

## Attachment C

### Hazardous Materials

Given the technical nature of the HAZMAT threat, it is essential that the National Response Team's NRT-1, *Hazardous Materials Emergency Planning Guide*, and the Environmental Protection Agency's (EPA) *Technical Guidance for Hazard Analysis* be used as the principal source documents for addressing HAZMAT planning needs. Other helpful guides include the *Handbook of Chemical Analysis Procedures*, co-published by the Department of Transportation (DOT), EPA, and FEMA, and the planning section of the *Guidelines for Public Sector Hazardous Materials Training*, coordinated by FEMA under an agreement with DOT. The planning team should use the guides and this attachment to help facilitate the completion of the hazard analysis and to identify unique planning requirements that should be addressed in the EOP.

#### The Hazard

##### **Working Definition of Hazardous Materials**

Definition of a risk area for hazardous materials depends on defining "hazardous materials." Many Federal laws and regulations exist to help the planner do just that; however, since the various lists overlap and serve different purposes (identifying acceptable quantities for "wastes" and "pollutants," reportable quantities for "emergency releases," etc.), this chapter will use the term "hazardous materials" in a broad sense to include:

- Explosive, flammable, combustible, corrosive, oxidizing, toxic, infectious, or radioactive materials
- that, when involved in an accident and released in sufficient quantities,
- put some portion of the general public in immediate danger from exposure, contact, inhalation, or ingestion.

Off-site planning for radiological accidents at nuclear power plants is addressed in Tab 1 to Attachment F. Radiological protection planning for the nuclear conflict threat is addressed in Tab 2 to Attachment F. Planning for the release of lethal unitary chemical agents and munitions is addressed in Attachment E.

*For a discussion of the different lists of hazardous materials, see EPA's A Review of Federal Authorities for Hazardous Materials Accident Safety, Chapter 4. Note that substances not on these lists may still be hazardous.*

**Risk Areas**

Areas at risk for hazardous materials transportation incidents lie along highways, rail lines, pipelines, rivers, and port areas. A large number of States also are potentially involved with nuclear waste incidents, given the routing for shipments. Jurisdictions with facilities that produce, process, or store hazardous materials are at risk, as are jurisdictions with facilities for the treatment, storage, or disposal of hazardous wastes. These risks are compounded by natural hazards (e.g., earthquakes, floods) or, for highway transportation of hazardous materials, poor weather conditions. In addition, other kinds of facilities (e.g., for natural gas) may contribute to risks posed by hazardous materials facilities.

**Locating  
Hazardous  
Materials**

This section discusses information made available to planners under Federal law. States and localities may have additional or more stringent information requirements, and planners may wish to check with their State Emergency Response Commission (SERC), State Environmental Protection Agency, State Department of Transportation, Public Service Commission, Radiological Health Division of the State Health Department, and the like for additional information. Area Committees established under the auspices of the National Oil and Hazardous Substances Pollution Contingency Plan (NCP) and the Oil Pollution Act (OPA) may provide additional resources in identifying areas at risk from a hazardous materials incident.

*At Fixed  
Facilities*

EPCRA, or Title III of the Superfund Amendments and Reauthorization Act (SARA), requires facilities to notify the SERC and LEPC if they have present any of the substances designated by the EPA as an "extremely hazardous substance" when the amount on hand exceeds the EPA-defined "threshold planning quantity." Facilities must submit to the appropriate LEPC, local fire department, and SERC a list of the "hazardous chemicals" (as defined by the Occupational Safety and Health Administration, or OSHA) on site in excess of threshold quantities or the OSHA-required material safety data sheets (MSDS) on each of these chemicals. In addition, facilities must provide the appropriate LEPC, local fire department, and SERC with an inventory form containing general, aggregate ("Tier I") information on amounts of the chemical present at the facility and their location, or (upon a request made to the facility by the LEPC, fire department, or SERC) more specific ("Tier II") information. LEPCs may complete the general picture of the fixed facility hazard by obtaining data from EPA's Toxic Chemical Release Inventory and by reviewing previous notifications of accidental releases of "hazardous substances" in excess of "reportable quantities" (as defined in 40 CFR 302). Interviews with facility emergency coordinators, fire and law enforcement personnel, and news reporters also may be used to obtain needed information.

**On Transport  
Routes**

The LEPC is entitled to information from facilities subject to SARA Title III that may be necessary for emergency planning, and the LEPC is required by SARA Title III to address routes for transportation of extremely hazardous substances in emergency planning. Facility emergency coordinators may provide information on frequency of shipments, form and quantity of shipments, and routes. Representatives of trucking, rail, air freight, and shipping industries also may assist. Planners should know of State and local route designations for hazardous materials shipments. Information is available from the Department of Energy (DOE) or the Nuclear Regulatory Commission on nuclear waste shipment routes, and from DOT on the routes for and volume of shipments involving "highway route controlled quantities" (HRCQ) of radioactive material.

**Estimating  
Vulnerable  
Zones**

Having plotted the location of facilities and transportation routes with the potential for hazardous materials incidents, planners can estimate vulnerable zones. The widest area of vulnerability would be for an airborne release. For airborne releases of acutely toxic chemicals, vulnerable zones would be plotted as circles around facilities--given uncertainty about wind direction--and as corridors along land transportation routes. Calculating the radii for these circles and corridors depends on knowing what concentration represents a "level of concern" for health effects, the quantity of material likely to be released, the likely rate of release, physical state of the material, elevation at which the release occurs, wind speed, and surrounding topography or construction. In determining vulnerable zones, planners will want to use both worst case and more probable scenarios for the potential releases. Planners should take advantage of any hazard assessments completed by facilities themselves, as these can provide valuable information.

*The Risk Management Program under the Clean Air Act, Section 112(r), will require facilities to conduct hazard assessments for a selected list of about 140 toxic chemicals. The facilities are not required to have completed these hazard assessments until May 1999.*

**Determining  
Vulnerability**

Once vulnerable zones have been plotted, planners can assess the possible consequences of potential hazardous materials incidents. In particular, planners should look at what critical facilities (e.g., hospitals, utilities and treatment plants, broadcast stations, police and fire stations, emergency operating centers) lie within the vulnerable zones; they should also note what facilities house people with special evacuation needs (e.g., schools, prisons, hospitals and nursing homes). SARA Title III requires identification of facilities subject to additional risk due to their proximity to facilities that may release hazardous

materials. Beyond the facility level, planners should consider the demographics of the population in the area (particularly with regard to age and language use) and the potential for property damage in the zone. They should also note the potential for contamination of drinking water supplies and other environmental consequences. The vulnerable facilities, bodies of water, and other features should also be shown on a vulnerability map.

**Assessing  
Risk**

Finally, planners will want to estimate the probability of incidents and the severity of their consequences, in order to focus preparedness and prevention efforts. Probability estimates may be simply qualitative (i.e., "low," "medium," or "high"); in any case they can be based on the historical record of releases and incidents, on general transportation accident statistics for roads (and for airports and railways), on fault tree analyses or hazard operability studies shared by facilities, as well as on professional opinion. SARA Title III requires the LEPC to identify facilities (e.g., for natural gas) that, due to their proximity to facilities that may release hazardous materials, may contribute to risk; these should be considered in assessing risk. Potential consequences may be estimated from case studies of the worst incidents involving particular hazardous materials.

**Hazardous Materials Unique Planning Considerations**

This section contains a listing of the functional annexes that typically would require the preparation of a hazard-specific appendix for hazardous materials. It also identifies many of the unique and/or regulatory planning considerations that should be examined by the planning team and used, as appropriate, when preparing appendices specific to hazardous materials. Note that, whatever the HAZMAT planning provisions adopted by the jurisdiction, SARA Title III requires that HAZMAT emergency planning include training programs and schedules for response and medical personnel, as well as methods and schedules for exercising the provisions.

**Direction and  
Control**

For this hazard, OSHA's Hazardous Waste Operations and Emergency Response Standard (29 CFR 1910) requires that *an* ICS be used for on-scene management of response activities. A description of ICS is provided in Attachment A to Chapter 5. SARA Title III requires a community's plan to include the designation of a community emergency coordinator and facility emergency coordinators, who shall make determinations necessary to implement the plan.

*Response  
Actions*

Response actions are triggered when the organization that is responsible for managing HAZMAT response operations is notified. Response is initiated when an incident or accident report is received from an operations center in a facility that stores, manufactures, or uses hazardous materials or when a police officer, fireman, or member of an emergency services organization is informed of an emergency situation involving HAZMAT. SARA Title III requires HAZMAT planning to address methods for determining the occurrence of a release and the area or population likely to be affected, procedures for timely notification of the community emergency coordinator by facility emergency coordinators, and methods and procedures to be followed in response to a release.

Therefore, provisions should be made, as appropriate, to describe the on-scene management structure and address the following planning considerations in one or more appendices to a direction and control annex:

- Identify and designate special technical experts (chemists, toxicologists, occupational health physicians, etc. to augment the response organization. Where appropriate, private sector response organizations (chemical manufacturers, commercial cleanup contractors, etc.) should be part of the response organization.
- Notify response organizations, public officials, and appropriate local and State organizations that are directly involved in the response.
  - From the initial incident report, disseminate as much information as possible.
  - If possible, identify the hazardous material involved and the severity (degree of threat to people, property, environment, etc.) of the accident before exposing response personnel to possible health hazards.
    - For transportation accidents information sources include placards, container labels, cargo manifests, and shipping papers. These items provide initial information that can be checked against the *North American Emergency Response Guidebook*; shipping papers should also include an emergency contact number. Also, if the above information is not visible or

available, an interview with the vehicle operator could provide the information needed.

- For fixed facility accidents, this information should be readily available from the responsible party.
- Initiate a response to the situation in accordance with the jurisdiction's ICS concept of operations for responding to HAZMAT accidents. Critical actions to address include:
- Upon arrival at the incident site, identifying the IC and notifying the EOC of the identity of the IC and the location of the ICP.
  - Ensuring response personnel have and don the appropriate protective gear (clothing and breathing apparatus).
  - Ensuring response personnel approach the incident site from upwind and obtain the following information, if not already known:
    - The time of the release.
    - The quantity released.
    - Characteristics of the immediately endangered area (e.g., body of water or dense residential/commercial district nearby).
    - Color and odor of vapors (if readily noticeable), and any health effects noted.
    - Direction and height of any vapor cloud or plume (observed and computer-projected).
    - Weather and terrain conditions.
    - Entry of material into the environment (water, drains, soil).

- Action already initiated by personnel at the scene.
- Ensuring unnecessary people at the site are moved away (in a crosswind direction) and denied entry. For transportation incidents, the *North American Emergency Response Guidebook* contains recommended initial isolation zone distances for substances with poisonous vapors that are not burning and additional instructions in case of fire.
- Establishing a Protective Action Zone, if necessary. This is an area in which people can be assumed to be at risk of harmful exposure, and in need of either in-place protective shelter or evacuation.
- Containing the hazardous material. For liquids, it may be necessary to use ditches or dikes to contain spread, so that removal may take place later. It also may be necessary to cover some materials with tarps to prevent vapors from rising.

### *Additional Notifications*

Various Federal laws and regulations on hazardous materials require notifications from the responsible party (employer, transporter, facility manager)--not necessarily from local or State agencies. Local and State agencies may establish their own reporting requirements as well. The following are typical notifications jurisdictions may be responsible for or interested in ensuring:

- *Chemical Releases.* Notification should be made to the National Response Center by the responsible party. Legal provisions also may exist for notification of specific State and local authorities.
- *Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA).* For hazardous substances identified in the CERCLA list, a release that equals or exceeds the reportable quantity (as defined in 40 CFR 302) must be reported to the National Response Center.
- *Emergency Planning and Community Right-to-Know Act (SARA Title III).* Releases of Extremely Hazardous Substances (under section 302 of the Act) or of CERCLA hazardous substances must be made known to the SERC and the LEPC's

community emergency coordinator by the facility owner or operator. In a transportation accident, this requirement is satisfied by contacting 911 or, if 911 is unavailable, the local telephone operator.

- *Clean Water Act.* For hazardous substances (as listed in 40 CFR 116.4) released into water in excess of reportable quantities (established in 40 CFR 117.3), dischargers must make an immediate report to the National Response Center. Notification must also be made to the Nuclear Regulatory Commission if radioactive material spilled in a waterway exceeds the reportable quantity.
- *General Transportation Accidents.* Notifications are as above. In addition, the *North American Emergency Response Guidebook* recommends contacting the Chemical Manufacturer's Association's Chemical Transportation Emergency Center (CHEMTREC) with initial requests for assistance.
- *Involving Radioactive Materials.* Typically, notification should be made to the State Department of Public Health so that detection and monitoring can take place. For incidents involving nuclear weapons, notification should be made to the nearest military base and to the Joint Nuclear Accident Coordinating Center (JNACC).
- *Involving Infectious (Etiological) Agents.* Local and/or State health departments should be notified. Officials in these departments have the responsibility for notifying the Emergency Response Coordinator for the CDC.

*Reentry to  
Areas Directly  
Affected by the  
HAZMAT  
Release*

Address the types of detection devices and systems that will be used to determine when a toxic cloud has cleared a particular area and if the concentration of the hazardous material in soils, drinking water, and sewage systems are at a safe enough level to permit return. Also address concerns such as:

- Control of access to the area until it is safe. Only those people directly involved in emergency response operations should be allowed to enter.



- Arrangements for ongoing site control, monitoring of the environment, and compliance with State and Federal regulations regarding disposal of the wastes.
- Protocol for determining the appropriate time to allow evacuees and the general public to re-enter the area.

*Decontamination  
and Cleanup*

Relevant actions to be addressed are:

- Establish "zones" for controlling contamination (hot zone, transition zone, and clean zone).
- Provide for handling and disposal of:
  - Contaminated soil, water, and other items that could not be adequately decontaminated.
  - Contaminated clothing.

*Request for  
Federal  
Assistance*

If the situation exceeds the capability of the responsible State and local authorities, assistance can be obtained through the National Response Center. In accordance with the NCP, upon receiving notification, the National Response Center notifies the appropriate Federal On-Scene Coordinator (OSC), who monitors private and State actions, provides support and advice, and may intervene to direct operations in rare instances when the situation exceeds the capability of the responsible party or State and local government (or when the "responsible party" would be the Department of Defense (DOD) or DOE). Assistance may include support by the National Strike Force, including strike teams for oil spill response and a Public Information Assistance Team; Radiological Emergency Response Teams; salvage teams; scientific support coordinators; and other specialized resources.

For peacetime radiological emergencies, the Federal Radiological Emergency Response Plan (FRERP) provides a mechanism for DOE to dispatch Radiological Assistance Program (RAP) teams in response to a State request for monitoring assistance.

**Warning**

SARA Title III requires that HAZMAT emergency planning address procedures for timely notification to the public that a release has occurred; this depends on facilities making immediate notification to State and local

authorities. HAZMAT accidents generally occur without warning, and the speed at which events develop and effects spread varies from incident to incident. For small-scale occurrences, public notification may be made door-to-door, through mobile public address systems, or with portable megaphones. For larger-scale occurrences, a jurisdiction-wide warning system should be used. The following considerations should be addressed, if appropriate, in an appendix to a warning annex:

- If used, description of and responsibility for activating a HAZMAT warning system and its mode of operation (how it is activated, where located, number of warning devices (sirens, horns, whistles, etc.) in the system.
- How **timely** warning information will be disseminated to the public, including immediate notification to local and State authorities.

### **Emergency Public Information**

The flow of accurate and timely emergency information is critical to the protection of lives and property immediately following a HAZMAT release. This section deals with the provisions that should be included in the plan for the preparation and dissemination of notifications, updates, and instructional messages as a follow-up to initial warning. The following planning considerations should be addressed, if appropriate, in one or more appendices to an EPI annex:

- Informing the public of health hazards associated with the HAZMAT involved in the accident.
- Providing personal protective actions instructions, including:
  - Survival tips for people on what to do immediately after a HAZMAT release has occurred.
  - Instructions for in-place protection (when to stay, where to stay, and what to do) when that option is chosen.
  - Event-specific evacuation instructions and information (routes, road closures, available transportation) when that option is chosen.

Note that LEPCs also will be working toward ensuring that area residents are informed of risks in the area, of first aid measures and in-place protective actions they can take, and of what to do if an evacuation is ordered in response to a hazardous materials incident.

## Evacuation

SARA Title III requires HAZMAT emergency planning to address evacuation, including provisions for a precautionary evacuation and alternative traffic routes. Hazardous materials evacuation planning is little different from evacuation planning in general. The most important difference is that initial movements should be crosswind. Another difference is that some transportation incidents may involve "selective evacuation" of a small area. The IC's authority to order such an evacuation should be clarified in the appendix, and provision should be made for the necessary coordination with the jurisdiction's EOC.

The following planning considerations should be addressed, if appropriate, in one or more appendices to an evacuation annex:

- Maps that identify primary and alternate evacuation routes for risk zones around locations that present a significant threat to the public.
- Pickup points and government provided transport to move evacuees.
- Provisions for moving special needs population (residents of custodial facilities such as hospitals, jails, mental health facilities, nursing homes, retirement homes, etc.) in a HAZMAT situation.
- Tracking extent of evacuations ordered by the IC(s) during response operations.

Evacuation may not be always necessary or advisable: **In-place protection** may be the preferred option. For some chemical hazards, using wet towels and shutting off air circulation systems may suffice; sometimes the cloud may move past more quickly than the evacuation can be effected. Also, if the hazardous materials incident results from another hazard event (such as an earthquake or a flood), any protective action decision will have to factor in additional concerns. If appropriate, an appendix or tab should be prepared that outlines the criteria that will be used to determine when to rely on in-place protection instead of evacuation to protect the public at risk. The following concerns should be addressed:

- Health risks (respiratory and skin) associated with duration of exposure.
- Speed of onset and persistence of the HAZMAT.
- Use of barriers (overhead protection, closing windows and doors, seeking shelter in home basements, etc.) to reduce exposure.

**Mass Care**

Any HAZMAT appendix to a mass care annex should address the location of shelters, to be upwind and/or out of range of the release. (In-place protective actions might be taken.)

**Health and Medical**

The following planning considerations should be addressed, if appropriate, in one or more appendices to a health and medical annex:

- Provisions for keeping people informed of the health risks created by a HAZMAT release.
- Designation of medical facilities that:
  - Have the capability to decontaminate and medically treat exposed persons.
  - Dispose of contaminated items (clothing, medical supplies, and other waste material).
- Monitoring of water quality and sanitary conditions in the areas affected by the HAZMAT release.
- Provisions for continued medical surveillance of personnel performing decontamination tasks (including radiological monitoring, if appropriate).

**Resource Management**

SARA Title III requires HAZMAT emergency planning to include a description of emergency equipment and facilities in the community and at each facility in the community subject to Title III, along with identification of persons responsible for the equipment and facilities. The following planning considerations should be addressed, as appropriate, in one or more appendices to a resource management annex:

- Provisions for purchasing, stockpiling or otherwise obtaining essential HAZMAT response items such as spare or replacement protective gear for response personnel, detection devices and sampling equipment (for water, soil, etc.), decontamination supplies, etc.
- Provisions for identifying agencies and contractors that could be involved in cleanup operations and related tasks (including storage, cleaning, and reconditioning of response equipment and supplies).
- Resource lists that identify the quantity and location of the items mentioned in the first bullet, above, along with points of contact (day, night, and weekend).

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