ARFF CURRICULUM - INTERFACE BETWEEN REQUIREMENTS FOR
THE TRAINING OF ARFF PERSONNEL

Presented by Les Omans
For the Air Line Pilots Association, International
President’s Committee for Cargo
ARFF Curriculum - Interface Between Requirements for Training of ARFF Personnel

ARFF personnel haz mat knowledge & skills:

- Identify Federal Aviation Administration (FAA), National Fire Protection Association (NFPA), & Occupational Health & Safety Administration (OSHA) hazardous material related training & response requirements

- Recognize the hazardous nature of aircraft & airport emergencies

- Be familiar with the types of cargo aircraft, methods of loading, types of shipments, labels, markings, & associated paperwork

- Utilize the DOT Emergency Response Guidebook

- Perform Haz Mat First Responder Operations Action Steps

- Begin proper response procedures for fires on cargo aircraft, haz mat releases, fuel spills, lavatory waste spills, agricultural aircraft incidents, & terrorist WMD incidents
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Important Reference Materials:

- NFPA 1003, Standard for Airport Fire Fighter Professional Qualifications
- NFPA 405, Standard for the Recurring Proficiency of Airport Fire Fighters
- NFPA 402, Guide for Aircraft Rescue & Fire-Fighting Operations
- Aircraft Rescue & Fire Fighting, International Fire Service Training Association (IFSTA)
- Emergency Response Guidebook, Department of Transportation (DOT)
- Hazardous Material Response Manuals, Training Materials, & Programs
- State Haz Mat Response & Training Programs & Requirements
- Federal Aviation Regulations (FAR) Part 139, Certification and Operations of Land Airports Serving Certain Air Carriers
- FAA Advisory Circular 150/5210-17, Programs for Training of Aircraft Rescue and Fire Fighting Personnel
- NFPA 472, Professional Competence of Responders to Hazardous Material Incidents
- 29 CFR 1910.120, Hazwoper Regulation, OSHA
- Airport Services Manual, Part 1, Rescue & Fire Fighting, ICAO
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- Why does ARFF need to
  - Train
  - Prepare
  - Plan

- For aircraft haz mat related incidents?

- Cargo aircraft fires?
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HAZARDOUS MATERIALS INCIDENT REPORT

IN-FLIGHT FIRE,
McDONNELL DOUGLAS DC-9-83, N569AA,
NASHVILLE METROPOLITAN AIRPORT
NASHVILLE, TENNESSEE,
FEBRUARY 3, 1988

NTSB/HZM-88/02

UNITED STATES GOVERNMENT
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BIOLOGICAL/CHEMICAL CHARACTERISTICS:

Suspended cultures on ready-to-use inoculating loop sealed in foil package.

Telephone 318-479-1000 • 1 800 256-GERM 3941 Ryan Street • Lake Charles, LA 70605
FAX 318 479-1006

FACSIMILE FROM: Michael Reed

COMPANY: ________________________________

ATTENTION: ________________________________

FAX NUMBER: 909-467-2513

PAGES: _______ (Including cover sheet)

COMMENTS:

(Bacteria) = S. aureus, E. faecalis, S. epidermidis, P. vulgaris, S. sanguis, E. coli, C. albicans, N. gonorrhoeae, Corynebacterium sp., S. Pyogenes

Not all contained in package. List of items that went out with ASIM MCF B-2.
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identification:
Product:
- QUANT-CULT
- QUANT-CULT PLUS
- CFURINE

Components:
- Viable Microorganisms: BH
- Stabilizing Medium: NH
- Rehydrating Fluid: NH

BH = BIOHAZARD - May be extremely hazardous depending on the strain once the foil seal is broken. Open packets should be handled only by qualified laboratory personnel according to CDC/NIH guidelines.

NH = NOTHAZARDOUS - Contains no hazardous or toxic substances (or less than the defined minimum) as defined by Federal or any State Right to Know Laws.

Chemical Family:
- Bacteria & Fungi

physical/chemical characteristics:
Contains a film of a specified number of preserved bacteria in a clear cap of vial. The vial is sealed within a silver mylar envelope. Rehydrating fluid is provided in the second vial.

handle these products at the appropriate biosafety level as recommended for the organism in the CDC/NIH manual "Biohazards in Microbiological and Biomedical Laboratories", 3rd Edition, 1992.

Avoid generating and inhaling aerosols. Avoid contact with open wounds and body openings. Wash hands frequently. Disinfect work area after use. Dispose properly.

Protective Clothing and Equipment:
Consult CDC/NIH guidelines. As warranted by the organism and activity, wear protective gloves, clothing and face mask. Autoclave and BioSafety cabinets as required for infectious material. (See Precautions above)

Spill or Leak Procedures:
Package design provides spill hazard.

Disposal:
Autoclave before disposal.

Other Information:
To the best of our knowledge, the information contained herein is accurate. However, this information is intended to be used only as a guide and does not purport to be complete. Neither Chrisope Technologies, Inc. nor any of its affiliates shall be held liable for the completeness or accuracy of this information or for any damage resulting from contact with, or use of the above product. All chemicals may present unknown health hazards and should be used with caution.

Fire and explosion hazard data:
No unusual fire or explosion hazard. Excessive heat renders the contents non-infectious.

May release toxic fumes on combustion. Wear self-contained breathing apparatus. Water spray, carbon dioxide or dry chemical extinguishing media.

reactivity data:
Stable

Health hazard data:
These products contain viable microorganisms sealed in a foil package and pose no health hazard if handled properly and the seal remains intact. (See Precautions)

These products are potentially infectious, especially if allowed to contact open wounds and body openings, and should not be used by unqualified or immunocompromised personnel. These products are for laboratory use only. Foil packets should be opened only under supervision of a qualified laboratory technologist.

Stable

Health hazard data:
These products contain viable microorganisms sealed in a foil package and pose no health hazard if handled properly and the seal remains intact. (See Precautions)

These products are potentially infectious, especially if allowed to contact open wounds and body openings, and should not be used by unqualified or immunocompromised personnel. These products are for laboratory use only. Foil packets should be opened only under supervision of a qualified laboratory technologist.

Symptoms of exposure range from localized infection to systemic illness depending on organism and host response.

First Aid:
In case of skin contact, immediately disinfect area with antiseptic solution. Consult a physician for appropriate antibiotic therapy for contaminating organism if an infection develops.

In case of eye contact, immediately flush with copious amounts of water, including under eyelids, for 15 minutes. Consult a physician for appropriate antibiotic therapy.
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(c) Frank van den Berg
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**FLIGHT 101’S FINAL SECONDS**

NTSB investigators now believe that Flight 101’s crew worked desperately amid two warning alarms to recover control of the plane that may have been too heavy to take off. Here is what happened:

**Side view, looking south**

MIAMI INTERNATIONAL AIRPORT, RUNWAY 27 LEFT

Contrary to some witness reports, the tail of the DC-8 did not strike the runway on takeoff.

60°

Highest point in flight: Plane 600 feet off ground, angle 60° from horizontal.

Left wing strikes aviation guidance structure as right wing hits the ground. Within milliseconds, wings break off and engines burst into flames. Fuel fireball engulfs area.

End of runway

Body of plane rolled 10° to left

Warehouse

Miami Dairy Road

A.081397 SOURCE: National Transportation Safety Board investigators

ROBERTSON ADAMS / Herald Staff

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**Images**

- Aircraft on fire with smoke billowing into the sky.
- Police cars and emergency vehicles block a road.
- Aerial view of a fire scene with smoke and flames.
- Ground view of a smoke-filled area with emergency responders.

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The more things change...
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All aircraft accidents should be considered & treated as haz mat incidents

Large amounts of fuel & quantities of toxic hydraulic fluids

Site & wreckage contaminated with body fluids, lav waste, other bio hazards

Burning rubber tires & magnesium produce very toxic smoke

Plastic, foam rubber, & leather used in interior finishes & personal items produce a wide assortment of toxic gases under fire conditions
- Composite materials can cause asbestos-like respiratory injuries & skin irritation
- Military aircraft can involve weapons, high explosives & radioactives
  - Exotic fuels such as hydrazine
- Extensive amounts of aircraft fuels are stored & transferred on airports
- Besides flammability, fuels are toxic, irritants, & environmentally detrimental
- Some airports are bases for agricultural spraying operations
- Maintenance facilities that utilize paints, solvents, & other toxic chemicals
- Presence of dangerous cargo only complicates already dangerous situation
- Almost anything can & is being transported by aircraft
- Air freight business has become a very profitable endeavor
- More shippers are turning to air cargo to move valuable, fragile, or time critical shipments rapidly across great distances
- Increasing every year, as well as aircraft related haz mat incidents
Certain dangerous goods can be transported on passenger aircraft

- Carried in “inaccessible” cargo holds with baggage & other cargo
- 60 lbs of allowable materials & 150 lbs of nonflammable gas
- “Combies” that carry both passengers & cargo on main deck
- Used by foreign carriers & encountered at international airports or Alaska
Undeclared dangerous goods

- Hazardous shipments that air carrier does not know are on board
- Materials in luggage, mail, or other general cargo
- Responsible person may not realize material is dangerous,
  Ignorant of the regulations
- May be deliberately trying to conceal to avoid extra costs
Dangerous products can be purchased at grocery, hardware, or sporting goods stores

Warning posted at ticket counters & cargo check-in areas

Unless package looks suspicious, shipper rarely questioned

1990, 21% of aircraft related haz mat incidents involved undeclared materials

1997, it was 35% & trend is increasing
Military have their own dangerous goods regulations
Many hazardous military cargos, including weapons & munitions
In peacetime, procedures are very similar to civilian air cargo carriers
In times of conflict, regulations may be relaxed to expedite transport of needed military materials
Dangerous goods can be found on almost any type of aircraft

Anyone can charter aircraft to transport hazardous materials

No airport is immune to this type of activity
Training & Response Requirements

- Original 139 required initial & recurrent training on “Aircraft Cargo Hazards”
- Also required Airport Emergency Plan (AEP) to contain instructions for radiological, bomb, & sabotage incidents
- Recent changes now require ARFF to also be trained for haz mat incidents
- Haz mat incidents & fires at fuel storage areas, have been added to AEP
- Each ARFF vehicle must have available DOT Orange NAERG
- 139 also addresses handling & storage of haz mat on airport
Most recent version - 17A, 4/28/2006

- Aircraft familiarization
- ARFF should be able to identify hazards indicted by labels
- Use DOT ERG
- Access Chemtrec & other response resources
- Obtain haz mat information
- Identify appropriate response requirements
- OSHA Hazwoper regulation 29 CFR 1910.120 has response, planning, & training requirements for hazardous substance releases
- 5 training levels: Awareness, Operations, Technician, Specialist, & IC
- ARFF are emergency responders, should be trained to Operations level
- Respond to releases to protect persons, environment, & property
- Defensively, to control releases from safe distance & keep it from spreading
- Technicians & Specialists are on haz mat teams & take more offensive actions
Few of larger airports may have specialized haz mat team & equipment
Most rely on mutual aid to provide this extensive expertise & resources
ARFF should train with their mutual aid haz mat teams
Become familiar with equipment, procedures, & capabilities, how to assist them
Familiarize teams with airport layout, access, hazards, & haz mat situations
Meet Fire Fighter II requirements in NFPA 1001, Standard for Fire Fighter Professional Qualifications

- Trained to First Responder Operations level (NFPA 472)
- General Knowledge & Skill Requirements
  - Hazards associated with aircraft cargo & dangerous goods
  - Hazardous areas, entry control points, crash scene perimeters
  - Hot, warm, & cold zones
  - Operate cargo area extinguishing systems
  - Aircraft familiarization
  - Attack, control, & extinguish fires involving aircraft & cargo
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- Identifies Operations, Technician, Specialist, & Incident Commander knowledge & skill requirements

Operations
- Analyze situation to determine magnitude of problem
- Collect hazard & response information
- Scene control
- Plan & implement initial response
- Defensive options
- Emergency decontamination

- Haz Mat Initial & recurrent training curriculums may vary from state to state
- Numerous training courses, programs, & reference materials available
Chapter 6 - Aircraft Familiarization
Chapter 9 - Aircraft Cargo Hazards
Personal protection & monitoring devices
Knowledge of airport’s dangerous cargo response plan
Use reference sources to identify dangerous goods & determine appropriate actions
Identification, risk assessment, isolation, rescue, & evacuation
Decontamination procedures
- Familiar with each type of aircraft that uses airport
- Location & operation of cargo doors
- Familiarize mutual aid fire-fighters with aircraft special problems
- Follow procedures identified in DOT Emergency Response Guidebook
- Chapter 11 - Interior Aircraft Fires
- Preservation of Mail, Baggage, & Cargo
Lesson 5 - Airport Haz Mat
Sections:
- Introduction
- Training Requirements
- Hazardous Cargo
- Cargo Aircraft
- Shipping Papers & Packaging
- Haz Mat Incident Action Steps
- Other Airport Haz Mat Emergencies

Lesson 13 - ARFF Tactical Operations
- Section 7 - Interior Cargo Fire & Haz Mat Scenario

Lesson 14 - Aircraft Incident Exercises
- Section 10 - Cargo Aircraft Fire
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- 5th Edition will be out next year
- Supports NFPA Requirements
- More information on
  - Cargo aircraft familiarization
  - Types of hazardous cargos
  - Loading procedures
  - Packaging, labels, & Markings
  - Cargo Paperwork
- Still weak & not specific on tactics
- Other haz mat response reference & training materials available from IFSTA Fire Protection Publications
Chapter 12 - Aircraft Fire Fighting & Rescue Procedures

12.4 - Accidents Involving Dangerous Goods

3 pages of real basic information

Not specific on tactics

Does encourage ARFF to fight aircraft fires even if they might involve dangerous cargos

Stresses using proper protective equipment

Working from upwind
Hazardous materials is a fire department term

On aircraft hazardous cargos are called “dangerous goods” or “restricted articles”

2 regulatory standards applicable to shipping dangerous goods by air

Title 49 of Code of Regulations (CFR)

Issued by Department of Transportation

Apply to all modes of transportation

Applicable only over the United States
Technical Instructions for the Safe Transportation of Dangerous Goods by Air

Published by International Civil Aviation Organization (ICAO)

United Nations body with authority over air transport issues

Recognized & enforced worldwide, including in United States

“Dangerous Goods Regulations”, published annually by the International Air Transport Association (IATA)

Very complicated regulations, ARFF only needs general familiarization with
Critical to be able to recognize when hazardous materials are involved in an airport or aircraft incident.

- Take necessary steps to protect self, public, & the environment.
- Haz mat incidents may be reported as medical aid, fire, vehicle, or aircraft incident.
- Initial report may not indicate presence of hazardous materials.
- Failure to recognize common haz mat warning clues may cause ARFF to become part of problem.
- Don’t bring victims to the incident.
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- First clue is location of incident
- Beware of emergencies involving cargo & military aircraft
- Cargo, fuel, & aircraft maintenance facilities
- Container shapes are another clue
- Storage tanks, tank trucks, drums, & cylinders
Forward part of ERG has section identifying shapes of rail cars & truck trailers that typically carry haz mat

Most airports don’t have rail cars

Identify the appropriate guide number & follow its directions

Which guide would be used for the typical airport fuel truck
Visible hazardous placards & labels provide many clues

- Diamond shape
- Color & symbols
- Hazard class & sometimes UN #
- Problem, if not using binoculars, may be too close to read placard
- Other markings & colors, such as company names or written warnings (No smoking)
- Not much on cargo aircraft
Other warning clues may be
- Statements of responsible persons or witnesses
- Persons running from, showing unusual medical symptoms, or collapsed in an area
- Evidence of leaks
- Unusual colors, smoke, or vapors

Least desirable clue is your sense of sight, smell, or feel

Situation just doesn’t seem right, assume haz mat until proven otherwise

ARFF usually does not have chemical protective or appropriate training, so getting in close proximity is not an option
Besides recognition, safety to ARFF consists of location & distance

Location consists of approaching & positioning upwind, uphill, & upstream

Farther away, the safer

ERG will help determine how far you & public need to be away from a haz mat

Each of the 61 orange Guides (Pages 169-293) list minimum initial isolation distances “Public Safety” section

Recommended distance for smallest release, such as 1 drum or package

If multiple packages or a large container is involved, distance may have to be double, tripled, etc

If there is wind, downwind perimeter may have to be enlarged
Sometimes “Public Safety” section will list an evacuation distance.

If involved material is highlight yellow in yellow section (Pages 25-95) or blue section (Pages 97-167), additional isolation & evacuation distances will be listed in green section towards back of ERG.

- Avoid contact with liquids, vapors, smoke, or water runoff from a haz mat fire.
- Give a good report on conditions & identify safe route to incident staging.
- Additional resources will usually consist of mutual aid fire & haz mat teams, emergency medical, health department, & law enforcement.
ARFF first responders should have a current copy of the orange DOT Emergency Response Guidebook

- Know how to use it
- Book will provide enough information & guidance to keep you out of trouble until more capable assistance arrives on scene
For unknown materials or suspected haz mat situations, follow directions listed in orange Guide 111 (Pages 170-171)

- Recommends minimum immediate isolation distance of 330 feet
- Increase distances up to 1/2 mile for tanks, rail tank cars, & tank trucks involved or exposed to fire
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### POTENTIAL HAZARDS

**HEALTH**
- **TOXIC; Extremely Hazardous.**
- May be fatal if inhaled or absorbed through skin.
- Initial odor may be irritating or foul and may deaden your sense of smell.
- Contact with gas or liquefied gas may cause burns, severe injury and/or frostbite.
- Fire will produce irritating, corrosive and/or toxic gases.
- Runoff from fire control may cause pollution.

**FIRE OR EXPLOSION**
- These materials are extremely flammable.
- May form explosive mixtures with air.
- May be ignited by heat, sparks or flames.
- Vapors from liquefied gas are initially heavier than air and spread along ground.
- Vapors may travel to source of ignition and flash back.
- Runoff may create fire or explosion hazard.
- Cylinders exposed to fire may vent and release toxic and flammable gas through pressure relief devices.
- Containers may explode when heated.
- Ruptured cylinders may rocket.

- Guides in orange section of ERG are divided into 3 subsections
- **Potential Hazards** - 2 choices, Fire / Explosion or Health effects
- Highest potential hazard is listed first
- Subsections helps to make decisions regarding the protection of responders & exposed persons
**PUBLIC SAFETY**

- CALL Emergency Response Telephone Number on Shipping Paper first. If Shipping Paper not available or no answer, refer to appropriate telephone number listed on the inside back cover.
- As an immediate precautionary measure, isolate spill or leak area for at least 100 meters (330 feet) in all directions.
- Keep unauthorized personnel away.
- Stay upwind.
- Many gases are heavier than air and will spread along ground and collect in low or confined areas (sewers, basements, tanks).
- Keep out of low areas.

**PROTECTIVE CLOTHING**

- Wear positive pressure self-contained breathing apparatus (SCBA).
- Wear chemical protective clothing that is specifically recommended by the manufacturer. It may provide little or no thermal protection.
- Structural firefighters' protective clothing provides limited protection in fire situations ONLY; it is not effective in spill situations where direct contact with the substance is possible.
- Sometimes firefighting gear & SCBA may provide limited protection.

- Usually chemical protective gear is required.

- Public Safety - Second subsection outlines suggested public safety measures.

- Provides initial isolation & sometimes evacuation distances, recommended protective clothing & respiratory protection.
Emergency Response - Third subsection covers emergency response actions

Outlines special precautions for incidents that involve fire, spill, or chemical exposure

Information on first aid is general guidance prior to advanced medical care

Will indicate if AFFF foam is adequate or if an alcohol resistant (AR) foam is needed
Based on recommended isolation distances, quickly establish a perimeter around release & prevent any entry into that area.

Perimeter may need to be increased one or more times depending on size of release, container, or wind.

Secure access points, such as doors & gates.

Use vehicles to block roads.

Take advantage of natural barriers.

Use tape, rope, barricades, & other warning materials to close up gaps.

Determine if persons are contaminated or in need of rescue.

Rescue is usually not an option until material(s) are identified, trained, & properly protected personnel on scene.

Ambulatory contaminated persons should be collected in a safe upwind area & decontaminated.
Perform emergency decon whenever contamination is confirmed or suspected
Use fire hose to “flush - strip - flush”
Do not waste time starting decon
Try to pick a location that will protect privacy & minimize environmental impacts
Grassy areas or a containment area formed by diking a curb / gutter
Almost all ERG guides call for flushing for 20 minutes
Isolate contaminated clothing & secure personal valuables
Firefighters doing decon should be in full protective gear & SCBA
Provide something to dry off with & wear, provide medical care & interview
If possible, provide secondary decon (proper shower with soap & warm water)
- Determine if there is a need to evacuate
- Sometimes persons can be protected inside buildings by closing windows, doors
- Called “sheltering or protecting in place”
- Evacuation is getting exposed persons completely away from hazards
- Most desirable, but hardest to accomplish
- Especially true in busy, crowded, congested airport terminals & baggage areas
- Focus on downwind areas, begin closest to release & work away from spill site
- Orange sections may indicate an evacuation distance
- Highlighted yellow or blue, refer to green section, you will need to evacuate
If 4 digit UN ID number is known, go to yellow section of ERG (Pages 25-95)

Sequentially lists the United Nations (UN) numbers, proper shipping name, & orange guide for all the common haz mat transported

Find the UN #, go to the appropriate orange guide, & follow its direction

If it is highlighted in yellow, it is especially bad stuff & you may have to evacuate

Refer to green section in back of ERG
If proper shipping name of material is available, refer to blue section of ERG (Pages 97-167)

Alphabetically lists the proper shipping names of commonly transported haz mat

Recommended guide & UN number

Be sure to use exact & correct spelling

Go to recommended guide & follow directions

If it is highlighted blue, it is bad stuff & will probably need to evacuate

Refer to green section for isolation & evacuation distances
Green section is “Table of Initial Isolation & Protective Action Distances”
Yellow & blue highlighted materials are listed sequentially by UN #
List isolations distances for small & large spills
Small spill is one from a single small package or a small leak from a large container
Large spill is a large leak from large container or many smaller containers
Larger evacuation distances are listed for night vs day, explained on page 4 of ERG
Different dispersion, night air is calmer, so chemical disperses less, more toxic
During day, chemicals are dispersed more by active atmosphere, less toxic area
Adjust original isolation & evacuation distances if indicated by green section
Last part of green section lists yellow & blue highlighted materials that are also water reactive & the toxic gas that is produced.

Page 301 identifies how to estimate spread of toxic concentration downwind.

Width of the furthest downwind spread of a toxic cloud will usually be as wide as the distance the cloud has spread downwind.
1. **CHEMTREC®**, a 24-hour emergency response communication service, can be reached as follows:
   
   **CALL CHEMTREC® (24 hours)**
   
   1-800-424-9300
   
   (Toll-free in the U.S., Canada, and the U.S. Virgin Islands)
   
   For calls originating elsewhere:
   
   703-527-3887 (Collect calls are accepted)
   
   or

2. **CHEM-TEL, INC.**, a 24-hour emergency response communication service, can be reached as follows:

   **CALL CHEM-TEL, INC. (24 hours)**

   1-800-255-3924

   (Toll-free in the U.S., Canada, and the U.S. Virgin Islands)

   For calls originating elsewhere:

   813-248-0685 (Collect calls are accepted)

   or

3. **INFOTRAC**, a 24-hour emergency response communication service, can be reached as follows:

   **CALL INFOTRAC (24 hours)**

   1-800-535-5053

   (Toll-free in the U.S., Canada, and the U.S. Virgin Islands)

   For calls originating elsewhere:

   352-323-3500 (Collect calls are accepted)

   or

4. **3E COMPANY**, a 24-hour emergency response communication service, can be reached as follows:

   **CALL 3E COMPANY (24 hours)**

   1-800-451-8346

   (Toll-free in the U.S., Canada, and the U.S. Virgin Islands)

   For calls originating elsewhere:

   760-602-8703 (Collect calls are accepted)
RESIST RUSHING IN!
APPROACH INCIDENT FROM UPWIND
STAY CLEAR OF ALL SPILLS, VAPORS, FUMES AND SMOKE

HOW TO USE THIS GUIDEBOOK DURING AN INCIDENT INVOLVING DANGEROUS GOODS

ONE IDENTIFY THE MATERIAL BY FINDING ANY ONE OF THE FOLLOWING:
   THE 4-DIGIT ID NUMBER ON A PLACARD OR ORANGE PANEL
   THE 4-DIGIT ID NUMBER (after UNNA) ON A SHIPPING DOCUMENT OR PACKAGE
   THE NAME OF THE MATERIAL ON A SHIPPING DOCUMENT, PLACARD OR PACKAGE
   IF AN ID NUMBER OR THE NAME OF THE MATERIAL CANNOT BE FOUND, SKIP TO THE NOTES BELOW.

TWO LOOK UP THE MATERIAL’S 3-DIGIT GUIDE NUMBER IN EITHER:
   THE ID NUMBER INDEX...(the yellow-bordered pages of the guidebook)
   THE NAME OF MATERIAL INDEX...(the blue-bordered pages of the guidebook)
   If the guide number is supplemented with the letter “P”, it indicates that the material may undergo violent polymerization if subjected to heat or contamination.
   If the index entry is highlighted (in yellow or blue), it is a TTH (Toxic Inhalation Hazard) material, a chemical warfare agent or a Dangerous Water Reactive Material (produces toxic gas upon contact with water). LOOK FOR THE ID NUMBER AND NAME OF THE MATERIAL IN THE TABLE OF INITIAL ISOLATION AND PROTECTIVE ACTION DISTANCES (the green-bordered pages). Then, if necessary, BEGIN PROTECTIVE ACTIONS IMMEDIATELY (see Protective Actions on page 298). If protective action is not required, use the information jointly with the 3-digit guide.

USE GUIDE 112 FOR ALL EXPLOSIVES EXCEPT FOR EXPLOSIVES 1.4 (EXPLOSIVES C) WHERE GUIDE 114 IS TO BE CONSULTED.

THREE TURN TO THE NUMBERED GUIDE (the orange-bordered pages) AND READ CAREFULLY.

NOTES IF A NUMBERED GUIDE CANNOT BE OBTAINED BY FOLLOWING THE ABOVE STEPS, AND A PLACARD CAN BE SEEN, LOCATE THE PLACARD IN THE TABLE OF PLACARDS (pages 16-17), THEN GO TO THE 3-DIGIT GUIDE SHOWN NEXT TO THE SAMPLE PLACARD.

IF A REFERENCE TO A GUIDE CANNOT BE FOUND AND THIS INCIDENT IS BELIEVED TO INVOLVE DANGEROUS GOODS, TURN TO GUIDE 111 NOW, AND USE IT UNTIL ADDITIONAL INFORMATION BECOMES AVAILABLE. If the shipping document lists an emergency response telephone number, call that number. If the shipping document is not available, or no emergency response telephone number is listed, IMMEDIATELY CALL the appropriate emergency response agency listed on the inside back cover of this guidebook. Provide as much information as possible, such as the name of the carrier (trucking company or railroad) and vehicle number. AS A LAST RESORT, CONSULT THE TABLE OF RAIL CAR AND ROAD TRAILER IDENTIFICATION CHART (pages 18-19). IF THE CONTAINER CAN BE IDENTIFIED, REMEMBER THAT THE INFORMATION ASSOCIATED WITH THESE CONTAINERS IS FOR THE WORST CASE POSSIBLE.
NATIONAL RESPONSE CENTER (NRC)
The NRC, which is operated by the U.S. Coast Guard, receives reports required when dangerous goods and hazardous substances are spilled. After receiving notification of an incident, the NRC will immediately notify the appropriate Federal On-Scene Coordinator and concerned Federal agencies. Federal law requires that anyone who releases into the environment a reportable quantity of a hazardous substance (including oil when water is, or may be affected) or a material identified as a marine pollutant, must immediately notify the NRC. When in doubt as to whether the amount released equals the required reporting levels for these materials, the NRC should be notified.

CALL NRC (24 hours)
1-800-424-8802
(Toll-free in the U.S., Canada, and the U.S. Virgin Islands)
202-267-2675 in the District of Columbia

- Page 11 lists how to contact National Response Center (NRC)
- Must be notified when hazardous substances are released in environment above a certain reportable quantity
- RQ should be listed on shipping paper or in Haz Mat Table in CFR 49
- NRC should also be notified anytime a person is contaminated, injured, or killed, or release involves environmental damage or cleanup
- Responsible party (RP) is required by law to notify NRC & 911
- Criminal & civil penalties for failure to make notifications
- Responders will also usually make notifications, but not required to
MILITARY SHIPMENTS
For assistance at incidents involving materials being shipped by, for, or to the Department of Defense (DOD), call one of the following numbers (24 hours):

703-697-0218 (call collect) (U.S. Army Operations Center) for incidents involving explosives and ammunition.

1-800-851-8061 (toll-free in the U.S.) (Defense Logistics Agency) for incidents involving dangerous goods other than explosives and ammunition.

NATIONWIDE POISON CONTROL CENTER (United States Only)
Emergency and information calls are answered by the nearest Poison Center (24 hours):

1-800-222-1222 (toll-free in the U.S.).

The above numbers are for emergencies only.

Page 11 also lists contacts for military shipments

Poison Control should be contacted anytime someone is contaminated
HAZARD CLASSIFICATION SYSTEM

The hazard class of dangerous goods is indicated either by its class (or division) number or name. For a placard corresponding to the primary hazard class of a material, the hazard class or division number must be displayed in the lower corner of the placard. However, no hazard class or division number may be displayed on a placard representing the subsidiary hazard of a material. For other than Class 7 or the OXYGEN placard, text indicating a hazard (for example, “CORROSIVE”) is not required. Text is shown only in the U.S. The hazard class or division number must appear on the shipping document after each shipping name.

Class 1 - Explosives
  Division 1.1 Explosives with a mass explosion hazard
  Division 1.2 Explosives with a projection hazard
  Division 1.3 Explosives with predominantly a fire hazard
  Division 1.4 Explosives with no significant blast hazard
  Division 1.5 Very insensitive explosives with a mass explosion hazard
  Division 1.6 Extremely insensitive articles

Class 2 - Gases
  Division 2.1 Flammable gases
  Division 2.2 Non-flammable, non-toxic* gases
  Division 2.3 Toxic* gases

Class 3 - Flammable liquids (and Combustible liquids [U.S.])

Class 4 - Flammable solids; Spontaneously combustible materials; and Dangerous when wet materials/Water-reactive substances
  Division 4.1 Flammable solids
  Division 4.2 Spontaneously combustible materials
  Division 4.3 Water-reactive substances/Dangerous when wet materials

Class 5 - Oxidizing substances and Organic peroxides
  Division 5.1 Oxidizing substances
  Division 5.2 Organic peroxides

Class 6 - Toxic* substances and Infectious substances
  Division 6.1 Toxic* substances
  Division 6.2 Infectious substances

Class 7 - Radioactive materials

Class 8 - Corrosive substances

Class 9 - Miscellaneous hazardous materials/Products, Substances or Organisms

Also located in the front of ERG is the Hazard Classification System

Shows 9 hazard classes & corresponding subdivisions

Found on shipping papers & bottom of placards & labels
- Identify involved materials & determine conditions
- Attempt to locate shipping documents, MSDS, & other written information
- Interview responsible persons & witnesses
- Examine involved area with binoculars
- If a placard or label is visible, use “Table of Placards & Initial Response Guides” (Pages 16-17), determine appropriate guide, & follow its directions
Gather as much information as you can
- What type & quantity of containers are involved?
- What is their condition & quantity of contents?
- How are the containers behaving & what conditions are affecting that behavior?
- Take note of every aspect of the involved area
- What are the symptoms exhibited by contaminated persons?
- Sometimes a similar container can be located on the airport
- Labels can provide a lot of information, emergency instructions, or contacts
- Try to obtain copies of shipping papers & MSDS’s
Take actions to contain, slow, restrict, or redirect spread of spilled materials
As long as safe to do so & ARFF will not be exposed in any way
Eliminate ignition sources near released flammable materials
Consider preparing for possible ignition
Provide decontamination & exposure documentation for emergency responders
Document & keep chronological records of all information gathered, incident events, & actions taken
What tasks ARFF will perform at fuel spills depends on:
- Department procedures
- Interagency agreements

Minimum service will be to standby
- Prevent or deal with ignition of spilled fuel
- Provide first aid or decontamination

Some ARFF departments may be tasked with controlling spill, recovery, & clean-up
Aircraft Lavatory Waste Spills

- Lav waste tanks on air carrier aircraft range from 20 to over 300 gallon capacities.
- Tanks are drained & re-supplied with fresh blue degerming solution as part of normal ground servicing.
- Lav waste usually disposed of at an airport facility.
- Spills may occur on aircraft ramp or in route to disposal site.
- May contain a considerable amount of toilet paper & solid human waste.
- Besides offensive to senses.
- Spills are a bio hazard & need to be properly cleaned up.
• Fixed & rotary wing aircraft used for aircraft spraying operations
• Wide variety of toxic liquids & dusts can be encountered
• Different pesticides & herbicides used depending on pest & time of year
• Most fixed wing aircraft will be loaded at airport or dirt strip & flown to job site
• Rotary wing aircraft are usually trailered to & loaded at job site
• Aircraft can carry hundreds of gallons of chemical solutions
Airports are mass transit systems with a large number & concentration of civilians. They are prime targets for terrorist acts involving nuclear, biological, or chemical (NBC) weapons of mass destruction (WMD). ARFF needs to be trained & prepared to respond to these types of emergencies. Many training programs & sources of information are available. Chemical WMDs are basically treated just like a haz mat incident.
Indications of a possible terrorist incident involving NBC / WMD include:

- Explosions that disperse liquids, mists, vapors, or gas
- Explosions that only destroy a package or a bomb device
- Unscheduled & unusual dissemination of aerosol sprays
- Abandoned spray devices or unexplained odors
- Mass casualties without obvious cause or trauma
- Definite pattern of casualties & common symptoms
- Civilian panic in a high profile target area, such as an airport
ARFF Curriculum - Interface Between Requirements for Training of ARFF Personnel

- Signs & symptoms of nuclear & biological agents typically appear hours to days after the incident

- Emergency Response Guidebook has a section on NBC / WMD

- Use ERG Guide #158 for biological agents & #163 for nuclear agents

- Chemical agents are characterized by a rapid onset of symptoms within minutes or hours, as well as easily observed indicators

- Types of chemical agents, common symptoms, & recommended ERG guides:
  - **Blister agents** (Guide #153) - Red eyes, skin irritation, burning sensation, blisters, upper respiratory damage, cough, coma
  - **Blood agents** (Guide #117) - Respiratory distress, headache, unresponsiveness, seizures, coma
  - **Choking agents** (Guide #125) - irritation to eyes, nose, & throat, respiratory distress, nausea, vomiting, burning sensation
  - **Nerve agents** (Guide #153) - Pinpoint pupils, extreme headache, severe tightness in chest, dyspnea, runny nose, coughing, salivation, unresponsiveness, seizures
Questions?

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