70-687

UNITED STATES
NUCLEAR REGULATORY COMMISSION
WASHINGTON, D. C. 20555

FEB 11 1981

Union Carbide Corporation
ATTN: R. E. Bollinger, Vice President
General Manager, Nuclear Products
Sterling Forest Laboratory
P.O. Box 234
Tuxedo, New York 10987

Gentlemen:

Enclosed is an Order pertaining to License No. SNM-639 that requires you to prepare and submit radiological contingency planning information to NRC for review.

If you have any questions concerning provisions of the Order, please contact Mr. R. G. Page (301-427-4309) or Dr. F. D. Fisher (301-427-4135) of my staff.

Sincerely,

Richard E. Cunningham, Director
Division of Fuel Cycle and
Material Safety

UNITED STATES OF AMERICA
NUCLEAR REGULATORY COMMISSION

In the Matter of	)	Docket No. 70-687
	)	Materials License
Union Carbide Corporation	)	No. SNM-639
Medical Products Division	)	
P.O. Box 324		
Tuxedo, New York 10987		

ORDER TO MODIFY LICENSE

I

Union Carbide Corporation ("the licensee") with facilities in Tuxedo, New York, is the holder of Materials License No. SNM-639 issued by the Nuclear Regulatory Commission ("the Commission"). The license authorizes the possession and use of up to 13 kilograms of uranium-235 as enriched uranium and other isotopes in small quantities. The licensee produces isotopes for medical use from the fission of enriched uranium targets. The current license was renewed on January 13, 1976 and is presently being considered for renewal.

II

Before issuance of a license to operate, staff review of the application determined that the licensee can operate the facility in a safe manner. Nonetheless, based on the lessons learned from the accident at Three Mile Island and new perspectives on emergency preparedness and planning, the Commission has reevaluated the emergency preparedness requirements for its fuel cycle and materials licensees. The Commission has decided that significant improvements need to be made promptly to ensure that adequate onsite emergency response actions will be taken by licensees with major operations in cases where, even though unlikely, potentially serious radiation accidents could occur. The

operations licensed to be carried out pursuant to Materials License No. SNM-639 appear to fall in this category and require the development of a more comprehensive onsite radiological contingency plan than previously submitted to the Commission for review. Specifically, considerations are needed to ensure (1) that the plant contains adequate engineered safety features and is otherwise designed to limit releases of radioactive materials and radiation exposures in the event of an accident, (2) that a capability exists for measuring and assessing the significance of accidental releases of radioactive materials, (3) that appropriate emergency equipment and planning are provided onsite to protect workers against radiation hazards that might be encountered following an accident, (4) that notifications are made promptly to federal, state, and local government agencies, and (5) that necessary recovery actions are taken in a timely fashion to return the plant to a safe condition following an accident.

The information to be developed and documented is described in the enclosed "Standard Format and Content for Radiological Contingency Plans for Fuel Cycle and Materials Facilities" (Enclosure 1). In summary, the information to be submitted to NRC for review includes a (1) description of plant systems important to safety; (2) characterization of classes of credible emergencies that might occur; (3) description of radiological contingency measures for each class of emergency; (4) designation of authorities and responsibilities of key individuals and groups employed by the licensee; and (5) a description of equipment and facilities designated for use during radiation emergencies. The plan is to be directed toward mitigating the consequences of radiological emergencies and providing reasonable assurance that appropriate measures will be taken during

an emergency to assure protection of the public and minimize adverse environmental impacts. In preparing the plan, consideration should be given to a set of credible accidents ranging from almost everyday occurrences of small consequence through highly improbable, but not impossible, accidents such as those resulting from severe natural phenomena, human error, and multiple equipment failures, and sabotage.

III

In addition to onsite radiological contingency planning, as discussed in Section II above, offsite emergency response planning is also highly important. Offsite planning requirements for fuel cycle and materials facilities are being developed separately and will be considered in a proposed rulemaking to be published in the coming months. Within the framework of that rulemaking, NRC will carry out extensive coordination with state governments and the Federal Emergency Management Agency (FEMA) concerning applicable requirements.

IV

The Commission believes that it is prudent and necessary to require the licensee to develop and submit within 120 days of the effective date of this Order, or before, an onsite radiological contingency plan, as discussed in Section II above, applicable to operations licensed pursuant to Materials License No. SNM-639. Such a plan can be developed and effectively implemented apart from offsite emergency response planning, which necessarily involves state and local government emergency planning actions. The onsite radiological contingency plan is a necessary extension of protective actions taken by the licensee during normal operations. Such planning is essential to

ensure that proper plans are made by the licensee to protect the public from accidents that could result from the licensed operations. A lesson learned from the Three Mile Island accident is that accidents thought to be highly improbable can and will occur, and that proper emergency preparedness is required to mitigate radiological consequences.

The reporting and record keeping part of this onsite radiological contingency plan is subject to clearance by the General Accounting Office. GAO review and clearance will not stay the effective date of this Order as regards the requirement that the licensee develop the plan. Unless advised to the contrary, GAO clearance will be effective within 45 days from the date of this Order.

V

Accordingly, pursuant to sections 161b and 161o of the Atomic Energy Act of 1954, as amended, §§70.32(a)(8), 70.32(b)(2), and 70.32(b)(5) of 10 CFR Part 70, and §2.204 of 10 CFR Part 2, IT IS HEREBY ORDERED THAT within 120 days of the effective date of this Order, the licensee shall submit:

1. A radiological contingency plan in accordance with Enclosure 1 of this Order, "Standard Format and Content for Radiological Contingency Plans for Fuel Cycle and Materials Facilities," and an application for license amenement to incorporate such plan as approved as a condition of the license; <u>or alternatively</u>,

2. An application for license amendment to reduce the possession limits for radioactive materials below those specified in Enclosure 2 of this Order.

VI

The licensee or any person whose interest may be affected by this Order may, within 20 days of the date of the Order, request a hearing with respect to all or part of the Order. A request for a hearing shall be addressed to the Secretary of the Commission, U.S.N.R.C., Washington, D.C. 20555. A copy of the hearing request shall also be sent to the Executive Legal Director, U.S.N.R.C., Washington, D.C. 20555. If a person other than the licensee requests a hearing, that person shall set forth with particularity the nature of his or her interest and the manner in which his or her interest may be affected by this Order in accordance with 10 CFR §2.714(a)(2) of the Commission's Rules of Practice.

If a hearing is requested by the licensee or a person who has an interest affected by this Order, the Commission will issue an order designating the time and place of the hearing.

If no hearing is requested, this Order will become effective 20 days from the date of the Order. If a hearing is requested, this Order will become effective on the date specified in an order made following the hearing.

VII

If a hearing is held, the issue to be considered at the hearing shall be whether the licensee (1) shall submit a radiological contingency plan which complies with Enclosure 1 of this Order, "Standard Format and Content for Radiological Contingency Plans for Fuel Cycle and Materials Facilities," or (2) if a plan is not submitted as required in Section V (1) of the Order, should an application for a license amendment to reduce its possession limits for radioactive materials below those specified in Enclosure 2 of this Order be submitted.

FOR THE NUCLEAR REGULATORY COMMISSION

Richard E. Cunningham, Director
Division of Fuel Cycle and Material Safety

Dated at Silver Spring, Maryland this 11th day of February, 1981

ENCLOSURE 1

STANDARD FORMAT AND CONTENT FOR RADIOLOGICAL CONTINGENCY PLANS FOR FUEL CYCLE AND MATERIALS FACILITIES

January 9, 1981

Office of Nuclear Material Safety and Safeguards
U.S. Nuclear Regulatory Commission

ENCLOSURE 1

STANDARD FORMAT AND CONTENT FOR RADIOLOGICAL CONTINGENCY PLANS FOR FUEL CYCLE AND MATERIALS FACILITIES

January 9, 1981

Office of Nuclear Material Safety and Safeguards
U.S. Nuclear Regulatory Commission

STANDARD FORMAT AND CONTENT FOR RADIOLOGICAL CONTINGENCY PLANS FOR FUEL CYCLE AND MATERIALS FACILITIES

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INTRODUCTION

NRC has initiated an extensive program to reevaluate and upgrade the requirements for emergency preparedness planning of its fuel cycle and major materials licensees. In advance of that comprehensive regulatory program which includes rulemaking, a pressing need is believed by the Commission to promptly require radiological contingency planning of those licensed fuel cycle and major materials facilities exhibiting the potential for accidents which could result in: (i) offsite radiation doses exceeding 1 rem to the whole body, 5 rems to the thyroid, or 3 rems to other critical body organs, (ii) chemical exposures which could impact radiological safety, or (iii) potentially serious radiation overexposures of workers from a nuclear criticality incident or release of radioactive materials. Radiation doses of 1 rem to the whole body and 5 rems to the thyroid are the lowest Protective Action Guides (PAG's) established by the Environmental Protection Agency for triggering a protective action in public areas following a radiation accident. The radiological contingency planning requirements addressed in this guide apply only to onsite planning.

Radiological contingency planning is that part of emergency response preparedness contributed by plant operators to assure (1) that plants are properly configured to limit releases of radioactive materials and radiation exposures in the event of an accident, (2) that a capability exists for measuring and assessing the significance of accidental releases of radioactive materials, (3) that appropriate emergency equipment and procedures are provided onsite to protect workers against radiation hazards that might be encountered following an accident, (4) that notifications are promptly made offsite to Federal, State, and local government agencies, and (5) that necessary recovery actions are taken in a timely fashion to return a plant to a safe condition following an accident. Onsite radiological contingency planning should be sufficiently encompassing to meet the following objectives:

1. Confinement systems for radioactive material provide a proper level of protection against accidental releases, radiation alarms are used to detect accidental releases, and appropriate means exist for limiting accidental releases.

2. The responsibilities of the various supporting organizations are specifically established, and a requisite number of staff is designated to respond initially and continuously throughout any emergency that might occur.

3. On-shift licensee responsibilities for emergency response are unambiguously defined, adequate staffing is provided to assure that key functional areas will continuously operate, and the interfaces among various onsite response activities and any offsite support and response activities are specified.

4. Arrangements are made for requesting and effectively using assistance resources, and other organizations capable of augmenting the planned response are identified.

5. A standard emergency classification and action level scheme is in use by the licensee.

6. Procedures have been established for notification of State and local response organizations and for notification of emergency personnel by the licensee and for assuring that messages concerning emergencies are unambiguously communicated to these individuals.

7. Provisions exist for prompt communications to State and local response organizations, to other organizations, and to emergency personnel.

8. Adequate emergency facilities and equipment to support the emergency response are provided and maintained.

9. Adequate methods, systems, and equipment for assessing and monitoring actual or potential offsite releases of radioactive materials are in use.

10. Means for controlling radiological exposures, in an emergency, are established for emergency workers.

11. Arrangements are made for medical services for injured individuals who are contaminated.

12. General plans for recovery and reentry are developed.

13. Periodic exercises are conducted to evaluate major portions of emergency response capabilities, periodic drills are conducted to develop and maintain key skills, and deficiencies identified as a result of exercises and drills are corrected.

14. Radiological emergency response training is provided to those who may be called on to assist in an emergency.

15. Responsibilities for plan development and review and for distribution of plans are established, and the planners are properly trained.

Licensees who are required to prepare radiological contingency plans must submit them to the Director, Division of Fuel Cycle and Material Safety, NMSS, Nuclear Regulatory Commission, Washington, D.C. 20555, for review and approval. NRC will assess and evaluate the licensee's proposed response and recovery actions and will use the information provided to plan NRC's response activities. For completeness, the plan must include descriptions of (i) facilities, (ii) chemical and physical processes, (iii) types, forms, and quantities of

radioactive and other hazardous materials, (iv) distribution of radioactive material inventories, (v) specifications of structures, systems, and components important to safety, and (vi) the elements of emergency planning.

Purpose and Applicability

This Standard Format has been prepared to help assure uniformity and completeness in the preparation and review of Radiological Contingency Plans.

The licensee is encouraged to prepare his Radiological Contingency Plan in accordance with the Standard Format and to provide all information to support the conclusion that his plan is adequate and capable of implementation. The information specified in the Standard Format is the minimum for a Radiological Contingency Plan. Although strict conformance with the Standard Format is not mandatory, presentation of an equivalent level of information is necessary. Additional information may be required for completion of the staff review of a particular plan. The information provided should be up-to-date with respect to the licensee's current radiological contingency planning and should reflect current awareness of the need for preplanning for abnormal occurrences and current state of the art and technology for emergency management. Information requirements which are deemed by the licensee to be not applicable should be explicitly so designated and justification provided unless the nonapplicability is obvious.

Page Numbering

Pages should be numbered by chapter and sequentially within the chapter, e.g., the first page of Chapter 3 would be 3-1, etc. Do not number the entire report sequentially.

Format References

References in the application to this Standard Format should be by chapter, section number, and subsection number.

Procedures for Updating or Revising Pages

The updating or revising of data and text should be on a replacement page basis.

Each changed or revised portion of a page should be highlighted by a vertical line. The line should be on the margin opposite the binding margin at each line changed or added. All pages submitted to update, revise, or add pages to the report should show the date of change. The transmittal letter should include an index page that lists the pages to be inserted and the pages to be removed. Where major changes or additions are made, pages for a revised Table of Contents should be provided.

Number of Copies

The licensee should submit six copies of his Radiological Contingency Plan.

Compatibility

The licensee should ensure that the Radiological Contingency Plan is compatible with the other sections of his license or license application.

Upon receipt of the prepared plan, the Regulatory staff will perform a preliminary review to determine if the plan provides a reasonably complete presentation of the information needed. The Standard Format will be used by the staff as a guideline to identify the information needed. If the application does not provide a reasonably complete presentation of the necessary information, an additional submission will be requested and further review will be suspended until needed information is provided.

Use of the Standard Format

The licensee should follow the numbering system of the Standard Format at least down to the level of sections such as Section x.y.z. Under some circumstances, certain sections may not be applicable to a specific plan. In such cases, that should be explicitly stated, and sufficient information should then be provided to support that conclusion.

Style and Composition

A table of contents should be included in each plan.

The plan should strive for clear presentations of the information provided. Confusing or ambiguous statements and general statements of intent should be avoided. Definitions and abbreviations should be consistent throughout the submittal and consistent with generally accepted usage.

The licensee should direct his response to the subject matter of each section. Wherever possible, duplication of information should be avoided. Thus, information already included in other sections of the plan may be covered by specific reference to those sections.

Where numerical values are stated, the number of significant figures should reflect the accuracy or precision to which the number is known. The use of relative values should be indicated clearly.

Drawings, diagrams, and tables should be used where the information may be presented more understandably or more concisely by such means. These should be located in the section in which they are primarily referenced. Due concern should be taken to ensure that all information presented in drawings is legible, symbols are defined, and drawings are not reduced to the extent that they cannot be read by unaided normal eyes.

Physical Specifications of Submittals

All material submitted as part of the license application should conform to the following physical dimensions of page size, quality of paper and inks, and printing and binding specifications:

1. Paper Size

Text pages: 8-1/2 x 11 inches.

Drawings and graphics: 8-1/2 x 11 inches preferred; however, larger size is acceptable provided the finished copy, when folded, does not exceed 8-1/2 x 11 inches.

2. Paper Stock and Ink

Suitable quality in substance, paper color, and ink density for handling and for reproduction by microfilming.

3. Page margins

No less than one inch on the top, bottom, and binding side of all pages submitted.

4. Printing

Composition: text pages should be single spaced.

Type face and style: suitable for microfilming.

Reproduction: may be mechanically or photographically reproduced. All pages of the text may be printed on both sides with the image printed head to head.

5. Binding

Pages should be punched for looseleaf ring binding.

1.0 GENERAL DESCRIPTION OF THE PLANT/LICENSED ACTIVITY

The information in this section is to provide perspective about the plant and the licensed activity such that the adequacy and appropriateness of the licensee's contingency planning, emergency organization, and emergency equipment can be evaluated. Where this information duplicates information provided elsewhere in the licensee's various applications, it is recommended that it also be repeated here; however, it can be referenced instead if specific sections, paragraphs, and page numbers are cited.

1.1 Licensed Activity Description

Present briefly the principal aspects of the overall licensed activity. The following should be included: a general description of licensed and other activities conducted at the plant site; the location of the plant; the type, form, and quantities (possession limits) of radioactive materials; the types of product; and the wastes produced.

1.2 Site and Facility Description

Include a description of the principal characteristics of the site at which licensee activities are conducted. Indicate the site on a general area map (approximately 10-mile radius) and upon a United State Geographical Survey 7.5' topographical map(s). Provide a site plan or aerial photograph indicating onsite structures and near-site structures (about 1-mile radius). On this photograph or site plan, include the following: (1) location of population centers (office buildings, schools, arenas, stadiums, etc), (2) the location of facilities which could present potential evacuation problems (prisons, nursing homes, and hospitals), (3) identification of primary routes for access of emergency equipment or for evacuation as well as potential impediments to traffic flow (rivers, drawbridges, railroad grade crossings, one way streets, etc.), (4) location of any emergency facilities (fire station, police station, hospital with capability for handling radioactive contamination, etc.), (5) other sites of potential emergency significance (LPG terminals, pipelines, filling stations, etc.) Indicate approximate populations, both commuters and residents, associated with onsite and near-site structures. Provide a detailed site plan and a concise description of the facilities. The description should include a discussion of the principal design criteria; descriptions of process or manufacturing systems; confinement systems for handling and storage of radioactive and other hazardous materials, the release of which could impact adversely on the safety of licensed operations; auxiliary systems such as ventilation; radioactive waste management system(s); alarms to detect accidental releases; and means for limiting accidental releases when detected. Provide equipment, piping, and instrumentation diagrams of systems pertinent to the processing or confinement of radioactive materials to further describe the functions and interactions of plant systems. 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.

1.3 Process Description

Descriptions of the process(es) used in the facility should be included. Identify reactants, products, and waste streams. Provide sufficient detail, including process flow diagrams, in the discussion to provide an understanding of the processes involved.

2.0 ENGINEERED PROVISIONS FOR ABNORMAL OPERATIONS

The impacts of radiological contingencies are affected by the nature of a particular event; design of plant facilities, processes, and control operations which contribute to limiting radiation exposures or releases of radioactive materials; implementation of emergency response actions; and recovery actions taken. In this section describe those facility process and control measures which contribute to: (1) promptly detecting accidental releases of radioactive materials and effecting corrective or mitigating responses; (2) limiting releases of radioactive materials and potentially dangerous nonradioactive materials which could adversely affect the safety of licensed operations; and (3) permitting safe and prompt recovery actions to be taken in the event of abnormal operations.

2.1 Criteria for Accommodation of Abnormal Operations

In this section, describe the design criteria for performance of facility systems during abnormal operations and conditions.

2.1.1 Process Systems

Describe the performance criteria for response of process systems to abnormal conditions resulting from operator error or malfunction of process and control equipment.

2.1.2 Alarm Systems and Release Prevention

Specify criteria for detectors and alarms provided to detect and alert operators to accidental releases of radioactive materials and describe the responses anticipated to effectively limit accidental releases and to mitigate the consequences of such releases.

2.1.3 Support Systems

Describe the performance criteria for response of support systems to abnormal conditions such as operator error, malfunctions of equipment or controls, accidents, and severe natural phenomena. Those should include but are not necessarily limited to:

2.1.3.1 Structural Performance vs. Site Environmental Factors

2.1.3.1.1 Severe Natural Phenomena

2.1.3.1.2 Accidents at Neighboring Activities

2.1.3.2 Confinement Barriers and Systems

2.1.3.3 Access and Egress of Operating Personnel and Emergency Response Teams

2.1.3.3.1 Onsite

2.1.3.3.2 Near site

2.1.3.4 Fire and Explosion Resistance and Suppression

2.1.3.5 Shielding

2.1.4 Control Operations

Describe the criteria for controlling and maintaining the capabilities of plant engineered systems to respond as planned to abnormal conditions.

2.2 Demonstration of Engineered Provisions for Abnormal Operation

In this section describe facility systems important to safety and demonstrate that their anticipated performances (regarding the detection and sounding of an alarm for accidental releases of radioactive materials or potentially hazardous nonradioactive materials, which could adversely affect radiological safety, and limiting releases of radioactive materials and exposures of persons to radiation) during and following an abnormal operation or condition are in accordance with the criteria of Section 2.1.

2.2.1 Process Systems

Describe the anticipated performances of process systems under abnormal conditions caused by such things as operator error or malfunctions or process equipment and controls.

2.2.2 Alarm Systems and Release Prevention Capability

Describe detectors, alarms, and other components and the anticipated performance of all effluent alarm systems under abnormal conditions and describe the strengths and weaknesses of the methods planned for limiting releases when such releases are detected.

2.2.3 Support Systems

Describe the anticipated behavior of support systems during abnormal conditions such as malfunctions of equipment or controls, operator error, accidents, and severe natural phenomena.

2.2.4 Control Operations

Describe in this subsection a safety assurance program which includes provisions for monitoring and auditing plant equipment and procedures for continued safety, for detecting deteriorating safety performance, and for identifying where improvements are needed.

3.0 CLASSES OF RADIOLOGICAL CONTINGENCIES

3.1 Classification System

The radiological contingency plan should characterize several classes of emergency situations and relate them to response levels. The system of classification used should consist of largely mutually exclusive groupings, and it should cover the entire range of credible emergency situations. Each defined class should be associated with a particular set of immediate response actions that are to be taken to cope with the situations.

Specific implementing procedures should be prepared for each identified class of radiological contingency.

A recommended classification scheme is described in Section 3.2. In it, emergency situations are classified into the four categories specified in Section IV of Appendix E of 10 CFR Part 50 i.e., Notification of Unusual Event, Alert, Site Area Emergency, General Emergency.

The rationale for the notification and alert classes is to provide early and prompt notification of minor events which could lead to more serious consequences given operator error or equipment failure or which might be indicative of more serious conditions which are not yet fully realized. A gradation is provided to assure fuller response preparations for more serious indicators. The site area emergency class reflects conditions where some significant releases are likely or are occurring but where an uncontrolled release situation is not indicated based on current information. In this situation, full mobilization of emergency personnel in the near site environs is indicated as well as dispatch of monitoring teams and associated communications. The general emergency class involves actual or imminent uncontrolled releases of large inventories.

3.2 Recommended Classification Scheme

Class

NOTIFICATION OF UNUSUAL EVENT

Class Description

Unusual events are in process or have occurred which indicate a potential degradation of the level of safety of the plant. No releases of radioactive material requiring offsite response or monitoring are expected unless further degradation of safety systems occurs.

Purpose

Purpose of offsite notification is to (1) assure that the first step in any response later found to be necessary has been carried out, (2) bring the operating staff to a state of readiness, and (3) provide systematic handling of unusual events information and decisionmaking.

Licensee Actions

1. Promptly inform State and/or local offsite authorities of nature of unusual condition as soon as discovered.
2. Augment on-shift resources as needed.
3. Assess and respond.
4. Escalate to a more severe class, if appropriate.

   or

5. Close out with verbal summary to offsite authorities, followed by written summary within 24 hours.

Class

ALERT

Class Description

Events are in process or have occurred which involve an actual or potential substantial degradation of the level of safety of the plant. Any releases are expected to be limited to small fractions of the EPA Protective Action Guideline exposure levels.

Purpose

Purpose of offsite alert is to (1) assure that emergency personnel are readily available to respond if situation becomes more serious or to perform confirmatory radiation monitoring if required and (2) provide offsite authorities current status information.

Licensee Actions

1. Promptly inform State and/or local authorities of alert status and reason for alert as soon as discovered.

2. Augment resources and activate onsite operational support emergency facilities and equipment. Bring key emergency personnel to standby status.

3. Assess and respond.

4. Dispatch onsite monitoring teams and associated communications.

5. Provide periodic plant status updates to offsite authorities.

6. Provide periodic meteorological assessments to offsite authorities and, if any releases are occurring, dose estimates for actual releases.

7. Escalate to a more severe class, if appropriate.

or

8. Close out or recommend reduction in emergency class by verbal summary to offsite authorities followed by written summary within 8 hours.

Class

SITE AREA EMERGENCY

Class Description

Events are in process or have occurred which involve actual or likely major failures of plant functions needed for protection of the public. Offsite releases are not expected to exceed EPA Protective Action Guideline exposure levels except near site boundary.

Purpose

Purpose of the site area emergency declaration is to (1) assure that response centers are manned, (2) assure that monitoring teams are dispatched, (3) assure that personnel required for evacuation of site areas are at duty stations if situation becomes more serious, (4) provide consultation with offsite authorities, and (5) provide updates for the public through offsite authorities.

Licensee Actions

1. Promptly inform State and/or local offsite authorities of site area emergency status and reason for emergency as soon as discovered.

2. Augment resources by activating onsite emergency response organization.

3. Assess and respond.

4 Dispatch onsite and offsite monitoring teams and associated communications.

5. Dedicate an individual for plant status updates to offsite authorities.

6. Make senior technical and management staff available onsite for consultation with NRC and State on a periodic basis.

7. Provide meteorological and dose estimates to offsite authorities for actual releases via a dedicated individual or automated data transmission.

8. Provide release and dose projections based on available plant condition information and foreseeable contingencies.

9. Escalate to general emergency class, if appropriate.

or

10. Close out or recommend reduction in emergency class by briefing of offsite authorities followed by written summary within 8 hours of closeout or class reduction.

Class

GENERAL EMERGENCY

Class Description

Events are in process or have occurred which involve actual or imminent loss of confinement integrity. Releases can be reasonably expected to exceed EPA Protective Action Guideline exposure levels offsite for more than the immediate site area.

Purpose

Purpose of the general emergency declaration is to (1) initiate predetermined protective actions for the public, (2) provide continuous assessment of information from licensee and offsite organization measurements, (3) initiate additional measures as indicated by actual or potential releases, (4) provide consultation with offsite authorities, and (5) provide updates for the public through offsite authorities.

Licensee Actions

1. Promptly inform State and local offsite authorities of general emergency status and reason for emergency as soon as discovered (Parallel notification of State/local).

2. Augment resources by activating onsite emergency response organiztion.

3. Assess and respond.

4. Dispatch onsite and offsite monitoring teams and associated communications.

5. Dedicate an individual for plant status updates to offsite authorities.

6. Make senior technical and management staff available onsite for consultation with NRC and State personnel on a periodic basis.

7. Provide meteorological and dose estimates to offsite authorities for actual releases via a dedicated individual or automated data transmission.

8. Provide release and dose projections based on available plant condition information and foreseeable contingencies.

or

9. Close out or recommend reduction of emergency class by briefing of offsite authorities followed by written summary within 8 hours of closeout or class reduction.

3.3 Range of Postulated Accidents

Emergency planning is concerned with individual and organizational responses to the continuum of potential accident situations including those accidents that have been hypothesized but have a very low probability of occurrence. The radiological contingency plan should demonstrate how the postulated accidents are encompassed within emergency characterization classes. This section of the plan should describe how the postulated accidents are covered by the plan and should provide a summary analysis of their implication for emergency planning, including assessment of offsite impact, instrumentation capability for prompt detection and continued assessment, and manpower needs in relation to the anticipated sequence and timing of events.

4.0 ORGANIZATION FOR CONTROL OF RADIOLOGICAL CONTINGENCIES

In this chapter, describe the radiological contingency 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 radiological contingency response.

4.2 Onsite Radiological Contingency Response Organization

Describe the onsite radiological contingency organization for controlling each class of emergency including the times when normal operations are not being conducted. As appropriate, use organization charts and tables.

4.2.1 Direction and Coordination

Designate the position of the person and his alternate(s) who have the overall responsibility for implementing and directing the radiological contingency procedures. Discuss his 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.

4.2.2 Plant Staff Radiological Contingency Assignments

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

The functional groups should provide capability in the following areas:

- Plant Systems Operations
- Radiological Survey and Assessment,
- Fire Control
- Rescue Operations
- First Aid/Decontamination of Personnel
- Plant Security and Access Control
- Repair and Damage Control

- RecordKeeping
- Personnel Accountability
- Facility Decontamination
- Communications
- Post-Event Assessment

4.3 Offsite Assistance to Facility

Describe provisions and arrangements for assistance to onsite personnel during and after a radiological emergency. 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
- Services of other Medical Personnel On Site
- Firefighting Backup
- Police Assistance
- Other

4.4 Coordination with Participating Government Agencies

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

- Its authority and responsibility in a radiological 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 law enforcement, departments of health or environmental protection, emergency/disaster control agencies, and the Regional Coordinating Offices for Radiological Assistance of the U.S. Department of Energy.

5.0 RADIOLOGICAL CONTINGENCY MEASURES

Specific radiological contingency response measures should be identified for each radiological contingency class and related to action levels or criteria that specify when the measures are to be implemented. Response measures include assessment actions, corrective actions, protective actions, exposure control, and aid to injured persons.

5.1 Activation of Radiological Contingency Response Organization

Describe the means to activate the radiological contingency response personnel for each class of radiological contingency as defined in Section 3.1, including a general description of the message authentication scheme. Identify the action levels selected and relate them to the responsibilities identified in Chaptor 4.0. In this section and subsequent sections, attach 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.

5.3 Corrective Actions

Discuss the response actions that will be taken for the events identified in Chapter 3.0.

5.4 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 and radioactive 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 from Site and Accountability

This segment of the radiological contingency plan should include the following items:

a. Action criteria,

b. The means and the time required to notify persons involved,

c. Evacuation routes, transportation of personnel, and reassembly areas,

d. Missing persons check,

c. Radiological monitoring of evacuees and decontamination and selection for medical attention, if required.

5.4.2 Use of Protective Equipment and Supplies

Effective use of protective equipment and supplies, including the proper onsite distribution of special equipment, is an important measure for minimizing the effect of radiological exposures or contamination problems. Measures that should be considered include:

1. Individual respirator protection and

2. Use of protective clothing

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

1. Criteria for issuance,

2. Locations of items,

3. Means of distribution.

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 the following items:

1. Isolation and area access control,

2. Criteria for permitting return to normal use.

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

5.5 Exposure Control in Radiological Contingencies

Describe means for controlling radiological exposures, in an emergency, for emergency workers. The means for controlling radiological exposures should include exposure guidelines consistent with EPA Emergency Worker and Lifesaving Activity Protective Action 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 protect facilities, eliminate further escape of effluents, or to control fires.

5.5.1 Emergency Exposure Control Program

5.5.1.1 Exposure Guidelines

Specify onsite exposure guidelines consistent with EPA Emergency Worker and Lifesaving Activity Protective Actions Guides (EPA 520/1-75/001) for:

a. removal of injured persons;

b. undertaking corrective actions;

c. performing assessment actions;

d. providing first aid;

e. performing personnel decontamination;

f. providing ambulance service; and

g. providing medical treatment services.

5.5.1.2 Radiation Protection Program

Describe an onsite radiation protection program to be implemented during emergencies, including methods to implement exposure guidelines. Identify individual(s), by position or title, who can authorize workers to receive emergency doses. Procedures shall be worked out 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 decisionmaking and a reasonable consideration of relative risks.

5.5.1.3 Monitoring

Describe provisions for 24-hour-per-day 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.

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, wounds, supplies, instruments, and equipment, and the means for collecting and handling radioactive wastes. Describe provisions for decontaminating relocated onsite personnel, including provisions for extra clothing and decontaminants suitable for the type of contamination expected.

5.6 Medical Transportation

Specify arrangements for transporting injured personnel, who may also be radiologically contaminated, 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 exposure and uptake. 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 EQUIPMENT AND FACILITIES

In this chapter, describe the licensees' equipment and facilities designated for use during a radiological emergency. 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, if provided for, alternate onsite location from which emergency control is exercised.

6.2 Communications Equipment

Describe the onsite communication systems that would be required to perform vital functions in transmitting and receiving information throughout the course of an emergency and subsequent recovery.

6.3 Facility for Assessment Teams

Describe the facilities designated for use by staff performing post-accident and recovery assessment and protective action functions.

6.4 Onsite Medical Facilities

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

6.5 Emergency Monitoring Equipment

List and describe the 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 and the capability of the equipment to function properly during an emergency. Operational data for the instrumentation such as sensitivity, range, backup power, calibration frequency as well as any alarm function and associated set point should be included. The location of all monitoring equipment should be described. Include similar descriptions of effluent monitors and meteorological measurement systems. Describe how those are to be used to timely assess the magnitude and likely dispersion of releases.

7.0 MAINTENANCE OF RADIOLOGICAL CONTINGENCY PREPAREDNESS CAPABILITY

7.1 Written Procedures

Identify the means for assuring that implementing written procedures clearly state the duties, responsibilities, action levels, and actions to be taken by each group or individual in responding to an emergency condition. Discuss provisions for approval of the procedures and their periodic review for adequacy.

7.2 Training

Describe the programs and procedures used to train the onsite radiological emergency staff and the support offsite personnel. Specify the training afforded to those personnel who prepare, maintain, and implement Radiological Contingency Plans. Include schedules, training lesson plans, and the frequency of retraining and the estimated number of hours of training that will be provided.

7.3 Tests and Drills

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 radiological 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. When applicable, these exercises should contain provisions for coordination with offsite assistance organizations, including testing of procedures and equipment for communication and notification of local and state agencies. The procedures should include a requirement for the use of observers during drills and exercises to evaluate the effectiveness of the personnel, the procedures, and the readiness of equipment and instrumentation and to recommend needed changes. It is recommended that drills and exercises be held by the licensee annually with involvement of outside observers and support agencies at least once every five years.

7.4 Review and Updating of the Plan and Procedures

Discuss the program to be used to annually review the radiological contingency plans and procedures to assure that they are adequate. In addition to the input obtained from the evaluation of tests and drills above, consideration should be given to a defined periodic review time as well as a review whenever changes occur in processes, kinds of material or inventory at risk, and plant organization.

7.5 Maintenance and Inventory of Radiological 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 periodic checking that the specified inventory is intact and in operating condition, including instrumentation operation and calibration, demand respirators, supplemental lighting, and communications equipment. The procedures should include corrective action to be taken when deficiencies are found during these checks.

8.0 RECORDS AND REPORTS

8.1 Records of Incidents

In this section provide a detailed description of the records that will be kept of radiological contingencies according to the following classification: (1) notification of unusual event, (2) alert, (3) site area emergency, and (4) general emergency. The records should include the cause of the incident, personnel and/or equipment involved, extent of injury and/or damage 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 for recovery action. The title(s) of the personnel responsible for maintaining the records should be identified. The minimum retention time for each type 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

In this section provide a description of the records that will be kept to confirm the maintenance of preparedness to respond to radiological contingencies. These records include (1) training and retraining, (2) drills, exercises, and related critiques, (3) inventory and locations of emergency equipment and supplies, (4) maintenance, surveillance, and testing of emergency equipment and supplies, (5) agreements with offsite support organizations, and (6) reviews and updates of the radiological contingency plan and notification of all personnel and offsite agencies affected by an update of the plan and procedures.

8.3 Reporting Arrangements

In this section describe the arrangements for reporting accidents and related information offsite. These reports are needed to keep local, state, and federal agencies, corporate management, and the public informed on (1) the occurrence of an emergency condition, (2) its effect on the health and safety of operating personnel, the public and the environment, (3) progress on its control, and (4) recovery from the emergency condition. Responsibility for reporting information should be specified.

9.0 RECOVERY

9.1 Reentry

This section should discuss the criteria for reentry. Radiological criteria should be as described in Section 5.5.1 of this standard format. Reentry is the first step in recovery after an emergency.

9.2 Plant Restoration

This section should describe the 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 on-going 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 masks, air filters).

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

9.3 Resumption of Operations

This section should describe the criteria for resumption of operations. Operations should not be resumed until normal facility conditions have been restored, investigation has determined the cause of the incident, and necessary corrective actions have been taken. Any problems identified in the investigation should be resolved prior to resumption of operations.

ENCLOSURE 2

Licensed Possession Limits for Which
Licensee Radiological Contingency Plans are Required

Licensees exhibiting the potential for significant employee exposures from criticality incident or release of radioactive materials and for offsite radiation doses exceeding 1 rem to the whole body, 5 rems to the thyroid or 3 rems to other critical body organs are required to prepare and submit for review Radiological Contingency Plans. It is judged that licensees having possession limits of radionuclides as specified below do exhibit such potentials for employee and/or offsite exposures and, accordingly, shall prepare and submit Radiological Contingency Plans.

CONDITIONS

Where the license authorizes possession of a single radionuclide in forms other than as sealed sources, §30.4(r), or special form, §71.4(o), the licensee shall prepare and submit a Radiological Contingency Plan if the authorized possession limit exceeds that quantity specified for that radionuclide in the attached Schedule Limiting of Possession Limits.

Where possession of two or more radionuclides, in forms other than as sealed sources, §30.4(r), or special form, §71.4(o), is authorized by the license, the licensee shall prepare and submit a Radiological Contingency Plan if the sum of the quotients of the authorized possession limits for individual radionuclides divided by the quantities of those radionuclides specified in the attached Schedule of Limiting Possession Limits exceeds unity.

Where the license authorizes possession of a broad range of radionuclides, e.g., any byproduct material of atomic numbers 3 through 83, inclusive, in excess of those quantities specified in Schedule A of §33.100, e.g. Type A specific Licenses of Broad Scope, and in forms other than as sealed sources, §30.4(r) or special form, §71.4(o), the licensee shall prepare and submit a Radiological Contingency Plan if the quantity of any radionuclide authorized, either explicitly or implicitly, exceeds that quantity specified in the attached Schedule of Possession Limits or if the sums of the quotients of those quantities explicitly or implicitly authorized divided by the quantities of those radionuclides specified in the Schedule of Limiting Possession Limits exceeds unity.

Licensees possessing U-235, U-233, or plutonium in such quantities as to require criticality monitors and alarms in accordance with §70.24 are also required to prepare and submit for review Radiological Contingency Plans. Possession of large quantities of UF_6, even where no criticality hazards exist, shall also require preparation and submittal for review of Radiological Contingency Plans.

Schedule of Limiting Possession Limits Arranged Alphabetically by Elements

Radionuclide	Group Number	Limiting Possession Limit	
		Curies	Grams
Americium-241	I	0.30	0.09
Americium-243	I	0.30	1.5
Antimony-124	IV	1000	
Barium-140	V	2000	
Cadmium-113m	V	1500	
Calcium-45	IV	800	
Carbon-14	V	1300	
Californium-252	I	0.30	5.0×10^{-4}
Cesium-134	IV	350	
Cesium-137	IV	600	
Chromium-51	VI	150,000	
Cobalt-60	V	4000	
Copper-64	VI	50,000	
Curium-242	II	8.0	2.5×10^{-3}
Curium-244	I	0.50	6.0×10^{-3}
Gold-198	VI	100,000	
Hydrogen-3	V	6000	
Iodine-125	II	8.0	
Iodine-129	II	1.0	
Iodine-131	II	3.3	
Iridium-192	VI	50,000	
Iron-55	VI	30,000	
Iron-59	V	2400	
Krypton-85	V	7000	
Manganese-54	V	1500	
Manganese-56	VI	120,000	
Molybdenum-99	V	3000	
Neptunium-237	I	0.20	250
Nickel-63	V	5000	
Niobium-95	V	5000	
Phosphorous-32	III	15	
Plutonium-238	I	0.10	6.0×10^{-3}
Plutonium-239	I	0.10	1.5
Polonium-210	II	3.2	
Promethium-147	V	3500	
Ruthenium-103	V	1500	

Ruthenium-105	VI	15,000	
Scandium-46	V	2500	
Selenium-75	IV	500	
Silver-110m	IV	500	
Strontium-90	III	25	
Sulfur-35	IV	500	
Tantalum-182	VI	15,000	
Technetium-99m	VI	200,000	
Thallium-204	VI	30,000	
Thulium-170	IV	1000	
Thorium-228	I	0.30	4.0×10^{-4}
Tin-113	IV	1000	
Tin-123	IV	1000	
Tungsten-187	V	5000	
Uranium-233	II	5	500
Xenon-133	V	10,000	
Zinc-65	V	2500	
Zirconium-93	V	5000	
Zirconium-95	V	1300	

Schedule of Limiting Possession Limits
Arranged In Order of Increasing Limiting Possession Limits

	Radionuclide	Limiting Possession Limit Curies	Limiting Possession Limit Grams
Group I, Less than 1 Curie	Pu-238	0.10	6.0×10^{-3}
	Pu-239	0.10	1.5
	Np-237	0.20	250
	Am-241	0.30	0.09
	Th-228	0.30	4.0×10^{-3}
	Cf-252	0.30	5.0×10^{-4}
	Am-243	0.40	1.5
	Cm-244	0.50	6.0×10^{-3}
Group II, One Curie to Ten Curies	I-129	1.0	
	Po-210	3.2	
	I-131	3.3	
	U-233	5.0	500
	I-125	8.0	
	Cm-242	8.0	2.5×10^{-3}
Group III, Ten Curies to One Hundred Curies	P-32	15	
	Sr-90	25	
Group IV, One Hundred Curies to One Thousand Curies	Cs-134	350	
	S-35	500	
	Se-75	500	
	Ag-110m	500	
	Cs-137	600	
	Ca-45	800	
	Sn-113	1000	
	Sn-123	1000	
	Sb-124	1000	
	Tm-170	1000	
Group V, One Thousand to Ten Thousand Curies	C-14	1300	
	Zr-95	1300	
	Mn-54	1500	
	Ru-103	1500	
	Cd-113m	1500	
	Ba-140	2000	
	Fe-59	2400	
	Sc-46	2500	
	Zn-65	2500	
	Mo-99	3000	
	Pm-147	3500	
	Co-60	4000	
	Ni-63	5000	
	Zr-93	5000	
	Nb-95	5000	
	W-187		

	H-3	6000
	Kr-85	7000
	Ta-182	10,000
	Xe-133	10,000
Group VI, Over Ten Thousand Curies	Au-198	11,000
	W-187	15,000
	Fe-55	30,000
	Ir-192	40,000
	Cu-64	50,000
	Ru-103	50,000
	Ru-105	50,000
	Mn-56	120,000
	Cr-51	150,000
	Tc-99m	200,000