

# ACRP REPORTS ARGUMENTS

Adopting NFPA 403



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# **COALITION LETTER IN OPPOSITION TO CHANGES IN ARFF STANDARDS**

**MAY 5, 2010**

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President  
Airports Council International-North America**

**James C. May  
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**Roger Cohen**  
**President**  
**Regional Airline Association**

**R. Bruce Josten**  
**Executive Vice President, Government Affairs**  
**U.S. Chamber of Commerce**

## Coalition Letter in Opposition to Changes in ARFF Standards

- H.R. 1586, as adopted by the House, contains a provision that could force airports of all sizes to comply with controversial National Fire Protection Association (NFPA) requirements.
- To meet NFPA standards, airports of all sizes would be required to dramatically increase the number of fire fighters and add additional facilities without any evidence that these changes would improve the safety of airports.

- A June 2009 study by the Airport Cooperative Research Program (ACRP) run by the National Academies of Sciences found that the capital costs to comply with the NFPA requirements is estimated to be an additional \$2.9 billion industry wide.
- The ACRP study also concluded that annual operating and maintenance costs would increase by \$1 billion to \$1.5 billion for airports throughout our system.

Updates to the FAA ARFF standards have been evaluated by the Aviation Rulemaking Advisory Committee (ARAC), which allowed all interested stakeholders, including airlines, pilot organizations, airports, the FAA and fire fighters to participate. Last year, the ARAC agreed to formally submit its report to the FAA. The FAA has the information put forth by both the ARAC and the ACRP study so it can determine what, if any, changes are needed to the ARFF standards. There is, therefore, no need for Congress to take action on this issue.

Please reject any efforts to include any language in the final version of the FAA Reauthorization bill that would either legislate changes to the current ARFF standards or legislate that an unfair rulemaking process be undertaken to make changes in the standards. Instead, we urge you to let the FAA to continue to work with aviation stakeholders through the ARAC process and allow them to complete their review of the findings of the ACRP report data.

<http://www.airlines.org/Pages/Coalition-Letter-in-Opposition-to-Changes-in-ARFF-Standards.aspx>

a. The Aviation Rulemaking Advisory Committee consists of approximately 66 member organizations selected by the FAA as most representative of the various viewpoints of those impacted by FAA regulations. The organizations provide a membership fairly balanced in terms of points of view of those represented and the functions to be performed by the committee. These organizations are:

- |  |  |
|--|--|
| 1. AECMA   | 33. Flight Dispatchers, Meteorologists, & Operations Specialists Union     |
| 2. Aeronautical Repair Station Association           | 34. General Aviation Manufacturers Association                             |
| 3. Aerospace Industries Association of America, Inc. | 35. Helicopter Association International                                   |
| 4. Aerospace Industries Association of Canada        | 36. Independent Pilots Association   |
| 5. Aerospace Medical Association                     | 37. International Airline Passengers Association                           |
| 6. Air Line Pilots Association                       | 38. International Association of Fire Chiefs                               |
| 7. Air Traffic Control Association                   | 39. International Association of Fire Fighters                             |
| 8. Air Transport Association of America              | 40. International Association of Machinists and Aerospace Workers          |
| 9. Airbus Industries                                 | 41. International Brotherhood of Teamsters                                 |
| 10. Aircraft Electronics Association                 | 42. International Society of Aviation Maintenance Professionals            |
| 11. Aircraft Owners and Pilots Association           | 43. Light Aircraft Manufacturers Association                               |
| 12. Aircraft Rescue and Fire Fighters                | 44. National Aeronautic Association  |
| 13. Airline Dispatchers Federation                   | 45. National Agricultural Aviation Association                             |
| 14. Airline Suppliers Association                    | 46. National Air Carrier Association, Inc.                                 |
| 15. Airport Consultants Council                      | 47. National Air Disaster Alliance Foundation                              |
| 16. Airports Council International, N.A.             | 48. National Air Transportation Association, Inc.                          |
| 17. Alaska Air Carriers Association                  | 49. National Association of Flight Instructors                             |
| 18. Allied Pilots Association                        | 50. National Association of State Aviation Officials                       |
| 19. American Association of Airport Executives       | 51. National Business Aviation Association, Inc.                           |
| 20. American Helicopter Society Int'l                | 52. National Organization to Insure a Sound Controlled Environment (NOISE) |
| 21. Association of Air Medical Services              | 53. Negro Airmen International   |
| 22. Association of European Airlines                 | 54. Organization of Black Airline Pilots                                   |
| 23. Association of Flight Attendants                 | 55. Parachute Industry Association   |
| 24. Association of Professional Flight Attendants    | 56. Popular Rotorcraft Association, Inc.                                   |
| 25. Aviation Consumer Action Project                 | 57. Pratt & Whitney  |
| 26. Aviation Insurance Association                   | 58. Professional Aviation Maintenance Association                          |
| 27. Aviation Technician Education Council            |  |
| 28. Boeing Commercial Airplane Group                 | 64. United States Parachute Association                                    |
| 29. Career College Association                       | 65. United States Ultralight Association Inc.                              |
| 30. Cargo Airline Association                        | 66. Used Aircraft Certification Conformity Committee                       |
| 31. Embraer Aviation                                 |  |
| 32. Experimental Aircraft Association                |  |
| 59. Public Citizen                                   |  |
| 60. Regional Airline Association                     |  |
| 61. Small Aircraft Manufacturers Association         |  |
| 62. The Soaring Society of America, Inc.             |  |
| 63. The Ninety-Nines, Inc                            |  |



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***ARFF Requirements Working Group  
(ARFFRWG)  
Notice of Proposed Rulemaking***

***FINAL RECOMMENDATION***

***To***

***ARAC  
Airport Certification Issues Group***

***14 CFR Part 139 Subpart D***

***March 2004***

# ARFF Requirements Working Group (ARFFRWG)

- **Air Line Pilots Association International (ALPA)** – Captain Thomas J. Phillips
- **Air Transport Association (ATA)** – Mr. Tom Farrier
- **ARFF Working Group (ARFFWG)** – Assistant Chief Jack Kreckie co-chair
- **Airports Council International - North America (ACI-NA)** – Ms. Dawn E. Lucini
- **Allegheny County (PA) Airport Authority (ACAA)**– Mr. Bradley E. Penrod, A.A.A.E.
- **American Association of Airport Executives (AAAE)** – Mr. Craig Williams
- **Armen DerHohannesian and Associates, L.L.C. (ADA)** co-chair
- **Aviation Cabin Safety Specialists, Inc. (ACSS)** – Ms. Kathy Lord-Jones
- **Charlottesville-Albemarle County (Va.) Airport Authority (CHO)** – Mr. W. D. Pahuta
- **Independent Pilots Association (IPA)** – Captain Shannon L. Jipsen
- **International Association of Fire Fighters (IAFF)** – Captain Charles M. Burroughs
- **National Fire Protection Association (NFPA)** – Mr. Mark Conroy
- **International Association of Fire Chiefs (I-Chiefs)** – Chief Donald Hilderbrand
- **Port Authority of New York and New Jersey (PANYNJ)** – Ms. Pam L. Phillips
- **San Jose (CA) Fire Department (SJFD)** – Captain Les Omans

Pratt & Whitney  
400 Main Street  
East Hartford, CT 06108



**Pratt & Whitney**  
A United Technologies Company

June 23, 2009

Federal Aviation Administration  
800 Independence Avenue, SW  
Washington, D.C. 20591

Attention: Pam Hamilton, Director, Office of Rulemaking

Subject: ARAC Report Submittal, Airport Rescue and Firefighting  
Requirements

Reference: ARAC Tasking, Federal Register, March 22, 2001

Dear Pam,

The referenced tasking resulted in formation of the Airport Rescue and Firefighting Requirements Working Group. In March 2004, the ARFFRWG completed its work and submitted a proposed draft NPRM to the ARAC Airport Certification Issues Group. This document represented extensive effort by the Working Group, but in many areas they were unable to achieve consensus.

The ARAC EXCOM has reviewed the Working Group report and believes that there is a substantial amount of valuable information in this report that would be of use to the FAA even though consensus was not reached. Accordingly, the ARAC EXCOM has voted to provide this report to the FAA for FAA use in any future rulemaking activity. Additionally, attached are comments on the document from the National Air Disaster Alliance/Foundation.

I would like to express our thanks to all of the Working Group members for their dedication in working this very challenging task.

Sincerely yours,

C. R. Bolt  
ARAC Chair (Outgoing)

Norm Joseph  
ARAC Chair (Incoming)

# **Surviving the Crash**

*The Need to Improve Lifesaving  
Measures at Our Nation's Airports*

COALITION FOR  
AIRPORT AND AIRPLANE PASSENGER SAFETY

## **COALITION FOR AIRPORT AND AIRPLANE SAFETY MEMBER ORGANIZATIONS**

- International Association of Fire Fighters
- International Association of Fire Chiefs
- National Fire Protection Association
- International Brotherhood of Teamsters
- Transport Workers Union
- National Air Traffic Controllers Association
- Air Line Pilots Association
- Association of Flight Attendants
- International Union of Police Associations
- International Association of Machinists and Aerospace Workers
- Transportation Trades Department, AFL-CIO

### **CAAPS**

**Coalition for Airport and Airplane Passenger Safety  
c/o International Association of Fire Fighters  
1750 New York Avenue, NW  
Washington, DC 20006-1728  
(202) 737-8484  
[www.iaff.org/acrobat/airportsafety.pdf](http://www.iaff.org/acrobat/airportsafety.pdf)**

The 1999 CAAPS “***Surviving the Crash***” report states,

*“A review of 60 NTSB reports of survivable aviation accidents (accidents in which conditions would allow for the possibility of survivors) from 1970 to 1995 shows that the survival rate was better than 16 survivors for every person killed.”*

-CAAPS report page 8

*“The NTSB reports classified fatalities in three categories: during the impact, post-impact, and those that occurred at an undeterminable time. Excluding undeterminable fatalities, 78 percent of all fatalities occurred post-impact; almost all (95.4 percent) resulted from smoke inhalation and/or burns. If the 327 people who died during post-impact accidents had been rescued, the survival rate for the 7,488 people involved would have been 98.3 percent.”*

*“To reduce fatalities from post-impact fire and smoke inhalation, Part 139 must be revised to mandate victim rescue and interior fire suppression as part of the airport fire service’s mission.*

*Part 139 must include more stringent response time requirements, increase ARFF staffing for a comprehensive response capability, and improve extinguishing agent requirements. The NTSB’s chairman agrees that these regulations must be revised, and notes that DOD standards offer a good model for the FAA to follow.”*



*“As the Quincy situation and others illustrate, there is a need for the FAA to do a better job of ensuring public safety. The FAA can do a better job if it improves Part 139 - especially at a time when improved cabin technology has helped to keep more people alive beyond the impact, and when fire fighters have better tools to rescue victims. It is critically important that the FAA adopt specific standards for the ARFF regulations that reflect realities of modern aviation and ensure that air travel remains a safe and dependable form of transportation. CAAPS, which is composed of organizations concerned with public safety at American airports, urges the FAA to enact the following recommendations to improve aviation safety.”*



# ACRP

Web-Only Document 7:

## How Proposed ARFF Standards Would Impact Airports

Richard Golaszewski  
Gregson Helledy  
GRA, Incorporated  
Jenkintown, PA

Benedict Castellano  
Airport Safety Consultants, LLC  
Gambrills, MD

Robert E. David  
Robert E. David & Associates, Inc.  
Fredericksburg, VA

Contractor's Final Report for ACRP Project 11-02, Task 11  
Submitted June 2009

Airport Cooperative Research Program

TRANSPORTATION RESEARCH BOARD  
OF THE NATIONAL ACADEMIES

The ACRP7 report states,

*“The NFPA two-minute runway response requirement could more than double the number of firefighters and vehicles at the 476 Part 139 airports considered in this study.”*

– page 9

This statement is one of many highly subjective statements using a small sample of the 476 certificated airports identified. Estimating this requirement based on a small ( $49/476 = \mathbf{10.2\%}$ ) value without considering other unique airport conditions is fallacious.

The report states,

*“The two-minute demonstrated response time to the runway end has the higher costs of the two NFPA response standards, with an annualized cost of approximately \$1.03 billion”.*

–page 10

This is substantiated in the ACRP 7 report with the information on two charts....

## **FAR Part 139.317**

*(e) Index E. Three vehicles— (1) One vehicle carrying the extinguishing agents as specified in paragraphs (a)(1) or (a)(2) of this section; and (2) Two vehicles carrying an amount of water and the commensurate quantity of AFFF so the total quantity of water for foam production carried by all three vehicles is at least 6,000 gallons.*

**Figure 44: NFPA Two-Minute Runway End Demonstration  
at the Interviewed Airports**

<b>NFPA Two-Minute Response to Farthest Runway End</b>								
<b>Number of Airports Meeting NFPA Two-Minute Response Time Demonstration</b>								
Can airport meet two-minute response time?	Could fire station be relocated?	Airport ARFF Classification						Total
		IIIA/IIA	IA	IB	IC	ID	IE	
Yes	N/A	1	1	2				4
No	Yes	3	5	1				9
No	No	3	5	6	12	4	4	34
<b>Total for Analysis</b>		<b>7</b>	<b>11</b>	<b>9</b>	<b>12</b>	<b>4</b>	<b>4</b>	<b>47</b>
No	No Response			2				2
No	Impossible to meet	1						1
No Response	No Response			2		1		3
<b>Total</b>		<b>8</b>	<b>11</b>	<b>13</b>	<b>12</b>	<b>5</b>	<b>4</b>	<b>53</b>
<b>Number of Additional or Relocated Fire Stations Required to Meet Two-Minute Response Time</b>								
Airports Requiring		Airport ARFF Classification						Total
		IIIA/IIA	IA	IB	IC	ID	IE	
One Station		6	9	5	6	2		28
Two Stations			1	2	6	1	1	11
Three Stations						1	1	2
Four Stations							1	1
Five Stations								0
Six Stations							1	1
<b>Total Airports Interviewed</b>		<b>6</b>	<b>10</b>	<b>7</b>	<b>12</b>	<b>4</b>	<b>4</b>	<b>43</b>
<b>Additional or Relocated Stations</b>		<b>6</b>	<b>11</b>	<b>9</b>	<b>18</b>	<b>7</b>	<b>15</b>	<b>66</b>

**Figure 45: Impact of NFPA Two-Minute Response Time at 476 Airports**

Estimated Impact of NFPA Two-Minute Runway Response Time Assuming Satellite Stations							
Airport Class	IIIA/IIA	IA	IB	IC	ID	IE	Total
Number of Airports Responding	7	11	9	12	4	4	47
Number of Airports in Group	99	131	111	78	33	24	476
Number of Additional Fire Stations	85	131	111	117	58	90	592
Number of Additional Vehicles	42	107	222	351	116	180	1,018
Number of Additional Firefighters	509	1,905	3,244	2,802	908	1,680	11,047
Average No. of Added Fire Stations Per Airport	1	1	1	2	2	4	1
Average No. of Added Vehicles Per Airport	0	1	2	5	4	8	2
Average No. of Added Firefighters Per Airport	5	15	29	36	28	70	23

Satellite stations used for Index D and E airports.

Note that the four Class/Index 1E airports reporting, have identified that 15 new fire stations would need to be built or relocated to meet the NFPA 403 2-minute response standard. It is very presumptuous to assume that the cost data estimated for four of 24 airports identified in this airport category, can be averaged for the remaining 20 Class 1E airports. This is very “fuzzy” math.

**DFW, MSP, ATL, & DEN were used for analysis.**

**What if ANC, HNL, IAD & FLL were used? Same result?**

Regarding staffing and the differences in other ARFF standards identified in the ACRP reports; consider the differences in ARFF ideologies (objectives) of the NFPA, ICAO and FAA.

**NFPA** - *“NFPA response strategy is designed to have a sufficient number of aircraft rescue and firefighting personnel on duty that would respond to the fire and could commence not only fire suppression but also aid in rescue operations.”*

-ACRP12 pg. 31





## NFPA 403

*“1.2.2 The principle objective of a rescue and fire-fighting service is to save lives. For this reason, the preparation for dealing with an aircraft accident or incident occurring at, or in the immediate vicinity of, an airport is of primary importance because it is within this location that the greatest opportunity to save lives exists. The possibility of, and need for, extinguishing a fire that can occur either immediately following an aircraft accident or incident, or at any time during rescue operations, must be assumed at all times.”*

**ICAO** - “The most important factors bearing on effective rescue in a survivable aircraft accident are: the training received, the effectiveness of the equipment and the speed with which personnel and equipment designated for rescue and firefighting purposes can be put to use.” -Annex 14, 9.2

**FAA** - “The FAA’s concept has been based on the need for controlling and extinguishing any fire that may be endangering the lives of the passengers and crew by securing an escape path(s) from the aircraft.” -ACRP12 page

30

**Note** – the word “rescue” is excluded from the FAA’s objective in this ACRP report and a cost basis is not mentioned as a primary consideration for determining the ARFF response mission.

The ACRP7 report studied only three aircraft accidents in an eleven year period. This suggests a lack of empirical data for any comprehensive analysis.

*“...Air carrier accidents over an eleven-year period (January 1, 1997 to December 31,2007) were reviewed to determine if revised ARFF standards would have made a difference in the number of fatalities.*

*The three Part 121 accidents of interest required reviewing the pertinent sections of the full NTSB report to determine if different ARFF standards might have had any impact on the outcome in terms of reducing the severity of injuries or in preventing deaths. A brief summary based upon the NTSB accident report is provided for each one of these accidents.”*

– page

Note that two of the three Part 121 accidents used in this report occurred outside of the NFPA “Rapid Response Area” and are not applicable to the NFPA 403 standard. The other single “nine passenger seat” accident in Charlotte was not survivable due to severe impact trauma and burns caused to the victims when the aircraft impacted the hangar and burst into flames. ARFF response was not a factor for analysis. Other notable aircraft accidents occurring on the airport should have been considered for this ACRP report. Many others were identified in the ACRP12 report.

Notable accidents that could have been used in the ACRP7 report to analyze variations in effective ARFF response that occurred **ON** the airport are;

**August 19 1980** – Saudia Flight 163, a Lockheed L-1011 Tristar, lands at King Khalid International Airport in Riyadh, Saudi Arabia when a fire breaks out on board; the evacuation of the plane is delayed and all 301 on board die.

**June 2 1983** – Air Canada Flight 797, a McDonnell-Douglas DC-9, catches fire during flight over Kentucky; 23 of 46 passengers die from smoke inhalation even after the crew successfully lands the aircraft in Cincinnati, Ohio.

**August 22 1985** – British Airtours Flight 28M, a Boeing 737, aborts its takeoff from Manchester, England because of an engine fire. While 82 passengers and crew escape alive, 55 are killed, most from smoke inhalation.

**August 31 1988** – Delta Air Lines Flight 1141, a Boeing 727, crashes on takeoff from Dallas-Fort Worth International Airport as a result of pilot error; of 108 people on board, 12 passengers and two crew members are killed.

**February 1 1991** – USAir Flight 1493, a Boeing 737, strikes SkyWest Airlines Flight 5569, a Fairchild Metro commuter plane waiting to take off from the same runway on which the Boeing 737 was landing at Los Angeles International Airport. Of the 101 people on both aircraft, 34 people, including all 12 aboard the Metro and 22 of the Boeing 737 passengers, are killed.

**NTSB Accident Report PB91-910409, NTSB/AAR-91/08**

*“2.6 Survival Factors*

*The emergency response for this accident was timely and effective. The close proximity of Fire Station 80 to the accident site, coupled with the rapid response of ARFF units, facilitated personnel efforts to apply extinguishing agent to the external fires and to assist some of the passengers in egressing from the B-737. The Safety Board believes that these factors reduced injuries and saved lives. The Safety Board also found that the rapid availability of adequate numbers of ARFF-trained fire fighters, from both Fire Station 80 and off airport structural fire companies, allowed ARFF personnel to implement an interior fire attack immediately. Sufficient personnel also allowed the extrication of the first officer, while protecting him from fire.”*

(Note - The ARFF response by the Los Angeles City Fire Department was in compliance with the NFPA 403 standard and exceeded FAA Part 139 requirements. **Q.** Is this not proof that the NFPA 403 standard saves lives?)

**20 August 2007** - China Airlines 737-800; Naha, Japan: Shortly after landing at Naha on the island of Okinawa, the left engine caught fire and the crew initiated an emergency evacuation. Although the aircraft was destroyed by fire, all 157 passengers (including two toddlers) and eight crew members survived.

<http://youtu.be/r357EzZD5YU>

The ACRP7 report states,

*“...It is difficult to suggest what might happen in terms of future accidents. With the very small number of accidents in passenger air carrier operations and the multiplicity of causes and outcomes, it is not possible to reach a conclusion about future mortality from past accidents.”*

-ACRP7 pg. 33

“Very small number of accidents”? In what time period? The recent 11 years?

The statement made, *“it is not possible to reach a conclusion about future mortality from past accidents”* is very ignorant of past history and lessons learned by this technical committee.



**FAA AC 150/5200-31C**, Appendix 3 uses the following criteria for air accident exercise evaluation.

(See Table 7-2)

-page 111

**Q.** If it is not possible to predict future mortality, how was this criteria (above) established?

In planning for a full scale exercise, the minimum number of “casualties” to be used should be based on the following: Airport Index	Minimum # “Casualties”	
A	20	- 30
B	40	- 50
C	60	- 70
D	80	- 90
E	100 or more	

*“It was assumed that five firefighters are needed to cover one position on a shift if the station operates 24 hours, seven days a week.”*

-page 42

This is erroneous. How did they arrive at five? Using a formula of 1.7 persons needed for each position is generally understood as a managerial staffing formula, but in reality, on a typical 3-platoon 24-hour staffing system, three firefighters would be needed. This is a staffing cost error of 40%.

Most fire departments use flexible staffing levels to reduce higher salary costs while using overtime to supplement the minimum manpower needed to cover for vacation and sick time absences. This minimizes additional costs for employee medical benefits as well.

*“The largest costs are firefighter salaries and benefits, at \$545.7 million per year. The total estimated annual cost increases at Class I, II, and III airports are \$568 million, or an average of about \$1.2 million per airport.”*

-page 49

**Figure 35: Estimated Numbers of Firefighters and ARFF Vehicles at 476 Class I, II and III Part 139 Airports**

Extrapolation of Reported Firefighters and Trucks to Total Number of Part 139 Airports							
Airport Class	IIIA/IIA	IA	IB	IC	ID	IE	Total
Number of Firefighters From Interviews	60	103	193	256	215	460	1,287
Number Of Airports Responding	8	10	13	9	5	4	49
Average Number of Firefighters	8	10	15	28	43	115	26
<b>Estimated Firefighters for 476 Airports</b>	<b>743</b>	<b>1,349</b>	<b>1,648</b>	<b>2,219</b>	<b>1,419</b>	<b>2,760</b>	<b>10,137</b>
Number of ARFF Vehicles From Interviews	10	17	22	38	22	29	138
Number Of Airports Responding	8	11	13	12	5	4	53
Average Number of ARFF Vehicles	1	2	2	3	4	7	3
<b>Estimated ARFF Vehicles for 476 Airports</b>	<b>124</b>	<b>202</b>	<b>188</b>	<b>247</b>	<b>145</b>	<b>174</b>	<b>1,080</b>

Using the FAA minimum of 3 (ARFF vehicles) X 3 (shifts) = **9 drivers/1E** airport needed to satisfy Part 139 response requirements. **NOT 115!**

These are contradictory statements,

*“It should be noted that it **is not** the purpose of this research to recommend whether or not the proposed regulation should be enacted.”*

-ACRP12 pg. 31

*“Overall, there is no conclusive evidence in the accident reports to indicate that accident fatalities or serious injuries would be reduced by replacing the current Part 139 ARFF standards with those found in ICAO Annex 14 or in NFPA 403 and its associated documents.”*

-ACRP12 pg. 49

BY ORDER OF THE  
SECRETARY OF THE AIR FORCE

AIR FORCE PAMPHLET 32-2004

21 APRIL 2010

Civil Engineering



**AIRCRAFT FIRE PROTECTION FOR  
EXERCISES AND CONTINGENCY  
RESPONSE OPERATIONS**

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**ACCESSIBILITY:** Publication is available on the e-Publishing website at <http://www.e-publishing.af.mil> for downloading or ordering.

**RELEASABILITY:** There are no releasability restrictions on this publication.

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Certified by: AF/A7CX

Supersedes: AFPAM32-2004,

(Col Curt A. Van De Walle)

1 September 1999

Pages: 9

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This pamphlet provides planners guidance for contingency response operations lasting a maximum of 120 days. Planners use this guidance to determine the minimum number of Fire Emergency Services (FES) aircraft rescue and fire fighting (ARFF) manpower and vehicles necessary to provide fire suppression for Air Force (AF) aircraft during major exercises and real world contingencies. These operations may include exercises for training purposes, disaster response, humanitarian relief operations, or other non-combat type operations. Determining requirements is based on the type and size of aircraft being protected. For the purposes of this document, applicable AF ARFF vehicle sets and requirements are found in Allowance Standard (AS) 019, *Vehicle Fleet (Registered) All MAJCOM Common*, based on National Fire Protection Association (NFPA) Standard 403, *Aircraft Rescue and Fire Fighting Services at Airports*, AF NFPA 403, *Technical Implementation Guide* and the *Vehicle Validation and Realignment Plan*. These sets are used as a baseline and modified to meet exercise and contingency requirements. The capabilities outlined in this pamphlet provide ARFF fire suppression and limited rescue capability, but do not include structural fire protection or other emergency response capabilities. This guidance applies to all AF Active, Reserve, and Guard Civil Engineer (CE) units. Ensure that all records created as a result of processes prescribed in this publication are maintained in accordance with AFMAN 33-363, Management of Records, and disposed of in accordance with (IAW) the Air Force Records Disposition Schedule (RDS) located at <https://www.my.af.mil/gcss-af61a/afirms/afirms/>. Refer recommended changes and questions about this publication to the Office of Primary Responsibility using AF Form 847, *Recommendation for Change of Publication*; route AF Form 847s from the field through Major Command (MAJCOM) publications/forms managers.

4.1.1. **OLS** capability represents the amount of agent needed to execute rescue operations at large fires (exterior and interior) involving aircraft. OLS provides sufficient agent for quick knockdown of exterior fires (one minute) (Q1), continued control of the exterior fire after the first minute or complete extinguishment (Q2), and agent to support hose lines for interior fire fighting and rescue operations (Q3). OLS provides reasonable expectation of successful rescue where large fires are involved.

4.1.2. **RLS** capability represents the amount of agent needed to execute rescue operations at substantial fires at one location of an aircraft. Sufficient agent is provided for exterior fire control for one minute and enough continued control of the fire after the first minute or complete extinguishment of the exterior fire. This level of service represents increased risk/loss potential due to lack of sufficient agent to perform rescue and simultaneously conduct both interior and exterior fire fighting. A rescue operation is not expected from catastrophic fire situations where simultaneous interior and exterior fire attack is required.

4.1.3. **CLS** capability represents the amount of agent needed to execute rapid intervention at small fires at one location of an aircraft. At this level of service aircraft interior rescue is not expected to be successful. This level of service represents increased risk/loss potential due to the lack of sufficient agent to maintain control of exterior or interior fire long enough to conduct interior rescue operations. Rescue may still be possible from fighter-type aircraft where interior fire fighting operations are not needed.



Table 2. Manpower Requirements.

ARFF SET	RIT	DRIVER	SEARCH RESCUE	INTERIOR HOSE	INTERIOR HOSE	EXTERIOR HOSE	SAFETY	IC	TOTAL
6 OLS	2	*	4	2	2	1	1	1	13
6 RLS	2	*	2	2		1		1	8
6 CLS	2	*	2	1		1		1	7
5 OLS	2	*	2	2	2	1	1	1	11
5 RLS	2	*	2	2		1		1	8
5 CLS	2	*	2	1		1		1	7
4 OLS	2	*	2	2		1	1	1	9
4 RLS	2	*	2	2		1		1	8
4 CLS	2	*	2	1		1		1	7
3 OLS	2	*	2	2		1	1	1	9
3 RLS	2	*	2	1		1		1	7
3 CLS	2	*	2	1				1	6
2 OLS	2	*	2	1				1	7
2 RLS	2	*	2	1	1				6
2 CLS	2	*	2					1	5
1 OLS		*	2	2				1	7
1 RLS		*	2	1				1	5
1 CLS		*	2					1	3

\*Add one driver per ARFF vehicle required to deliver the required agent.

Table 1. Fire Fighting Agent Requirements.

USAF ARFF Vehicle Set	NFPA Airport Category	Typical USAF Aircraft	OLS (gallons)	RLS (gallons)	CLS (gallons)
6	10	C-5A/B	12,626	7,508	2,589
5	9	E-4, VC-25, MD-11, 747, 777, KC-10	8,792	6,292	2,330
4	8	B-1, B-2, B-52, C-17, C-141, E-3A, KC/EC-135, 767, C-727	6,864	4,364	1,732
3	6 & 7	AC-130, B-1, C-9, C-22, C-32, C-37, C-40, C-130, E-3, E-8, MH53, T-43, VC-137	4,585	3,335	1,456
2	5	C-20	2,563	1,316	752
1	1-4	A-10, BQM-34, C-12, C-21, CV-22, C-38, F-15, F-16, F-22, F-117, HH60, T-1, T-37, T-38, T-6, UH-1, UV18, and U-2	1,125	526	334

BY ORDER OF THE  
SECRETARY OF THE AIR FORCE

AIR FORCE INSTRUCTION 32-2001

9 SEPTEMBER 2008



Civil Engineering

**FIRE EMERGENCY SERVICES PROGRAM**

**COMPLIANCE WITH THIS PUBLICATION IS MANDATORY**

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This instruction implements Air Force Policy Directive (AFPD) 32-20, *Fire Emergency Services*, and Department of Defense (DoD) Instruction (DoDI) 6055.06, *DoD Fire and Emergency Services Program*, Department of Labor – Occupational Safety and Health Administration (OSHA), Code of Federal Regulations (CFR), Air Force Instructions (AFI), and National Fire Protection Association (NFPA) standards as they are adopted and/or implemented by NFPA Technical Information Guides (TIG). It applies to personnel who develop and implement fire emergency services (FES) programs at Air Force installations worldwide including expeditionary locations, facilities, and contractor-operated facilities. For government-owned/contractor-operated and contractor-owned/contractor-operated facilities, contracts shall be revised to comply with this instruction when such contracts are extended, revised or rewritten and when new delivery orders are applied to existing contracts. This instruction does not apply to Air Force Reserve Command (AFRC) or Air National Guard (ANG) firefighters when in training status. Additionally, selected paragraphs of this publication do not apply to the ANG and will be modified by ANG supplements. Refer to AFI 10-210, *Prime Base Engineer Emergency Force (BEEF) Program*, and Air Force Reserve Command and Air National Guard supplements for applicability. Users should send comments and suggested improvements on AF Form 847, **Recommendation for Change of Publication**, through major commands (MAJCOM), Air National Guard, and Headquarters Air Force Civil Engineer Support Agency (AFCESA), 139 Barnes Drive, Suite 1, Tyndall AFB FL 32403-5319, to USAF/A7CX, 1260 Air Force Pentagon, Washington DC 20330-1260. Forms may be electronically forwarded to AFCESA/CEXF Corporate Mailbox, [HQAFCESA.CEXF@tyndall.af.mil](mailto:HQAFCESA.CEXF@tyndall.af.mil). Ensure that all records created as a result of processes prescribed in this publication are maintained in accordance with AFMAN 33-363, *Management of Records*, and are disposed of in accordance with the Air Force Records Disposition Schedule (RDS). The use of the name or mark of the NFPA or any commercial products, commodity, or service in this publication does not imply endorsement by the USAF. When using Personally Identifiable Information (name, rank, etc. IAW DoD 5400.11-R/ AFI 33-332 Privacy Act statements must be accompanied/ attached or on printed forms.

TO 00-25-172, *Ground Servicing of Aircraft and Static Grounding/Bonding, 15 May 2008*

TO 00-105E-9, *Aerospace Emergency Rescue and Mishap Response Information (Emergency Services, Current Edition)*

NFPA TIG 403, *Aircraft Rescue and Fire Fighting Services at Airports, Current Edition*

NFPA TIG 1500, *Fire Department Occupational Safety and Health, Current Edition*

NFPA TIG 1582, *Standard on Comprehensive Occupational Medical Program for Fire Departments, Current Edition*

NFPA TIG 1710, *Standard for the Organization and Deployment of Fire Suppression Operations, Emergency Medical Operations, and Special Operations to the Public by Career Fire Departments, Current Edition*

FES CONOPS, *Concepts of Operations for Fire Prevention and Consequence Management, 15 Jun 2007*

NFPA 472, *Standard for Competence of Responders to Hazardous Materials/Weapons of Mass Destruction Incidents, Current Edition*

NFPA 1001, *Standard for Firefighter Professional Qualifications, Current Edition*

NFPA 1002, *Standard on Fire Apparatus Driver/Operator Professional Qualifications, Current Edition*

NFPA 1006, *Standard for Rescue Technician Professional Qualifications, Current Edition*

NFPA 1061, *Standard for Professional Qualifications for Public Safety Telecommunicator, Current Edition*

NFPA 1201, *Standard for Providing Emergency Services to the Public, Current Edition*

NFPA 1403, *Standard on Live Fire Training Evolutions, Current Edition*

“3.5.3.1. *It is a core mission to rescue aircrew members from aircraft involved in accident/fire incidents.*

*At locations with a flying mission, rescue personnel designated by the Fire Chief must be trained in aircrew rescue and extraction techniques on mission assigned aircraft as identified in TO 00-105E-9, Aerospace Emergency Rescue and Mishap Response Information (Emergency Services).”*

-AFI32-2001 9 SEPTEMBER

## Attachment 3

RESPONSE TIME AND LEVELS OF SERVICES FOR FES OPERATIONS<sup>1</sup>

PROGRAM ELEMENT	O =OLS <sup>2</sup> R =RLS <sup>3</sup> C =CLS <sup>4</sup>	ART (minutes) <sup>5</sup>	RATE (%) <sup>6</sup>	COMPANIES <sup>7</sup>	STAFF
<b>Structural Fire</b>					
First Arriving Company	C	7	90	1	4
Initial Full Alarm Assignment	O	12	90	3	13
<b>Other Fire Response/Investigative Response</b>					
First Arriving Company	C	7	90	1	4
<b>HazMat/CBRNE</b>					
First Arriving Company (Defensive Operations)	C	7	90	1	4
Full Alarm Assignment (Offensive Operations)	O	22	90	3	15
<b>Emergency Medical</b>					
<sup>8</sup> First Arriving Company (basic life support (BLS) with automatic external defibrillator (AED)) (no EMT)	O	7	90	1	2
Transport Unit (BLS with AED)	N/A	10	90	1	2
Advanced Life Support (ALS) Capability	N/A	12	90	1	2
<b>ARFF</b>					
Unannounced First Arriving Company	C	5	90	1	3
<sup>9</sup> Announced First Arriving Company	C	1	90	1	3
Additional Units - should arrive at 30-second intervals		-	-	-	-
<b>Technical Rescue</b>					
First Arriving Company	C	7	90	1	4
Full Alarm Assignment	O	22	90	3	13
<b>Wildfire</b>					
As required to meet Installation Wildland Fire Management Plan		-	-	-	-
<b>Other Response</b>					
<sup>10</sup> As required to meet NFPA standard, other consensus standard or installation standard of cover		-	-	-	-

<sup>1</sup> This table may deviate from NFPA standards based on historical risk profile of DoD installations.

<sup>2</sup>OLS is the Optimum Level of Service (see paragraph 2.7.)

<sup>3</sup>RLS is the Reduced Level of Service (see paragraph 2.7.)

<sup>4</sup>CLS is the Critical Level of Service (see paragraph 2.7.)

<sup>5</sup> Aggregate response time (ART) consists of dispatch time, turnout time and travel time.

## **Programs for Training of ARFF Personnel - AC 150/5210-17b**

**b. Live-Fire Drills.** *All rescue and firefighting personnel must participate in at least one live-fire drill every 12 months. This drill must include a pit fire with an aircraft mock-up or similar device, using enough fuel to provide a fire intensity that simulates realistic firefighting conditions. The conditions would simulate the type of fire that could be encountered on an air carrier aircraft at the airport. AC 150/5220-17 provides more detailed guidance on recommended standards for the burning area structure. It is intended that the drill provide an opportunity for the firefighting team to become familiar with the use of all fire extinguishment equipment they will use in the event of an accident. If possible, a simulated rescue of aircraft occupants will help in creating a realistic simulation. During the drill, each fire fighter must demonstrate the following:*

**(1)** *the control and extinguishment of a simulated aircraft fire using handlines and turrets, given an airport-type foam firefighting vehicle. The decision to train on handline or turret should be based on whether the trainee is assigned a handline or whether the trainee is a driver/operator who would normally operate the turrets. Many training programs may have all the participants working the handlines, and it would be acceptable for the driver/operator to meet the annual requirement in this fashion. However, it would not be acceptable for a handline firefighter to use training on the turrets to meet the annual requirement;*

**(2)** *the control and extinguishment of a simulated aircraft fire using handlines and turrets, given each type, other than foam-type, firefighting vehicle [see (1) above for guidance on acceptability of handline and turret operation]; and*

**(3)** *using fire streams to protect fire fighters and aircraft occupants, given an airport firefighting vehicle.*



It is not mentioned in the ACRP7 Report that the FAA is not exempt from White House circular A-119, *“Federal Participation in the Development and Use of Voluntary Consensus Standards and in Conformity Assessment Activities”* identified in the **2004 ARFFRWG Final Draft.**

-page 75

[http://www.whitehouse.gov/omb/circulars\\_a119](http://www.whitehouse.gov/omb/circulars_a119)

The ACRP7 report states,

*“...Any actual differences in future ARFF standards would depend on how ICAO and NFPA standards entered into changes to Part 139. Under existing procedures FAA would have to justify such changes and conduct a regulatory evaluation. In addition, the proposed legislation would require that FAA justify cases where it did not adopt voluntary consensus standards (it is general government practice to base regulations on common standards).”*

- page 31

**Q.** Although the Senate removed the requirement from the S. 223 bill, is the FAA willing to recommend adoption of NFPA 403 standards or comment why the standards are not adopted as stated in the coalition letter with flawed ACRP analysis?

*“...allow them to complete their review of the findings of the ACRP report data.”*

*“The proposed rule will generally not be adopted unless the benefits of the rule outweigh its costs. If the final version of the rule has a benefit-cost ration greater than one, the agency may decide to issue the rule. The various requirements contained in the final rule then become required for entities and persons within the applicability of the rule. For Part 139, this includes certificated airport operators and their employees.”*

-ACRP12

page 20-21

**Q.** How much is a human life worth?



# ACRP

Web-Only Document 12:

## Risk Assessment of Proposed ARFF Standards

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Contractor's Final Report for ACRP Project 11-02, Task 17  
Submitted January 2011

Airport Cooperative Research Program

TRANSPORTATION RESEARCH BOARD  
OF THE NATIONAL ACADEMIES

**Table 8. Accidents Where Occupants Needed to be Extricated  
from Aircraft by ARFF (1989-2008)**

Accident Date	Airport LOC ID	Fire	Description
7/19/89	KSUX	Yes*	Extricated flight crew that was trapped in deformed cockpit.
9/27/89	KGCN	Yes*	Extricated several passengers that were trapped in deformed fuselage.
2/1/91	KLAX	Yes	Rescued first officer from cockpit as flames approached.
7/2/94	KCLT	Yes*	Rescued several passengers from three rows of seats after extinguishing fire.
12/16/97	CYCF	No	Extricated seven passengers from deformed fuselage.
6/1/99	KLIT	Yes	Extricated first officer from the cockpit and assisted some passengers from first class in exiting aircraft.
8/22/99	HKG	Yes	Assisted passengers in evacuating the cabin.
7/9/06	IRK	Yes	Rescued 11 passengers from the cabin.
8/27/06	KLEX	Yes	Extricated first officer from the cockpit.

\* Fire was either not present in area of rescue or had been extinguished prior to rescue.

*“In making its determination, the research team considered carefully what the accident investigating agency said about the survivability of each accident. Although this approach was somewhat subjective, the members of the research team believed that they had the background to make objective reviews and determinations on these accidents. The team’s decision to determine a range for the reductions, e.g. 0 to 2 serious injuries provided a means to capture uncertainty introduced by the subjective nature of the determination.”*

-ACRP12 page 44

What are the qualifications of the “research team”?  
Admitted subjectivity.

*“While the Little Rock and Quincy accidents were rich with data, it turned out that most of the other accidents were not. This was particularly true for accidents that occurred outside the United States. Some accidents were relatively easy to analyze. For example, many of the fatalities were the result of trauma from impact or where the fire occurred so quickly the accident was considered non-survivable. In those cases, a change in ARFF standards would not have affected the number of fatalities. However, in other accidents, there would be a statement that “all the fatalities were due to impact or were fire related.” In those accidents, the research team could not determine if a change in ARFF standards would have made any difference in the accident outcome.”*

-ACRP12 page 44

Admitted lack of empirical evidence to support conclusion.

*“The research team believes that the additional two firefighters and agent that the NFPA standard would have required could have resulted in a reduction of 3 to 14 fatalities.”*

-ACRP12, Quincy Accident

page 46

This comment does not support the overall ACRP12 conclusion. This tragic accident that demonstrated a lack of an NFPA ARFF response is identified as an “exception”.



*“For many of the accidents, the data included in the accident reports were not sufficient to allow the research team to conclude that a change in ARFF standards would have changed the accident outcome in terms of fatalities and/or serious injuries. Based on the data the research team was uncomfortable even with providing a range of estimates for fatalities and serious injuries. If additional data were available, it is possible that the research team may have reached a different conclusion for some of these accidents.”*

-ACRP12 page 47

Additional data was available. Every ARFF agency has local accident response records. Interviews with Incident Commanders for details are helpful to determine problems not identified in official accident reports.

*“Notwithstanding the lack of detailed data, based upon the information contained in the accident reports, the research team’s collective judgment was that a change in ARFF standards would not have reduced fatalities or serious injuries in any of the accidents reviewed as part of this research effort with the possible exception of one accident .”*

*“Overall, there is no conclusive evidence in the accident reports to indicate that accident fatalities or serious injuries would be reduced by replacing the current Part 139 ARFF standards with those found in ICAO Annex 14 or in NFPA 403 and its associated documents.”*

-ACRP12 page 49

**OPINION: These flawed ACRP reports were used to support misinformed recommendations to the FAA ARAC and in the May 5, 2010 Coalition letter to the Senate.**

**Thank you !**



*ARFF Solutions.com*