

APPENDIX C

EMERGENCY PREPAREDNESS EVALUATION REPORT

BY THE

DIVISION OF EMERGENCY PREPAREDNESS

AND ENGINEERING RESPONSE

OFFICE OF INSPECTION AND ENFORCEMENT

U.S. NUCLEAR REGULATORY COMMISSION

IN THE MATTER OF

CONNECTICUT YANKEE NUCLEAR POWER STATION

DOCKET NO. 50-213

INTRODUCTION

The Northeast Utilities Service Company submitted for review the Haddam Neck Nuclear Plant Emergency Plan, Revision 10, dated February 1, 1982.

The plan was reviewed against the 16 planning standards in Section 50.47 of 10 CFR Part 50, the requirements of Appendix E to 10 CFR Part 50, and the criteria of Regulatory Guide 1.101, Revision 2, which endorses NUREG-0654/FEMA-REP-1, Revision 1, entitled "Criteria for Preparation and Evaluation of Radiological Emergency Response Plans and Preparedness in Support of Nuclear Power Plants," November 1980.

This evaluation report follows the format of Part II of NUREG-0654 in that each of the Planning Standards is listed and followed by a summary of the applicable portions of the plan and the deficiencies that relate to the specific standard. The final section of this report provides our conclusions.

A. ASSIGNMENT OF RESPONSIBILITY (ORGANIZATIONAL CONTROL)

Planning Standard

Primary responsibilities for emergency response by the nuclear facility licensee, and by State and local organizations within the Emergency Planning Zones have been assigned, the emergency responsibilities of the various supporting organizations have been specifically established, and each principal response organization has staff to respond and to augment its initial response on a continuous basis.

Emergency Plan:

- ° The Federal and private sector organizations that are intended to be part of the overall response organization for the Emergency Planning Zones are identified.
- ° The licensee's concept of operations and its relationship to the total effort is specified.
- ° The Director of Station Emergency Operations (Shift Supervisor unit relieved by a designated DSEO) is identified as the individual who shall be in charge of the nuclear facility emergency response.

- ° 24-hour per day emergency response is provided, including 24-hour per day manning of communications links.
- ° The Corporate Manager of Resources, in conjunction with the Manager of Onsite Resources, is responsible for assuring continuity of resources.

Deficiencies:

1. The State agencies and local organizations that are intended to be part of the response organization are not identified. Also, how the licensee interfaces with offsite organizations for emergency response activities such as radiological monitoring, accident assessment, protective action decision making, and public alerting and notification should be described in more detail.
2. The plan should illustrate (i.e., by block diagram) the interrelationships of each organization and suborganization having an operational role.

B. ONSITE EMERGENCY ORGANIZATION

Planning Standard

On-shift facility licensee responsibilities for emergency response are unambiguously defined, adequate staffing to provide initial facility accident response in key functional areas is maintained at all times, timely augmentation of response capabilities is available, and the interfaces among various onsite response activities and offsite support and response activities are specified.

Emergency Plan:

- ° The Shift Supervisor initially assumes administrative control as the Director of Station Emergency Operations.
- ° The functional responsibilities assigned to the Director of Station Emergency Operations are established and the responsibilities that cannot be delegated are listed.
- ° The corporate management, administrative, and technical support personnel who will augment the plant staff are specified.
- ° Contractor and private organizations that may be requested to provide technical assistance are specified (Table 5-2).

- ° The services to be provided by local agencies during emergencies are identified. Copies of letters of agreement are appended to the plan.

Deficiencies:

1. The plan should discuss the staffing of the onsite emergency organization for all shifts and its relation to the responsibilities and duties of the normal staff complement.
2. A line of succession for the emergency coordinator position (i.e., the Director of Station Emergency Operations) and specific criteria for assuming this position should be more clearly discussed in the plan.
3. Table 5-1 of the plan does not conform to the augmentation capabilities guidance suggested in Table B-1 of NUREG-0654 and sufficient detailed justification is not provided in order to make a judgement that the augmentation times set forth in the plan are acceptable. Provide an analysis of the augmentation functions to be performed, the positions by title identified to perform the functions and times, by minutes, as to when response personnel will be in place.
4. The interfaces between the onsite functional areas of emergency activity, licensee headquarters support, local services support, and State and local government response organizations need to be discussed in greater detail.

C. EMERGENCY RESPONSE SUPPORT AND RESOURCES

Planning Standard

Arrangements for requesting and effectively using assistance resources have been made, arrangements to accommodate State and local staff at the licensee's near-site Emergency Operations Facility have been made, and other organizations capable of augmenting the planned response have been identified.

Emergency Plan:

- ° Federal assistance will be requested through the State of Connecticut Department of Environmental Protection.
- ° Corporate representatives are dispatched to the State of Connecticut EOC, to the Media Center and, if required, to local community EOC's.
- ° Organizations that are relied upon in an emergency to provide assistance are identified and letters of agreement are appended.

Deficiencies:

1. The individual who is responsible for requesting Federal assistance should be clearly identified.

2. The Federal resources expected to be available during an emergency should be specified.
3. Licensee support for the Federal response needs to be described.
4. The expected availabilities of the radiological laboratories identified in the plan should be addressed in the letters of agreement.

D. EMERGENCY CLASSIFICATION SYSTEM

Planning Standard

A standard emergency classification and action level scheme, the bases of which include facility system and effluent parameters, is in use by the nuclear facility licensee, and State and local response plans call for reliance on information provided by facility licensees for determinations of minimum initial offsite response measures.

Emergency Plan:

- ° An emergency classification and emergency action level scheme compatible with the scheme in Appendix 1, NUREG-0654 has been established.

Deficiencies:

Criterion 1:

Unusual Event

Initiating Condition No. 1 (ECCS discharge to vessel). An EAL indicating ECCS flow to the vessel should be used.

Initiating Condition No. 4 (abnormal temperature or pressure). EAL's for high T_{ave} , high reactor pressure, and high core temperature should be added.

Initiating Condition No. 8 (loss of containment). The portion of the EAL response referring to "unexplained computer alarm or vapor container weight of air" needs clarification.

Initiating Condition No. 9 (loss of engineered safety feature). The relevant sections of the technical specifications should be listed.

Alert

Initiating Condition No. 1 (loss of fuel cladding). An EAL using the failed fuel monitor indications should be included. Laboratory analysis should be used to verify the emergency classification.

Initiating Condition No. 6 (radiation levels or airborne contamination). The EAL response should specifically address iodine or particulate airborne concentrations.

Initiating Condition No. 10 (loss of functions needed for cold shutdown). An adequate EAL should specify the particular systems and their instrument readings that are related to maintaining cold shutdown (e.g., residual heat removal system and indications of flow in the reactor coolant loops).

Initiating Condition No. 11 (failure to trip reactor). The requirement that one or more control rods be stuck out of the core should be deleted. All that is necessary is that the reactor remain critical after trip whatever the reason.

Initiating Condition No. 12 (fuel handling accident). The requirement for visual observation of the fuel handling accident should be deleted.

Initiating Condition No. 16 (ongoing security compromise). The EAL response should also indicate an event that results in an area of the plant being occupied, but not loss of control over shutdown capability or any vital areas as defined in the security plan.

Initiating Condition No. 17 (natural phenomena). The EAL response should also include specific indicators such as seismic monitor readings and meteorological parameters (e.g., wind speed).

Initiating Condition No. 18 (other hazards). If instrumentation for toxic or flammable gases exists, appropriate readings should be included in the EAL's.

Site Area Emergency

Initiating Condition No. 1 (LOCA). An adequate EAL should include indications of a decrease in reactor coolant system pressure and loss of subcooling margin (refer to NUREG-0818 for guidance).

Initiating Condition No. 3 (failure of steam generator tubes). See comment for initiating Condition No. 3, Alert.

Initiating Condition No. 5 (steam line break and indication of fuel damage). The requirement for concurrent alarms on the air ejector monitor and the letdown monitor appears to be too restrictive; therefore, the EAL should delete this requirement.

Initiating Condition No. 8 (loss of function for plant hot shutdown). The EAL should include indications that the scram system is not operable or that there is no feedwater or emergency feedwater flow.

Initiating Condition No. 10 (spent fuel damage). The requirement that the fuel handling accident be observed should be deleted.

Initiating Condition No. 12 (loss of annunciators). The EAL response should include the shift supervisor's judgement and the loss of all alarms for 15 minutes.

Initiating Condition No. 14 (loss of physical control of plant). The EAL response should include an indication of physical attack on the plant involving imminent occupancy of the control room, auxiliary shutdown panels, or other vital areas as defined by the security plan.

Initiating Condition No. 15 (natural phenomena). In addition to observation, specific indicators such as seismic, meteorological, and hydrological monitor readings should be included in the EAL.

Initiating Condition No. 16 (other hazards). If instrumentation for toxic or flammable gases exists, appropriate readings should be included in the EAL in addition to direct observation.

Initiating Condition No. 17 (other plant conditions). The EAL response should include the addition of the shift supervisor's judgement.

Initiating Condition No. 18 (evacuation of control room). The EAL should include the shift supervisor's judgement.

General Emergency

Initiating Condition No. 2 (loss of fission barriers). Specific indicators of core and containment conditions should be developed to indicate the loss of two fission product barriers with a potential loss of a third.

Initiating Condition No. 2 (containment radiation levels). Plots of containment radiation levels as a function of core damage should be developed and incorporated into the EAL's along with predetermined protective action recommendations in accordance with the guidance of Appendix 1, NUREG-0654.

Initiating Condition 3 (loss of physical control). The EAL should include an indication of physical attack on the plant resulting in occupation of the control room and the auxiliary shutdown panels by unauthorized personnel.

Criterion 2: The following Initiating Conditions of NUREG-0654 are not addressed.

Unusual Event: Initiating Condition No. 11.

Alert: Initiating Condition No.'s 2, 19, and 20.

Site Area Emergency: Initiating Condition No. 9.

General Emergency: Initiating Condition No.'s 5 and 7.

E. NOTIFICATION METHODS AND PROCEDURES

Planning Standard

Procedures have been established for notification by the licensee of State and local response organizations and for notification of emergency personnel by all response organizations; the content of initial and followup messages to response organizations and the public have been established; and means to provide early notification and clear instruction to the populace within the plume exposure pathway Emergency Planning Zone have been established.

Emergency Plan:

- ° Procedures are established which describe a mutually agreeable basis for notification of response organizations consistent with the emergency classification and action level scheme.
- ° Procedures for alerting, notifying and mobilizing emergency response personnel are established.

- ° The contents of the initial emergency messages to be sent from the plant are established.

Deficiencies:

1. The contents of followup messages, from the facility to offsite authorities, should be included.

2. The emergency plan does not adequately describe the administrative and physical means, and the time required for notifying and providing prompt instructions to the public within the plume exposure pathway Emergency Planning Zone as specified in 10 CFR 50, Appendix E, Section IV.D.3. In addition, the onsite and offsite protective action decision making process is not adequately described. The plan should be revised to include the above information.

3. Draft messages intended for the public, which are consistent with the emergency classification scheme and the predetermined protective actions of Appendix 1, NUREG-0654, should be provided in the plan.

F. EMERGENCY COMMUNICATIONS

Planning Standard

Provisions exist for prompt communications among principal response organizations to emergency personnel and to the public.

Emergency Plan:

- ° There are provisions for alerting and activating onsite emergency personnel and for 24-hour notification to and activation of the State and local emergency response organizations.
- ° Communications with contiguous State/local governments within the EPZ's are provided.
- ° Communications between the nuclear facility and the EOF, State and local EOC's, and radiological monitoring teams are provided.
- ° Communication by the licensee with NRC Headquarters and NRC Regional Office EOC's is provided.
- ° Periodic testings of communications systems is provided.

Deficiencies:

1. Organizational titles and alternates for both ends of the communication links should be provided in the plan.
2. The plan should describe the means for a coordinated communication link for fixed medical facilities.

G. PUBLIC EDUCATION AND INFORMATION

Planning Standard

Information is made available to the public on a periodic basis on how they will be notified and what their initial actions should be in an emergency (e.g., listening to a local broadcast station and remaining indoors), the principal points of contact with the news media for dissemination of information during an emergency (including the physical location or locations) are established in advance, and procedures for coordinated dissemination of information to the public are established.

Emergency Plan:

- ° A public information brochure containing the required information is distributed annually to residents.
- ° Points of contact and physical locations for use by the news media during an emergency are designated.
- ° The Director of Corporate Emergency Operations serves as the official company spokesperson for the corporate organization. At the Media Center, the corporate representative is the official corporate spokesperson.
- ° Arrangements for timely exchange of information among designated spokespersons are established.
- ° The Media Center is used to deal with rumors.
- ° An annual information program designated to acquaint the news media with emergency plans and procedures has been initiated.

Deficiencies:

1. The public information program should describe in more detail how the transient population, within the plume exposure EPZ, will be made aware of emergency information.

2. The plan should indicate that space for the news media is provided at the EOF.

H. EMERGENCY EQUIPMENT AND FACILITIES

Planning Standard

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

Emergency Plan:

- ° The licensee has established a Technical Support Center (TSC), an Operational Support Center (OSC), and an Emergency Operations Facility (EOF).
- ° Evaluation and coordination of licensee activities related to the emergency will be carried out at the EOF (including surveillance, support services, recovery actions and collection, retention, retrieval, and transmission of station and local environmental parameters).
- ° Onsite monitoring systems used to initiate emergency measures including geophysical, radiological and process monitors, and fire and combustion detectors are identified in Table 7.2 of the plan.

- ° Radiological monitoring equipment has been provided near the plant for use by response personnel.
- ° Arrangements have been made to obtain current and forecast weather information from onsite and offsite resources.
- ° Provisions have been made for the routine inspection and operational check of emergency equipment and instruments on a quarterly basis. Instruments are calibrated at least semi-annually and repaired or replaced if necessary.
- ° Contents of emergency kits are identified by category and location in Appendix E of the plan.

Deficiencies:

1. The plan should adequately describe the location and layout of the TSC, OSC, and EOF. The plan should also indicate for the TSC, OSC, and EOF their function, their staffing levels, and their interaction with other onsite and offsite emergency response facilities.

2. Provisions to acquire offsite hydrologic should be addressed.
3. The physical capacity of the OSC and the supplies assigned to it should be described.
4. The plan should discuss reserves of equipment to be used while dedicated equipment is removed for calibration or repair.
5. The plan should specifically indicate whether the responsibility for receipt and analysis of field monitoring data and coordination of sample media are functions to be performed at the EOF.

I. ACCIDENT ASSESSMENT

Planning Standard

Adequate methods, systems, and equipment for assessing and monitoring actual or potential offsite consequences of a radiological emergency condition are in use.

Emergency Plan:

- ° Procedures for determining the release rate and projected doses when the instruments used for assessment are inoperable or off-scale are established.
- ° The plan describes the resources available for field monitoring within the plume exposure pathway Emergency Planning Zone.
- ° Methods, equipment, and expertise to make rapid assessments of the actual or potential magnitude and locations of radiological hazards are discussed.
- ° The licensee has the capability to detect and measure radioiodine concentration in air as low as 10^{-7} uCi/cc under field conditions.
- ° Estimation of integrated dose using actual or projected dose rates is discussed.

Deficiencies:

1. Plant system and effluent parameter values should be identified and made part of the emergency action levels.
2. Additional information concerning the onsite capability and resources for radiological and effluent monitoring is needed in order to evaluate this portion of the plan. Specifically, post accident sampling capability and in-plant iodine instrumentation should be described.

3. The emergency plan should more clearly describe the establishment of methods and techniques to be used for determining the source term or releases of radioactive material within plant systems. The magnitude of the releases based on plant system parameters and effluent monitors should also be described.
4. The plan should better describe the relationship between effluent monitor readings and onsite/offsite exposures or contamination for various meteorological conditions.
5. Provisions for access to meteorological information at the Technical Support Center, the offsite NRC center, and other applicable emergency response facilities should be described in the plan.
6. The plan should describe the capability for field monitoring within the plume exposure pathway Emergency Planning Zone.
7. The means for relating the various measured parameters to dose rates for the key isotopes shown in Table 3, page 18, NUREG-0654 and gross radioactivity measurements should be discussed in the plan.

J. PROTECTIVE RESPONSE

Planning Standard

A range of protective actions have been developed for the plume exposure pathway EPZ for emergency workers and the public. Guidelines for the choice of protective actions during an emergency, consistent with Federal guidance, are developed and in place, and protective actions for the ingestion exposure pathway EPZ appropriate to the locale have been developed.

Emergency Plan:

- The plan provides for the evacuation of onsite non-essential personnel, visitors, contractor, and construction personnel. Individuals will be evacuated from onsite by private or company transportation.
- Respiratory protection and protective clothing will be provided for emergency personnel.
- Figures C-2 and C-3 in Appendix C of the plan show the onsite and offsite locations of sampling and monitoring points.

Deficiencies:

1. The time required to notify onsite personnel should be discussed. The plan should also discuss the means for notifying people who may be in the owner-controlled area, but outside the protective area.
2. Evacuation routes and alternatives in case of inclement weather, high traffic density, or radiological conditions should be described. A more detailed map clearly showing evacuation routes should be included in the plan.
3. Section 6.4.1 of the plan indicates that only those individuals suspected of contamination will be monitored during evacuation. The plan should indicate that all evacuees will be monitored for contamination and that a record keeping procedure will be used that identifies each individual monitored and the results.
4. The location of decontamination sites should be clearly identified.
5. The plan should describe the capability to account for all individuals onsite at the time of the emergency and ascertain the names of missing individuals within 30 minutes.

6. The plan should indicate Northeast Utilities position on the use of protective drugs such as potassium iodide.

7. Protective actions [to include consideration of the recommendations found in Tables 2.1 and 2.2 of the Manual of Protective Incidents (EPA-520/1-75-001)] should be described in the plan.

8. Evacuation time estimates should be included in the plan.

9. More detail concerning the licensee's capabilities to implement protective measures within the plume EPZ should be included in the plan (See NUREG-0654, J.10 for guidance).

K. RADIOLOGICAL EXPOSURE CONTROL

Planning Standard

Means for controlling radiological exposures, in an emergency, are established for emergency workers. The means for controlling radiological exposures shall include exposure guidelines consistent with EPA Emergency Worker and Lifesaving Activity Protective Action Guides.

Emergency Plan:

- The plan establishes onsite exposure guidelines consistent with EPA Protective Action Guides.
- General provisions have been made for an onsite radiation protection program to be implemented during emergencies which includes methods to implement exposure guidelines, identify individuals who may authorize emergency workers to receive doses in excess of 10 CFR Part 20 limits, and for permitting onsite volunteers to receive above normal radiation exposures in the course of carrying out lifesaving or other emergency activities.
- Provisions have been made for a 24-hour per day capability to determine doses received by the emergency personnel involved in nuclear accidents.
- The plan provides for maintaining the dose records of emergency workers involved in a nuclear accident.

- ° The plan specifies action levels for decontamination; procedures for radiological decontamination have been developed.
- ° Onsite contamination control measures for area access have been established.

Deficiencies

1. The personnel exposure limits for providing first aid, personnel decontamination, ambulance service, and medical treatment should be identified.
2. The plan should specify the frequency that personnel dose monitoring devices will be read during emergency operations.
3. Sufficient information concerning decontamination of personnel, decontamination of supplies and equipment, and waste disposal should be included in the plan along with reference to specific procedures.
4. Onsite contamination control measures for drinking water and food supplies should be described.
5. The plan should provide more information concerning the capability to decontaminate skin contaminated with radioiodine.

L. MEDICAL AND PUBLIC HEALTH SUPPORT

Planning Standard

Arrangements are made for medical services for contaminated injured individuals.

Emergency Plan:

- ° Onsite first aid capability is provided.
- ° Arrangements have been made for transporting victims of radiological accidents to medical support facilities.
- ° Local and backup hospital and medical services are provided.
- ° The personnel providing transportation and hospital services for contaminated persons are trained and prepared to handle these individuals.

Deficiency:

1. The plan should address the capability of medical personnel in the evaluation of radiation exposure and uptake of radioactive materials by contaminated individuals.

M. RECOVERY AND RE-ENTRY PLANNING AND POST-ACCIDENT OPERATIONS

Planning Standard

General plans for recovery and re-entry are developed.

Emergency Plan:

- ° The structure, functions, and membership of the facility recovery organization are described.

- ° A method for periodically estimating total population exposure is established.

Deficiencies:

1. General plans and procedures for re-entry and recovery are not described; the decision making process to relax protective measures is also not described. Both of these concerns should be discussed in the plan.

2. The means for informing members of the response organizations that a recovery operation has begun should be specified in the plan.

N. EXERCISES AND DRILLS

Planning Standard

Periodic exercises are (will be) conducted to evaluate major portions of emergency response capabilities, periodic drills are (will be) conducted to develop and maintain key skills, and deficiencies identified as a result of exercised or drills are (will be) corrected.

Emergency Plan:

- ° The annual emergency preparedness exercise simulates an emergency that would require response by offsite authorities. A joint exercise, to involve mobilization of State and local personnel and resources, is provided.
- ° Required communication drills are provided.
- ° A medical emergency drill involving a simulated contaminated individual, which contains provisions for participation by the local support services agencies, is conducted annually.
- ° Required radiological monitoring and health physics drills are included.

Deficiencies:

1. The plan should indicate that exercises and drills will be conducted in accordance with 10 CFR 50.47 and Appendix E requirements.
2. The plan should address varying the scenario, varying the starting times of the exercises, conducting exercises under varied weather conditions, and beginning some exercises unannounced.
3. The plan should indicate that fire drills will be conducted in accordance with the plant technical specifications.
4. A discussion of post-exercise critiques should be included in the plan.
5. The plan should establish the means for evaluating observer and participant comments on areas needing improvement. The plan should also discuss provisions for assigning responsibility for corrective actions in these areas.

O. RADIOLOGICAL EMERGENCY RESPONSE TRAINING

Planning Standard

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

Emergency Plan:

- ° The plan provides for emergency response training for those offsite emergency organizations who may be called on to provide assistance in the event of an emergency.
- ° The training program includes practical drills so that individuals may demonstrate ability to perform their assigned emergency functions.
- ° Initial training and annual retraining of personnel with emergency responsibilities are provided for in the plan.

Deficiencies:

1. More information concerning training for offsite organizations should be provided in the plan (see footnote 1, page 75 of NUREG-0654 for guidance).

2. The plan should indicate that the emergency response training program provides for training of personnel responsible for protective action decision making, accident assessment, police and security functions, repair and damage control/correctional action, Civil Defense/Emergency Services, medical support, and transmission of emergency information and instruction.

P. RESPONSIBILITY FOR THE PLANNING EFFORT:

DEVELOPMENT, PERIODIC REVIEW, AND DISTRIBUTION OF EMERGENCY PLANS

Planning Standard

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

Emergency Plan:

- ° The Chief, Radiological Assessment Branch (RAB) at NUSCO is responsible for the development of the Station and Corporate (NUSCO) Emergency Plan.
- ° Periodic revision of the plan, including changes identified by drills and exercises, is provided. Approved changes in the emergency response plan will be distributed to all organizations and appropriate individuals. Supporting plans are listed.

- ° Emergency Plan Procedures are listed and pertinent sections of the plan are cross-referenced.
- ° A table of contents and a cross-reference to NUREG-0654 are supplied.
- ° The telephone numbers in the Emergency Plan Procedures will be updated quarterly.

Deficiencies:

1. The plan should discuss provisions for training persons responsible for the emergency planning effort.
2. The plan should identify the individual at the station with authority and responsibility for radiological emergency response planning.
3. The plan should designate an individual as the Station Emergency Planning Coordinator.
4. The licensee's annual independent review of the emergency preparedness program should address interfaces with State and local governments.

CONCLUSION,

Based on our review, we conclude that the Connecticut Yankee Nuclear Power Station emergency plan, upon satisfactory correction of the previously identified deficiencies, will meet the requirements of 10 CFR 50.47 and Appendix E and conform to the planning standards set forth in NUREG-0654, Revision 1.