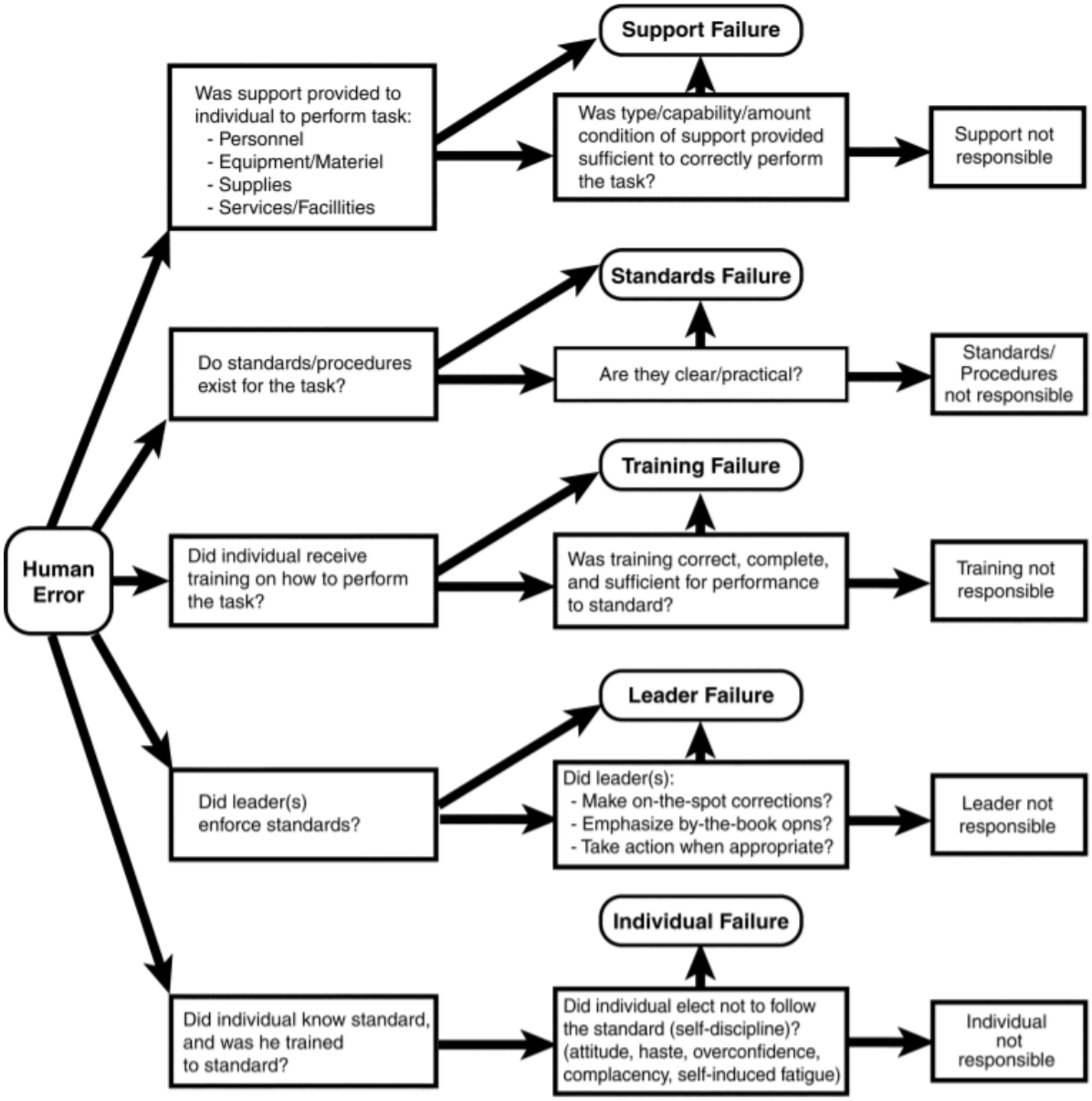
4.6.4.1 JUST CULTURE INVESTIGATION PROCESS





* Indicates a 'System' induced error. Manager/supervisor must evaluate what part of the system failed and what corrective and preventative action is required. Corrective and preventative action shall be documented for management review.

Determining System Inadequacy (ies) Responsible for Human Error



TRAVIS COUNTY

STAR *Flight*

EMERGENCY RESPONSE PLAN

INITIAL NOTIFICATION

Initial Notification Data Sheet

Date/Time of Call:	**Your Name (Call Taker):**

Step 1 → Caller Information

Name of caller:

Phone number of caller:

Step 2 → Initial Description

Aircraft location (nearest main road intersection or major landmark):

Aircraft type (if known):

Brief description of the accident:

IMPORTANT: Inform the caller you need to verify information provided and that they will be contacted within 5 minutes at the number provided.

Step 3 → Verification Contact/SF Command Notification

Immediately notify MEDCOM with the information, request verification and command page notification to SF Management. If unable to contact MEDCOM, notify SF Management directly and provide all known information.

Name/Title/Phone # of MEDCOM/SF Management contact:

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1.0 Emergency Response Program

This is a worst-case scenario. STAR *Flight* (SF) is prepared to respond to an aviation accident involving one of its aircraft. This Emergency Response Program (ERP) is intended to provide guidance to SF personnel responding to such an event. An important part of any ERP is that the scale of the program is appropriate to the size and scope of the organization.

This manual describes the SF ERP and the overall response strategy and provides guidance on initial steps to be taken to activate SF elements consistent with that strategy.

This ERP will be used in the initial and follow-on response to both Post Accident Incident Plan (PAIP) activation by MEDCOM or SF personnel, or by any SF employee directly receiving information that an SF aircraft was involved in an accident.

All accident response actions will be aligned with SF priorities, listed here.

Priority 1	Support SF personnel, passengers, and families.
Priority 2	Work with authorities to provide Life Safety support to affected persons.
Priority 3	Proactively respond with sufficient resources to professionally support affected parties.
Priority 4	Professionally manage and protect SF resources.
Priority 5	Determine the root cause of what occurred and modify procedures as necessary to prevent recurrence, where possible.

SF utilizes a Response Folder system to create a systematic method to respond to emergencies.

Throughout this manual, the Response Folder system will be described.

1.1 Program Distribution

This program shall be distributed to all SF personnel who would/could be key responders should there be an aircraft accident. A copy of this manual will remain in the Safety Office in a known location to assist in the ERP.

Key responders include:

- Program Director
- Director of Operations
- Director of Maintenance
- Safety Officer
- Chief Pilot
- Senior Pilots/Medical Crews (assigned)
- Administrative Support (assigned)

1.2 Organization and Responsibilities

SF will establish direction and control for the entire response. SF will act as the strategic decision-making body and use organizational resources, as necessary, to respond to internal and external demands. Throughout this program, there are responsibilities and tasks that need to be accomplished.

Title	Responsibilities
Senior Management Contact	Entire Operation
Emergency Response Center Director	Emergency Response Center including Go and On site teams
Scheduler	Movement of people and things
Administrative Support	Support of the operation and facility
Maintenance	All matters concerning maintenance including interface with manufacturers and other stakeholders

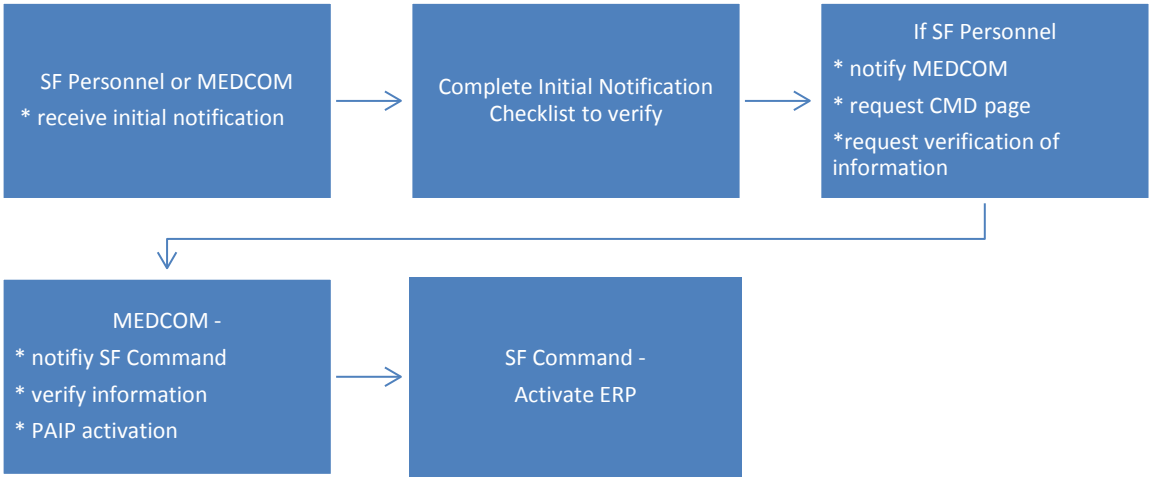
The response may include the establishment of an Emergency Response Center (ERC) at the hangar location to coordinate the technical aspects of a response and the related investigation.

Additionally, SF may mobilize members of its emergency response investigation team (Go-Team), and may mobilize selected personnel (Base Support Team) to go to the hangar to jointly manage the family/media/security response. The Senior Management Contact will determine if these teams will be dispatched.

If mobilized, the Go-Team will join with appropriate agencies to investigate the causes of the accident. The Base Support Team will assist with personnel and family support, security, media relations, and relations with others affected by the accident.

1.3 Notification and Verification of Accident

Accident response begins with notification and verification that a SF aircraft has been involved in an accident. Initial notification may come as a telephone call to the SF main number, one of the crew quarters or assigned crew phones, or by other means. A process map is provided for guidance in completing this notification. The ERP will be implemented upon verification of an event. The media may enhance or hinder the verification effort, but accidents in many remote locations may not be covered by the media until a response is underway.



1.3.1 Initial Notification Form

The Initial Notification Form is used to record the information provided from the contact, and is located in the front of the ERP Manual and in each "Response Folder". When contact is made with SF, the information will be quickly verified if possible and routed to MEDCOM and the Senior Management Contact. Verification consists of SF personnel contacting a MEDCOM ACS Supervisor/Person and wait for verification and further instructions.

1.3.2 Notification of STAR Flight Management Contact

After notification that an accident has occurred, as soon as possible, the person receiving the initial notification shall contact the Management Contact by appropriate and available means. Send an email scan/facsimile of the Initial Notification Form to MEDCOM and the Management Contact, if it can be directly received (via iPhone/iPad/company printer). Caution should be taken when sending facsimile copies to a hotel or other locations where Non-SF personnel may handle or read the content of the message. If the Management Contact is unavailable, continue to communicate with MEDCOM until someone is reached that can verify the accident (if not already completed), and implement the ERP.

1.3.2.1 Retrieving and Verifying Manifest

The first priority upon verification of an accident is the retrieval of an accurate crew and passenger manifest. Once verified, the SF scheduler will immediately print the trip and manifest information of the flight involved. That employee will attempt to retrieve any manifest modifications sent by the aircraft prior to its takeoff in accordance with SF flight following procedures. Once the manifest is secured and vetted, the information will be passed to the Management Contact to begin the process of notifying and supporting the Next-of-Kin.

1.3.2.2 Initial Brief

While SF personnel are retrieving and verifying the manifest, the Management Contact (or designee) will gather all personnel in the office, or contact available personnel for a conference call to inform everyone what is known, and to make assignments for completing notifications and establishing the ERC. This brief will be fact based, and personnel assignments will be made based on who is available to fill the ERC positions. If possible, verified crew and passenger manifest information will be available by the completion of the initial briefing.

1.3.3 Home Base Notifications

Home Base Notifications:_____(name)

Notification	Scheduled	Completed
Contact and notify SF personnel – be sensitive to what they are doing (e.g., flying), and their relationship with those involved		
Inform employees that any activity related to accident response must be recorded on an Event Record		
Brief the Response Program Folder System		
Remind everyone that there is to be no contact with the media except through official communications		
Request support of aircraft and personnel		
Request segregation and security of required maintenance and operational documentation.		

1.3.4 Public Affairs Notifications

Public Affairs Notifications:_____(name)

Notification	Scheduled	Completed
Provide latest information for support of press release		
Determine whether on-site media representative will be assigned and arrange transportation.		

1.3.5 Security Notifications

Security Notifications:_____(name)		
Notification	**Scheduled**	**Completed**
Determine if on-site security representative will be assigned and arrange appropriate transportation.		
Determine if security at Hangar is appropriate. Make necessary modifications.		

1.4 Emergency Response Center

The Emergency Response Center (ERC) is central to the technical response to any incident involving SF aircraft. The Senior Management Contact, or a designee, will implement the ERP and activate the ERC. The ERC responsibilities have been organized into functions to provide sufficient resources for responding to the many aspects of an incident. Personnel familiar with the types of activities required will fill the positions. As staff is available, personnel will be scheduled in shifts to cover responses requiring a 24-hour presence if necessary.

1.5 Emergency Response Center Plan

The Emergency Response Center (ERC) is a critical component of the response process. Each member in the ERC must be aware of their responsibilities and the resources available to support them in their tasks and understand what they can expect during the life of the response center. The following sections provide a review of functions expected during the response.

1.5.1 Managing the Emergency Response Center

A significant amount of information/tasking should be expected in the early stages of a response. The Emergency Response Center Director will play the critical role in management of the ERC and its personnel. All personnel in the ERC will:

- Manage incoming information;
- Search for needed information to support decision making;
- Respond to requests by On-Site personnel;
- Make decisions on technical response issues, and;
- Provide/obtain information to support STAR *Flight*.

This is a highly stressful environment, which may last a few days. If sufficient staff is available, it is important to have more than one person who can fill each position to allow for rest periods.

Regular contact will be maintained with personnel On-Site. Initially this is planned to be hourly, on the half hour (to allow for latest information to be used in preparation of media releases on the hour). The schedule

should be modified as necessary. Almost continual contact will be maintained with the organization and supporting functions. Initial briefings will discuss known facts, open tasks, and set priorities for the upcoming period.

1.5.1.1 STAR Flight Headquarters (at time of notification)

a. Initial Notification Received and ERP process started;
b. Begin using Response Folders;
c. Confirm accident;
d. Verification of manifest;
e. Conduct initial briefing;
f. Deploy Go teams as appropriate;
g. Send on Site Teams as required;
h. Establish ERC;
i. Begin internal notification;
j. Notify NTSB;
k. Contact Insurance representative;
l. Next-of-Kin notification process initiated;
m. Make media contact as soon as possible with short factual release.

1.5.2 Response Activities Next 24 Hours

1.5.2.1 On-Site

a. Emergency Response units depart;
b. STAR *Flight* response personnel begin arriving on-site as appropriate;
c. NTSB/FAA personnel arrive;
d. Accident investigation begins;
e. Go Team is on site;
f. On Site team is in place;
g. Next-of-Kin begin arriving On-Site if permitted and appropriate;
h. Airframe, avionics, engine manufacturers contacted.

1.5.2.2 STAR *Flight* Headquarters

a. Continues using the Response folder system to assure effective communications and processes;
b. Maintain media contact;
c. Contact FBO/service providers for information on last stop;
d. Follow-up contact begins with Next-of-Kin;
e. ERC operates at high intensity while information comes in, is verified and distributed, and people and equipment are transported to the accident site;
f. Aircraft Maintenance and Pilot Records are segregated and secured for turnover to NTSB for accident investigation.

1.6 Documentation Requirements

Due to the complexity and stress of a response, forms are provided as tools for the accurate tracking of tasks, events, and communications. All activities associated with a response (OTHER than those listed on a checklist) must be recorded by the person performing the action on an Event Record. A folder is provided for each member of the response team to assure the appropriate forms are easily available. All affected personnel must use the forms provided in the program for this purpose. The following table characterizes the type, personnel requirements, and folder.

Type	Personnel to Use	Folder
Initial Notification	All Participants	ALL
Event Record	All Participants	ALL with Prefix
Routing Form	All Participants	ALL
Victim Location and Status	ERC Director	ERC Director
Next of Kin Notification	ERC Director	ERC Director
Coordination Record	Schedule	Scheduler
Shift Turnover Briefing Checklist	All Participants	ALL
Records Transmittal Checklist	Senior Contact	Senior Contact
ERC Director Action List	ERC Director	ERC Director
Notification Directory	Senior Contact	Senior Contact
ERP Checklist	ALL	ALL
On-site Action List	On-Site Team Leader	Senior Contact
Scheduler Action List	Schedule	Scheduler
Administrative Support Action	Administrative Support	Administrative Support
Senior Contact Action List	Senior Contact	Senior Contact
Maintenance Action List	Maintenance	Maintenance
Go Kit Contents	Senior Contact	Senior Contact

1.6.1 Initial Notification

A copy of the initial notification is provided in each folder and its use is described earlier in this chapter. Following the initial contact, this form will be provided to the Senior Management Contact for management of the Emergency.

1.6.2 Event Record

Every phone call, contact, or activity required in support of the Emergency Response is to be recorded on an Event Record. Each folder contains 5 copies of the Event Record for that function to record all activities with a unique prefix, preprinted on each Event Record. All employees are required to use an Event Record to manage the Emergency. Number these Event Records as they are used - #1 being the first number with the prefix specified. Each event such as phone call, personal visit, or other contact should be documented on an individual form. Three phone calls, three event records.

Each day response team members will start a new Event Record and any event that is not able to be completed by the member will be forwarded to another individual via the Routing Form, for completion of the event. Copies of the Event Record should be made for reference and information integrity.

Daily, each response team member will provide the original copies of the Event Record to the ERC Director for review and to assure that accurate, complete records are maintained.

RECORD NUMBER:

EVENT RECORD

NAME:		**DATE:**
TIME	**EVENT**	**ROUTING NUMBER (if required)**

1.6.3 Routing Form

NUMBER:

ROUTING FORM

FROM:	TO:	DATE:
FROM EVENT RECORD NUMBER:		

EXPLANATION

1.6.4 Victim Location and Status Record

Victim Location and Status Record

Date/Time	Pax/Crewmember Name	Location	Status	Telephone Numbers

1.6.5 Next-Of-Kin Notification/Family Assistance Assignment Record

Next-Of-Kin Notification/Family Assistance Assignment	
Date/Time	**1. Name of Crew Member/Passenger**:
Date/Time	**2. Name of STAR Flight Person Assigned:**
Date/Time	**3. Location/Status of Deceased/Injured Crew Member or Passenger:**
Date/Time	**4. Primary Next-Of-Kin Name/Address/Contact Info:**
Date/Time	**5. Notifier(s) Name(s) and Contact Info:**
Date/Time	**6. Additional Comments:**

1.6.6 Personnel/Materials Coordination Record

Personnel/Materials Coordination Record					
Name/Material	Title/Function	ETA/Area (D/T)	Method of Transportation	ETA Site (D/T)	Local Transport/Tracking Number

1.6.7 Administrative Support Action List

Administrative Support Action List

Note:
☐ = One-time activities; check when complete. Detail on Event Record
• << = Continual activities.

Emergency Response Center Activation

1. Communications Equipment	
☐ Telephones	☐ Plug in telephone systems/Check dial-tone
☐ Computer	☐ Set up computers, check status
☐ FAX Machines	☐ Set up FAX, check status
☐ Television	☐ Turn on TV to appropriate channel
2. Administrative Supplies	
☐ Three copies of the ERP ☐ 10 Copies of Event Record ☐ Pads, pencils, pens ☐ Easels, markers ☐ One tablet each of Records ☐ Clipboards, file folders	☐ Provide each function with needed materials ☐ Complete heading info on Victim Location and Status Record (all affected persons) ☐ Post telephone number list near each telephone ☐ Response folder copies duplicated as necessary

3. Emergency Management Shift Schedule

Personnel assignments for **Shift A** (Date/Time Period):_____

☐ ERC Director _____
☐ Scheduler _____
☐ Administrative Support _____
☐ Maintenance_____

Personnel assignments for **Shift B** (Date/Time Period):_____

☐ ERC Director _____
☐ Scheduler _____
☐ Administrative Support _____
☐ Maintenance _____

1.6.8 Senior Contact Action List

Senior Contact Action List

Note: ☐ = One-time activities; check when complete. Detail on Event Record
• = Continual activities.

Immediate Action

1. **Notification/Verification**

☐ Upon receipt of a report that a company aircraft has been involved in an accident, ensure the information is verified (using Initial Notification) and passed to the senior contact.

☐ If aviation accident has been verified, request copy of verification report.

☐ Begin using the response folder system.

2. **Initial Briefing**

☐ Gather available department personnel, contact by telephone (not cellular) when not in the office.

☐ Inform them of the facts known about the incident.

☐ Brief all personnel on proper media responses shown below.

☐ Make initial contacts:

- ☐ Chief Pilot
- ☐ Maintenance Manager
- ☐ Pilots / Maintenance Technicians
- ☐ Base Administrative / Support Personnel

Responses for Request for Information

- "We are in the process of investigating a report of an incident involving one of our aircraft. There is no information available at this time. If the incident is confirmed, informational updates will be provided by_____."
- "Your Company confirms that an incident involving one of our aircraft has occurred, however, we are unable to provide any details at this time. Your Company will be providing periodic updates on the situation as information becomes available. "
- "The focus of our efforts at this time is to attend to the needs of our passengers, crew and their families, and work with the NTSB and local public safety officials to determine the cause and extent of the accident."

1.6.9 Go-Kit Contents

Go-Kit Contents	(The following is a recommended list of items. Go-kit contents may change based on modification of specific contents)
General Contents	**Quantity**
Go Kit Case (Pelican 1650 with photo/lid organizer)	1
Motorola 16mi Range Walkie Talkie (Citizens Band)	2
Digital camcorder/camera and SD card (Vivitar Night Vision Boy Digital Video Recorder - Black (DVR-510))	1
21 inch marker flags	10
Anti-Static Bags	5
Moldex Particulate Respirator 2300N95	5
Latex free disposable gloves (10-L, 10-XL)	2
Ear plugs	1
Tape Measure	1
Compass	1
Water Purification Tablets (bottle)	1
Flashlight (2 cell D-type)	1
Plastic Tarps (8' x 10')	2
Waterproof Matches (box)	1
Rite in the Rain pad	1
Rite in the Rain Pen	1
Red Biohazard Disposable Bags and Post-Doffing Wipes and Towels	2
300ft Measuring tape	1
Shop towels	1
Rope (100 ft.)	1
Tyvek Suits (1-L, 2- XL, 2-XXL)	5
Pyramex G204 Goggles	5
Caution Tape	1
Digital Voice Recorder	1
Small Magnet (to test metal types)	1
Magnifying Glass	1
Disposable Camera	1
8.5" X 11" Legal Pads	6
Pencils (Sharpened #2)	1
Pens (Ball Point, Black)	1
Felt Tip Markers (Various Colors)	1
Calculator	1
12" Ruler	1
Scotch Cellophane Tape (rolls)	2
Paper Clips (box)	1
Rubber Bands (box)	1
Graph Paper Pad	1
Spare Batteries D, AA, AAA (2 sets each)	2
Labels	1
Folders Legal Size	12
Envelopes (Document Sized)	12

1.7 49 CFR Part 830

49 CFR Part 830 - NOTIFICATION AND REPORTING OF AIRCRAFT ACCIDENTS OR INCIDENTS AND OVERDUE AIRCRAFT, AND PRESERVATION OF AIRCRAFT WRECKAGE, MAIL, CARGO, AND RECORDS

Source: USGPO, e-CFR.

Subpart A – General

830.1 Applicability.

This part contains rules pertaining to:

(a) Initial notification and later reporting of aircraft incidents and accidents and certain other occurrences in the operation of aircraft, wherever they occur, when they involve civil aircraft of the United States; when they involve certain public aircraft, as specified in this part, wherever they occur; and when they involve foreign civil aircraft where the events occur in the United States, its territories, or its possessions.

(b) Preservation of aircraft wreckage, mail, cargo, and records involving all civil and certain public aircraft accidents, as specified in this part, in the United States and its territories or possessions.

830.2 Definitions.

As used in this part the following words or phrases are defined as follows:

"Aircraft accident" means an occurrence associated with the operation of an aircraft, which takes place between the time any person boards the aircraft with the intention of flight and all such persons have disembarked, and in which any person suffers death or serious injury, or in which the aircraft receives substantial damage.

"Civil aircraft" means any aircraft other than a public aircraft.

"Fatal injury" means any injury, which results in death within 30 days of the accident.

"Incident" means an occurrence other than an accident, associated with the operation of an aircraft, which affects or could affect the safety of operations.

"Operator" means any person who causes or authorizes the operation of an aircraft, such as the owner, lessee, or bailer of an aircraft.

"Public aircraft" means an aircraft used only for the United States Government, or an aircraft owned and operated (except for commercial purposes) or exclusively leased for at least 90 continuous days by a government other than the United States Government, including a State, the District of Columbia, a territory or possession of the United States, or a political subdivision of that government. "Public aircraft" does not include a government-owned aircraft transporting property for commercial purposes and does not include a

government-owned aircraft transporting passengers other than: transporting (for other than commercial purposes) crewmembers or other persons aboard the aircraft whose presence is required to perform, or is associated with the performance of, a governmental function such as firefighting, search and rescue, law enforcement, aeronautical research, or biological or geological resource management; or transporting (for other than commercial purposes) persons aboard the aircraft if the aircraft is operated by the Armed Forces or an intelligence agency of the United States. Notwithstanding any limitation relating to use of the aircraft for commercial purposes, an aircraft shall be considered to be a public aircraft without regard to whether it is operated by a unit of government on behalf of another unit of government pursuant to a cost reimbursement agreement, if the unit of government on whose behalf the operation is conducted certifies to the Administrator of the Federal Aviation Administration that the operation was necessary to respond to a significant and imminent threat to life or property (including natural resources) and that no service by a private operator was reasonably available to meet the threat.

"Serious injury" means any injury which: (1) Requires hospitalization for more than 48 hours, commencing within 7 days from the date of the injury was received; (2) results in a fracture of any bone (except simple fractures of fingers, toes, or nose); (3) causes severe hemorrhages, nerve, muscle, or tendon damage; (4) involves any internal organ; or (5) involves second- or third-degree burns, or any burns affecting more than 5 percent of the body surface.

"Substantial damage" means damage or failure which adversely affects the structural strength, performance, or flight characteristics of the aircraft, and which would normally require major repair or replacement of the affected component. Engine failure or damage limited to an engine if only one engine fails or is damaged, bent fairings or cowling, dented skin, small punctured holes in the skin or fabric, ground damage to rotor or propeller blades, and damage to landing gear, wheels, tires, flaps, engine accessories, brakes, or wingtips are not considered "substantial damage" for the purpose of this part.

"Unmanned aircraft accident" means an occurrence associated with the operation of any public or civil unmanned aircraft system that takes place between the time that the system is activated with the purpose of flight and the time that the system is deactivated at the conclusion of its mission, in which:

(1) Any person suffers death or serious injury; or

(2) The aircraft has a maximum gross takeoff weight of 300 pounds or greater and sustains substantial damage.

Subpart B – Initial Notification of Aircraft Accidents, Incidents, and Overdue Aircraft

830.5 Immediate notification.

The operator of any civil aircraft, or any public aircraft not operated by the Armed Forces or an intelligence agency of the United States, or any foreign aircraft shall immediately, and by the most expeditious means available, notify the nearest National Transportation Safety Board (NTSB) office,[1] when:

[1]NTSB headquarters is located at 490 L'Enfant Plaza SW., Washington, DC 20594. Contact information for the NTSB's regional offices is available at *http://www.ntsb.gov.* To report an accident or incident, you may call the NTSB Response Operations Center, at 844-373-9922 or 202-314-6290.

(a) An aircraft accident or any of the following listed serious incidents occur:

(1) Flight control system malfunction or failure;

(2) Inability of any required flight crewmember to perform normal flight duties as a result of injury or illness;

(3) Failure of any internal turbine engine component that results in the escape of debris other than out the exhaust path;

(4) In-flight fire;

(5) Aircraft collision in flight;

(6) Damage to property, other than the aircraft, estimated to exceed $25,000 for repair (including materials and labor) or fair market value in the event of total loss, whichever is less.

(7) For large multiengine aircraft (more than 12,500 pounds maximum certificated takeoff weight):

(i) In-flight failure of electrical systems which requires the sustained use of an emergency bus powered by a back-up source such as a battery, auxiliary power unit, or air-driven generator to retain flight control or essential instruments;

(ii) In-flight failure of hydraulic systems that results in sustained reliance on the sole remaining hydraulic or mechanical system for movement of flight control surfaces;

(iii) Sustained loss of the power or thrust produced by two or more engines; and

(iv) An evacuation of an aircraft in which an emergency egress system is utilized.

(8) Release of all or a portion of a propeller blade from an aircraft, excluding release caused solely by ground contact;

(9) A complete loss of information, excluding flickering, from more than 50 percent of an aircraft's cockpit displays known as:

(i) Electronic Flight Instrument System (EFIS) displays;

(ii) Engine Indication and Crew Alerting System (EICAS) displays;

(iii) Electronic Centralized Aircraft Monitor (ECAM) displays; or

(iv) Other displays of this type, which generally include a primary flight display (PFD), primary navigation display (PND), and other integrated displays;

(10) Airborne Collision and Avoidance System (ACAS) resolution advisories issued when an aircraft is being operated on an instrument flight rules flight plan and compliance with the advisory is necessary to avert a substantial risk of collision between two or more aircraft.

(11) Damage to helicopter tail or main rotor blades, including ground damage, that requires major repair or replacement of the blade(s);

(12) Any event in which an operator, when operating an airplane as an air carrier at a public-use airport on land:

(i) Lands or departs on a taxiway, incorrect runway, or other area not designed as a runway; or

(ii) Experiences a runway incursion that requires the operator or the crew of another aircraft or vehicle to take immediate corrective action to avoid a collision.

(b) An aircraft is overdue and is believed to have been involved in an accident.

830.6 Information to be given in notification.

The notification required in §830.5 shall contain the following information, if available:

(a) Type, nationality, and registration marks of the aircraft;

(b) Name of owner, and operator of the aircraft;

(c) Name of the pilot-in-command;

(d) Date and time of the accident;

(e) Last point of departure and point of intended landing of the aircraft;

(f) Position of the aircraft with reference to some easily defined geographical point;

(g) Number of persons aboard, number killed, and number seriously injured;

(h) Nature of the accident, the weather and the extent of damage to the aircraft, so far as is known; and

(i) A description of any explosives, radioactive materials, or other dangerous articles carried.

Subpart C – Preservation of Aircraft Wreckage, Mail, Cargo, and Records

830.10 Preservation of aircraft wreckage, mail, cargo, and records.

(a) The operator of an aircraft involved in an accident or incident for which notification must be given is responsible for preserving to the extent possible any aircraft wreckage, cargo, and mail aboard the aircraft, and all records, including all recording mediums of flight, maintenance, and voice recorders, pertaining to the operation and maintenance of the aircraft and to the airmen until the Board takes custody thereof or a release is granted pursuant to §831.12(b) of this chapter.

(b) Prior to the time the Board or its authorized representative takes custody of aircraft wreckage, mail, or cargo, such wreckage, mail, or cargo may not be disturbed or moved except to the extent necessary:

(1) To remove persons injured or trapped;

(2) To protect the wreckage from further damage; or

(3) To protect the public from injury.

(c) Where it is necessary to move aircraft wreckage, mail or cargo, sketches, descriptive notes, and photographs shall be made, if possible, of the original positions and condition of the wreckage and any significant impact marks.

(d) The operator of an aircraft involved in an accident or incident shall retain all records, reports, internal documents, and memoranda dealing with the accident or incident, until authorized by the Board to the contrary.

Subpart D – Reporting of Aircraft Accidents, Incidents, and Overdue Aircraft

830.15 Reports and statements to be filed.

(a) *Reports.* The operator of a civil, public (as specified in §830.5), or foreign aircraft shall file a report on Board Form 6120. ½ (OMB No. 3147-0001)[2] within 10 days after an accident, or after 7 days if an overdue aircraft is still missing. A report on an incident for which immediate notification is required by §830.5(a) shall be filed only as requested by an authorized representative of the Board.

[2]Forms are available from the Board field offices (see footnote 1), from Board headquarters in Washington, DC, and from the Federal Aviation Administration Flight Standards District Offices.

(b) *Crewmember statement.* Each crewmember, if physically able at the time the report is submitted, shall attach a statement setting forth the facts, conditions, and circumstances relating to the accident or incident as they appear to him. If the crewmember is incapacitated, he shall submit the statement as soon as he is physically able.

(c) *Where to file the reports.* The operator of an aircraft shall file any report with the field office of the Board nearest the accident or incident.

APPENDIX B

1.0 FATIGUE MANAGEMENT AND SLEEP DEPRIVATION

1.1 INTRODUCTION

***STAR** Flight's* around-the-clock demands pose unique physiological challenges for each of us who remain central to safe and productive operations. Optimal alertness and performance are critical factors that are increasingly challenged by unusual, extended, or changing work/rest schedules. Technological advancements and automated systems can exacerbate the challenges we face in these environments.

Shift work, meetings, required continuing education, and continuous operations engender sleep loss and circadian disruption. Both of these physiological factors can lead to increased sleepiness, decreased performance, and a reduced margin of safety. These factors can increase vulnerability to incidents and accidents in our operational setting. The consequences can have both societal effects (e.g., major destructive accidents such as Three Mile Island, Exxon Valdez, and Bhopal) and personal effects (e.g., an accident driving home after a night shift).

1.2 ALERTNESS MANAGEMENT IN OPERATIONAL SETTINGS

Alertness management strategies can minimize the adverse effects of sleep loss and circadian disruption and promote optimal alertness and performance in operational settings. Sleep and circadian physiology are complex, individuals are different, the task demands of settings are different, and schedules are extremely diverse; therefore, no single strategy will fully address the fatigue, sleepiness and performance vulnerabilities engendered by 24-hour operational demands. Rather than attempt to eliminate fatigue, it may be more useful to consider the critical factors that can promote and optimize alertness management. There are at least six critical factors that can be addressed for their role in managing fatigue in operational settings. These factors include: hours of service, scheduling, education and training, countermeasures, technology, and research. Each of these factors deserves attention to determine how scientific findings on fatigue, sleep, and circadian physiology can be incorporated and addressed in each area.

The application of 'strategic countermeasures' involves three components:

• understanding the physiological principles related to sleep and circadian rhythms;

• determining the specific alertness and performance requirements of a given operation;

• taking deliberate actions to apply the physiological principals to meet the operational requirements.

2.0 *STAR FLIGHT* PREVENTIVE STRATEGIES TO MANAGE FATIGUE AND SLEEP DEPRIVATION

1. Mandatory completion of an initial professionally developed (e.g., Z-Coach) educational course on alertness management (Operations Manual).

2. Mandatory FAA class re-current training and education on the same subject.

3. Periodic professional education from external industry topic experts on Fatigue and Stress management.

4. Close management and monitoring of individual work/rest schedules.

5. Full leader support of the "Employee Readiness Policy".

2.1 *STAR FLIGHT* OPERATIONAL STRATEGIES TO MANAGE FATIGUE AND SLEEP DEPRIVATION

1. Strategic naps during shifts.

2. Eat high protein meals (avoid high fat and high carbohydrate foods).

3. Drink plenty of fluids; especially water.

4. Caffeine can help counteract noticeable fatigue symptoms if awake for 18 hours or less.

5. Rotate flight tasks and converse with other crewmembers.

6. Keep the flight deck temperature cool.

7. Move / stretch in the seat, and periodically get up to walk around the aircraft if possible.

8. Gradually shift times for sleep, meals, and exercise.

3.0 CONCLUSION

Crewmember fatigue has been shown to be a hazard in EMS flight operations. Many factors contribute to fatigue in the EMS aviation environment. Circadian rhythm disruption, prolonged work schedules, inadequate crew rest, and inadequate restful sleep contribute to the potential for fatigue. When the regulations regarding "rest" are compared to identify requirements for "restful sleep," one can see that adequate restorative rest may not occur. Enhanced training is critical to managing fatigue, and to recognize fatigue when it occurs so that effective

countermeasures can be employed. Doing so will help insure that crews fly adequately rested and alert thereby improving performance and safety efforts.

TRAVIS COUNTY

STAR *Flight*

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INTRODUCTION

Any organization or operation is subject to continual change. Changes often are made in equipment, materials and processes to increase operational productivity or to correct hazards. In some cases, temporary adaptations, connections, bypasses or other modifications are made to the organization or processes. Managers may decide to move employees within a specific process, which could eliminate or create positions within the organization or process. All of these changes have the potential to create new workplace hazards, some of which are not immediately recognizable. Although some changes are more critical than others, each modification should be analyzed to the extent necessary to identify inherent hazards that may result from the change. Although change usually is proposed for a good reason, changes made to improve one aspect of an operation actually may increase the potential for hazards in other areas of the same operation. To assess the impact of change and to monitor its implementation, it is essential to have a policy and procedure for Management of Change (MOC).

MOC seems deceptively simple, but it can be one of the most difficult elements of management to implement effectively. MOC invariably impacts other elements of a Safety Management System (SMS) once it is implemented. Therefore, to be truly effective, MOC needs to be integrated into all aspects of the SMS, and the involvement of everyone in an organization needs to be encouraged. Commitment from management creates a climate that empowers people to initiate needed change, and provides a supportive structure for the implementation of change. Employee participation is essential. Those on the line often are the first to notice problems, and involvement in the design of the MOC program fosters commitment and ownership. Commitment at all levels is crucial. No matter how well designed an MOC program is, it will be ineffective if it is not used.

It is impossible to describe a single, uniform method for managing change. The unique circumstances and needs of each organization require that a system be designed specifically to meet those needs.

DEFINITIONS

Change

Is the result of a conscious decision to exchange, substitute, convert, alter, add, modify or vary a component of an existing process, its equipment and/or control and management systems? Change can be administrative, organizational and/or technical.

Administrative Change

Administrative changes are modifications to work procedures. An example might be decreasing the frequency of inspection or maintenance in one section of an operation. The section involved may not view the change as significant; however, the consequences of this change may seriously affect other parts of the operation.

Organizational Change

Modifying the structure of an organization, regardless of its size, is a major change, and requires appropriate impact analysis. Typical organizational changes include:

- decreasing or increasing the number of supervisors
- decreasing or increasing the number of hours that employees work
- contracting instead of using company personnel
- changing operating philosophies

Technical Change

Technical changes affect the operating process. Adding or deleting equipment or materials, or renovating or changing process techniques are examples of technical change. Technical changes often are implemented to increase efficiency, capability, or to decrease hazards. If not analyzed, they can actually can increase the potential for hazards.

MOC Policy

A public statement of the company's commitment to implement change in a safe manner. The company needs to communicate its MOC Policy to all its workers. The MOC Policy provides a values-based framework for addressing change in the organization's facilities and operations. The MOC Policy must be applied to all activities that fall under the umbrella of change.

MOC Program

MOC is a component of an SMS. A systematic program is necessary to ensure that changes are managed in such a way that they do not compromise the safe design and operation of an organization.

MOC Procedure

The approved sequence through which changes are initiated, evaluated, authorized, implemented and followed up. The intention of an MOC procedure is to ensure that changes are reviewed and approved by people with appropriate knowledge and experience. These people will then be accountable for effective implementation of the changes.

BENEFITS OF MOC

Safety

Safety is the most important reason for implementing an MOC program. An effective program will result in fewer incidents in the following areas:

Fewer hazardous situations

Unidentified hazardous situations will have the most serious and sometimes catastrophic Health, Safety and Environmental consequences.

Less hazardous repair and maintenance

Problems created by uncontrolled change often lead to equipment stress and damage, and repair and maintenance of such equipment can be hazardous to personnel.

Fewer operational incidents

Uncontrolled (unevaluated) change may move operating conditions into an unsafe range, encouraging or often requiring operators to override built-in safety systems. In some cases, uncontrolled change means that personal protective equipment must be discarded or physical safety devices must be temporarily overridden.

Economic

Economic considerations are another compelling reason for implementing an MOC program.

Production

Production levels should increase because of fewer direct losses. Production quality and capacity should increase and costs decrease because there will be less need to recycle or reprocess off-spec materials.

Assets

Fewer incidents will lead to fewer losses.

Operations

Reduced down time for maintenance and repair and fewer injuries will result in increased capability and health and welfare of operators.

Reputation

A company that has a reliable SMS record satisfies its

- Customers
- Taxpayers
- Employees
- Local residents
- Government agencies
- Insurance underwriters

The organization then can attract investment capital, generate relevance of its product, and avoid legal ramifications. Conversely, dissatisfaction amongst customers may lead to lost revenue. Anger amongst members of the public and the workforce may result in costly lawsuits or disciplinary actions by government regulatory bodies. If these problems tarnish the organization's reputation, it may experience difficulty in attracting future financial opportunities.

THE CHANGE PROCESS

Identify Problem or Opportunity

The change process begins when a problem or opportunity requiring change is recognized. For continual improvement to take place, it is essential that all personnel involved in an operation are actively encouraged to become part of the MOC process. Management must be willing to listen to the ideas of employees at all levels.

Evaluate Proposed Change

The next step is to decide if the change is practical, and if the desired outcome can be achieved by using existing systems more efficiently. Examples are refresher training for employees and improved document/communication management. If possible, corrective actions should be taken while operations continue. If the desired outcome cannot be achieved merely by increasing the efficiency of existing systems, a more thorough analysis is required.

Analyze Root Causes

A detailed team evaluation is designed to identify the true, underlying causes of the problem and the areas in which change can be most effective.

Obtain Approval

Before a change can be implemented, management must formally approve it.

Update Information

Prior to implementation of the change, safety information needs to be updated. This may include the creation of new procedures and training all parties in the new procedures.

Notify All Involved

Before implementation, all affected parties need to be notified of the proposed change and given an overview of what is being done, the reason it is being done, and what the outcome is expected to be.

Implement Change

The change is implemented as designed.

Monitor Change

Assessments of the impact of change at any time during the design and operation of a organization or process are critical. Unless the implementation of change is monitored closely, opportunities to maximize the effectiveness of the MOC program can be lost. Monitoring change involves ongoing hazard/risk assessment and follow-up to ensure requirements are being met. Post-change assessment is a valuable method of identifying additional need for improvement. It is only in monitoring and follow-up of implemented change that the system can continue to be evaluated and improved.

WHEN IS MANAGEMENT OF CHANGE REQUIRED?

Many changes occur in the everyday operation of an organization. However, not all of these changes require the scrutiny of an MOC procedure. Only initiated change (conscious decision to change) can be analyzed and evaluated for its potential hazardous consequences and, therefore, managed. Reactive, spontaneous or covert (hidden) change cannot be managed because it cannot be anticipated. These kinds of changes must be managed within other elements of the Safety Management System (SMS), for instance, Hazard Identification and Risk Mitigation measures.

Consideration of the following criteria should help to determine if the Management of Change procedure needs to be implemented in a particular case. However, as a general rule, if the proposed change affects one or more of the other elements in the SMS, the MOC procedure will probably need to be completed.

TYPES OF CHANGE

In-Kind/Not In-Kind change

If it is proposed to replace a piece of equipment with another that is functionally identical and of the same specifications, the change is In-Kind and does not require an MOC process.

CAUTION: Always consider that a replacement In Kind may be Not In-Kind in many respects, i.e., it may made by different people, made with different machinery, made at a different time, stored for different lengths of time in different conditions, or installed by different people.

Keeping the above points in mind, equipment replacement is considered In-Kind if it meets the following criteria:

- Material specifications (dimensions, weight, etc.) are the same.
- The service for which the equipment is being used remains unchanged. All process conditions must remain the same as for those of the original item. Inspection and maintenance requirements do not change.
- The replacement is part of routine maintenance. The In-Kind item is being replaced because it has a known life span. Replacing In-Kind equipment that is failing without known cause requires investigation and Management of Change.
- The new item is equivalent to the original one, not an improved model or from a new supplier. Upgrades or new vendors should be assessed using the Management of Change process. Even a seemingly minor change in any of the specifications may impact some aspect of the process in some way.

Critical Change

A critical change is one that could create a serious incident if it is mismanaged. Critical changes should receive more thorough scrutiny than those considered non-critical.

CAUTION: The criticality of a proposed change is not always obvious without a detailed evaluation within the MOC process.

When a proposed change is deemed to be critical but also expensive, the proposal should be subjected to a Qualitative Risk Analysis (QRA). See appendix A for QRA Risk Analysis Matrix.

Small/large Change

Large changes usually involve many modifications to equipment, infrastructure or administrative procedures, and therefore should receive a full MOC review. However, small changes may not be reviewed with the same rigor because they can be implemented quickly and do not appear to make a significant impact on the way an organization operates. MOC reviews, at least through a checklist, should accompany even small changes.

CAUTION: Experience shows that it often is the small changes that ultimately lead to serious incidents. Because they are small, they may not be subjected to the scrutiny they really deserve.

Emergency Change

Emergency change is one that has to be made very quickly when someone in authority decides that the dangers of doing nothing are greater than those possibly associated with the proposed change. An emergency change may be justified for reasons such as the following:

- danger to personnel
- potential for major equipment damage
- potential for major operational loss
- serious environmental impact
- serious community complaint
- regulatory violation

Every effort must be made to minimize the number of emergency changes, because they bypass the normal systems for hazard identification. After the fact, every emergency change should be reviewed by the formal MOC procedure to ensure that no unforeseen problems exist and to ensure the change is documented and monitored.

Temporary Change

In many instances temporary changes also are emergency changes. They usually are implemented to keep an operation running while a piece of equipment is repaired or replaced. **A temporary change should have an automatic termination date**. A temporary change of even a short duration should go through at least a Safety Review by at least two or three people. A new procedure should be written and an emergency response prepared in case the modification does not work properly.

CAUTION: Because of the short duration of some temporary changes, there can be a temptation to by-pass the formal MOC procedure. Some of the most serious incidents have occurred because of temporary changes.

Infrequently Repeated Change

Infrequently repeat changes are those that have occurred at least once before and are repeated at infrequent intervals. If a change has been carried out before, and if it was properly managed, the MOC process generally will not need to be repeated. However, it needs to be stated in the MOC records that this is the case.

Instrumentation Change

Because computerization/automation, advanced systems and the introduction of process simulations has allowed organization to operate closer to their safe operating limits most of the time, there is less latitude for reaction should a process upset occur. Usually, a proposal to change advanced systems requires a formal MOC approval.

Process Hazard Analysis (PHA) Recommendations for Change

One of the most important decisions that the MOC Committee has to make is whether or not to require that a Process Hazards Analysis be carried out. PHA is a thorough, orderly, and systematic approach for identifying, evaluating, and controlling the hazards of processes involving highly hazardous activities.

The organization should perform a process hazard analysis on all processes determined to have extremely severe consequences to life or equipment in a worst case “what if” scenario. The process hazard analysis methodology selected must be appropriate to the complexity of the process and must identify, evaluate, and control the hazards involved in the process. First, the organization must determine and document the priority order for conducting process hazard analyses based on a rationale that includes such considerations as the extent of the process hazards, the number of potentially affected employees, the age of the process, and the operating history of the process. The process hazard analyses should be conducted as soon as possible.

With regard to most proposed changes, the following five guidelines can provide assistance in determining whether or not a PHA is needed.

a) If the change will be large and extensive, a PHA helps to identify systems problems. For example, if the change will modify or adapt the process and/or layout of an organization, the effect on the rest of the organization needs to be considered.

b) If the change involves input from many disciplines and departments, then a PHA may help in the identification of accident scenarios that result from potential interdepartmental misunderstandings.

c) If the consequences of the change could lead to a serious incident, a PHA should be carried out.

d) If the proposed change involves adjusting critical operating parameters, it should be evaluated with a PHA.

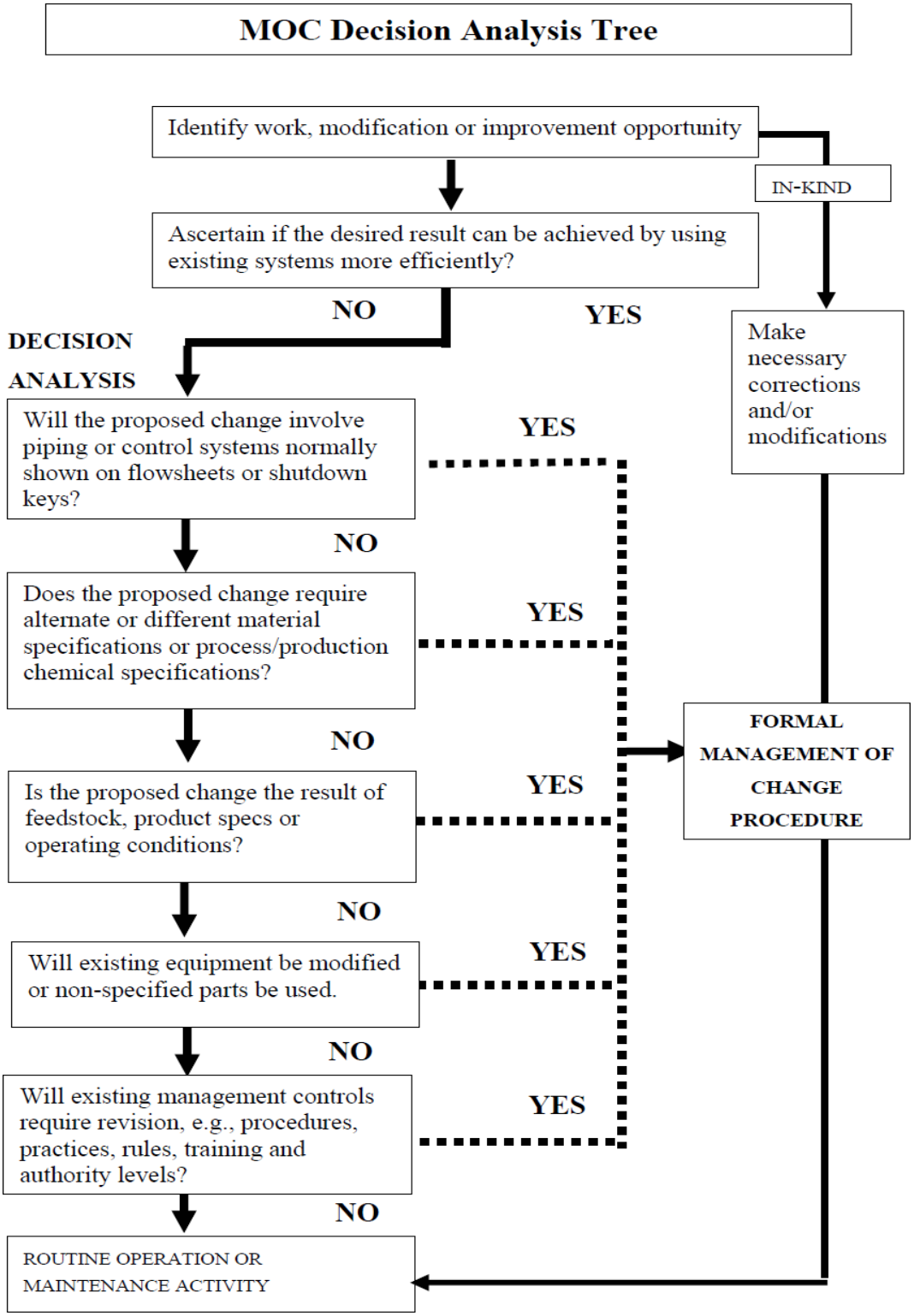
e) If new technology or a brand new process is proposed, a PHA should be carried out in order to help identify currently unforeseen events.

Whatever method(s) are used, the process hazard analysis should address the following:

- The hazards of the process;
- The identification of any previous incident that had a likely potential for catastrophic consequences;
- Equipment or administrative controls applicable to the hazards and their interrelationships, such as appropriate application of detection methodologies to provide early warning of potential danger;
- Consequences of failure of equipment or administrative controls;
- Human factors;
- A qualitative evaluation of a range of the possible safety and health effects of failure of controls.

One of the more important roles of an MOC program is to manage the recommendations arising from a Process Hazard Analysis (PHA). These recommendations could fall into any of the already described types of change and, like any proposed change, each recommendation must be evaluated and managed. Even if a proposed change has resulted from a PHA, an initial review may indicate the need for another PHA or a Root Cause Analysis in order to identify hidden hazards caused by this specific change. Without such an analysis, the quick solution may focus on the symptoms rather than the real cause. Hence, the problem could recur.

SAMPLE MOC ANALYSIS TREE

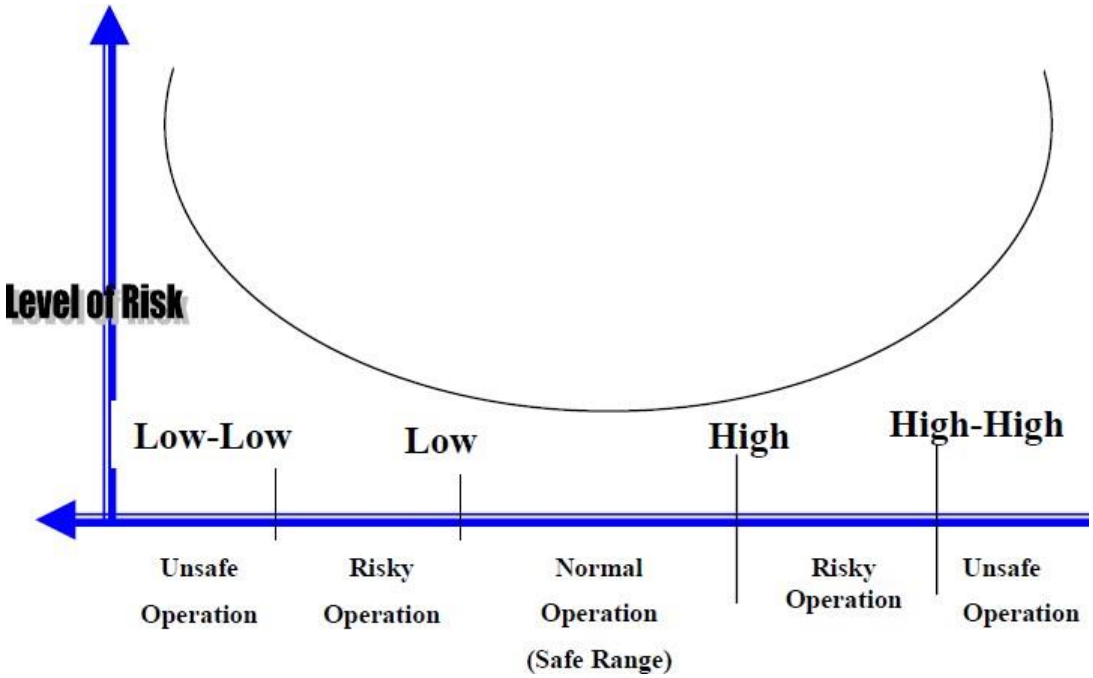


OPERATING LIMITS

A successful MOC program first must establish the safe operating range for all key variables in an operation. It is necessary to know the upper and lower limits in order to build in necessary safeguards to ensure that no deviation outside these limits can take place. Clearly defined limits provide the necessary reference points against which proposed changes can be measured. If change is to be properly managed, these limits need to be communicated to all involved in evaluating proposed changes.

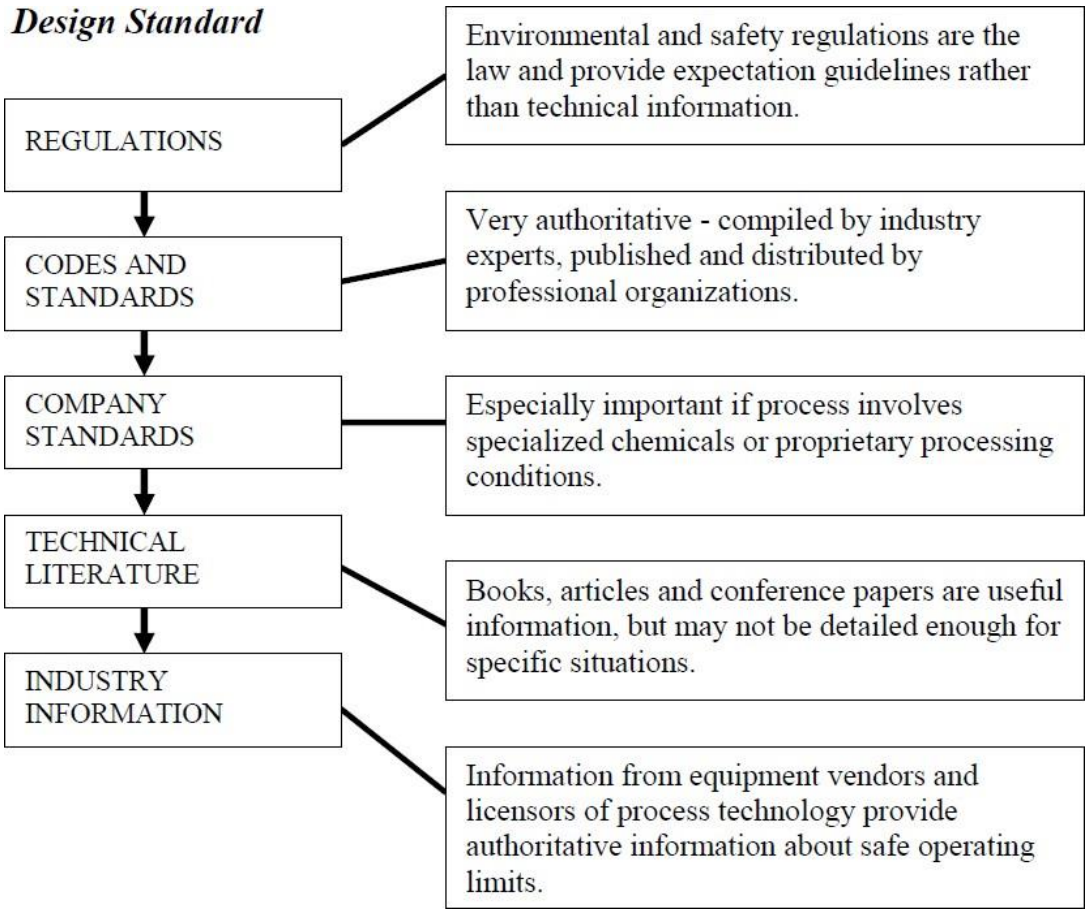
Conditions usually do not instantly move from safe to unsafe. This movement more often takes place along the continuum between the safe end of the operating range and the risky end of the operating range. As conditions move further away from design values, the operation becomes more risky.

CAUTION: A move instantly from safe to unsafe in certain conditions, e.g., if the wrong materials are used or if unintended interactions occur.



Defining the Safe Operating Range

Ideally, managers design and specify operating limits. When limit values are not provided, those operating within the organization need to find a means for determining safe limits and what needs to be done if those limits are exceeded. The following are the most commonly used resources for ascertaining design standards.



MOC POLICY AND PROCEDURE

Management of MOC

Each organization develops its own policy and MOC procedure within the overall SMS. When designing such a policy and procedure it is important that the system reflects the existing culture and the way in which people in the organization actually work and interact with one another. In particular, the system should recognize that informal discussions and conversations are a feature of virtually all aspects of change management, and that these informal communications should be encouraged and, where possible, recorded and attached to the MOC form. It is often in the informal communications that valuable insights can be gained.

Team approach

A team of people should always carry out the Management of Change process. The benefits of fresh ideas and increased commitment to the process make the extra time that this may take worthwhile. More than one person should question the impact of even a small, quick change (along the lines of the Decision Analysis Tree). Because it is often the small, quick changes that have not been thought through that cause incidents, if the change warrants a formal MOC review, it should be done. This being said, it is important not to make the procedure so cumbersome that workers will be tempted to bypass the process.

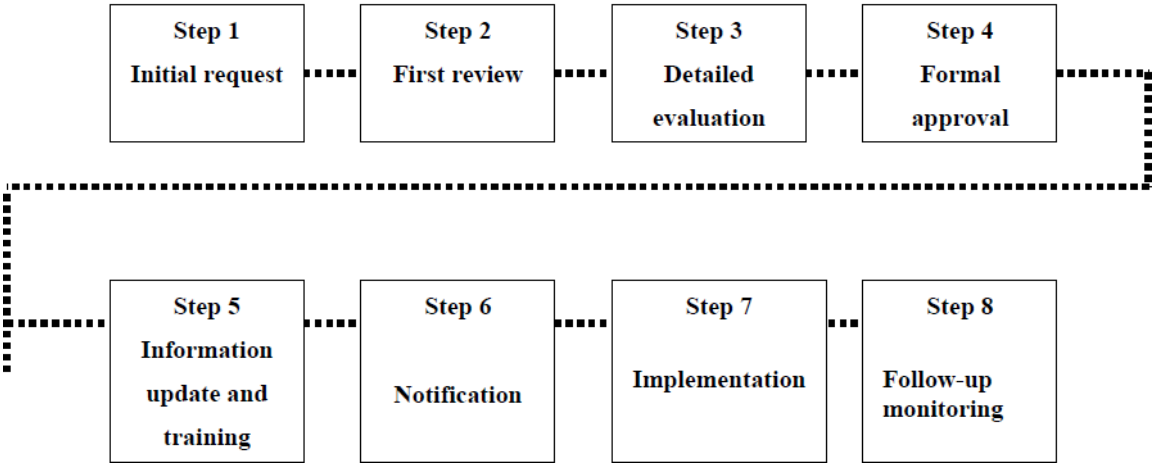
Formal structure of MOC

Once a suggested change has been discussed informally and the decision made to commit it to the MOC form, the formal process has begun. It is important that the MOC procedure and form be easy to use while also ensuring that a thorough review takes place before the change is implemented. Designing the procedure and the MOC form is always a challenge when first implementing a Management of Change Program. The following sections provide a basic structure that addresses all the issues that should be covered when recommending and evaluating change and around which your own policy, procedure and MOC record form can be designed.

MOC Coordinator's responsibilities

The appropriate manager usually is responsible for ensuring that the policy and procedures are followed and that all appropriate documentation and authorizations are in place before the proposed change is implemented. In larger organizations, a separate Management of Change group often carries this responsibility.

The eight steps of the MOC process



1. Initial request

The person who makes the initial request is called the Initiator. Usually the Initiator is a manager, a supervisor or a technical expert. However, all employees should feel free to propose changes they feel will make the organization safer, cleaner or more profitable. Participation of all employees is crucial if continual improvements are to be made.

It should be recognized that, by suggesting the change, the Initiator is demonstrating that he or she cares enough about the organization to want to make it better. So, for an MOC program to encourage other workers to make their own suggestions, it is important that the Initiator be kept involved in the discussions that take place once the proposal for change has been submitted. If the Initiator has proposed a solution, it should be considered along with suggestions solicited by the MOC Coordinator from others in the operation.

2. First review

Before the formal MOC process is initiated, the proposed change needs a quick, common sense reality check from people the Initiator knows and trusts. If it turns out that the idea is impractical, not much time will have been wasted and the Initiator will not have been made to look foolish in front of his management or co-workers.

Regardless of how the Management of Change system is organized, it should be recognized that the first review process will happen anyway so it should be incorporated into the Management of Change process. The first review should accomplish two things:

a) Make an initial assessment of the problem and the proposed solution and add relevant information and suggestions based on knowledge and experience.

b) Determine if the change is In-Kind/Not-In-Kind. If the decision is made that the change is In-Kind, the necessary action can be taken without further review or analysis, and the formal Management of Change process is not pursued.

The "In-Kind/Not-In-Kind" decision is critically important and is the most challenging aspect of managing change. If a supposed In-Kind change turns out to be Not-In-Kind after all, a serious incident may occur.

Because of the criticality of this decision, supervisors need to be thoroughly trained in the criteria for deciding whether a change should be In-Kind or Not-In-Kind, particularly since the choice of In-Kind change offers a tempting way of by-passing the whole Management of Change process.

The MOC Form: Section A – Initial Request

When the request is formulated, it is entered in the first section of the MOC form. This part of the MOC form is completed by the Initiator and the MOC Coordinator. In a smaller organization or facility, the appropriate Manager usually acts as the MOC Coordinator for the duration of the MOC process. In a larger facility or organization, there usually is a dedicated, permanent MOC Coordinator. The MOC Coordinator assigns an MOC record number to the suggestion, and tracks the form's progress as it moves through the MOC process. The MOC Coordinator also is usually part of the MOC Committee in the final approval process. The first section of the form should contain the following information:

Administrative information

The first part of the form provides all the administrative information and the basis for the proposed change and should include the following:

- name of the Initiator and the date
- change category (technical, organizational or administrative)
- process system and location
- equipment and process identification
- criticality (risk ranking) of the problem

- whether the change is deemed emergency, permanent or temporary and, if temporary, its time frame
- related PHA information if the change is a recommendation arising from a study

Technical basis for the change/description of the problem

The person(s) requesting the change should clearly define the problem to be considered or outline the opportunity for improved performance. This will be the basis for other evaluations of the situation. To the extent that the Initiator is familiar with the historical background of the change scenario, it should be described at this point. In particular, if previous solutions to similar problems were attempted, and failed, a description of what happened should be provided. Here, also, the Initiator should explain why he believes action must be taken. This could be for any combination of the following reasons:

- safety
- environment
- operations
  - increased production
  - increased productivity/efficiency
  - reduced consumption/losses
- maintenance
  - reduced maintenance costs
  - reduced spare parts inventory
- public relations
  - public response
  - other companies in the area
  - other companies using similar technology
- regulatory requirements
- risk vulnerability (refers to those changes that are made to reduce risk, even if
  - an incident has not yet taken place)

The MOC Form: Section B – First Review

First determine if the change Technical (equipment affecting processes), Organizational (manning structure, facilities), or Administrative (processes). The First Review process is conducted usually between two or three supervisors or employees to determine if the MOC process needs to occur at all. If the consensus is to proceed with the MOC process then formalize the team.

The MOC Form: Section C – Detailed Evaluation

After the first review, if it is decided that the proposed change should be pursued, it will proceed to the next stage of the process, the detailed evaluation. This evaluation is performed by a team representing different disciplines and specialties according to the nature of the change. The detailed evaluation Reviewers have three tasks:

a) Confirm the problem

i) Can the problem be solved by using existing controls more efficiently?
ii) Does the situation under consideration take the work process into an unsafe range?

b) Analyze the problem

i) Thoroughly understand the problem.
ii) Use Checklist, Root Cause Analysis or PHA if necessary.

c) Identify possible solutions

i) Brainstorm.
ii) Think out of the box.

The MOC Form: Section D – MOC/Evaluation Team

Each change is the responsibility of the MOC Coordinator. Following the same steps as for PHA preparation, his next task is to seek out and select appropriate, experienced and technically knowledgeable reviewers to serve as team members. Someone on the team should also have an understanding of the organizational issues, such as the organizational politics/rivalries related to the proposed change. The review team needs to be sensitive to these issues and adjust the proposal accordingly. The following are the minimum selection criteria for the MOC Review Team:

- **Experience:** Members should have knowledge of the process under review and knowledge of similar problems that occurred in the past and actions that were taken to solve them.

- **Knowledge:** Collectively, the team members should have multidisciplinary technical knowledge. Someone with knowledge of regulations, codes and standards should review the final recommendations for compliance.

- **Creativity:** Just as for a Process Hazards Analysis, at least some of the reviewers need to be able to think “out of the box” to generate new ideas.

Establishing time schedule and planning work flow

Having selected the Review Team, the next step for the MOC Coordinator is to plan the work flow and establish a schedule that will make sure the evaluation stays on track while also making sure that people have enough time to think about what is being proposed. Scheduling may require coordination with other departments or functions.

Technical information coordination

The reviewers usually need access to either technical or procedural documents in order to conduct the evaluation. The MOC Coordinator, where possible, should make sure they have ready access to documents that are likely to be requested by the team. Providing a single source of information increases efficiency, and reduces the time needed for the review. Such documents frequently include the following:

- process diagrams
- equipment and material data sheets
- environmental and safety regulations
- other pertinent documents

The MOC Form: Section E – Team Recommendation

Each of the Committee members will sign off on the MOC form once they are satisfied that the change is safe and workable. The change should be given an implementation timeframe, and the responsible person from management will sign the formal authorization.

The Coordinator will collect all of the comments and ideas that have been generated and summarize and analyze them. Along with the Initiator, he then decides on what action should be proposed. This is written up in a report, which forms the basis for the recommendations that will be presented to management.

The MOC Form: Section F – Formal Approval

Before a change can be implemented, it must be formally approved and accepted by key executives in management. For our organization that most likely will be the Program Director, the Director of Operations and the Director of Maintenance. The MOC form and approval provide a paper trail in case there is an incident in which the change is implicated as a possible cause.

Information Updating

Once the change has been approved, any new safe operating limits must be defined, and other documentation updated before start-up. Everyone affected by the new values must be informed and trained in what to do if the new limits are exceeded.

Process Safety Information (PSI), such as operating and maintenance procedures; process diagrams; training and mechanical integrity documentation, must be updated before the change is completed, otherwise there is a good chance that these paperwork issues will be deferred indefinitely. The MOC form provides an information checklist in section C that documents the completion of critical pre-implementation tasks before start-up.

Notification

Before the change is implemented, everyone who could be affected by the consequences of the change should be notified. It is the MOC Coordinator's responsibility to make sure that relevant personnel are told of the proposed change date, along with a brief overview of what will be done, why it will be done, and what the impact on the process is likely to be.

Implementation

On smaller projects, events usually move quickly, and the Management of Change Committee's formal review of the change usually is adequate. However, management must be satisfied that the change cannot be modified between approval and implementation.

Follow-Up

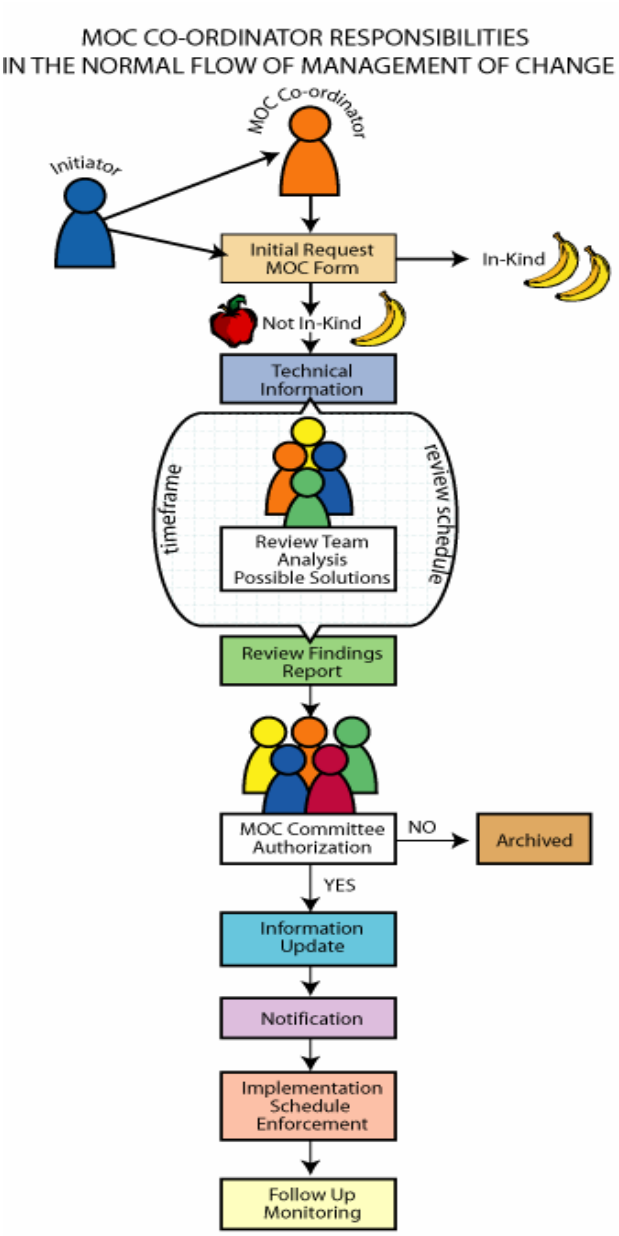
Once the change has been implemented, there should be a follow-up supervised by the MOC Coordinator to make sure that all precautions and preparations were handled properly and that the change has actually achieved the desired results of improved safety or operability. A follow-up should include the following considerations.

a) Were all the elements of process safety properly evaluated to ensure that there were no unexpected side effects?

b) Was the change itself implemented properly, and do the operators have an understanding of the new operating limits and what to do if those limits are exceeded?

REVIEW

If MOC Coordination was your responsibility, what would you be required to do at each step? Review and make notes beside the diagram at each step



MOC AUDIT

Audits are an integral part of any management program, including Management of Change. There is almost always a gap between what management believes is occurring and what actually is taking place in the field. Hence, audits are needed to identify the gaps and to provide guidance for improvements. With regard to Management of Change, audits can help in the following areas:

- Ensures that a functioning and effective Management of Change system is in place. (The audit must ensure that changes are being properly identified and managed.)

- Identifies those situations in which the proper change analysis procedures were not followed.

- Ensures that all those people who felt that they had a contribution to make were given the opportunity to do so.

- Ensures that the formal change control procedures with respect to regulations and standards were followed.

APPENDIX A

***STAR** Flight* **MOC Form**

MOC Process Form

A ***Initial Request***

Name of initiator: Functional area of initiator:

If "OTHER", describe:

Problem or Opportunity: Description of Problem or Opportunity:

Date of Initial Request (mm/dd/yyyy):

B ***First Review***

Technical MOC ☐ Organizational MOC ☐ Administrative MOC ☐

Describe the technical basis for the change or a description of the problem:

In-Kind or Not In-Kind: Equipment involved?: If "YES", describe:

Is this change (*check all that apply*): EMERGENCY ☐ PERMANENT ☐ TEMPORARY ☐ CRITICAL ☐

If temporary, what are the FROM/TO dates (mm/dd/yyyy)? From: To:

Is a PHA recommended: If "POSSIBLE", describe:

Date the MOC Process was initiated (mm/dd/yyyy):

C ***Detailed Evaluation***

Section C to Be Completed Before Startup

Major Modification..... ☐ YES ☐ NO *If YES, complete a PHA*

Construction or equipment

IAW Design Specifications..... ☐ YES ☐ N/A Date: _____

Operation/Maintenance

Processes Updated..... ☐ YES ☐ N/A Date: _____

MOC Process Form

PHA Safety/Regulatory Items

Resolved..... ☐ YES ☐ N/A Date: _____

Training Completed..... ☐ YES ☐ N/A Date: _____

Safe Work Practices In Place..... ☐ YES ☐ N/A Date: _____

Impact On Health and Safety

Documented..... ☐ YES ☐ N/A Date: _____

Documents/Reports attached? ☐ YES ☐ N/A

Other Findings Documented Here:

D ***MOC/Evaluation Team***

Name: Signature & Date Assigned: _____

Name: Signature & Date Assigned: _____

Name: Signature & Date Assigned: _____

Name: Signature & Date Assigned: _____

Name: Signature & Date Assigned: _____

Name: Signature & Date Assigned: _____

E ***Team Recommendation***

Section E to Be Completed Before Authorization of Change

Recommendation:

To Be Routed By Manager Responsible for MOC

Functional area:	*Agree*	*Disagree*	*N/A*	*Signature & Date*
Operations.....	☐	☐	☐	_____

MOC Process Form

Management.....	☐	☐	☐	_____
Maintenance.....	☐	☐	☐	_____
Line Staff.....	☐	☐	☐	_____
Health and Safety...	☐	☐	☐	_____
Office Staff.....	☐	☐	☐	_____
Other.....	☐	☐	☐	_____

Recommend Authorization of Change: If "NO", describe reason:

F ***Formal Approval***

Startup of Change Authorized by: Date (mm/dd/yyyy):

Program Director ☐

Director of Operations ☐

Director of Maintenance ☐

Date to be Implemented By (mm/dd/yyyy):

Date Actually Implemented (mm/dd/yyyy):

APPENDIX B

Qualitative Risk Analysis Matrix

PROBABILITY	SEVERITY				
	A Catastrophic	B Critical	C Major	D Minor	E Negligible
5 Frequent	5A	5B	5C	5D	5E
4 Occasional	4A	4B	4C	4D	4E
3 Remote	3A	3B	3C	3D	3E
2 Improbable	2A	2B	2C	2D	2E
1 Extremely Improbable	1A	1B	1C	1D	1E

COLOR ZONE	RISK LEVEL	SCORE	DECISION REQUIREMENTS
Red	**High**	**5A, 5B, 5C, 4A, 4B**	Unacceptable under the existing circumstances. The action or event must not be undertaken. Imperative that risk be reduced if action or event is to proceed.
Yellow	**Medium**	**5D, 5E, 4C, 3B, 3A, 2A**	The action or event may only proceed with the approval of the accountable executive. This may be a standing approval if associated with a previous risk assessment.
Green	**Low**	**4D, 4E, 3C, 3D, 3E, 2B, 2C, 1A, 1B**	The action or event may only proceed with the approval of management if there is no standing policy or procedure containing existing controls for this action or event.
Blue	**Negligible**	**2D, 2E, 1C, 1D, 1E**	The action or event is always acceptable.

APPENDIX C

Process Hazard Analysis "What If?" Checklist

Process Hazards Analysis "PHA" Checklist (What if?)

Initial Analysis ☐ Follow-up Analysis ☐

MOC Event: Date PHA completed:

Responsible manager's guidelines/goal for MOC:

Use the following criteria to categorize the hazards: (choose all that apply)

- ☐ Danger to personnel
- ☐ Potential for major equipment damage
- ☐ Potential for major operational loss
- ☐ Serious environmental impact
- ☐ Serious community complaint
- ☐ Regulatory violation

What if? (list in numerical order)

Answers to What if: (numerical order of What If's)

Likelihood and Consequences: (numerical order of answers)

Process Hazards Analysis "PHA" Checklist (What if?)

Recommendations:

List the top three (3) hazards that are priority for mitigation:

Facilitator name: Click here to enter text.

Date forwarded to MOC team: Click here to enter a date.

"What-If" Process Hazard Analysis (Guidebook)

What-If Analysis Overview

What –If Analysis is a structured brainstorming method of determining what things can go wrong and judging the likelihood and consequences of those situations occurring. The answers to these questions form the basis for making judgments regarding the acceptability of those risks and determining a recommended course of action for those risks judged to be unacceptable. An experienced review team can effectively and productively discern major issues concerning a process or system. Each member of the review team participates in assessing what can go wrong based on their past experiences and knowledge of similar situations.

Team members usually include operating and maintenance personnel, and a safety representative. At each step in the procedure or process, What-If questions are asked and answers generated. To minimize the chances that potential problems are not overlooked, moving to recommendations is held until all of the potential hazards are identified.

The review team then makes judgments regarding the likelihood and severity of the "What-If" answers. If the risk indicated by those judgments is unacceptable then a recommendation is made by the team for further action. The completed analysis is then summarized and prioritized, and responsibilities are assigned.

Getting Started – What's needed?

The first steps in performing an effective analysis include picking the boundaries of the review, involving the right individuals, and to have the right information. The boundaries of the review may be a single piece of equipment, a collection of related equipment or an entire facility. A narrow focus results in an analysis that is more detailed and explicit in defining the hazards and specific recommended controls. As the review boundaries expand to include the equipment involved in a large complex process or even an entire facility the findings and recommendations become more overview in nature. The boundaries can include the steps in the construction of the system under review, the steps involved in the operation of the equipment or facility or the steps required to maintain the equipment or facility. A clear definition of the boundaries of the analysis starts the review off in an effective manner.

Assembling an experienced, knowledgeable team is probably the single most important element in conducting a successful What-If analysis. Individuals experienced in the design, operation, and servicing of similar equipment or facilities is essential. Their knowledge of design standards, regulatory codes, past and potential operational errors as well as maintenance difficulties brings a practical reality to the review.

The next most important step is gathering the needed information. It is important that the review team gather information on existing processes, equipment or operational procedures that are essential information for the team to review. If these documents are not available, the

first recommendation for the review team becomes clear. Develop the supporting documentation! Effective reviews cannot be conducted without up-to-date reliable documentation.

Conducting the Review – How's it done?

Now that the team has had an opportunity to review the information, the next step is conducting the analysis. Generally, an experienced hazards review facilitator will lead the group through a series of "What-If" questions. A focused, energetic and knowledgeable facilitator can keep the review moving productively and effectively. A scribe is usually assigned to take notes of the review. Scheduling more than four hours at a time can result in the team members losing energy and eager to finish the analysis rather than probing deeper. Generally, in a well-designed system or well-operated system, the participants in the review will need to work hard to find major issues. It is the job of the facilitator to keep the effort moving productively.

Developing the "What-If" Questions – Using the documents available and knowledge of the review team, "What-If" questions can be formulated around human errors, process upsets, and equipment failures. These errors and failures can be considered during normal production operations, during construction, during maintenance activities, as well as during de-bugging situations. The questions could address any of the following situations:

- Failure to follow procedures or procedures followed incorrectly
- Procedures incorrect or latest procedures not used
- Operator inattentive or operator not trained
- Procedures modified due to upset
- Process conditions upsets
- Equipment failure
- Instrumentation calibration
- De-bugging errors
- Utility failures such as power, steam, gas
- External influences such as weather, vandalism, fire
- Combination of events such as multiple equipment failures

Experienced personnel are knowledgeable of past failures and likely sources of errors. That experience should be used to generate "What-If" questions.

For example, consider a chemical manufacturing process which includes the charging of a granular-like material from a 55-gallon drum to a 1000-gallon mix vessel containing a highly caustic liquid. Some typical questions that could be generated are shown in Figure 1 for illustration purposes.

As the "What-If" questions are being generated, the facilitator should ensure that each member of the team has an opportunity to input potential errors or failures. Determining the answer to each question as it is generated creates the danger of closing too soon on all possible upsets. The facilitator needs to assess if the team has really looked at all of the possibilities before going to the next step of answering the questions. Break up the analysis into smaller pieces if there is danger of just developing questions and not gaining the value of having them fresh in mind to answer those questions.

Figure 1. Example of Completed Step No. 1 What-If Analysis Form

Division: Chemical Ops	Desc. of Operation: Manufacturing B Mix/Drum Charging Operations – Page 2 of 4	By: Review Team Date 9/97

What If?	Answer	Likeli-hood	Conse-quences	Recommendations
1. Granular powder is not freely flowing? 2. Drum is mislabeled? 3. Wrong powder in the drum? 4. Drum hoist is not used? 5. Two drums are added? 6. Drum is misweighed? 7. Drum hoist fails? 8. Drum is corroded? 9. Ventilation at mixing tank is not operating? 10. Granular powder				

becomes dusty? 11. Powder gets on operator's skin? 12. Tank liquid level too high?				

Determining the Answers – After being assured that the review team has exhausted the most credible "What-If" scenarios, the facilitator then has the team answer the question, What would be the result of that situation occurring? For example, consider the following answers illustrated in Figure 2 to the "What-If" questions in our previous example.

Figure 2. Example of Completed Step Nos. 1 & 2 What-If Analysis Form

Division: Chemical Ops	Desc. of Operation: Manufacturing B Mix/Drum Charging Operations – Page 2 of 4	By: Review Team Date 9/97

What If?	Answer	Likeli-hood	Conse-quences	Recommendations
1. Granular powder is not freely flowing? 2. Drum is mislabeled? 3. Wrong powder in the drum? 4. Drum hoist is not used? 5. Two drums are added? 6. Drum is misweighed? 7. Drum hoist fails? 8. Drum is corroded?	1. Back injury potential when breaking up clumps 2. Quality issue only 3. If wet, could cause exotherm 4. Back injury potential 5. Quality issue only 6. Quality issue only 7. Leg, foot, back, arm injury 8. Iron contamination as well as drum failure & injury			

9. Ventilation at Mix Tank is not operating? 10. Granular powder becomes dusty? 11. Powder gets on operator's skin? 12. Tank liquid level too high?	9. Dusting & potential operator exposure 10.Same as above 11.Possible burn 12.Possible caustic splash as well as quality issue			

If done correctly, reviewing the potential equipment failures and human errors can point out the potentials for not only safety and health improvements but also the opportunity to minimize operating and quality problems.

Assessing the Risk & Making Recommendations – Not having considered the answers to the "What-If" questions, the next task is to make judgments regarding the likelihood and severity of that situation. In other words what is the risk? The review team needs to make judgments regarding the level of risk and its acceptability. For example, consider the following risk judgments and recommendations to the answers in our example as illustrated in Figure 3.

Figure 3. Example of Completed What-If Analysis Form

Division: Chemical Ops	Desc. of Operation: Manufacturing B Mix/Drum Charging Operations – Page 2 of 4	By: Review Team Date 9/97

What If?	Answer	Likeli-hood	Conse-quences	Recommendations
1. Granular powder is not freely flowing? 2. Drum is mislabeled? 3. Wrong powder in the	1. Back injury potential when breaking up clumps 2. Quality issue only	Quite Possible Remote	Serious Serious	Design de-lumping equipment Contact vendor

drum?	3. If wet, could cause exotherm	Unlikely	Minor	Include inspection in procedure
4. Drum hoist is not used?	4. Back injury potential	Possible	Serious	Train personnel & ensure use
5. Two drums are added?	5. Quality issue only	Remote	Minor	None
6. Drum is misweighed?	6. Quality issue only	Possible	Serious	Require 2nd check on weight
7. Drum hoist fails?	7. Leg, foot, back, arm injury	Remote	Serious	Ensure hoist on PM program
8. Drum is corroded?	8. Iron contamination as well as drum failure & injury	Remote	Serious	None
9. Ventilation at mixing tank is not operating?	9. Dusting & potential operator exposure	Unlikely	Minor	Include vent check in SOP
10. Granular powder becomes dusty?	10.Same as above	Unlikely	Minor	None beyond existing procedure
11. Powder gets on operator's skin?	11.Possible burn	Quite Possible	Serious	Use dust suit & gloves
12. Tank liquid level too high?	12.Possible caustic splash as well as quality issue	Remote	Very Serious	Use goggles and apron

Notice that the team has not only assessed the risk at each situation but has also made their recommendation at each situation. The discussion of each situation leads naturally to the recommendation. The team will then continue the review question by question until the entire process or operation has been analyzed. At this point, the facilitator should have the team step back and review the "big picture" and determine they have inadvertently missed anything.

Reporting the Results – To Whom & How?

The hard work of conducting the analysis has been completed. The important work of reporting the results still remains. The makeup of the organization generally determines to whom and how the results get reported. In some organizations, the report recommendations will also include who has been assigned the responsibility to follow up and time frame. In other cases, a separate staff or function will review the recommendations and determine the actions

required. A periodic report is then generated to summarize the present status of each of the recommendations. Those organizations that have a well-developed hazard review program require follow-up assignments every three to five years based on the associated hazard levels.

"What-If" Summary – Pros and Cons

The What-If Analysis technique is simple to use and has been effectively applied to a variety of processes. Individuals with little hazard analysis training can participate in a full and meaningful way. It can be applied at any time of interest such as during construction, during debugging, during operations, or during maintenance. The results of the analysis are immediately available and usually can be applied quickly. This is especially true if the review team members also operate or maintain the system being assessed.

APPENDIX D

1.0 LASER EXPOSURE RESPONSE GUIDE

1.1 INTRODUCTION

Flight crewmember exposure to laser light, while operating an aircraft at night, has resulted in glare, flash blindness, and after image. Temporary visual impairment and the distraction, disorientation, and discomfort that can accompany it often result in hazardous situations. A database of aviation reports involving laser illumination of flight crewmembers has been established and maintained at the Civil Aerospace Medical Institute. A review of recent laser illumination reports was initiated to investigate the significance of these events.

1.2 METHODS

Reports of high-intensity light illumination of aircraft were collected from Federal Aviation Administration (FAA) regional offices, Transportation Security Administration, Department of Homeland Security/Federal Bureau of Investigation Information Bulletins, the FAA's Office of Accident Investigation, newspaper articles, and interviews with pilots submitted by the airline industry. Reports that involved laser exposures of civilian aircraft in the United States were analyzed for the 13-month period (January 1, 2004 – January 31, 2005).

1.3 RESULTS

There were 90 reported instances of laser illumination during the study period. A total of 53 reports involved laser exposure of commercial aircraft. Lasers illuminated the cockpit in 41 (46%) of the incidents. Of those, 13 (32%) incidents resulted in visual impairment or distraction to a pilot, including 1 incident that reportedly resulted in ocular injury. Nearly 96% of these reports occurred in the last 3 months of the study period. There were no aviation accidents in which laser light illumination was found to be a contributing factor.

1.4 CONCLUSION

The study of laser illumination incidents in the national airspace system can identify the operational problems that result from such events. Improved reporting and analysis of laser events enhances aviation safety by providing the FAA with data necessary to assist in the development of methods for mitigating the effects of laser exposure.

2.0 LASER EXPOSURE PRE-MISHAP PLAN and REPORT

Paste this link for electronic fillable form:

O:\Program\QM\Safety\STAR Flight Safety Folders\Forms\Laser Exposure

If a LASER eye injury is suspected or observed, a complete medical eye examination must be conducted by an ophthalmologist or optometrist as soon as practical following the overexposure. The DO/CP shall ensure the following steps are completed during initiation of reporting procedures:

1. Contact the Program Director, Director of Aviation, Chief Pilot, and Safety Officer.

2. PD, DO, CP will contact a Flight Doctor as soon as possible to arrange eye exam.

3. Aircraft (circle one): N373TC N378TC N292TC N832DH

4. LASER System Color (if a color noted): _____

5. Mode (circle one): Takeoff, Enroute, Landing

6. Estimate of exposure time and distance:_____

_____

7. Description of incident:_____

_____

8. Extent of injury (if known):_____

_____

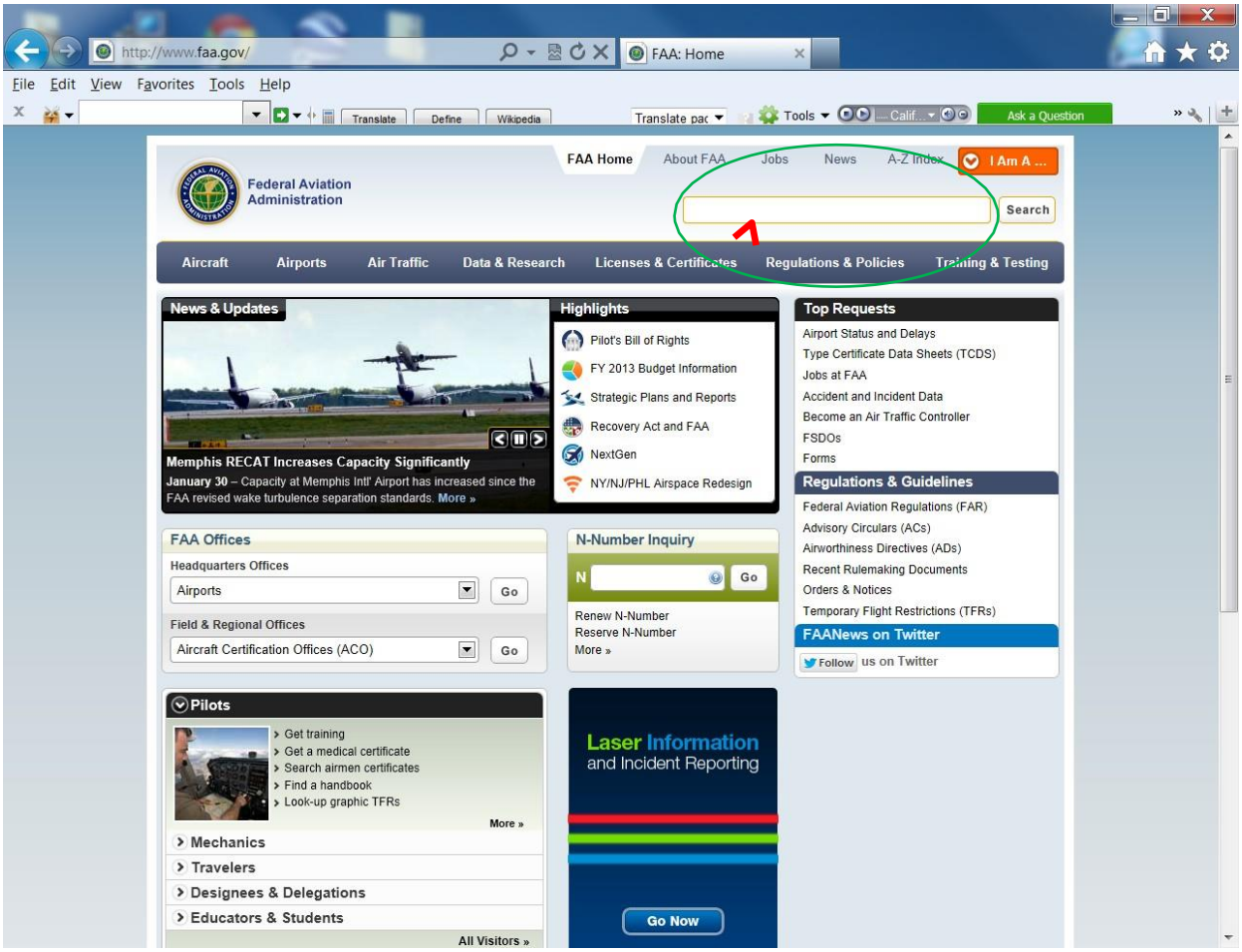
9. Contact local law enforcement authorities with location and description of laser event.

10. Contact ABIA tower operations and report event location and time.

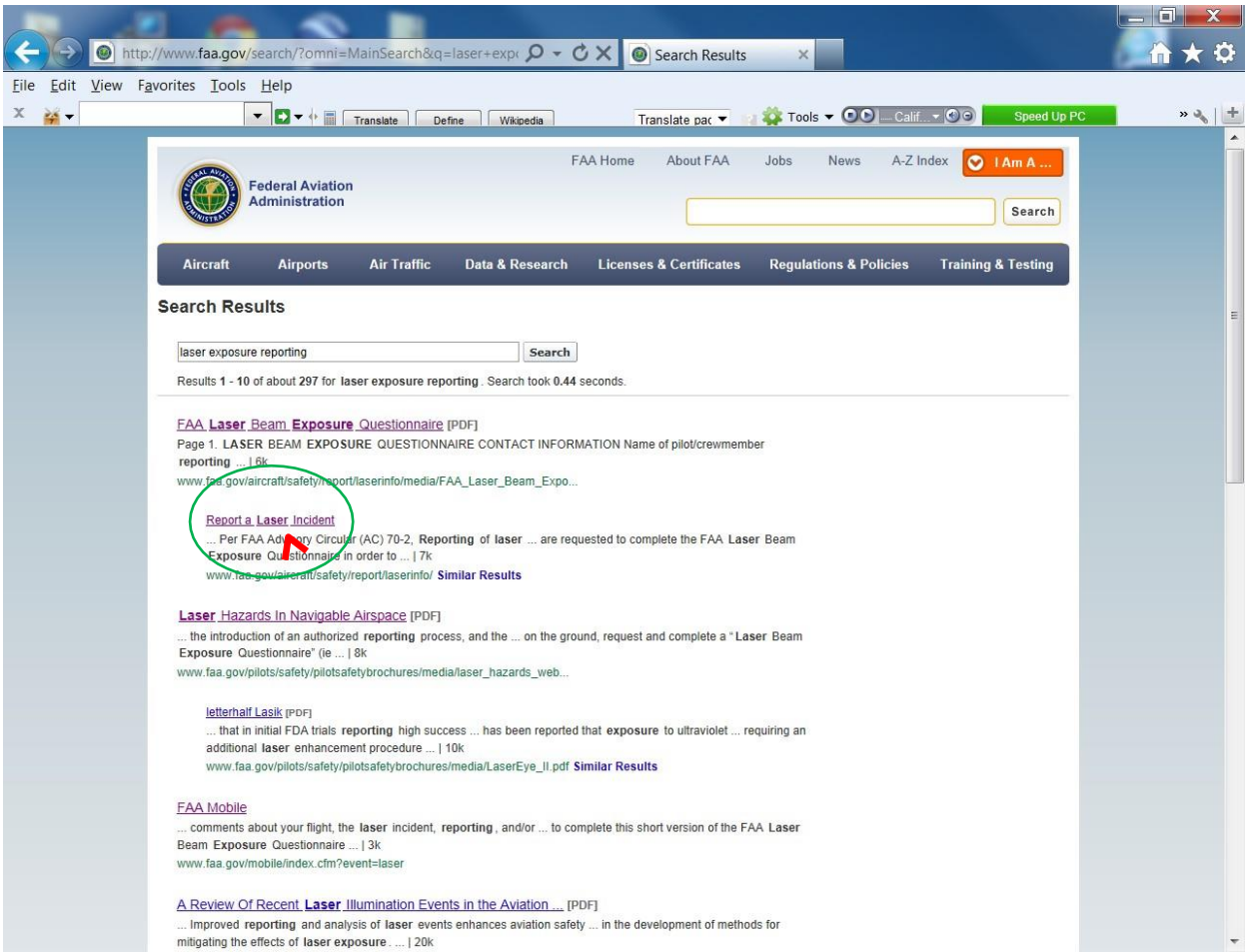
11. Telephone report with written follow-up to FAA (FSDO) with full description of laser event.

12. Complete FAA Laser Beam Exposure Questionnaire and follow distribution instructions.

2.1 LASER EXPOSURE REPORTING PROCEDURES FOR *STAR Flight*



1. Go to the FAA Home page.
2. Type "laser exposure reporting" in the search window.

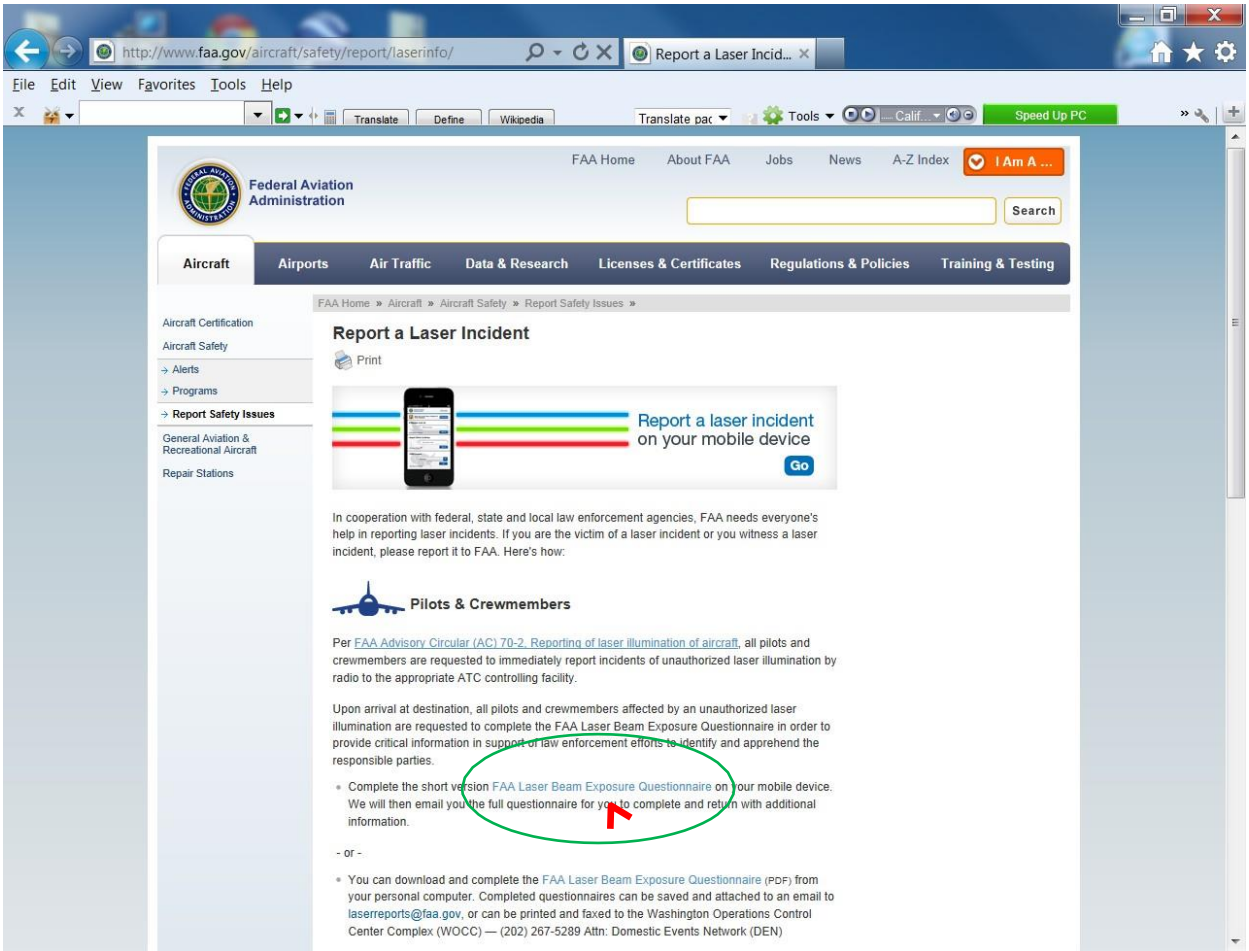


3. Click on the "Report a Laser Incident" link.

Use this link to a fillable Word document if you have difficulty gaining access to the FAA fillable pdf from the website:

O:\Program\QM\Safety\STAR Flight Safety Folders\Forms\Laser Exposure

LASER BEAM EXPOSURE QUESTIONNAIRE.doc



4. You can download and complete the "FAA Laser Beam Exposure Questionnaire" from your personal computer. Print the questionnaire, scan it, and then attach to an email to laserreports@faa.gov, or print and fax it to the Washington Operations Control Center Complex (WOCC); (202) 267-5289, Attn: Domestic Events Network (DEN). (Note that on this page you can also view or download a copy of the FAA Advisory Circular (AC) 70-2, Reporting of laser illumination of aircraft) (You will not be able to save the FAA report even though it tells you to; just print it out)

5. Complete a STAR Flight Occurrence and Hazard Identification Report (PRISM), a Laser Exposure Pre-Mishap Plan and Report (STAR Flight local), then submit all three reports to your supervisor as soon as possible.

6. If you have any questions about these procedures or about what else to do please contact your supervisor or the Safety Officer.

APPENDIX E

1.0 SAFETY STAND-DOWN PROGRAM

1.1 INTRODUCTION

Reducing Preventable Accidents; World-class organizations do not tolerate preventable accidents. EMS accident rates have increased dramatically recently, and we need to do our part to turn this situation around. A goal of "zero" accidents is achievable, and attaining it will directly increase our operational readiness and responsiveness to the citizens of Travis County. We owe our best efforts to the men and women who crew the Travis County ***STAR*** *Flight* helicopters.

A ***STAR*** *Flight* SAFETY STAND-DOWN is one tool that the PM or DAO can use to achieve this goal. Since safety stand-downs are required at various phases in an aviation operational environment, they represent a unique chance to really cover some relevant and necessary topics.

A ***STAR*** *Flight* SAFETY STAND-DOWN is a dedicated period of time, usually 1/2 to 2 days, when the program concentrates on safety issues and training. Usually, all other operations cease during the safety stand-down. The safety stand-down is a program wide event, so participation is mandatory by all crew members and supervisors.

1.2 REQUIREMENTS

A safety stand-down is generally directed the PM or DAO in response to a serious mishap or near mishap, or to improve safety readiness before major events, such as deployments, major inspections, overhauls, and before holidays.

Safety and occupational health are inherent responsibilities of ***STAR*** *Flight* management. It is thus up to individual management and staff to plan and conduct the stand-down. The objectives are to increase operational readiness, evaluate safety and health risks, correct deficiencies, and emphasize awareness of good safety and health practices for all personnel.

Safety stand-downs can be conducted at any time. ***STAR*** *Flight* management can use this tool as a means to address specific concerns at their discretion. The FAA, NTSB, and other higher authorities occasionally will recommend industry wide safety stand-downs to address their concerns.

APPENDIX F

1.0 SMS TRAINING

We will provide SMS training to all employees commensurate with their level of responsibility. Training consists of initial SMS training and further recurrent training. Aviation safety-related positions, responsibilities and authorities are defined, documented and communicated throughout the organization. To ensure currency, our training program for all levels of SMS training is conducted, reviewed and updated annually.

1.1 INTRODUCTION

Successful operation of our organization's SMS is tied to the success of our safety management system training program. All personnel must understand our safety philosophy, policies, procedures and practices. They must understand their roles and responsibilities within that safety management framework. Accordingly, safety training will begin with each employee's initial indoctrination and continue throughout the term of employment.

We are committed through SMS training to provide all of our employees with the skills and competencies to work safely and effectively.

To accomplish this we will:

- Identify skill requirements through SMS training needs and risk assessment;
- Develop SMS training programs in co-operation with employees;
- Deliver SMS training programs in a timely fashion;
- Maintain training records of all training completed.

The specific SMS training programs utilized at our organization are discussed below.

1.2 PERSONNEL REQUIREMENTS (COMPETENCE)

Competency is the result of knowledge, skills, and abilities that are obtained by education, training, and experience. In order to ensure competency in our organization we have developed minimum qualification standards for all personnel and we will provide training to ensure that each individual meets or exceeds that standard.

Our organization provides initial and recurrent SMS training for all employees. The level of training provided will range from general safety familiarization to very specific levels of

understanding depending on the topic. Training is tailored depending on the employee position in the organization. Example below:

Top Management
Safety Personnel
Line Management
Line Staff

We will provide initial and recurrent SMS training in accordance with these levels of job responsibilities regarding the SMS. Details of the SMS specific training content are provided below. This training will be periodically reviewed and updated.

SMS training records will be generated during all course offerings and retained to certify training completion for each employee with their individual training records and/or with the Safety Officer. Training records will be checked for accuracy and compliance with program requirements.

1.2.1 TOP MANAGEMENT

SMS training for Top Management will be appropriate to their schedule. This training will address the seven critical elements shown below.

1. What SMS is;
2. Safety culture and value;
3. The push for change;
4. Legal implications of SMS;
5. Front line involvement and committee process;
6. Response to events and emergencies;
7. Managing of Change (and the obstacles to change).

After these basics are covered, top management will then complete training on the implementation of SMS specific to our organization. This will include the items listed below.

1. This SMS manual;
2. Allocation of adequate resources to the SMS;
3. Communication and promotion of SMS standards throughout the organization;
4. Reporting procedures and responsibilities.

1.2.2 SAFETY PERSONNEL

The Safety Officer must be familiar with all aspects of our SMS and its impact on the activities of all personnel. The Safety Officer will complete all of the SMS training prescribed for every

organizational position. This will allow him to assess the quality of the training provided and

to adjust the curriculum accordingly. Additionally, because of the proprietary nature of our SMS, much of the Safety Officer's additional knowledge will be acquired by self-education.

Additional technical training provided to the Safety Officer must include at least the items listed below.

1. Crisis management and emergency response planning;
2. Accident and incident investigation;
3. Specialized training or familiarization (such as Flight Data Analysis, Safety Audits, Crew Resource Management and Safety Culture Surveys);
4. Performing safety audits;
5. Analysis of data;
6. Root cause analysis;
7. Decision Making.

Safety Risk Management Committee (SRMC) Training

SRMC training will be provided to employees who serve on the SRMC or to any employee assigned additional safety duties requiring this additional training. It is important that staff performing these functions receive adequate training in the special methods and techniques involved. This training may be provided from within our organization with the assistance of any of our various departments, or may be provided externally by contract arrangement. Safety training items are listed below.

1. Performing safety assessments;
2. Performing safety audits;
3. Operational data collection;
4. Root Cause Analysis.

1.2.3 LINE MANAGEMENT

Line management at our organization includes all managers to include: Chief Pilot, Chief Medical Supervisor, Chief Clinical Supervisor, Senior Pilots, Paramedics, Nurses and Lead Mechanics. These supervisory and leadership personnel must have a thorough understanding of the principles on which our safety management system is based. They must also be aware of their particular SMS responsibilities that are associated with their department. Additional training will be provided to these individuals to ensure that they are conversant with their special role in the operation of the SMS. The additional training provided will address at least the items listed below.

1. Specific SMS responsibilities and accountabilities of their position and department;
2. Legal issues involved, for example, their legal liabilities;
3. Root Cause Analysis;

4. Risk Acceptance;
5. Decision Making.

1.2.4 LINE STAFF

In addition to the specialized training discussed above, all employees will receive a basic training course on SMS that includes at least the following items:

1. Basic principles of safety management;
2. Overview of this SMS manual;
3. Proper safety culture;
4. Importance of complying with the safety policy and procedures that comprise the SMS;
5. Our organization's past safety record, including areas of systemic weakness;
6. Our safety goals and objectives;
7. Our voluntary and mandatory reporting systems;
8. Requirement for ongoing internal assessment of organizational safety performance (e.g. employee surveys, focus groups, safety audits and assessments);
9. Reporting accidents, incidents and perceived hazards;
10. Safety promotion and dissemination of information;
11. Human Factors;
12. Safety audits;
13. Familiarization of the layout and operations;
14. Emergency procedures, assembly points, and escape routes;
15. First aid facilities;
16. Fire safety.

APPENDIX G

1.0 UNMANNED AIRCRAFT SYSTEMS ENCOUNTER

1.1 Introduction

1.1.1 An unmanned aircraft system (UAS), sometimes called a drone, is an aircraft without a human pilot onboard. The UAS is controlled from an operator on the ground. The Federal Aviation Administration (FAA) have rules and regulations that apply to all UAS operators. However these rules are not easy to regulate, nor are they always followed or known by the UAS users. The FAA is currently looking at new regulations to enforce, but unfortunately behind in how to regulate or enforce regulations on such operators. It is our responsibility to report all UAS encounters that result from a UAS operator not following regulations. See Appendix G. part 1.1.2 for operating limitations.

1.1.2 PART 107

FAA Drone Regulations – Operational Limitations

- The unmanned aircraft systems must weigh less than 55 lbs.
- The drone must remain within Visual line-of-sight (VLOS) of the remote pilot in command and the person who operating the flight controls.
- Small unmanned aircraft may not operate over groups of people, over stadiums or sports events.
- The drone regulations also state that don't fly your drones at night. The Daylight operations or civil twilight (30 minutes before official sunrise to 30 minutes after official sunset, local time) only allowed.
- As per part 107 regulations, you must give way to manned aircraft.
- First-person view camera cannot satisfy "see-and-avoid" requirement.
- The Maximum speed of flight is 100 mph (87 knots).
- You can fly your drone at a Maximum altitude of 400 feet above ground level (AGL) or, if higher than 400 feet AGL, remain within 400 feet of a structure.
- The minimum weather visibility to fly the unmanned aircraft is 3 miles from the control station.
- Operations in Class B, C, D and E airspace are allowed with the required ATC permission.
- The drone flying laws allowed operations in Class G airspace without ATC permission.
- At a time, you are not allowed to operate two or more drones.
- As per the drone law, you should not operate a drone from a moving aircraft. Also, the rule clearly stated that no operations from a moving vehicle unless the operation is a sparsely populated area.
- As per part 107 regulations, you should not carry any hazardous materials in the drone.
- Requires preflight inspection by the remote pilot in command.
- A person may not operate a drone if he or she knows or has reason to know of any physical or mental condition that would interfere with the safe operation of a small UAS.
- Foreign-registered small unmanned aircraft are allowed to operate under part 107 if they satisfy the requirements of part 375.
- You can carry any payload in the unmanned aircraft provided the payload is securely attached and it should not affect the control of the drone.

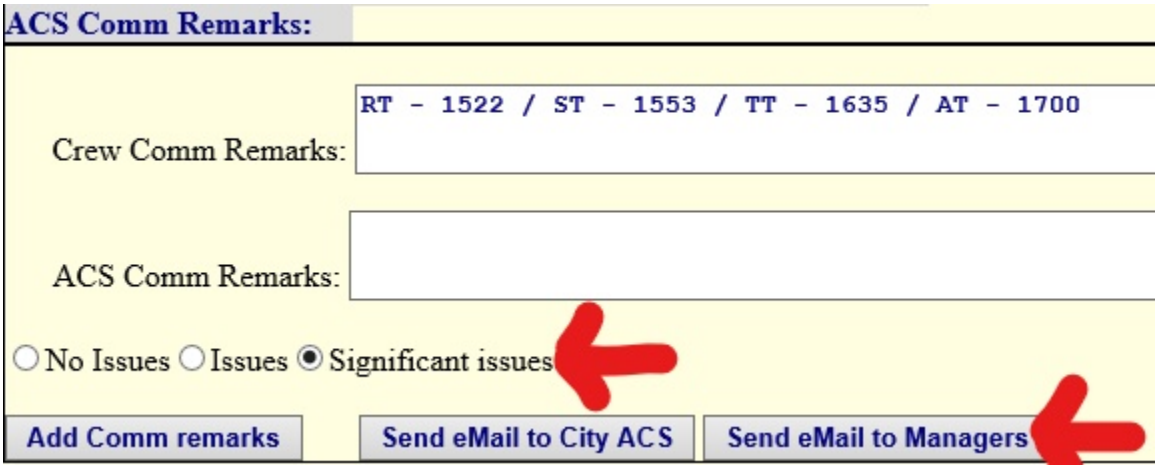
2.0 REPORTING

2.1 If a ***STAR*** *Flight* Helicopter encounters a UAS operating outside the FAA operational limitations it shall be submitted as outlined below.

3.0 STEPS FOR REPORTING

3.1 Pilot shall check the UAS Encounter check box located within the flight information portion of the flight data entry form.

3.2 After completing the flight data entry, the pilot will select the significant issue check box under the ACS comm. remarks section of the flight data entry form. Then click on Send email to Managers. This will send a notification email to all SF managers, and A/TCEMS commanders.



3.3 If safety of flight was jeopardized, or a delay in service was caused due to the UAS encounter, a Travis County STAR Flight Hazard Identification Report will be filled out by the crew.

3.4 The Safety Officer will continue the FAA notification process after the report has been submitted.

Federal Aviation Administration

FAA Drone Incident Reporting

Document and provide the following information to FAA:

- Identity of operators and witnesses (name, contact information)
- Type of operation (hobby, commercial, public/governmental)
- Type of device(s) and registration information (number/certificate)
- Event location and incident details (date, time, place)
- Evidence collection (photos, video, device confiscation)

Contact your FAA LEAP agent or an FAA ROC for assistance:

Western ROC	AK, AZ, CA, CO, HI, ID, MT, NV, OR, UT, WA, WY	206-231-2089	9-WSA-OPSCTR@faa.gov
Central ROC	AR, IA, IL, IN, KS, LA, MI, MN, MO, ND, NE, NM, OH, OK, SD, TX, WI	817-222-5006	9-CSA-ROC@faa.gov

3.5 Reports will be discussed during quarterly safety meetings, and staff meeting.

4.0 REVIEW

4.1 The UAS operators, and manned aircraft flying in the same National Airspace System is somewhat new. The FAA is continually looking at the regulations that need to be enforced. SF will continue to monitor UAS regulations, and change our notification system as new regulations are put in place by the FAA. As always, if a question arises contact the Safety Officer or your direct supervisor.