AIRCRAFT RESCUE AND FIREFIGHTING

ICAO/FAA
Regional Workshop for Aerodrome Certification Safety Inspectors

November 6-8, 2012

ARFF
Tools, records, knowledge and resources

- Results of previous inspections
- ACM
- Refractometer
- Type and size of aircraft operations
- Regulatory requirements
- Operational capabilities of vehicles
- Inspection check list
PHASES OF INSPECTION

- Inspection of physical facilities
- Examination of training program
- Response test
- Inspection of live fire training facilities
REQUIREMENTS TO BE INSPECTED

- ARFF category correct
- ARFF capability meets level and ACM
- Vehicle communications
- Vehicle marking and lighting
- Vehicle readiness
- Response requirements
REQUIREMENTS TO BE INSPECTED

- ARFF personnel properly equipped
- ARFF personnel training program
- Training curriculum
- Training records
- Sufficient ARFF personnel
- Alerting system
REQUIREMENTS TO BE INSPECTED

- Live fire training
- Emergency medical care training
- Alerting system
- Operational condition of vehicles
- Emergency access roads
INSPECTION OF PHYSICAL FACILITIES

- Note vehicle color, markings and beacons
- Ensure vehicles and agents meet level requirements and the ACM is current
INSPECTION OF PHYSICAL FACILITIES

- Conduct walk around inspection of vehicles and fire station with ARFF personnel
- Ask questions throughout the inspection to determine firefighter knowledge
Each ARFF vehicle must be equipped with or have available through a direct communications link

- The North American Emergency Response Guidebook, or
- Similar guidance for HAZMAT
Note overall condition of the ARFF vehicles
A clean vehicle generally indicates a well-maintained vehicle
Note if firefighters know what equipment is located in truck compartments before they are opened.
INSPECTION OF PHYSICAL FACILITIES

- Note what equipment is carried on the ARFF vehicles
- Training records should include training on the equipment
INSPECTION OF PHYSICAL FACILITIES

- Inspect equipment for signs of use from practical training
Have personnel demonstrate or explain equipment operation to help determine the adequacy of the ARFF training program.
INSPECTION OF PHYSICAL FACILITIES

- Check the condition of tires - worn tires provide poor traction in muddy off-pavement conditions
Check nitrogen tank gauges to ensure they are not discharged or below minimum pressure.
INSPECTION OF PHYSICAL FACILITIES

- Check fire extinguishers to make sure they are not discharged and are suitable for ARFF use

- ABC rated multi-purpose dry chemical extinguishers should not be on ARFF vehicles

- They are highly corrosive to aircraft and can cause extensive damage to aircraft engines
Check vehicle radio communications
Some vehicles may be equipped with FLIR
FORWARD LOOKING INFARED (FLIR)
FORWARD LOOKING INFARED (FLIR)

New flat screen type monitor mounted on dash in front of driver for better visibility while driving
Which firefighter is properly equipped with protective clothing to perform their duties?
The Aluminized Fyrepel Model 700 suit on the left is an industrial type suit and is not designed for firefighting.

They can provide additional protection for firefighters if equipped with aluminized neck shroud and 6” face shield.
Aluminized clothing provides the best protection.

An aluminized outer shell can reflect 90% of the radiant heat from a large fuel fire.
Acceptable hand protection includes a proximity protective glove meeting NFPA 1976 latest edition
Note the condition and adequacy of protective clothing
It is customary in the fire service for each firefighter to have their own set of protective clothing.
Some airport fire departments have both bunker gear and aluminized bunker gear
INSPECTION OF PHYSICAL FACILITIES

- Check SCBA to ensure tanks are fully charged and meet current standards
- SCBA should have positive pressure regulators rather than the old demand type
INSPECTION OF PHYSICAL FACILITIES

- Check reserve foam for proper extinguishing agents
- Twice the capacity of agent tanks in the required ARFF vehicles is recommended in reserve at the airport
Some airports have their reserve foam on a trailer for use at an accident scene.
INSPECTION OF PHYSICAL FACILITIES

- If ARFF vehicles are set for 3% on their proportioners, only 3% foam concentrate should be in reserve storage.
INSPECTION OF PHYSICAL FACILITIES

- AFFF meeting Military Specification MIL-F-0024385E is mandatory
U.L. 162 and U.L. M375 are acceptable until present supplies are depleted
Check reserve dry chemical to make sure only one type of dry chemical is available – some DC are not compatible
Check nitrogen tanks

Extra nitrogen tanks should be available for each ARFF vehicle with dry chemical, Halon 1211 or Halotron 1

Tanks should be chained to the wall to secure them
INSPECTION OF PHYSICAL FACILITIES

- Inspect other equipment in the fire station such as compressors for refilling SCBA tanks
Review alerting procedures and examine alerting system
INSPECTION OF PHYSICAL FACILITIES

- From the ACM, discussions and observations, determine if sufficient ARFF personnel are available to meet level of protection requirements, and other supplemental duties do not impact compliance to ARFF requirements.
Discuss the ARFF training program with the training officer
EVALUATE ARFF TRAINING

- Review the curriculum, training schedule and training records
EVALUATE ARFF TRAINING

- Acceptable training curriculums in AC 150/5210-17, Programs for Training of ARFF Personnel
- NFPA 1003, Airport Fire Fighter Professional Qualifications
- Annex 14 Aircraft Rescue and Fire Fighting Training guide
- Locally developed ARFF training program addressing the 12 required subject areas
- Some curriculums are available on the web
EVALUATE ARFF TRAINING

- Discuss emergency medical training and live fire training
- Review records and check for currency – may have different expiration dates
- Conduct a question and answer session with the ARRF personnel to compare their required knowledge levels to the knowledge and training requirements of the curriculum and training program
EVALUATE ARFF TRAINING

- Require practical demonstration of use of equipment such as the perishing nozzle, turrets, hand lines, rescue tools
- All ARFF personnel must have participated in and acceptable live fire drill
CONDUCT TIMED RESPONSE TEST

- Brief firefighters to discharge foam into the grass rather than on the pavement or signs.
CONDUCT TIMED RESPONSE TEST

- Prior coordination with ATCT needed
- Prior coordination with local emergency dispatch may be needed so only airport vehicles respond
- Safety should be stressed with firefighters prior to response drill (Times not released)
- Prior coordination needed concerning use of foam - firefighting systems may be checked later at discretion of ACSI
Many ACSIs conduct the response test from the ATCT
Other ACSIs prefer to ride along on the response
CONDUCT TIMED RESPONSE TEST

- Personnel pulling a hand line during a response test are expected to be wearing proper protective clothing.
Response test conducted from ATCT:
• More effective coordination with AT controllers
• Better visibility of response route
• More accurate timed response from initiation of alarm

Response test conducted from airfield:
• Ensure that firefighters are in normal station posture for response test
• Evaluate driver’s performance
• Evaluate vehicle performance
• Verify operation of foam system if tested during response
• Better feel for problems during response test
Any point of the farthest runway could be a mile or more from the tower, making it difficult to see the nature of any problems during the response.
CONDUCT TIMED RESPONSE TEST

- Response times are checked
- Remember that required response times are based on a direct path on dry pavement under good weather conditions
- If required times not met, may consider a re-test
CONDUCT TIMED RESPONSE TEST

- Inspection must not be concluded until
  - A successful ARFF response is conducted, or
  - An operational procedure is in place and tested to enable a successful ARFF response
CONDUCT TIMED RESPONSE TEST

- Alarm system and communications adequate
- ARFF personnel
  - Are properly cloth and equipped
  - Follow appropriate procedures
  - Are proficient in operating equipment
- ARFF vehicles operational
ACSI needs to inspect the adequacy of the alarm system when ARFF personnel are involved in other duties such as law enforcement, maintenance, inspections, etc.
ALARM SYSTEM
If the ACSI wants to evaluate use of SCBA, request donning SCBA and using hand line after turret discharge.
Storing SCBA in trunks is not practical for rapid donning
Better ways of doing things can be emphasized during the response drill and written recommendations can be made to improve ARFF operations.
● Foam can be evaluated during the response test or during an operational test of equipment after the response test.
A problem with the foam system in the truck on the left came to light during the response test.
A test of firefighting systems may be better conducted off the movement area in the event that a system fails to operate.
A test should be conducted by airport staff or ACSI if foam does not appear to be proportioned correctly.
Procedures for conducting a refractometer test are included in Order 5280.5 Appendix 24
If the airport is conducting live-fire training on or near the airport, the ACSI should inspect the facilities
SECTION 139.319(k)

- Ensure that roads designated as emergency access are maintained to support vehicles during all weather conditions.
COMMON ARFF PROBLEMS

- Inadequate training curriculum
- ARFF personnel not properly trained
- All ARFF personnel did not participate in live fire drill in past 12 months
- ARFF vehicle foam or DC systems not operable
- Failed response test
COMMON ARFF PROBLEMS

- Incomplete or missing training records
- Training not completed within the 12 month requirement
- Poor maintenance procedures for the vehicles
- Poorly organized training program
The airport foam storage area is on the EPA’s top 100 Superfund cleanup sites
During the response test, a firefighter discharges agent into the wind
TOP 10 INDICATORS OF ARFF PROBLEMS

7 10 year old rescue equipment is still covered in protective wrapping
During a foam system check, foam discharges out the wheel well rather than the turret.
TOP 10 INDICATORS OF ARFF PROBLEMS

5 Helmets are still wrapped in protective plastic bags
# TOP 10 INDICATORS OF ARFF PROBLEMS

This letter is to certify that I have had Aircraft Rescue and Firefighting Training in the following areas, prior to January 1, 1991:

1. Airport Familiarization
2. Aircraft Familiarization
3. Firefighter Safety and Protective Clothing
4. Airport Emergency Alarm and Communications
5. 1975 Ford Quick Response Vehicle Operation and Familiarization
6. 1984 International ARFF Vehicle Operation and Familiarization
7. Application of Extinguishing Agents
8. Emergency Aircraft Evacuation Assistance
9. Types of Aircraft Incidents
10. Anticipated Emergencies & Standby Positions
11. Hot Brakes & Wheel Fires
12. Firefighting Operations
13. Post Incident Operations
14. NTSB & Aircraft Accident Investigation
15. Hazardous Aircraft Cargo
16. Emergency Plan Familiarization
17. Rescue Equipment Familiarization

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Signature                    Date

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4 Yearly ARFF training records consist of one page
TOP 10 INDICATORS OF ARFF PROBLEMS

3 Nozzles and appliances still have shipping tags on them
TOP 10 INDICATORS OF ARFF PROBLEMS

2. The ARFF vehicle has a plow mounted on the front.
TOP 10 INDICATORS OF ARFF PROBLEMS

1. The ARFF vehicle must be carefully maneuvered around an ice machine that firefighters scrounged up when the airport restaurant closed.