
Standard Format and Content for Emergency Plans for Fuel-Cycle and Materials Facilities

Draft Report for Comment

**U.S. Nuclear Regulatory
Commission**

Office of Nuclear Material Safety and Safeguards



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Draft Report for Comment

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**Division of Industrial and Medical Nuclear Safety
Office of Nuclear Material Safety and Safeguards
U.S. Nuclear Regulatory Commission
Washington, DC 20555**



ABSTRACT

This report is issued as guidance to those fuel-cycle and major materials licensees who are required by the NRC to prepare and submit an emergency plan. This Standard Format has been prepared to help ensure uniformity and completeness in the preparation of those plans.

STANDARD FORMAT AND CONTENT
FOR EMERGENCY PLANS FOR
FUEL-CYCLE AND MATERIALS LICENSEES

DRAFT REPORT FOR COMMENT

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PREFACE

On April 20, 1987, the NRC published a Notice of Proposed Rulemaking to establish in its regulations a formal basis for emergency plans for fuel-cycle and materials licensees. The plans had earlier been required by order. The final rule is scheduled to be issued in March 1988.

The Standard Format and Content guidance (NUREG-0762) applicable to the plans required by order has been revised to conform to the requirements in the forthcoming rule. Comments on this draft Standard Format and Content are desired before the rule is issued. Comments should be sent to:

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STANDARD FORMAT AND CONTENT
FOR EMERGENCY PLANS FOR
FUEL-CYCLE AND MATERIALS LICENSEES

DRAFT REPORT FOR COMMENT

0.0 INTRODUCTION

The information specified in the following pages should be included in the licensee's emergency plan to comply with the requirements of 10 CFR 30.32(g)(3), 40.31(i)(3), or 70.22(i)(3), as the case may be. The licensee may include additional information by incorporation or by specific reference. The licensee is encouraged to have a single emergency plan to meet the requirements of state agencies or the Community Right-To-Know Act as well as to comply with the regulations of the Nuclear Regulatory Commission (NRC). Additional material to meet these other requirements may therefore be included in the licensee's emergency plan submitted to the NRC. This additional material will be reviewed by the NRC only to ensure that it does not interfere with the NRC's requirements.

Detailed descriptive information of processes, materials storage areas and containers, ventilation, process controls, activity locations, vessels, and confinement of radioactive or other hazardous materials may be necessary to evaluate the adequacy of the emergency plan. This information need not be a part of the plan itself but should be submitted as a supplement if such information is not already available as a part of other license submittals.

Licensees who prepared Radiological Contingency Plans in accordance with the guidance in NUREG-0762 will find that some requirements have been omitted here, and some new features have been added. Plans prepared in a format that corresponds with that contained herein will be more readily approved by the NRC.

- (4) Locations of any offsite emergency support organizations (fire station, police station, hospital with capability for handling contaminated/injured personnel (specify whether qualified to handled radioactive contamination, etc.);
- (5) the sites of potential emergency significance (LPG terminals, pipelines, etc.).

1.3 Description of Facility and Site

Provide a detailed site plan and a concise description of the facility features that affect emergency response, e.g., location of communications and assessment centers, location of assembly and relocation areas, identification of process and storage areas for radioactive and other hazardous materials. The arrangement of structures and major equipment items should be indicated on plan and elevation drawings in sufficient number and detail to provide a reasonable understanding of the general layout of the plant. Any additional features of the plant likely to be of special interest because of their relationship to safety should be identified.

2.0 TYPES OF ACCIDENTS

Emergency planning is concerned with individual and organizational responses to a range of potential accidents, including those accidents that have been hypothesized but that have a very low probability of occurrence.

2.1 Description of Postulated Accidents

Briefly describe accidents that could result in the release of significant amounts of radioactive or other hazardous material in terms of their relation to the process and the physical location where the accident could occur. Describe how the accident could happen (equipment malfunction, instrument failure, human error, etc.), possible complicating factors, and the possibility of onsite and offsite consequences.

2.2 Detection of Emergency Conditions

Describe the means provided to detect and alert the licensee's operating staff to any abnormal operating condition or to any other danger to the continued safe operation of the facility (e.g., fire or natural hazards such as would result in a severe weather warning). Describe the means for detecting accidental releases of radioactive or other hazardous materials, the method or device used to provide an alarm, and the response anticipated to the alarm. Examples are smoke detectors, process alarms, and criticality alarms. Indicate at what stage of the emergency the abnormal condition would be detected. Also indicate if the area of the event is under continuous visual observation.

- (2) Notification to the NRC if required by regulation or license condition.
- (3) Decision to escalate to Alert, if appropriate.
- (4) Decision to terminate the Unusual Event.

3.2.2 Alert

The purpose of declaring an Alert is to ensure that emergency personnel are alerted and at their emergency duty stations to mitigate the consequences of the accident, that the emergency is properly assessed, that offsite officials are notified, and that steps can be taken to escalate the response quickly if necessary. The licensee should describe how and by whom the following actions will be taken:

- (1) Decision to declare an Alert.
- (2) Activation of onsite emergency response organization.
- (3) Notification to offsite response authorities, if required by local or state regulations, within one hour of declaration of an Alert, or as specified by local or state regulations.
- (4) Notification to the NRC immediately after notification of offsite authorities, and in any case within one hour of the declaration of an Alert.
- (5) Decision to initiate any onsite protective actions.
- (6) Decision to escalate to Site Area Emergency, if appropriate.
- (7) Decision to terminate the emergency or enter Recovery Mode.

3.2.3 Site Area Emergency

The purpose of declaring a Site Area Emergency is to ensure that the public is adequately protected, that offsite officials are amply informed in order to carry out their obligation with respect to this protection, and to obtain augmentation of licensee response forces if necessary. The licensee should describe how and by whom the following actions will be taken:

- (1) Decision to declare a Site Area Emergency.
- (2) Activation of onsite emergency response organization.
- (3) Notification to state and local offsite response authorities of the status and reason for the emergency within 15 minutes after the declaration of a Site Area Emergency.
- (4) Notification to the NRC immediately after notification of the appropriate offsite response organizations and not later than one hour after the licensee has declared a Site Area Emergency.
- (5) Decision to escalate to a General Emergency, if appropriate.
- (6) Decision to initiate any onsite protective actions.
- (7) Decision to terminate the emergency or enter Recovery mode.

3.3 Information to be Communicated

The licensee should be prepared to provide clear, concise information to offsite response organizations. The communication should avoid technical terms and jargon and should be so couched as not to give an under- or over-valuation of the seriousness of the incident. Describe the types of information that will be communicated with respect to facility status, releases of radioactive or other hazardous materials, and recommendations for protective actions, if any, to be taken by offsite response organizations. A standard reporting form should be developed to facilitate timely notification. Provide assurance that the information and that it is periodically reaffirmed with these agencies.

4.0 RESPONSIBILITIES

In this chapter, describe the emergency organization to be activated for the possible events onsite and its augmentation and support offsite. Delineate the authorities and responsibilities of key individuals and groups, and identify the communication chain for notifying, alerting, and mobilizing the necessary personnel.

4.1 Normal Plant Organization

Provide a brief description of the plant organization and identify those individuals that have the responsibility and authority to declare an emergency and to initiate the appropriate response.

4.2 Onsite Emergency Response Organization

Describe the onsite emergency organization for controlling each emergency class, including periods when normal operations are not being conducted. Use organization charts and tables when appropriate.

4.2.1 Direction and Coordination

Designate the position of the person and alternate(s) who have the overall responsibility for implementing and directing the emergency procedures. Discuss this person's duties and authority, including control of the situation, termination of the emergency condition, and coordination with the staff and offsite personnel who augment the staff or require information concerning the event, as well as authority to delegate responsibilities. Indicate what emergency responsibilities, if any, cannot be delegated by the person in overall charge of emergency response.

4.2.2 Plant Staff Emergency Assignments

Specify the organizational group or groups that are assigned to the following functional areas of emergency activity, including the personnel assignment rationale for working and nonworking hours. For each group, describe its duties, authority, and interface with other groups and outside assistance.

The functional groups should provide capability in the following areas:

- Plant systems operations;
- Fire control;
- Personnel accountability;
- Rescue operations;
- First aid;
- Communications;
- Radiological survey and assessment;
- Decontamination of personnel;
- Plant security and access control;
- Repair and damage control;
- Facility and equipment decontamination;
- Post-event assessment;
- Recordkeeping.

4.3 Local Offsite Assistance to Facility

Describe provisions and arrangements for assistance to onsite personnel during and after an emergency. Indicate location of local assistance with respect to the facility if not previously stated. Identify the services to be performed, means of communication and notification, and type of agreements that are in place for:

- Medical treatment facilities;
- First aid personnel and ambulance service;
- Fire fighting;
- Law enforcement assistance.

Describe the measures that will be taken to ensure that offsite agencies maintain an awareness of their respective roles in emergency response and have the necessary periodic training, equipment, and supplies to carry out their emergency response functions.

4.4 Coordination with Participating Government Agencies

Identify the principal state agency and other government (local, county, state, and federal) agencies or organizations having responsibilities for radiological or other hazardous material emergencies in the vicinity of the facility. For each agency or organization, describe:

- Its authority and responsibility in a radiological or hazardous material emergency and its interface with others, if any;
- Its specific response capabilities in terms of personnel and resources available;
- Its location with respect to the facility.

Typical agencies to be included are the local emergency planning committee established under the Emergency Planning and Community Right-To-Know Act of 1986 and state departments of health, environmental protection, and/or emergency/disaster control. Assure that the licensee will meet at least annually with each offsite response group to review items of mutual interest.

5.0 EMERGENCY RESPONSE MEASURES

Specific emergency response measures should be identified for each emergency class and related to action levels or criteria that specify when the measures are to be effected. Response measures include assessment actions, corrective actions, onsite and offsite protective actions, exposure control, authorization of emergency exposures in excess of Part 20 limits, and aid to injured onsite persons.

5.1 Activation of Emergency Response Organization

Describe the means used to activate the emergency response organization for each class of emergency during both working and nonworking hours. Include a description of the message authentication scheme. Identify the activation levels for each class and relate them to the responsibilities identified in Chapter 4. In this and subsequent sections, describe the specific written procedures to be used.

5.2 Assessment Actions

For each class of emergency, discuss the actions to be taken to determine the extent of the problem and to decide what corrective actions may be required. Describe the types and methods of onsite and offsite sampling and monitoring that will be done in case of a release of radioactive or other hazardous material. Describe provisions for projection of offsite radiation exposures.

5.3 Corrective Actions

For the events identified in Chapter 2, describe briefly the means and equipment provided for mitigating the consequences of each type of accident. Include the mitigation of consequences to workers onsite as well as to the public offsite. In the event of a warning of impending danger, describe the criteria that will be used to decide on a process and/or facility shutdown and the steps that will be taken to ensure a safe, orderly shutdown of equipment. Mitigating actions could include actions to reduce or stop the release and actions to protect persons (e.g., evacuation, shelter, decontamination).

Means for limiting releases could include:

- sprinkler systems and other fire-suppression systems;
- fire detection systems;
- fire fighting capabilities;
- filtration or holdup systems;
- use of water sprays on vapor releases of uranium hexafluoride;
- automatic shutting off of process or ventilation flows.

5.4 Onsite Protective Actions

The nature of protective actions, the criteria for implementing those actions, the area involved, and the notification procedures to onsite persons should be described in the plan. In order to prevent or minimize exposure to radiation, radioactive materials, and other hazardous materials, the plan should provide for timely relocation of onsite persons, effective use of protective equipment and supplies, and use of appropriate contamination control measures.

5.4.1 Personnel Evacuation and Accountability

This segment of the emergency plan should include the following:

- Action criteria;
- The means and time required to notify persons involved;
- Evacuation routes, transportation of personnel, and assembly areas;
- Search and rescue;
- Monitoring of evacuees for contamination by or exposure to radiation and selection for contamination by or exposure to radiation and selection for medical attention, if required; and
- Criteria for control point and assembly area evacuation.

5.4.2 Use of Protective Equipment and Supplies

Effective use of protective equipment and supplies, including the proper onsite distribution or availability of special equipment, is an important measure for minimizing the effects of exposure to or contamination by radioactive materials. Measures that should be considered are:

- Individual respiratory protection;
- Use of protective clothing; and
- Communications equipment associated with any self-contained breathing apparatus.

For each measure that might be used, a description should be given of:

- Criteria for issuance if appropriate;
- Locations of emergency equipment and supplies;
- Inventory lists indicating the emergency equipment and supplies at each specified location; and
- Means for distribution of these items.

5.4.3 Contamination Control Measures

Describe provisions for preventing further spread of radioactive materials and for minimizing radiation exposures from radioactive materials unshielded or released by abnormal conditions. Onsite protective actions should be described and should include:

- Isolation and area access control;
- Criteria for permitting return to normal use.

Action criteria for implementation of the measures planned should be described.

5.5 Exposure Control in Radiological Emergencies

This section covers means for controlling radiological exposures for emergency workers.

5.5.1 Emergency Radiation Exposure Control Program

5.5.1.1 Radiation Protection Program

Describe an onsite radiation protection program to be implemented during emergencies, including methods to comply with exposure guidelines. Identify individual(s), by position or title, who can authorize workers to receive emergency doses. Procedures shall be provided in advance for permitting onsite volunteers to receive radiation doses in the course of carrying out lifesaving and other emergency activities. Procedures should provide for expeditious decision-making and a reasonable consideration of relative risks.

5.5.1.2 Exposure Guidelines

Specify onsite exposure guidelines consistent with EPA Emergency Worker and Lifesaving Activity Protective Actions Guides (EPA 520/1-75/001), viz., less than 75 rems planned whole-body exposures for lifesaving actions and less than 25 rems where it is desirable to enter a hazardous area in order to control fires, eliminate further escape of effluents, or to protect facilities. Note the criteria for exposure to low-enriched uranium based on its chemical toxicity. Exposure guidelines should be provided for:

- Removal of injured persons;
- Undertaking corrective actions;
- Performing assessment actions;
- Providing onsite first aid;
- Performing personnel decontamination;
- Providing ambulance service; and
- Providing offsite medical treatment.

5.5.1.3 Monitoring

Describe provisions for a capability to determine the doses and dose commitments from any internally deposited radioisotopes received by emergency personnel involved in any nuclear accident, including volunteers. Include provisions for distribution of dosimeters, both self-reading and permanent record devices, and means for assessing inhalation exposures. Describe provisions for assuring that dose and dose commitment records are maintained for emergency workers involved in any nuclear accident. (Detailed guidance for developing bioassay programs and environmental sampling programs is being prepared by the NRC and is scheduled to be available to the public in February 1988.)

5.5.2 Decontamination of Personnel

Specify action levels for determining the need for personnel decontamination. Describe the means for radiological decontamination of emergency personnel, supplies, instruments, and equipment, and the means for collecting and handling radioactive wastes. Describe provisions for surveying and decontaminating relocated onsite personnel, including provisions for extra clothing and decontaminates suitable for the type of contamination expected.

5.6 Medical Transportation

Specify how injured personnel, who may also be radiologically contaminated, will be transported to medical treatment facilities.

5.7 Medical Treatment

Describe arrangements made for local and backup hospital and medical services and their capabilities for the evaluation and treatment of radiation contamination

and exposure to individuals. For both hospital and medical services, the Plan should incorporate assurance not only that the required services are available but also that persons providing the services are prepared and qualified to handle radiological emergencies.

6.0 EMERGENCY RESPONSE EQUIPMENT AND FACILITIES

In this chapter, describe the onsite equipment and facilities designated for use during emergencies. Provide sufficient detail to allow the NRC staff to determine the adequacy of the equipment to perform its function during an emergency.

6.1 Control Point

Describe the principal and alternate location(s) from which control and assessment for the emergency will be exercised. Identify the criteria used to predetermine the number and location of control points in order to ensure that at least one will be habitable during any emergency. Indicate the means for identifying the control point that will be used in a given emergency. Specify the criteria for evacuating a control point and re-establishing control from an alternate location.

6.2 Communications Equipment

6.2.1 Onsite Communications

Describe the primary and any alternate onsite communication system(s) that would be required to perform vital functions in transmitting and receiving onsite information throughout the course of an emergency and subsequent recovery.

6.2.2 Offsite Communications

Identify a backup means for offsite communications, other than commercial telephone, for notification of emergencies or requests for assistance.

6.3 Onsite Medical Facilities

Describe the facilities and medical supplies at the site designated for emergency first-aid treatment and decontamination of onsite individuals.

6.4 Emergency Monitoring Equipment

List and describe the dedicated emergency equipment that will be available for personnel and area monitoring as well as that for assessing the release of radioactive materials to the environment. The description should include the purpose to be served. The location for all monitoring equipment should be described. Include similar descriptions of routine effluent monitors and meteorological measurement systems, if present. Describe how those are to be used to assess the magnitude and dispersion of releases. Include information in Section 6.2 by cross-reference if appropriate.

7.0 MAINTENANCE OF EMERGENCY PREPAREDNESS CAPABILITY

7.1 Written Emergency Plan Implementing Procedures

Identify the means for assuring that written emergency plan implementing procedures will be prepared and distributed to all affected parties. Assure that these procedures will clearly state the duties, responsibilities, action levels, and actions to be taken by each group or individual in responding to an emergency condition. Describe provisions for approval of the procedures, making and distributing changes to the procedures, and ensuring that each person responsible for an emergency response function has easy access to a current copy of each implementing procedure that pertains to his or her function(s).

7.2 Training

Describe the topics and general content of training programs used for annual training of the onsite emergency response staff. Specify the training afforded to those personnel who prepare, maintain, and implement the emergency plan. Assure that the implementing procedures include schedules, training lesson plans, and the frequency of retraining, and the estimated number of hours of initial training and retraining that will be provided. Include the training requirements for each position in the emergency organization. Describe training to be provided in the use of protective equipment, such as respirators. Describe the annual training program given to onsite personnel who are not members of the emergency response staff so that they are aware of what actions they may have to take following the declaration of an emergency.

7.3 Drills and Exercises

Describe provisions for the conduct of periodic drills and exercises to test the adequacy of timing and content of implementing procedures, to test emergency equipment and instrumentation, and to ensure that the emergency personnel are familiar with their duties. Preplanned descriptions of accidents should be used to prepare scenarios appropriate to the objectives of each drill and exercise. The procedures should include a requirement for the use of one or

more nonparticipating observers during exercises to evaluate the effectiveness of the personnel, the procedures, and the readiness of equipment and instrumentation, and to recommend needed changes.

7.3.1 Annual Exercises

Assure that an exercise will be held annually and that offsite response organizations will be invited to participate in the annual exercise in order to ensure coordination with offsite assistance organization(s), including testing of procedures and equipment for notification of and communication with local and state agencies. Assure that the NRC Regional Office will be notified before an exercise is held so that inspectors may observe if they wish. Assure that exercise scenarios are not known by exercise participants.

7.4 Exercise Critiques

Assure that a critique will be prepared for each exercise by one or more of the nonparticipating observers and that it will evaluate the appropriateness of the emergency plan, procedures, facilities, equipment, personnel training, and overall effectiveness. Describe how deficiencies identified by the critique will be timely corrected. (See Chapter 8 for records of exercises and exercise critiques.)

7.5 Review and Updating of the Plan and Procedures

Discuss the program to be used to annually review and audit the licensee's emergency preparedness program, including the emergency plan and its implementing procedures, to ensure that they are adequate. Describe the minimum qualifications of the person(s) that will be used for the annual audit and assure that the audits will be made by person(s) not having direct responsibility for implementing the emergency response program. The emergency plan and implementing procedures should be reviewed after each exercise, based on the evaluation of the exercise. Consideration should also be given to a review of the emergency plan and its revision, if necessary, whenever changes occur in processes, kinds of material at risk, or plant organization. Assure that offsite letters of agreement are reviewed annually and renewed at least every four years.

7.6 Maintenance and Inventory of Emergency Equipment, Instrumentation, and Supplies

Describe the plans for assuring that the equipment and instrumentation are in a working condition and that the stock of supplies is maintained. Provision should be made for monthly checking that the specified inventory is intact and in operating condition, including instrumentation operation and calibration, demand respirators, self-contained breathing apparatus, fire fighting equipment and gear, supplemental lighting, and communications equipment. The procedures should include timely corrective actions to be taken when deficiencies are found during these checks.

7.7 Verification of Emergency Telephone Numbers

Provide assurance that emergency telephone numbers will be verified at least quarterly.

8.0 RECORDS AND REPORTS

8.1 Records of Incidents

Describe the assignment of responsibility for reporting and recording incidents of abnormal operation, equipment failure, and accidents that led to a plant emergency. Provide a detailed description of the records that will be kept. The records should include the cause of the incident, personnel and/or equipment involved, extent of injury and/or damage (onsite and offsite) resulting from the incident, corrective actions taken to terminate the emergency, and the action taken or planned to prevent a recurrence of the incident. The records should also include the onsite and offsite support assistance requested and received. The title(s) of the personnel responsible for maintaining the records should be identified. The minimum retention time for each record should be specified. Those records unique to a radiological contingency, not covered by existing Commission regulations or license conditions, should be retained until the license is terminated.

8.2 Records of Preparedness Assurance

Provide a description of the records that will be kept to confirm the maintenance of preparedness to respond to emergencies. These records should include:

- Training and retraining;
- Drills, exercises, and related critiques;
- Inventory and locations of emergency equipment and supplies;
- Maintenance, surveillance, calibration, and testing of emergency equipment and supplies;
- Agreements with offsite support organizations; and
- Reviews and updates of the emergency plan and notification of all personnel and offsite agencies affected by an update of the plan or its implementing procedures.

9.0 RECOVERY

9.1 Plant Restoration

Describe plans for restoring the facility to a safe status. Although it is not possible to detail specific plans for every type of incident, the plans should include the general requirements for (1) assessing the damage to and the status of the facility's capabilities to contain radioactivity, (2) determining the actions necessary to reduce any ongoing releases of radioactive or other hazardous material and preventing further incidents, and (3) accomplishing the tasks to meet any required restoration action.

Specifically, the plans should include the requirements for checking and restoring to normal operations all safety-related equipment involved in the incident (e.g., criticality alarms, radiation monitoring instruments, respiratory protection equipment, fire-suppression and fire fighting equipment, containments, and air filters).

During any plant restoration operations, personnel exposures to radiation must be maintained within 10 CFR Part 20 limits and as low as reasonably achievable.

10.0 COMPLIANCE WITH COMMUNITY RIGHT-TO-KNOW ACT

Provide assurance that the licensee is in compliance with Title III of the Superfund Amendments and Reauthorization Act of 1986, Pub. L. 99-499, entitled "Emergency Planning and Community Right-To-Know Act of 1986," with respect to any hazardous materials possessed at the plant site.

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