Section 1 Safety Assurance System: General

3-3916 PURPOSE. This section provides information and guidance for Flight Standards Airworthiness aviation safety inspectors (ASI) who have oversight management responsibility for Title 14 of the Code of Federal Regulations (14 CFR) part 119 certificate holders (air carriers) conducting operations under 14 CFR part 121. It also outlines existing regulatory requirements and Federal Aviation Administration (FAA) National Policy regarding scheduled maintenance requirements and failure/defect reporting regarding emergency evacuation systems (EES).

3-3917 BACKGROUND.

A. Failure of EES. The National Transportation Safety Board (NTSB) has made a number of safety recommendations relating to accidents/incidents where the failure of an EES was a factor. Recently, the NTSB made safety recommendations in response to an accident where two of four available emergency evacuation exits failed to operate due to maintenance irregularities. During 2008, there were a number of instances on one in-service air carrier aircraft where the crew was unable to open the main exit door after landing at the destination. The air carrier failed to address the root cause of the malfunctions and failed to report any of those instances where the door could not be opened.

B. EES Operational Reliability. EES operational reliability has been an issue in a number of past and recent accidents/incidents; however, earlier efforts aimed at improving EES reliability have not resulted in significant improvement. During 2004, we developed a comprehensive strategic plan for air carrier EES reliability improvements. Our strategy involves an understanding of EES maintenance tasks, both on and off the aircraft, as well as a heightened awareness of the EES regulatory requirements. Our strategy also involves using operations specification (OpSpec) paragraph D105 to identify particular EES maintenance requirements. We also highlighted the monitoring of the performance and effectiveness of all EES maintenance with the Continuing Analysis and Surveillance System (CASS).

3-3918 DEFINITION. For the purposes of this section, the term “EES” includes components of all aircraft slide-equipped exits affecting the emergency egress function, including any of the slides, slide/rafts, exit doors, exit door or hatch mechanisms, exit door or hatch opening assist mechanisms, tail cone release mechanisms, arm/disarm mechanisms, slide activation mechanisms, electronic slide monitoring systems, and slide-to-airframe attachments.

3-3919 DISCUSSION. The particular regulations that address the requirements for a means for emergency evacuation are 14 CFR part 25, § 25.810 and part 121, § 121.310. You can find the general requirements for EES maintenance in part 121 subpart L. EES must be inspected regularly in accordance with inspection periods established in the OpSpecs to ensure its condition for continued serviceability and immediate readiness to perform its intended emergency purposes.
3-3920  EES MAINTENANCE REQUIREMENTS. You should ensure that the certificate holder’s EES maintenance requirements are an integral part of their air carrier maintenance program. The air carrier uses these EES maintenance requirements, coupled with their CASS, to ensure that their EES is in a serviceable condition and is ready to perform their intended emergency purpose.

3-3921  MAINTENANCE ORGANIZATION. You should also ensure that the certificate holder’s maintenance organization ensures, through its CASS, that all maintenance personnel perform all EES maintenance in accordance with the air carrier’s manual. The maintenance organization must also ensure that EES maintenance is effective—that it produces the desired result. If you note that the air carrier is experiencing an increase in the level of unscheduled EES maintenance, that may be an indicator of discrepancies in the maintenance program related to EES. The air carrier should thoroughly investigate any failure of an EES. The air carrier should establish a root cause for the failure so that the appropriate corrective action can be applied. You should also ensure that the air carrier’s maintenance program has provisions to ensure that competent personnel, adequate facilities, and equipment are provided for EES maintenance.

3-3922  EES MAINTENANCE TRAINING.

A. Maintenance Personnel. Because of the complexity and safety-critical nature of EES maintenance, the certificate holder must ensure that each individual performing maintenance or inspections for it on EES is properly trained and qualified, understands the air carrier’s maintenance instructions, and is competent to perform the EES task assigned.

B. Training Program. As one of the means of demonstrating compliance with the competent personnel requirement, the certificate holder should document EES maintenance and inspection personnel training for its EES personnel. In addition, you should encourage the certificate holder to consider including recurrent training as part of its training program to ensure the competency and currency of any of its maintenance providers. You should also encourage the certificate holder to promote the best practice of safety-critical awareness to any person who works with or around EES on its aircraft.

3-3923  EES MAINTENANCE TIME LIMITATIONS. The inspection tasks and inspection periods for EES should confirm the continued serviceability and immediate readiness of EES for their intended emergency purpose. The air carrier must establish inspections and inspection periods that are designed to establish that all components of the EESs installed on their aircraft are complete and serviceable, and may be expected to remain in this condition until either the next inspection or an actual use under emergency conditions.

NOTE: Because of the confusion and uncertainty related to using Maintenance Steering Group-2 (MSG-2) process terminology, you should ensure that the certificate holder does not use MSG-2 terminology for EES in an air carrier maintenance time limitations document. For clarity, the certificate holder should list EES inspection requirements in their maintenance time limitations using Maintenance Steering Group-3 (MSG-3) task descriptions. This is a straightforward requirement, as MSG-2 process requirements must be managed on a task basis rather than a process basis. In other words, the air carrier should...
determine what is the actual EES task(s) being accomplished under the process label and list that task(s) in the maintenance time limitations instead of the process label. Exclusive use of the process label can mask what actual scheduled maintenance task being accomplished actually is.

A. Inspection Tasks. Two of the types of tasks that are used in aircraft maintenance are failure-finding tasks, which identify functional failures (those that have occurred already), and failure prevention tasks, which identify potential failures (those that are in the process of occurring but have not occurred yet). A good EES overall maintenance strategy encompasses both types.

B. Risk Assessment Process. To satisfy the regulatory requirement, the certificate holder should include in its maintenance time limitations OpSpecs a system of EES tasks consisting of on-aircraft inspections, measurements, or tests designed to determine the item’s or system’s capability to immediately perform its intended emergency purpose. This is potential failure-finding where the purpose of the task is to look for degradation of the item’s resistance to failure. Deployment or operational checks (failure-finding) of an evacuation slide or a door system may be included and used on a sampling basis to help validate the effectiveness of overall EES maintenance strategy. However, failure-finding tasks do not prevent failures, as they can find failures only after the failure has occurred. In the maintenance program effectiveness (desired results) part of CASS for EES, an increase in failures during slide deployments or door operational checks has a negative impact (increased likelihood) on EES maintenance effectiveness and must initiate a corresponding increase in the sampling rate. This is a basic risk assessment/risk management process (RMP). However, evacuation slide deployment checks (operational checks) are failure-finding tasks that leave the evacuation slide in an unserviceable condition and not ready to perform its intended function. Deployment checks are, therefore, not suitable for compliance with § 121.309 inspection requirement.

C. Scheduled Slide Deployments. If the certificate holder chooses to use scheduled slide deployments, they may use a combination of on-aircraft operational tests, inspections, and test-fixture usage provided the test-fixture accurately replicates the aircraft installation.

D. Inadvertent Slide Deployments. While a source of useful information, the certificate holder should not use inadvertent or actual emergency use deployment as the sole source of information to determine the effectiveness of their air carrier’s EES maintenance program.

1) Actual emergency use or an inadvertent EES deployment, by their very nature, are failure-finding tasks that involve checking whether or not a function(s) is available. They are a qualitative task that does not require quantitative tolerances. They are operational checks. Failure-finding provides a yes or a no answer to the questions: Did it work? Was the function available? An EES functional check, on the other hand, is a quantitative check designed to determine whether one or more functions of the EES performed within specified limits or parameters. A functional check involves a collection of numbers which are compared to a performance standard; on the other hand, an operational check (inadvertent or actual emergency use EES deployment) does not collect numbers.
2) Since an inadvertent or actual emergency use EES deployment does not generate any quantitative data, the certificate holder cannot satisfy the compliance or the data collection requirements of a functional check. Therefore, you should ensure that the certificate holder does not use inadvertent or actual emergency use deployments to show compliance with any EES scheduled functional deployment check. If the certificate holder chooses to use functional checks as a part of its overall EES program, you should ensure that these tasks are accomplished according to the task interval listed in their maintenance time limitations. The certificate holder cannot take credit for a functional check with data from an inadvertent or actual emergency use EES deployment.

3) Additionally, since most inadvertent deployments occur in the jetway or catering truck, they do not generate any qualitative data because determination of whether or not the function(s) is available is usually not possible. Therefore, you should ensure that the certificate holder does not use inadvertent EES deployments to show compliance with any scheduled EES operational check requirement where a determination of the availability of the function is not possible.

3-3924 EES CASS. The primary function of a CASS is to identify and correct maintenance program discrepancies that could set the stage for an accident/incident. Essentially, the CASS should continuously evaluate the air carrier maintenance program, including the maintenance time limitations; maintenance procedures; maintenance methods, techniques, and practices; maintenance manual; and training related to EES. The certificate holder’s CASS should achieve this through a continuing cycle of surveillance, data collection, data analysis, corrective action, and followup.

A. EES Failure Reporting. Consistent with the reporting requirements of § 121.703(a)(17), you should ensure that the certificate holder has maintenance program procedures for reporting any failure, malfunction, defect, or loss of function of any EES or component. Consistent with the plain language requirements of § 121.703, these reporting requirements apply when these adverse occurrences take place during an actual emergency, or during training, testing, maintenance, or demonstrations, whether the EES is installed on an aircraft or not.

B. EES Airworthiness Release. The air carrier must have airworthiness release or log entry procedures for any on-aircraft EES maintenance, in accordance with § 121.709.

3-3925 ACTION. If you are an ASI with certificate responsibility for air carriers using aircraft with EES, you should verify that the certificate holder is complying with all of the requirements of the regulations and OpSpec paragraph D105, including:

A. EES Functional Checks. The air carrier does not use inadvertent or actual emergency use deployments to show compliance with EES functional check requirements listed in its maintenance time limitations (OpSpec paragraph D105(b) and (c)).

B. EES Operational Checks. The air carrier does not use inadvertent deployments to show successful compliance with any scheduled EES operational check requirement where a determination of the availability of the function is not possible.
C. **Reporting Requirements.** The air carrier has incorporated in its air carrier maintenance program EES failure/defect reporting procedures that are consistent with the regulations. The regulations require that each air carrier report all failures/defects of EES, including EES equipment that is:

1) Found defective, or

2) That fails to perform its intended functions during an actual emergency or during training, testing, maintenance, demonstrations, or inadvertent deployments (refer to § 121.703(a)(17)). Basically, this means just about any EES failure any time.

D. **Name and Location.** The air carrier has placed the name and physical location of the individual who is responsible for the § 121.703(a)(17) report on the listing required by part 119, § 119.59(b)(1)(ii).

E. **Action Documentation.** Consistent with paragraph 3-3926 below, document these actions and the results.

3-3926 **COMPLIANCE DOCUMENTATION REQUIREMENTS.** Principal maintenance inspectors (PMI) should use the reporting procedures in Volume 10 to record the actions outlined in this section:

- Safety Assurance System (SAS) Element 1.1.3 (AW), Continuing Analysis and Surveillance System.
- Enter “NTSB99103” in the “Local/Regional/National Use” field (without quotes).
- Document the actions outlined in this section, as well as any associated observations, in the generic information reporting block.

**RESERVED.** Paragraphs 3-3927 through 3-3940.