Company Manuals and Programs

What are the Regulatory Requirements?

Certificate holders and applicants must prepare a manual(s) for the use and guidance of flight, ground operations, and management personnel for conducting your operations. Each manual must include instructions and information to allow your personnel to perform their duties and responsibilities with a high degree of safety. (14 CFR Parts 121.133 and 121.135)

The FAA believes that a high degree of safety can be achieved when an air carrier properly designs and documents safety critical processes. An air carrier process, when designed adequately and clearly documented, provides the FAA and air carrier management with a high level of confidence that company personnel will know precisely what is expected of them as they perform their duties and responsibilities.

What is an Adequate Design?

Your process design must include **Policy** statements that describe what you intend the process to do. Policy statements describe the goals or objectives of a particular process. For example, a policy statement regarding crewmember flight and duty time would state, in part, that the objective of the process is that no airman exceeds regulatory limits.

The next step in a well-designed process is to build procedures that give instructions and information to the people who must manage and/or adhere to the process. **Procedures** explain the steps that the employee is required to use to accomplish the process. For example, flight and duty time procedures may include step-by-step instructions that would be required to ensure that airman's flight activities remain within the regulatory duty limitations.

Process design precedes manual development. Unless the design is clearly understood by the writer, it is impossible to develop procedures that provide accurate guidance to the end user. Effective procedures are written so that all users can follow the instructions to accomplish the steps in a task. One measure of a properly written procedure is if one hundred of your employees read the procedure, they would each accomplish the described task in precisely the same way.

How Does the FAA Evaluate Process Design?

FAA inspectors use Safety Attribute Inspection (SAI) tools to collect data that is used to evaluate the quality of written processes. The safety attributes are; procedures, controls, management responsibility and authority, interfaces, and process measurements. These attributes are not standards that must be complied with, but rather serve as a framework the FAA uses to assess the capabilities of your processes. However, if you consider the following discussion of these attributes when designing your processes, you will have confidence that employees will be able to accomplish the process reliably with a high degree of safety during a variety of conditions.

Procedures

Procedures have to be written so that they can be reasonably accomplished by the people who will be using them to perform their duties. Well-written procedures function during a wide variation in environmental conditions. In other words, if your procedures are properly written, they will produce the required outcome, each time, whether it is Monday morning or Saturday night, with no degradation of performance.

An important step is interviewing a representative from each organizational unit that will have a role in accomplishing the process. Have them work together to identify each step required to accomplish the process.

Use the information provided by the employees to create a flow chart or work flow of the process from start to finish. Flow-charting lays the foundation for documenting the process and ensures no step is omitted. FAA Order 8900.1, Volume 10, Chapter 1, Figure 10-3 has examples of flow chart symbols and there are flow charts in the beginning of each Section in Chapter 2. The FAA calls these flow charts Business Process Maps. There are many software programs that can assist you with this step.

Controls

Since human beings introduce variability or error into processes, look carefully at the flow chart and identify any areas where people accomplishing a task could deviate from the written procedures. Then insert steps into the process to either prevent the likelihood of an error or mitigate the severity of its effect. In doing so, you have embedded the appropriate controls in the procedures that ensure that the desired outcome is produced.

Section 2 "Controls" of every SAI DCT states that controls may be in the form of engineered controls, such as automated features or mechanical action or devices. Controls may also be in the form of administrative controls, which are secondary or supplemental written procedures. In systems that depend on humans to accomplish work, many controls are procedural, and it is sometimes difficult to distinguish a procedure from a control. Controls should not be written as a stand-alone paragraph for each process contained in your manuals in an attempt to obtain a "yes" answer for all the questions in this section. Controls are not tacked onto procedures, but rather are an attribute within a procedure that ensures a reliable and consistent outcome.

It is sometimes difficult to distinguish a procedure from a control. You can tell the difference by asking yourself if the work can be physically accomplished without the control. For example:

- Flight deck checklists are not necessary to operate the aircraft, but using a take-off or landing checklist ensures a consistent result, so the checklist and the procedure for using it are actually a control.

- Maintenance task cards and sign-off procedures are not necessary to physically accomplish work, but they do ensure a desired result. For example, a brake change may be successfully accomplished by an experienced mechanic. However, a task card reliably ensures proper removal and re-installation of the brake assembly.

Management Responsibility and Authority

In the previous discussion on the development of procedures, we recommended you speak with a representative participant who will have a role in accomplishing the process. Based on your organizational structure and regulatory requirements, an individual within that group will be identified as that person who has authority to establish and modify the process. In addition, the company will identify the person or persons who will be responsible for the quality of the outcome of the process. Once these individuals are identified, the company also must establish qualification standards, duties and responsibilities, and information and instruction for these management personnel to accomplish their duties. Lastly, the company must establish a procedure for the delegation of authority in the absence of the designated manager.

Companies should resist the temptation to again obtain "yes" answers to SAI questions by creating a stand-alone paragraph for each process contained in their manuals. By placing the management authority and responsibility requirements throughout the manual, two undesirable situations are created. Firstly, the Directors of Operations, for example, would have to search through the entire company's manual system to ensure they were aware of all the processes they had authority over. Secondly, an employee may not expend the effort to read through the procedures because they contain information that is extraneous and unrelated to the task. It is important to make work instructions clear, concise, to the point, and specific for the end users. Otherwise, employees may not bother to read the procedure before attempting to accomplish the task.

Interfaces

At this point, you have designed the process; you have written standard operating procedures for employees to follow; you've added controls or restraints to ensure a consistent outcome; and you've identified management personnel who will have the authority over the process as well as the individual(s) who will be responsible for the quality of the outcome of the process. To ensure consistency and avoid incongruent relationships between processes it is now necessary to identity and document the interface relationships that exist within and between your processes. Much of this work was accomplished during process design when you identified each participant that has a role in accomplishing the process. Many manual developers have successfully documented these relationships by using a matrix grid presentation rather than having a stand-alone paragraph titled "Interfaces" for each process contained in their manuals. By presenting the information in a grid matrix, the documented interfaces can be located in the discussion of manual management. In addition, all interface relationships are documented and can be viewed in a single location.

Process Measurements

The final step is to design process measurements, or audits, that will show how well the process is actually working   Process measure audits allow an organization to determine whether it's safety critical processes are being followed by personnel and producing the desired result. They also allow the organization to identify and *proactively* take corrective actions on poorly performing processes.

Process measurements are normally the domain of an organization's safety department and the Director of Safety. In the next few years, when safety management systems

(SMS) become a regulatory requirement, these audits will form one of the cornerstones of the safety management program requirements. Process measurement audit tools should be developed with this future requirement in mind. Effective process measurement audit tools are comprehensive, easily tracked and provide information for managers to use to improve the reliability of programs and processes. A company can audit its processes by using the ATOS data collection tools or other audit programs that comprehensively evaluate the performance of safety related activities.

A company can also measure processes *reactively* by establishing programs that investigate accidents or incidents. This is especially effective, in that it has been estimated that for each major accident there are hundreds of incidents that, properly investigated by safety monitoring and feedback programs, might have identified an underlying problem(s) in time to prevent the accident.

Some companies have attempted to obtain "yes" answers to SAI question by inserting a stand-alone paragraph titled "Process Measurements" for each process contained in their manuals. This practice is incorrect in that the process measurement questions are asking in effect, if the company conducts an audit regarding the subject of the questions.

Simply put, if the company does not have a written methodology for auditing their processes, including written forms to record observations, they cannot answer "yes" to process measurement questions. In addition, the company must use information gained from these audits to improve their processes. In the absence of these audit tools, the company has no way of knowing if its processes are being followed or if they are producing the desired result. The end result is that the company will have no structured method for improving its processes.

How Does the FAA Evaluate Process Documentation?

You must convert the information from the process design phase into an appropriate writing format. Your system documentation might include manuals, AD libraries, checklists, maintenance task cards, supplemental type certificates, etc.

When developing manuals, it is important to remember both the business and regulatory purpose of developing manuals. 14 CFR Part 121.135 requires the certificate holder to develop and maintain manuals to provide "instructions and information necessary to allow the personnel concerned to perform their duties and responsibilities with a high degree of safety." You must document the written process and procedures with the end user in mind. Managers and employees should be able to easily locate the instructions and information they need to perform their duties and responsibilities.

How Should I Organize the Information?

In some cases applicants and certificate holders have attempted to use the safety attributes as an outline for their manuals development. For instance, they mistakenly use the safety attributes as paragraph headings. This practice only complicates the procedures and makes it difficult for the end user, the employee, to gain meaningful information to accomplish work. This is especially serious when used to present safety critical procedures and tasks. A properly constructed manual should provide the stated

policy or goal related to the procedure or task, followed by clearly written procedures and steps to accomplish the task or activity in a logical manner.

How Should Manuals Present Information and Instructions to Employees?

Manuals should not be too large, or organized in such a way, that employees cannot find the information they need to perform their duties and responsibilities. The safety attributes for each process do not have to be documented together in the same section of the manual. It was not the intent of ATOS for the applicant or certificate holder to write statements in their manual just so they can answer "yes" to the data collection tool questions. A very experienced inspector once cautioned "using SAIs to build manuals is like using maintenance task cards to build an airplane, you may get it put together, but it'll never fly!" The lesson here is that processes must be first developed using design tools (flow charts) and once created, the SAIs are used to audit the quality of the processes.

Links to resources for developing a manual:

- *FAA Order 8900.1, Volume 3, Chapter 1*
- *FAA Order 8900.1, Volume 3, Chapter 32, Section 1 and Section 2*
- *AC 120-59A, as amended, Air Carrier Internal Evaluation Programs*
- *AC 120-66B, Aviation Safety Analysis Programs (ASAP)*
- *AC 120-79, Developing and Implementing a Continuing Analysis and Surveillance System*
- *AC 120-82, Flight Operational Quality Assurance*