



Memorandum

U.S. Department of
Transportation

Office of the Secretary
of Transportation
Office of Inspector General

Subject: **ACTION:** Management Advisory – Actions
Needed To Address Insufficient Maintenance of
Potentially Unsafe Aircraft Rescue and Fire
Fighting Vehicles at Luis Munoz Marin
International Airport, San Juan, Puerto Rico
Federal Aviation Administration

Date: September 30, 2015

From: Matthew E. Hampton
Assistant Inspector General
for Aviation Audits

Reply to
Attn. of: JA-10

To: Federal Aviation Administrator

The Office of Inspector General has an audit underway to assess the Federal Aviation Administration's (FAA) oversight of Aircraft Rescue and Fire Fighting (ARFF) requirements. Under Federal law, an airport operator¹ must meet FAA's operational and safety standards, which include providing aircraft rescue and firefighting personnel, facilities, and equipment. Our audit objectives are to evaluate the effectiveness of FAA's (1) oversight and enforcement of airports' adherence to ARFF requirements and (2) policies and guidance for implementing ARFF requirements.

While our review is ongoing, we are providing this advisory to inform you of concerns we have identified with the ARFF operations at Luis Munoz Marin International Airport in San Juan, Puerto Rico.² Specifically, we identified prolonged maintenance issues with ARFF operations that could directly impact the airport's ability to fight fires and respond to other emergencies on runways and taxiways. These issues include broken bumper and roof devices that are required to spray water and firefighting agents (turrets);³ pump systems that flow slowly or do not work properly; leaking nozzles, including the nozzle that can pierce an aircraft to put out internal fires; and vehicle lights that do not work properly. In fact, ARFF personnel described one vehicle as a

¹ Airports receiving scheduled and unscheduled passenger-carrying operations of an air carrier operating aircraft designed for more than 9 passenger seats and at least 31 passenger seats, respectively, must obtain an airport operating certificate (AOC) from FAA.

² In February 2013, FAA approved Aerostar Airport Holdings to serve as the private operator of the Luis Munoz International Airport (SJU) in San Juan, Puerto Rico, which was previously governed under the Puerto Rico Ports Authority (PRPA).

³ A turret is a device mounted on the ARFF vehicle designed to apply a large-capacity water stream, firefighting agent, or both

“danger” to operate in the written comments of the daily maintenance checklist on three separate occasions.

Under Federal regulations, airports must maintain an ARFF vehicle and its systems so as to be operationally capable of performing required functions. For example, Federal regulations require ARFF vehicles to spray water and fire-extinguishing agent at a specified discharge rate.⁴ We are concerned that vehicles with the prolonged maintenance issues we observed may not have met FAA regulatory requirements and could jeopardize the airport’s ability to accomplish its ARFF mission. Specifically, trucks with broken or damaged turrets or pumps may not be able to spray water or agent at the required rate, if at all, which could hinder their ability to put out fires in an emergency.

Federal regulations require the airport to:

- Operate three ARFF vehicles with water and/or fire-extinguishing agent (14 CFR § 139.317(d));
- Maintain vehicles and their systems so as to be operationally capable of performing required functions, such as application of fire-extinguishing-agent (14 CFR § 139.319(g)(1)); and
- Equip ARFF vehicles with radio communications to provide contact with other required emergency vehicles, the air traffic control tower, and fire stations (14 CFR §139.319(e)).

During our site visit to the Luis Munoz Marin International Airport in San Juan, we identified multiple potentially unsafe vehicle conditions that could impact the airport’s ability to meet Federal ARFF requirements. Specifically:

- During fiscal years 2013 and 2014, ARFF personnel recorded poor vehicle maintenance conditions repeatedly for weeks, and in some cases months, before repairs were completed. For example, maintenance records for the vehicle equipped with a piercing nozzle⁵ indicated that the nozzle and the camera⁶ 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

⁴ For example, Federal regulations under 14 CFR § 139.317(f)(2) require that “each [ARFF] vehicle with a minimum-rated vehicle water tank of at least 2000 gallons must have a turret discharge rate of at least 600 gallons per minute, but not more than 1200 gallons per minute.” Further, 14 CFR 139.317(g)(2) states the requirement for agent discharge is 16 pounds per second for “dry chemical . . . or clean agent through a turret . . .”

⁵ A piercing nozzle is mounted on the turret and allows ARFF personnel to pierce the aircraft’s fuselage and discharge agent inside the aircraft without having to enter it.

⁶ The Forward-looking Infrared Camera provides night vision capability in smoky, foggy, or dark environments by sensing thermal radiation instead of visible light.

manufacturer 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, tank, and pump were unable to spray water and/or agent at the required rate, the vehicles would not have met FAA regulatory requirements and could be hindered in their ability to put out fires in an emergency.

- Additionally, ARFF personnel described one vehicle as “dangerous” to operate in the written comments of the daily checklist on three occasions (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.
- We physically observed two vehicles with front or rear lights that did not work. In one vehicle, the agent and water level gauges inside the vehicle did not work, the suspension system needed repair, the horn did not operate properly, the radio communication was not clear, and the front windshield was cracked (this crack was noted on a daily checklist as far back as January 2, 2012). We obtained the daily vehicle checklists completed on the day of our site visit and verified that our observations were recorded by ARFF personnel earlier that morning.
- In January 2014, the airport borrowed a vehicle from another airport because two of its required vehicles were out of service. However, maintenance records and daily checklists indicated that this borrowed vehicle had maintenance issues including oil leaks, a broken roof turret, foam tank leaks, and a prime pump that did not operate properly.

Following our March 2015 visit, we informed FAA of our safety concerns and the vehicle issues we identified. According to FAA headquarters officials, requirements under 14 CFR Part 139 and FAA’s ARFF policies and procedures are primarily focused on overall vehicle functionality, rather than on specific issues such as oil leaks, broken vehicle lights, non-working horns or sirens, and broken turrets (as long as the vehicle has one working turret or the other vehicles have working turrets). FAA stated that as long as the vehicle “starts up,” is able to meet FAA regulations and requirements for responding to an emergency, and can discharge firefighting agent and water, it meets the minimum operational requirements. However, during an FAA inspection, FAA may not test all of an airport’s ARFF trucks to see if they can discharge water and other firefighting agents to meet requirements. As a result, FAA may not know whether the airport will have enough vehicles to safely and quickly respond to an emergency.

FAA officials stated that the airport operator is responsible for maintaining ARFF vehicles and its systems to be operationally capable of performing the required functions; as such, FAA does not regulate or inspect vehicle maintenance or replacement plans. However, the prolonged issues we observed in maintenance records suggest that the vehicles may not have been able to spray water and agent at a specified rate as required, and therefore may not be responsive in the event of an emergency. If the airport relied on these vehicles to meet Federal regulations, the airport may not have been in compliance with the law.

Also, ongoing and unresolved maintenance issues such as oil leaks and non-working lights, horns, or sirens could compromise safety on the runway. Airport officials stated that the prolonged nature of the maintenance issues occurred in part because it is more difficult to maintain aging ARFF equipment at this airport given its island location, where highly specialized replacement parts and supplies are more difficult to acquire. In our view, FAA is potentially missing an opportunity to ensure that the airport's vehicle maintenance policy and practices do not expose airport users and ARFF personnel to unnecessary safety risks.

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. Nevertheless, the airport has not yet provided us with evidence that it has completed a comprehensive assessment of all the vehicles⁷ or completed all repairs while the preventative maintenance plan and mechanics' training is in progress. FAA also stated it is willing to provide grant funding to assist the airport with purchasing new ARFF vehicles.

In addition, FAA officials stated that the airport is in compliance with FAA regulations and noted it has the option to use ARFF vehicles from the Puerto Rico Air National Guard (PRANG) if the airport's own vehicles are inoperable through a "mutual aid" agreement. However, there is no guarantee that these vehicles would always be available for the airport to use during an emergency, as PRANG determines the amount of equipment and personnel that will be provided after the airport requests assistance. In our discussions with National Transportation Safety Board (NTSB) officials, they cautioned on airports relying too heavily on these types of "mutual aid" arrangements.

Also, while PRANG officials stated that its vehicles are in compliance with DOD ARFF requirements as of August 2015, the vehicles have not undergone an external inspection since 2012. Further, although PRANG was involved in triennial exercises⁸ in 2010 and

⁷ The airport completed vehicle assessments for two ARFF vehicles in December 2014 and one vehicle in July 2015. As of August 19, 2015, assessments have not been completed for the remaining vehicles.

⁸ Federal regulations (14 CFR § 139.325(h)) require the airport to hold a full-scale airport emergency plan exercise at least once every 36 consecutive calendar months.

2013, the reports we reviewed on the exercises do not state whether PRANG vehicles were able to discharge foam or dry chemical agent. As a result, FAA cannot be assured that the PRANG vehicles can currently meet FAA operational requirements and effectively respond to an airport emergency.

Since our site visit, airport officials advised that they have completed repairs to their ARFF vehicles, including fixing a broken turret, repairing leaks, and installing a new camera. While the airport is reportedly making strides to complete the repairs identified in this advisory, recent discussions with airport officials indicated that two ARFF vehicles are out of service for recurrent maintenance problems (one vehicle has an inoperable turret and the other vehicle has steering problems).⁹ These reoccurring maintenance issues and the length of time it takes to complete the repairs demonstrates the need for a more comprehensive strategy to enhance the quality of maintenance repair service.

CONCLUSION

Because aircraft accidents and emergencies are unplanned events, it is imperative that airports maintain ARFF vehicles properly in the event an aircraft lands in distress or other emergencies occur. ARFF vehicles are highly specialized equipment that require regular maintenance and inspections to ensure they can perform their intended duties quickly and safely. Immediate attention is required to ensure that FAA and airport officials resolve these ARFF issues in an effective manner. At a minimum, FAA's action plan needs to be sufficiently comprehensive to resolve the operational issues outlined in this advisory and sustain operational capability until the new vehicles are purchased.

We discussed these findings with FAA's Airport Safety and Operations Division and incorporated their comments where appropriate. Our work is ongoing, and we will address the results of our site visits to other airports in greater detail in our final report. Our final report will also include an update on FAA's actions in response to this advisory as well as specific recommended action for the program.

If you have any questions concerning this management advisory, please contact me at (202) 366-0500 or Barry DeWeese, Program Director, at (415) 744-0420.

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cc: Deputy Administrator
Chief of Staff
FAA Audit Liaison, AAE-100

⁹ The vehicle with the inoperable turret went out of service on June 30, 2015 and the vehicle with the steering problem went out of service May 6, 2015. Both vehicles were still out of service as of August 2015.