
Office of Inspector General

Audit Report

FAA LACKS SUFFICIENT OVERSIGHT OF THE AIRCRAFT RESCUE AND FIRE FIGHTING PROGRAM

Federal Aviation Administration

Report Number: AV-2016-067
Date Issued: May 31, 2016





Memorandum

U.S. Department of
Transportation

Office of the Secretary
of Transportation
Office of Inspector General

Subject: **ACTION:** FAA Lacks Sufficient Oversight of
the Aircraft Rescue and Fire Fighting Program
Federal Aviation Administration
Report No. AV-2016-067

Date: May 31, 2016

From: Charles Ward 
Assistant Inspector General
for Aviation Audits

Reply to
Attn. of: JA-10

To: Federal Aviation Administrator

In July 2013, Asiana Flight 214 crashed on final approach into San Francisco International Airport, resulting in three fatalities and drawing attention to the importance of emergency response at our Nation's airports. Under Federal regulations,¹ an airport operator must provide aircraft rescue and firefighting (ARFF) personnel, facilities, and equipment.² Since 2004, the Federal Aviation Administration (FAA) has provided approximately \$750 million in Airport Improvement Program funds to airports nationwide for ARFF buildings, facilities, vehicles, and equipment.

FAA is responsible for ensuring that more than 500 airports comply with Federal regulations governing airport safety and emergency response operations. Specifically, FAA requires airport operators to develop plans and procedures to respond to aircraft incidents and accidents, fires, and hazardous materials incidents. FAA also requires all rescue and firefighting personnel to be trained prior to their first duties and to receive recurrent training every 12 consecutive calendar months.

¹ Title 14 of the Code of Federal Regulations (CFR) in Part 139.

² Airports with scheduled passenger-carrying operations of an air carrier operating aircraft of more than 9 seats and unscheduled passenger-carrying operations of an air carrier operating aircraft for at least 31 passenger seats, must comply with Federal regulations for ARFF under Part 139.

However, in its 2014 report on the Asiana crash,³ the National Transportation Safety Board (NTSB) highlighted safety issues related to ARFF training, staffing, and FAA oversight of emergency response. As a result, we initiated this audit to assess FAA's (1) oversight and enforcement of airports' adherence to ARFF requirements, and (2) policies and guidance for implementing the ARFF program.

We conducted this audit in accordance with generally accepted Government auditing standards. Exhibit A describes our scope and methodology, and exhibit B lists the organizations we visited or contacted.

RESULTS IN BRIEF

FAA's oversight and enforcement are not sufficient to ensure airports are adhering to ARFF requirements. At the four regions we visited,⁴ FAA inspectors did not consistently review airports' compliance with ARFF regulations and policy related to vehicle readiness or certification manual⁵ requirements. For example, we did not see evidence in inspection records that inspectors were consistently testing whether at least one truck discharged fire-extinguishing agent⁶—a key requirement in FAA's policy to ensure airports can adequately fight fires on the airfield. FAA's inspector checklist does not describe the actions inspectors must take to determine compliance with ARFF regulations. As a result, it is unclear what steps inspectors are taking to oversee ARFF requirements and if their actions are adequate to ensure airports are maintaining the program or trucks in a manner that ensures safety. Also, FAA has not sufficiently investigated potentially serious violations of ARFF requirements or reported enforcement data to its own database as Agency policy requires. For example, from a random sample of 68 potentially serious discrepancies⁷ between 2010 and 2014, nearly half the cases, such as trucks that could not spray fire-extinguishing agents or firefighters not being trained, were not investigated. This occurred in part because FAA lacks guidance that clearly delineates when a violation should be investigated. Without further guidance, such determinations are left up to the discretion of the inspector, which could lead to varying interpretations of when to investigate a violation and serious issues not being investigated.

³ NTSB, "Descent Below Visual Glidepath and Impact With Seawall Asiana Airlines Flight 214 San Francisco, California, July 6, 2013," NTSB/AAR-14/01 PB2014-105984.

⁴ FAA has nine regions. A discussion of how we selected the four regions to visit is in exhibit A of this report.

⁵ Airport operators are required to develop an Airport Certification Manual (ACM) that contains a description of the operating procedures, facilities and equipment, responsibility assignments, and any other information needed by personnel operating the airport to comply with applicable law under 14 CFR Part 139.

⁶ This policy is limited only to fire-extinguishing agent other than water, such as foam or dry chemical. These agents put out fires, in part, by excluding oxygen from a fire.

⁷ In this report, we are defining these instances when an airport is not in compliance with Federal regulations as "discrepancies." For example, discrepancies can include issues related to non-compliance with regulations on ARFF training, vehicle equipment, or fire-extinguishing agents.

FAA's policies and guidance are also not sufficient to effectively implement key components of the ARFF program because FAA lacks policies in these areas or the policies are not robust enough to make them effective. For example, FAA lacks policies for reviewing ARFF vehicle maintenance records. Such reviews could be used to determine whether airports are meeting Federal requirements for vehicle readiness.⁸ At one airport, we identified multiple and prolonged potentially unsafe vehicle conditions, described as "dangerous" in maintenance records, which could impact the airport's ability to meet Federal ARFF requirements. Also, FAA issued guidance to airports that conflicted with FAA regulations. Specifically, the guidance contained an ARFF vehicle discharge rate for fire-extinguishing agent that was lower than the rate required in FAA regulations. As a result, one airport purchased an ARFF truck that met FAA guidance, but did not meet regulations, potentially limiting the vehicle's effectiveness at fighting fires. Further, Federal regulations require that airports' ARFF personnel receive initial and recurrent training in 11 subject areas,⁹ such as firefighting operations and emergency aircraft evacuation assistance. However, since FAA's respective training policies and guidance are voluntary, they do not establish required standards for the content, length, and methods of teaching the subject areas. As a result, FAA may not be able to ensure firefighters are effectively trained in the skills they need.

We are making recommendations to improve FAA's oversight and enforcement of ARFF requirements and implementation of ARFF policies.

FAA OVERSIGHT AND ENFORCEMENT ARE NOT SUFFICIENT TO ENSURE AIRPORTS FULLY ADHERE TO ARFF REQUIREMENTS

FAA has not ensured that airports are adhering to ARFF requirements.¹⁰ FAA inspectors at the four regions we visited did not consistently review compliance with ARFF regulations related to an airport's ARFF vehicle readiness and certification manuals as described in FAA policy. This is due in part to FAA's lack of robust requirements in its inspector checklist on how inspectors should review airports' compliance with ARFF regulations. Also, FAA has not always investigated and followed up on serious ARFF discrepancies or reported on ARFF enforcement data as required.

⁸ Federal regulations (14 CFR 139.319(g)(1)) require airports to maintain ARFF vehicles to be operationally capable of performing required functions such as discharging fire-extinguishing agents.

⁹ Under Federal regulations, 14 CFR 139.319(i)(2), ARFF personnel are required to be trained every 12 consecutive months in 11 areas such as: application of fire-extinguishing agents, emergency aircraft evacuation assistance, airport and aircraft familiarization, and firefighting operations. See exhibit C for list of all 11 subjects.

¹⁰ A list of ARFF-related regulations and requirements is contained in exhibit E.

FAA Inspectors Do Not Consistently Review Airports' Compliance With ARFF Requirements

FAA inspectors do not consistently review compliance with all ARFF requirements or follow the methodologies in the Agency's ARFF policies. As a result, we identified weaknesses and discrepancies at the four regions we visited with FAA's oversight of ARFF requirements. For example:

- **Vehicle Readiness.** We did not see evidence in our review of inspection records that inspectors were testing whether trucks discharged foam or dry chemical consistently. Federal regulations require that airports' ARFF vehicles must be capable of performing required mission functions, including discharging fire-extinguishing agents. Specifically, under FAA policy, inspectors must witness a demonstration of the discharge of fire-extinguishing agents (other than water) for at least one required response vehicle. Without recording evidence of those tests, it is unclear if inspectors are consistently checking vehicles and which ones are tested, if any.
- **Airport Certification Manual (ACM).** FAA approved ACMs that contained inaccurate or outdated information. Airport operators are required to develop an ACM that contains a description of the operating procedures, facilities and equipment, responsibility assignments, and any other information needed by personnel operating the airport in order to comply with regulations. Under FAA policy, FAA inspectors review the ACM to ensure it is accurate, current, and implemented properly by those with responsibilities for the airport. However, at 4 of the 10 airports we visited, FAA had approved ACMs with outdated or inaccurate vehicle information.

FAA Lacks Robust Requirements on How To Review ARFF Regulations

FAA's oversight weaknesses are due in part to insufficient guidance and tools for its inspectors. Specifically, FAA uses an Airport Certification/Safety Inspection Checklist to document findings during the inspection process, including 16 ARFF operational and 11 Airport Emergency Plan (AEP)¹¹ requirements (see exhibit D). However, the checklist is not robust enough to ensure airports comply with ARFF regulations because the steps are written too broadly to help inspectors fully assess critical details regarding ARFF airport conditions. Further, inspectors are not required to document how they determined airports were or were not compliant with each ARFF regulation on the checklist, nor maintain copies of what they review. As a result, it is unclear what steps inspectors are taking to oversee ARFF

¹¹ Under 14 CFR 139.325, airports must develop and maintain an airport emergency plan designed to minimize the possibility and extent of personal injury and property damage on the airport in an emergency.

requirements and if their actions are adequate to ensure airports are adhering to ARFF requirements.

For example, inspectors are required to determine whether the airport has met vehicle readiness requirements. However, the checklist does not require inspectors to describe what actions they took to determine whether vehicle readiness requirements were met. For instance, the checklist does not require that inspectors document the number of trucks or critical parts of the trucks inspected or how the vehicle should be evaluated, such as through physical observation, testing, or documentation gathered.

In another example, FAA's checklist requires inspectors to determine whether a full-scale emergency exercise¹² has been conducted within 36 consecutive calendar months, but does not describe what actions the inspector must take to determine that the airport has met that requirement.¹³ Recognizing that additional guidance was needed, one region we visited developed an additional checklist to identify and document steps for reviewing the exercise. In its inspection file, the region included a checklist and documentation of: the last date of the triennial emergency exercise, summary of the emergency exercise findings to ensure the exercise was executed according to FAA's policy and in a timely manner, and the list of attendees to ensure all required personnel and agencies were present. However, FAA has not adopted this best practice of an additional checklist at the other regions we visited.

FAA Has Not Sufficiently Investigated Potentially Serious ARFF Discrepancies

FAA's investigations of ARFF discrepancies have been limited. From 2010 to 2014, FAA issued over 900 administrative enforcement actions¹⁴ for ARFF and AEP discrepancies, yet only issued 73 Letters of investigation (LOI). However, FAA policy¹⁵ states that in most cases, inspectors should issue an LOI to an airport when there is a possible violation of Federal regulations. An LOI serves the dual purpose of notifying the airport certificate holder is under investigation for a possible violation and providing an opportunity for the airport to present its case.

¹² Airports are required to have a simulated emergency exercise, as it would in an actual aircraft disaster, to ensure that all personnel, including ARFF, are familiar with assignments and are properly trained.

¹³ FAA's Part 139 regulation limits this requirement to Class I airports. Class I airports are certificated to serve scheduled operations of large air carrier aircraft and can also serve unscheduled passenger operations of large air carrier aircraft and/or scheduled operation of small air carrier aircraft.

¹⁴ Administrative actions are enforcement actions that do not include punitive actions, such as civil penalties and certificate actions. Administrative actions are (1) Warning notices that state the violation has been corrected and does not warrant legal enforcement action and (2) Letters of correction (LOC) which confirm an agreement with the airport owner and FAA that a corrective action will be taken within a reasonable time.

¹⁵ FAA Order 2150.3B: FAA Compliance and Enforcement Program.

While some of these discrepancies appear to be minor issues, many were potentially serious issues that warranted further investigation. For example, in a random sample of 68 ARFF and AEP administrative actions, nearly half of them appeared to be serious and FAA could have issued an LOI. Some of these cases involved trucks that could not spray fire-extinguishing foam or dry chemical, firefighters that had not been trained within 12 consecutive calendar months, and ARFF personnel lacking required knowledge and skills.

FAA policy states LOIs should be issued in most cases of possible violations; however, FAA guidance does not specify the types of violations that would be considered serious enough for an LOI to be issued. One FAA attorney stated that potentially serious ARFF violations should be investigated to confirm the facts, determine if the airport had measures to prevent or mitigate such violations, determine if additional violations may exist, and identify the appropriate enforcement action to be taken. However, without clear guidance, such determinations are left up to the discretion of the inspector, which has led to varying or inconsistent interpretations of when to issue an LOI and serious issues not being investigated.

For example, there were varying—and lengthy—periods of time when an LOI was issued after inspectors identified a discrepancy. While FAA has not defined the amount of time it should take to issue an LOI in its compliance and enforcement program policy, delaying the issuance of an LOI could impede FAA's ability to promptly identify violations and ensure swift compliance with ARFF safety regulation. For example, at two airports inspectors issued an LOI almost 2 months after identifying a potentially serious discrepancy. At one of these airports, ARFF personnel failed to meet the required response time¹⁶ during an inspection because they did not demonstrate they could effectively discharge firefighting agent. In contrast, at another airport, FAA issued an LOI the same day of an inspection when the airport did not meet the required response time during an ARFF drill.

Furthermore, FAA does not always follow up on serious ARFF discrepancies when they are initially identified and investigated to ensure that the violations do not recur. To illustrate, in 2013, under a settlement agreement with FAA, the Port Authority of New York and New Jersey (PANYNJ) agreed to pay a \$3.5 million fine due to ARFF violations at 4 New York area airports owned and operated by PANYNJ. For example, at one of the four PANYNJ airports, FAA found that 222 ARFF personnel had gaps in training and there were over 18,000 occurrences of ARFF personnel serving a shift while untrained. However, FAA also identified training gaps at the same airport in 2004, including 68 firefighters failing to

¹⁶ Airports are required to demonstrate they can respond to a simulated emergency during an ARFF drill within 3 minutes.

complete required live fire training.¹⁷ The reason FAA does not always follow up on serious discrepancies may be in part that FAA does not mark ARFF discrepancies as “serious” in its inspection database.

FAA Does Not Report on ARFF Enforcement Data as Required

FAA is also not reporting its ARFF enforcement data to a centralized database, the Enforcement Information System (EIS), as required. In 2011, a Presidential Memorandum directed Federal agencies to develop plans to make data related to enforcement and compliance activities publicly accessible, downloadable, and searchable.¹⁸ FAA has begun making plans in accordance with the Memorandum. Specifically, FAA has made some enforcement data publicly available such as data on civil penalties assessed to air carriers, commercial operators, or repair stations for maintenance, drug testing, hazardous materials, or flight operations violations. However, according to FAA’s Office of Chief Counsel and those who manage the database, FAA’s Office of Airports is not reporting its administrative enforcement actions, including those on ARFF, to FAA’s enforcement database as required under FAA policy.

According to Office of Airports officials, FAA does not enter all enforcement data into EIS because inspectors use another program to record inspection results that is not linked to EIS. These FAA officials stated that the Agency plans to connect the program to EIS and implement EIS in the next few years. They also stated that if FAA enters information into EIS prior to linking the program to EIS, it would be a waste of resources.

However, per FAA policy, all FAA offices are required to report all administrative and legal enforcement actions to the EIS database. Since 2000, the Office of Airports has not reported any administrative actions to the database. This lack of reporting also hinders FAA’s ability to evaluate its enforcement efforts—an issue that the Government Accountability Office has also highlighted in past reports.¹⁹

¹⁷ Federal regulations state all rescue and firefighting personnel must participate in at least one live-fire drill prior to initial performance of rescue and firefighting duties and every 12 consecutive months thereafter.

¹⁸ Presidential Document - Memorandum of January 18, 2011: *Regulatory Compliance*, published in Federal Register, Vol. 76, No. 14, January 21, 2011.

¹⁹ U.S. General Accounting Office: “Aviation Safety: Better Management Controls are Needed to Improve FAA’s Safety Enforcement and Compliance Efforts,” GAO-04-646, July 2004; “Aviation Safety: FAA’s Safety Oversight System is Effective But Could Benefit from Better Evaluation of Its Programs’ Performance,” GAO-06-266T, November 2005. The reports respectively stated that: (1) “FAA is limited in its ability to evaluate enforcement efforts because the agency lacks comprehensive nationwide data” and (2) “FAA’s nationwide enforcement database is not as useful as it could be because of missing or incomplete historical information about enforcement cases.”

FAA Headquarters Did Not Follow Policies on Oversight of Regional Inspectors

According to FAA policy, headquarters officials are required to conduct formal evaluations of regional inspection program activities every 3 years. However, two of the four regions we visited had their last review over 6 years ago.²⁰ The headquarters specialist assigned to the other two regions stated he has never conducted a review of the regions' inspection program activities due to budget constraints. Without conducting these evaluations on a regular basis, FAA cannot ensure that regions are providing effective oversight of the ARFF program.

FAA POLICIES AND GUIDANCE ARE NOT ADEQUATE TO ENSURE THAT AIRPORTS EFFECTIVELY IMPLEMENT ARFF TRAINING AND VEHICLE REGULATIONS

FAA's policies and guidance are not sufficient to implement the ARFF program in several key areas because FAA lacks policies in these areas or the policies are not robust, which can significantly limit their effectiveness. First, FAA lacks policies on reviewing vehicle maintenance records. Further, FAA guidance on ARFF vehicle specifications for a fire-extinguishing agent discharge rate does not meet the requirements listed in the regulations. Also, FAA does not have required standards for the content, length, and methods of ARFF training to ensure firefighters are adequately trained.

FAA Lacks Policies on Reviewing Maintenance Records To Ensure ARFF Vehicle Readiness

FAA does not require inspectors to review ARFF vehicle maintenance records, such as daily logs and routine maintenance checks. These records provide critical information that can be used to determine whether airports are meeting Federal requirements for vehicle readiness. Federal regulations state that each vehicle must be maintained to be operationally capable of performing required functions, such as radio communication and discharge of fire-extinguishing agent.

As a result of the lack of policies on reviewing maintenance records, FAA is potentially missing an opportunity to ensure that an airport's vehicle maintenance policy and practices do not expose airport users and ARFF personnel to unnecessary safety risks. To illustrate, during our site visit to Luis Munoz Marin International Airport in San Juan, Puerto Rico, we reviewed maintenance records and identified multiple potentially unsafe vehicle conditions that could impact the airport's ability to meet Federal ARFF requirements. During fiscal years 2013 and 2014, ARFF personnel recorded poor vehicle maintenance conditions repeatedly

²⁰ These regions provided us copies of their last reviews in 2009.

for weeks, and in some cases months at the airport, before repairs were completed. For example:

- Maintenance records for the vehicle equipped with a piercing nozzle indicated that the nozzle—which allows ARFF personnel to discharge firefighting agent into an aircraft without entering it—and the camera—which provides night vision capability—did not operate properly. At the time of our site visit in March 2015, repairs for the piercing nozzle and camera were not complete even though these issues were identified as far back as January 2014.
- In another example, checklists completed by the vehicle manufacturer²¹ in December 2014 indicated firefighting agent in two vehicles “did not flow” during its test of the system. Additionally, the manufacturer identified a leak in the foam tank of one vehicle that needed repair. If vehicles with the broken turret,²² tank, and pump were unable to spray water and/or agent at the required rate, the vehicles could be hindered in their ability to put out fires and would not have met FAA regulatory requirements.
- Additionally, ARFF personnel described one vehicle at the airport as “dangerous” to operate in the written comments of the daily checklist on three occasions over a period of 3 months (October 22, November 17, and December 22, 2014). The conditions described on the daily checklists include: (1) the bumper turret not working or opening properly to discharge agent or water, (2) the pump working slowly, and (3) heavy air and oil leaks. The daily checklists were signed by the driver, ARFF supervisor, and mechanic.

On September 30, 2015, we issued a management advisory to FAA regarding our concerns with the prolonged maintenance issues with ARFF operations that could directly impact the airport’s ability to fight fires and respond to other emergencies on runways or taxiways. FAA officials stated that they are working with the airport to address the ARFF vehicle maintenance issues in an action plan that includes establishing a preventative maintenance plan, completing an assessment and repairing ARFF vehicles, providing continuous training to mechanics on ARFF vehicles, and implementing an airport ARFF operations checklist.

FAA Guidance on ARFF Vehicle Specifications Does Not Meet Its Own Regulations

FAA’s guidance does not meet its own regulations regarding ARFF vehicle specifications. Specifically, FAA regulations require ARFF trucks with a

²¹ To address vehicle maintenance issues, the airport’s action plan states the “ARFF vehicle manufacturer will conduct assessment and repair of vehicles” and “ARFF vehicle mechanics will receive continuous training on vehicles.”

²² A turret is a device mounted on the ARFF vehicle designed to apply a large-capacity water stream, firefighting, or both.

“minimum-rated vehicle water tank capacity of at least 500 gallons” to have a turret discharge rate of at least 500 gallons per minute.²³ However, FAA’s Advisory Circular (AC)²⁴ on specifications for ARFF vehicles states a truck with a 500 gallon tank can have a slower turret discharge rate of only 60 gallons per minute. This discrepancy poses the risk that the truck may not be able to put out the minimum gallons per minute prescribed to put out a fire.

For example, according to FAA, one airport purchased a vehicle with a 200 gallon per minute discharge rate that met FAA guidance, but conflicted with the FAA regulations requirement of 500 gallons per minute. When the inspector for that airport contacted FAA Headquarters to get clarification on this issue, the inspector was advised that the airport should be “ok” as long as they meet FAA’s AC guidance. FAA officials stated that they are in the process of revising the Agency’s guidance to comply with the regulations.

FAA Does Not Have Adequate Policies To Implement ARFF Training

FAA lacks effective policies for implementing ARFF training requirements. Federal regulations require airports to train ARFF personnel in 11 subject areas every 12 consecutive months prior to conducting ARFF duties (see exhibit C). To help airports meet these regulations, FAA has developed guidance in an AC²⁵ on meeting the requirements for ARFF training. For example, under the “Firefighting Operations” subject area, the AC states airports should train ARFF personnel to, among other things: describe the standard operating procedures for various emergency scenarios and identify the procedures for securing and maintaining a rescue path. However, according to FAA, use of FAA’s AC on ARFF training is not mandatory. Therefore, FAA does not have a required standard for the content or length of training classes. As a result, FAA lacks a consistent approach for implementing training, and cannot be sure firefighters are effectively trained in the skills they need.

In addition, FAA has not established a required standard for the method of training. Although the AC highly recommends that firefighters receive hands-on training on the aircraft that regularly serve their airport, neither the regulations nor the AC specify when computer-based, classroom, or hands-on training is required for teaching the subject areas. In contrast, another Federal agency, the Federal Railroad Administration (FRA), has recognized the importance of establishing minimum required training standards for safety-related positions with hands-on training components, such as on-the-job training, simulation, and lab training.

²³ Federal regulations under 14 CFR §139.317(f)(1) state that “each vehicle with a minimum-rated vehicle water tank capacity of at least 500 gallons but less than 2000 gallons, must have a turret discharge rate of at least 500 gallons per minute, but not more than 1,000 gallons per minute.”

²⁴ AC 150/5200-10E: Guide Specification for ARFF Vehicles.

²⁵ AC 150/5210-17C: Programs for Training of ARFF Personnel.

FRA issued a final rule on minimum training standards for all safety-related railroad employees in 2014.²⁶ FRA stated that it “believes the final rule will achieve positive net benefits primarily through requiring that training programs include ‘hands-on’ training components.” Also, FRA expects that improving training primarily by requiring the inclusion and implementation of “‘hands-on’” elements where appropriate will reduce the number of railroad accidents and incidents. Similar actions taken by FAA could ensure ARFF personnel are properly trained.

FAA also lacks adequate polices on keeping and reviewing records on ARFF training. According to FAA Headquarters, airports are only required to provide FAA with names of firefighters, titles of classes, and dates of training, as a training record without any additional evidence of training, such as training certificates. However, our review of training records identified inaccurate or incomplete records of firefighter training. For example, at one airport we visited, dates listed in the firefighter training log of two ARFF personnel did not match the dates shown on training certificates and were beyond the time period when the firefighters should have been trained. Inspectors who only review training summary spreadsheets and do not review other evidence of training, such as training certificates, could miss errors in training records. Without complete and adequate records of ARFF training, FAA inspectors cannot adequately determine if personnel are properly trained to respond to fire emergencies.

In addition, some ARFF personnel did not receive training as required. Federal regulations require that airports’ ARFF personnel receive initial and recurrent training in 11 subject areas, such as firefighting operations and emergency aircraft evacuation assistance. Also, personnel must receive annual live fire training. However, we identified multiple instances where firefighters were not trained within required timeframes according to airport training records. For example, based on our review at one airport, one firefighter completed the annual live fire training 2 months after the required timeframes.

At another airport, all of the 11 training records we examined between 2013 and 2014 showed that firefighters did not complete 2 or more of the 11 segments within 12 consecutive months, and one firefighter did not meet required timeframes for 6 segments. Further, all 11 firefighters did not complete any training during 2013 for at least 1 of the 11 required segments. According to an airport official, FAA also recognized the training record gaps, but was ultimately able to confirm that the firefighters have the required training in the 11 subject areas. However, we based our analysis on the same documentation that was provided to the FAA inspector during the annual inspection, and the airport could

²⁶ “Training, Qualification, and Oversight for Safety Related Railroad Employees,” Final Rule, *Federal Register*, Vol. 79, No. 216, November 7, 2014.

not provide us with any additional evidence to confirm compliance with training requirements. Further, we did not find evidence that FAA identified these discrepancies based on our review of inspection files and enforcement actions. Unless inspectors can validate training records, FAA cannot be sure that firefighters are properly trained and the airport is in compliance with Part 139 regulations.

CONCLUSION

Although aviation accidents are rare, their potential for serious injury or fatalities require constant vigilance for airports to be prepared should an accident occur. Under the ARFF program, FAA is responsible for the oversight of airports that are required to have personnel, equipment, and procedures to respond to aircraft incidents. However, FAA needs to improve its management processes to ensure regions effectively oversee ARFF requirements, properly use enforcement actions, and effectively implement policies and guidance on ARFF vehicles and training. Until FAA takes these actions, the Agency may be missing opportunities to help ensure the safety of the flying public in the event of an accident or other fire emergency at an airport.

RECOMMENDATIONS

To improve oversight and enforcement of Aircraft Rescue and Fire Fighting requirements, we recommend that the Federal Aviation Administrator:

1. Establish minimum requirements for inspectors' review of airports' compliance with Aircraft Rescue and Fire Fighting regulations.
2. Update the inspection checklist for Airport Certification Inspections to include these requirements:
 - a. determining whether airports have conducted tests of fire-extinguishing agents;
 - b. reviewing vehicle maintenance records;
 - c. reviewing training materials; and
 - d. reviewing the type of foam airports use to ensure airports meet Federal requirements.
3. Document what items were reviewed to determine airport compliance under the Aircraft Rescue and Fire Fighting requirements in the inspection checklist for Airport Certification Inspections to include:

- a. which vehicles were reviewed to determine compliance with each regulation, such as which vehicles were inspected for their ability to discharge agent and execute the response time tests;
 - b. which personnel protective equipment were inspected; and
 - c. dates of the full scale triennial emergency exercise and annual review of the Airport Emergency Plan.
4. Provide training to inspectors on the updated inspection checklist for Airport Certification Inspections.
 5. Implement the requirement under FAA's Compliance and Enforcement Policy for FAA Headquarters to review regional inspection program activities of the Aircraft Rescue and Fire Fighting program on a 3-year cycle.
 6. Issue guidance to airport inspectors clarifying when inspectors should: (1) issue a formal Letter of Investigation and (2) investigate serious discrepancies to determine and document the cause of these discrepancies.
 7. Require FAA to periodically analyze Aircraft Rescue and Fire Fighting enforcement data nationwide to identify airports with serious Aircraft Rescue and Fire Fighting violations and verify they are corrected to prevent future discrepancies with the regulations. Document analysis and steps to ensure violations are corrected.
 8. Develop a process to ensure the Office of Airports reports its Aircraft Rescue and Fire Fighting enforcement actions to FAA's Enforcement Information System database according to FAA Order 2150.3B.
 9. Require inspectors to review airports' training materials and other documentation that shows the items taught during each of its training classes used for Aircraft Rescue and Fire Fighting personnel in each of the Aircraft Rescue and Fire Fighting areas required under 14 CFR Part 139 to ensure airports train personnel in a manner authorized by FAA.
 10. Identify and implement best practices regarding the content, length, and methods of teaching each of the 11 Aircraft Rescue and Fire Fighting subject areas.

AGENCY COMMENTS AND OFFICE OF INSPECTOR GENERAL RESPONSE

We provided FAA with our draft report on March 23, 2016, and received its formal response on April 21, 2016. FAA's response is included in its entirety as an

appendix to this report. FAA concurred with eight recommendations and partially concurred with recommendations 2 and 3. For recommendations 1, 3 through 8, and 10, FAA provided appropriate planned actions and timeframes. We consider these resolved but open pending their completion. We consider recommendation 2 resolved but open pending receipt of the additional documentation described below. We consider recommendation 9 unresolved and open and request that FAA reconsider its response, as detailed below.

Regarding the partial concurrences, FAA agreed with recommendations 2(a), 2(c), and 2(d), stating that the Agency added these items to the checklist. We request the Agency provide us the revised checklist so we can verify it meets the intent of our recommendations. FAA did not concur with recommendation 2(b) for reviewing ARFF vehicle maintenance records. FAA stated that reviewing maintenance records is outside the Agency's authority, but it believes visual inspections would meet the intent of the recommendation 2(b). As we stated in our report, maintenance records provide critical information that can be used to determine whether airports are meeting Federal requirements for vehicle readiness. We believe that reviews of maintenance records could allow FAA to determine potential safety issues with an airport's vehicles or maintenance practices. However, we accept FAA's alternative action for this recommendation pending receipt of documentation showing that the Agency conducts visual inspections.

Similarly, FAA partially concurred with recommendation 3. Specifically, FAA concurred with 3(a) and 3(c) but did not concur with recommendation 3(b) to have FAA inspectors record which firefighter protective equipment was inspected. In response, FAA stated that verifying airports have a process for firefighters to inspect protective equipment daily is more important than recording which specific equipment was inspected. We believe that requiring inspectors to record which equipment was inspected would allow FAA to verify with direct evidence that airports are conducting daily inspections. However, we accept FAA's alternative action for this recommendation.

In addition, FAA requested that we close recommendation 9. Specifically, FAA stated that it already reviews training records to ensure compliance during each annual airport inspection, and that it also reviews training programs when airports are certificated. However, 4 of the 10 airports we reviewed²⁷ were issued certificates over 10 years ago. We believe FAA should review airports' current training programs at least periodically after certification to ensure they are training firefighters in the required subject areas. Also, FAA stated it reviews training records. However, as we reported, airports are only required to provide FAA with

²⁷ We also shadowed an FAA inspector at one airport to obtain a better understanding of FAA's procedures during the annual airport inspections. We did not include this airport in our count of 10 discussed above.

names of firefighters, titles of classes, and dates of training as a training record. FAA inspectors are not required to conduct annual or periodic reviews of an airport's curriculum. Therefore, we request that FAA reconsider its response to this recommendation.

ACTIONS REQUIRED

FAA's planned actions for recommendations 1, 3–8, and 10 are responsive and we consider these recommendations resolved but open pending completion of the planned actions. We consider recommendation 2 resolved but open pending receipt of the documentation cited above. We consider recommendation 9 open and unresolved and request that the Agency reconsider its position. We request that the Agency provide us this additional information within 30 days of the date of this report in accordance with DOT Order 8000.1C.

We appreciate the courtesies and cooperation of FAA representatives during this audit. If you have any questions concerning this report, please call me at (202) 366-1249.

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cc: FAA Audit Liaison, AAE-100
DOT Audit Liaison, M-1

EXHIBIT A. SCOPE AND METHODOLOGY

We conducted this review between September 2014 and March 2016 in accordance with generally accepted Government auditing standards. Those standards require that we plan and perform the audit to obtain sufficient, appropriate evidence to provide a reasonable basis for our findings and conclusions based on our audit objectives. We believe that the evidence obtained provides a reasonable basis for our findings and conclusions based on our audit objectives.

The objectives of this audit were to assess FAA's (1) oversight and enforcement of airports' adherence to ARFF requirements, and (2) policies and guidance for implementing the ARFF program.

To address our objectives, we obtained and reviewed applicable regulations, policies, and guidance related to oversight, enforcement, and implementation of the ARFF program. More specifically, we obtained and reviewed documentation including FAA Part 139 ARFF regulations; NTSB's "Descent Below Visual Glidepath and Impact With Seawall Asiana Airlines Flight 214;" FAA Order 5280.5C: Airport Certification Program Handbook; FAA Order 2150.3B: Compliance and Enforcement Program; and FAA Advisory Circulars (ACs), including guidance for ARFF training, vehicles and equipment specifications, and National Fire Protection Association (NFPA) ARFF Standards.

To better understand ARFF requirements and FAA's oversight and enforcement responsibilities, we interviewed FAA senior executives responsible for overseeing the ARFF program, stakeholders, and Trade Associations responsible for developing ARFF standards, such as the NFPA. Finally, we interviewed airport and ARFF officials to determine how FAA's policies and guidance are implemented at the airports we visited. We also obtained and reviewed the National Transportation Safety Board's (NTSB) June 24, 2014 "Crash of Asiana Flight 214 Accident Report Summary" and interviewed responsible officials for their perspectives on the safety issues identified as they pertain to ARFF operations.

In addition, we conducted site visits to 4 of 9 FAA regions (Western-Pacific, Great Lakes, Southern, and Eastern) and 10 of 535 Part 139 airports.²⁸ We selected these regions because they represent over 60 percent of the total number of Part 139 airports and 73 percent of the total passenger boardings at commercial airports for calendar year 2013. Also, these airports were selected due to size and proximity to FAA's regional offices.

²⁸ According to FAA, as of January 2016, there were 535 Part 139 airports on FAA's Part 139 Airport Certification Status List.

For our review of FAA, we interviewed FAA inspectors to assess FAA's oversight and enforcement of airports' adherence to ARFF requirements as well as Airport officials and ARFF personnel to determine how FAA regulations, policies, and guidance are implemented. We also obtained and reviewed ARFF training and vehicle maintenance data, Airport Compliance Manuals, and airport emergency plans to determine airports' compliance with ARFF requirements. In addition, we collected and analyzed FAA inspection files for 5 years (2010–2014) to evaluate the FAA's inspection findings and assess FAA's oversight and enforcement of the ARFF program.

We reviewed training records (between 2013 and 2014) for 106 firefighters out of a universe of 952 firefighters at 10 airports we visited to determine compliance and/or discrepancies with ARFF training requirements and assess FAA's oversight of the ARFF training program. For 9 of the airports, we randomly selected training records for 95 firefighters out of a universe of 872 firefighters. At one airport, we collected 11 training records of firefighters (out of a universe of 80 firefighters) selected by the airport. We also shadowed an inspector at one airport to obtain better understanding of FAA's procedures during the annual airport inspections.

To determine if FAA is sufficiently investigating potentially serious issues, we reviewed a random sample of 68 out of over 900 ARFF and AEP administrative enforcement actions from 2010 to 2014. Examples of cases we considered serious included trucks that could not spray fire-extinguishing foam or dry chemical; firefighters that had not been trained within 12 consecutive calendar months; and ARFF personnel lacking required or comprehensive knowledge and skills.

We also conducted a physical observation of ARFF buildings, vehicles, and equipment to determine adherence to the ARFF requirements and identify any issues related to equipment, training, and staffing, and/or best practices at individual ARFF stations. We compared and evaluated physical observation, inspection record results, and enforcement action results. We spoke to firefighters on duty to determine whether FAA is effectively overseeing the ARFF program and whether FAA inspectors are using a consistent approach and conducting adequate annual airport inspections to determine compliance with all ARFF requirements.

We conducted data reliability assessment of FAA's inspection database, CCMIS, and found the data to be sufficiently reliable for audit purposes. Specifically, we interviewed knowledgeable Agency officials, conducted electronic testing of the data, and traced a sample to source documents.

Exhibit A. Scope and Methodology

EXHIBIT B. ORGANIZATIONS VISITED OR CONTACTED

FAA

Airport Safety and Standards Branch
Aviation Data Systems Branch
Office of Chief Counsel
Eastern Region Airports Division
Great Lakes Region Airports Division
Southern Region Airports Division
Western-Pacific Region Airports Division

NTSB

Office of Aviation Safety
Office of Recommendations and Communications

Trade Associations

Airlines for America
Airports Council International-North America
American Association of Airport Executives
International Association of Fire Fighters
National Fire Protection Association

Airport ARFF Facilities

Chicago Midway International Airport
Chicago O'Hare International Airport
Hartsfield-Jackson Atlanta International Airport
John F. Kennedy International Airport
La Guardia Airport
Los Angeles International Airport
Mineta San Jose International Airport
Oakland International Airport

Exhibit B. Organizations Visited or Contacted

San Juan Luis Muñoz Marín International Airport

San Francisco International Airport

Modesto City-County Airport

EXHIBIT C. REQUIRED TRAINING FOR ARFF FIREFIGHTERS

Federal regulations under 14 CFR Part 139.319 (i)(2) state that:

Each airport certificate holder [airport owner] must ensure all rescue and firefighting personnel are properly trained to perform their duties in a manner authorized by the Administrator. Such personnel must be trained prior to initial performance of rescue and firefighting duties and receive recurrent instruction every 12 consecutive calendar months. The curriculum for initial and recurrent training must include at least the following areas:

- (1) Airport familiarization, including airport signs, marking, and lighting.
- (2) Aircraft familiarization.
- (3) Rescue and firefighting personnel safety.
- (4) Emergency communications systems on the airport, including fire alarms.
- (5) Use of the fire hoses, nozzles, turrets, and other appliances required for compliance with this part.
- (6) Application of the types of extinguishing agents required for compliance with this part.
- (7) Emergency aircraft evacuation assistance.
- (8) Firefighting operations.
- (9) Adapting and using structural rescue and firefighting equipment for aircraft rescue and firefighting.
- (10) Aircraft cargo hazards, including hazardous materials/dangerous goods incidents.
- (11) Familiarization with firefighters' duties under the airport emergency plan.

In addition, 14 CFR Part 139.319 (i)(3) states that all rescue and firefighting personnel must participate in at least one live-fire drill prior to initial performance of rescue and firefighting duties and every 12 consecutive calendar months thereafter.

**EXHIBIT D. AIRPORT CERTIFICATION/SAFETY INSPECTION
CHECKLIST REGARDING ARFF AND AEP REQUIREMENTS
(FORM 5280-4)**

ARFF OPERATIONS	S	U	N/A
1. ARFF Capability Meeting Index Provided During ACR OPNS (319a)			
2. ARFF Requirements Met for Increase in Index (319b)			
3. Reduction in ARFF Index Meets Conditions (319d)			
4. Vehicle Communications in Required Vehicles (319e)			
5. Vehicle Marking & Lighting (319f)			
6. Vehicle Readiness (319g)			
7. Response Drill (No. Vehicles _____) (319h)			
8. Personnel Properly Equipped (319i1)			
9. Personnel Properly Trained (319i2)			
10. Live-Fire Drill Every 12 Consecutive Calendar Months for all Personnel (319i3)			
11. Personnel Trained and Current in Basic Emergency Medical Care Provided for ACR OPNS (319i4)			
12. Record of Training for 24 CCM (319i5)			
13. Sufficient Personnel to Meet Requirements (319i6)			
14. Alerting Procedures/Equipment Established (319i7)			
15. Hazardous Materials Guidance Available (319j)			
16. Emergency Access Roads Maintained (319j)			
AIRPORT EMERGENCY PLAN	S	U	N/A
1. Develop/Maintain Plan/Procedures for Prompt Response/Sufficient Detail (325a)			
2. Response Instructions Aircraft, Bomb, Structure, Fuel, Natural, Hazardous Materials, Sabotage/Hijack, Power, Water (325b)			
3. Must Address Medical, Transportation, Hospital, Ambulance, Inventory, Injured, Crowds, Disabled Aircraft (325c)			
4. Provide for Marshaling, Emergency Alarm, Coordination of ATCT Functions (325d)			
5. Contains Procedures for Notifying Agencies of Accident Location & Other Information (325e)			
6. Contains Provisions for Water Rescue to the extent practical (325f)			
7. Coordinate & Develop Plan with Participating Agencies/Personnel (325g1, 2.)			
8. Airport Personnel are Properly Trained (325g3)			
9. Review Plan every 12 CCM (325g4)			
10. Full-Scale Exercise every 36 CCM for Class I Airports (325h)			
11. Consistent with the Approved Security Program (325i)			

Source: FAA Order 5280.5C: Airport Certification Program Handbook.
Key: S= Satisfactory; U=Unsatisfactory; N/A=Not applicable

EXHIBIT E. ARFF-RELATED REGULATIONS AND POLICY DOCUMENTS

Category	Regulation/Policy	Description
Airport Rescue and Fire Fighting	14 CFR Part 139, Subpart D	Airport operators must provide aircraft rescue and firefighting (ARFF) personnel, facilities, and equipment.
Airport Certification	FAA Order 5280.5C: Airport Certification Program Handbook	This Order provides FAA personnel with the policies, standards, and procedures in enforcing Title 14 CFR, Part 139, Certification of Airports, including ARFF regulations.
	14 CFR Part 139.201 and 139.203	Airport operators are required to develop an Airport Certification Manual that contains a description of the operating procedures, facilities and equipment, responsibility assignments, and any other information needed by personnel operating the airport to comply with applicable law under 14 CFR Part 139.
Airport Emergency Plan	14 CFR Part 139.325	Airports are required to develop airport emergency plans that include procedures for prompt response to emergencies including a communications network.
Compliance and Enforcement	FAA Order 2150.3B: FAA Compliance and Enforcement Program	This order articulates FAA's philosophy for using various remedies, including corrective action, administrative action, and legal enforcement action, to address noncompliance with statutory and regulatory requirements enforced by FAA.
Emergency Exercise	14 CFR Part 139.325(h)	Airports are required to have a simulated emergency exercise, as it would in an actual aircraft disaster, to ensure that all personnel, including ARFF, are familiar with assignments and are properly trained.
Training	14 CFR 139.319(i)(2)	ARFF personnel are required to be trained every 12 consecutive months in 11 areas such as: application of fire-extinguishing agents, emergency aircraft evacuation assistance, airport and aircraft familiarization, and firefighting operations. (See exhibit C for list of all 11 subjects)
	FAA AC 150/5210-17C: Programs for Training of ARFF Personnel	The AC contains standards to help an airport's ARFF training program.
Vehicle Readiness	14 CFR 139.319(g)(1)	Airports are required to maintain ARFF vehicles to be operationally capable of performing required functions such as discharging fire-extinguishing agents.
	FAA AC 150/5220-10E: Guide Specifications for ARFF Vehicles	The AC provides an interactive specification that airports can use in procuring ARFF vehicles.

Source: OIG review of 14 CFR Part 139 and FAA policy documents

EXHIBIT F. MAJOR CONTRIBUTORS TO THIS REPORT

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Federal Aviation Administration

Memorandum

Date: April 21, 2016

To: Charles Ward, Assistant Inspector General for Aviation Audits

From: H. Clayton Foushee, Director, Office of Audit and Evaluation, AAE-1 

Subject: Federal Aviation Administration's (FAA) Response to the Office of Inspector General (OIG) Draft report: FAA's Oversight of the Aircraft Rescue and Fire-Fighting (ARFF) Program

The FAA agrees that maintaining and improving upon an already excellent U.S. airport safety record depends upon strong oversight and fully-qualified Aircraft Rescue and Fire-Fighting (ARFF) personnel. As evidence of the FAA's commitment to strong oversight of the ARFF program, we recently proposed a \$917,000 civil penalty against the Puerto Rico Ports Authority for aircraft rescue and firefighting violations at three of its commercial airports. Within the last year, we have taken numerous steps to improve and strengthen the ARFF program to include the following:

- Published an updated Advisory Circular (AC 150/5210-17C), "Programs for Training of Aircraft Rescue and Firefighting Personnel," on June 12, 2015, which provides information on courses and materials for training ARFF.
- Conducted Airport Certification Safety Inspector recurrent training in July 2015. This training included hands-on demonstrations of best practices for ARFF inspection procedures; new FAA Compliance and Enforcement Philosophy; specific Airport Improvement Program guidance; policy clarification to regional queries on ARFF procedures; and pending changes to Surface Movement Guidance Control System policy.
- Published an updated - Programs for Training of Aircraft Rescue and Firefighting Personnel on June 12, 2015, which provides information on courses and materials for training ARFF.

- Developed an enhanced ARFF inspection checklist in August 2015 that we will incorporate into the revised Airport Certification Program Order. Inspectors received training on the revised checklist in September 2015.
- Updated FAA Order 5280.5, Airport Certification Program Handbook, scheduled for issuance by September 30, 2016. This Inspector's handbook documents best practices for inspections and regulatory guidance.
- Modernized the Enforcement Information System (EIS), from a mainframe application to a web-based application. The updated EIS is scheduled to be deployed on September 30, 2016. At that time, the Certification and Compliance Management Information System will interface with EIS.

The FAA concurs with recommendations 1, 4, 5, 6, 7, 8, and 10 as written. We will complete Recommendations 1, 4, 5, and 8 by December 31, 2016; Recommendation 6 by September 30, 2016; and Recommendations 7 and 10 by July 31, 2016.

We concur with recommendation 9 and request closure. The FAA reviews training when airports are certificated and we also review training records to ensure compliance during each annual airport inspection. Since the FAA reviews and approves airport training programs, we believe we can and do ensure standards for adequately trained ARFF personnel, which are consistent with the general regulatory requirement and appropriate for the particular circumstances of each airport, without a more prescriptive regulatory requirement.

The FAA concurs, in part, with Recommendation 2. We agree with determining whether airports have conducted tests of fire-extinguishing agents where allowed (Recommendation 2a); reviewing training materials (Recommendation 2c); and reviewing the type of foam airports use to ensure airports meet Federal requirements (Recommendation 2d). FAA added these items to the checklist in August, 2015 and provided training in September, 2015. Since we have completed the requested actions, we request that the OIG close Recommendation 2 a, c and d. We do not concur with Recommendation 2b, which requires FAA inspectors to review vehicle maintenance records during the inspection on the basis that this is outside of FAA's authority. However, FAA inspectors conduct visual inspections of vehicles to determine whether an airport meets vehicle readiness requirements. Because this satisfies the intent of Recommendation 2b, we request that the OIG remove this recommendation from the Final Report.

We concur, in part, with Recommendation 3. Specifically, we concur with Recommendations 3a and 3c, as written and will add these requirements to the revised checklist by December 31, 2016. However, we do not concur with Recommendation 3b to identify specific personal protective equipment (PPE) that was inspected. The Airport Certification Safety Inspector may inspect only a small number of firefighters' equipment. In FAA's view, because FAA inspects only once a year, it is more important to verify that the airport has a daily inspection process in place that the firefighters conduct themselves.

Appendix. Agency Comments

We appreciate this opportunity to offer additional perspective on the OIG draft report. Please contact H. Clayton Foushee at (202) 267-9000 if you have any questions or require additional information about these comments.