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50-293

February 1, 1982

BECo. Ltr. #82-37

Mr. Ronald C. Haynes, Director
Office of Inspection and Enforcement
Region I
U.S. Nuclear Regulatory Commission
631 Park Avenue
King of Prussia, PA. 19406

License No. DPR-35
Docket No. 50-293

Dear Mr. Haynes:

On January 4, 1982 Mr. John Fulton wrote you regarding a joint exercise of on-site and off-site emergency response capabilities, and enclosed exercise objectives for planned response by Boston Edison and off-site agencies (BECo. Letter #82-1).

Planning for this exercise has continued, and the currently scheduled date remains March 3, 1982. I have enclosed a description of exercise features and a narrative summary of the exercise scenario. Boston Edison is, of course, keeping the number of people familiar with this scenario to a minimum, and I ask that the NRC do likewise. Key parameters of the scenario have been summarized and provided to state authorities, who have developed scenarios for use in exercising off-site response by state and local agencies. Mr. Paul J. Cahill, Director, Massachusetts Civil Defense Agency, will forward off-site scenario materials to Mr. David Sparks, Director, FENA Region I.

Boston Edison and Massachusetts Civil Defense Agency officials will remain available to assist in planning for federal observation and participation in the exercise.

Very truly yours,

Robert H. Cunningham
Staff Assistant to Vice President-
Nuclear

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PILGRIM NUCLEAR POWER STATION

1982 JOINT EMERGENCY PLAN EXERCISE

NARRATIVE SUMMARY OF FEATURES AND SCENARIOS

I. General:

The 1982 PNPS-1 Joint Emergency Plan Exercise is designed to exercise and test the adequacy and preparedness of the plans and personnel of the following organizations and their ability to work together as a cohesive emergency response organization.

BECo Emergency Response Organization
Massachusetts Civil Defense Agency (MCDA)
Massachusetts Department of Public Health (MDPH)
Federal Emergency Management Agency (FEMA)
Nuclear Regulatory Commission (NRC)
Supporting State and Federal Agencies

Evaluation of the scenario plan and the performance of participating individuals will be conducted by representatives of BECo, MDPH, MCDA, FEMA and NRC and their representatives.

In order to comprehensively exercise all participants concurrently, an elaborate and detailed sequence of events was contrived by BECo to represent an abnormal plant operating condition which gradually degrades through the various emergency categories under direction of the exercise observers. This approach ensures that there will be adequate time to exercise and properly evaluate the performance of the participants under conditions of varying severity.

II. Accident Scenario:

Phase 1 -- Unusual Event

The first phase of the scenario (Unusual Event) begins with the plant restarting from a recent reactor trip. A fire is discovered in the Turbine Building Truck Lock. The cause is undetermined. The combustible material is contaminated clothing in several uncovered 55 gallon shipping drums resulting in a potential airborne radiation hazard to firefighters and personnel in the Turbine Building. The fire produces large amounts of smoke due to combustion of some oil-soaked rags nearby.

The response of operations and fire brigade members will be assessed during this phase. There are no measurable releases of radioactivity from the plant. One of the fire fighters is burned and overcome by smoke.

Due to the smoke and contamination, fire fighting efforts will require longer than 20 minutes to control the fire. These events should trigger the Unusual Event declaration.

Phase 2 -- Alert

The second phase of the scenario (Alert Condition) occurs during the reactor startup. As the reactor approached 100 psig earlier, the RHR system, in shutdown cooling mode, automatically isolated. (Normally operators would manually take the system out of shutdown cooling mode but their attention was on the fire.) Due to burned-out indicator lamps and the distraction of the fire, the operators failed to recognize and reset the isolation signal to the RHR system feed valves (1001-29 A&B). Shortly after the operators have synchronized the unit onto the electrical distribution grid, the Reactor Vessel 2" drain line develops a crack at the welded joint inboard of the isolation valve.

The cracked joint contributes unidentified liquid leakage in excess of 50 gpm thereby triggering declaration of an alert condition based on this unidentified leakage. Drywell atmospheric monitor (C-19) is showing an increase in activity in both the Halogen and particulate channels. Drywell moisture monitors indicate increasing humidity. The operators begin to take action to identify the source of the leakage and drywell pressure continues to increase slowly. There has been no release of radioactive material from the plant at this time.

Phase 3 -- Site Emergency

The third phase of the scenario (Site Emergency) occurs when the crack in the Reactor Vessel drain suction line propogates and causes the drain line to snap off entirely. Simultaneously, the 4" decontamination connection downstream of the Recirculation line valve (MOV 220-4A) develops a serious crack resulting in a measurable lowering of reactor vessel water level. Drywell Pressure builds up rapidly and reactor water level begins to drop. The reactor scrams on low reactor water level and high drywell pressure signals. Drywell pressure has now been greater than 15 psig for more than 5 minutes and should trigger declaration of a Site Emergency. At this point, the operators should use drywell sprays to reduce drywell pressure and temperature. When the reactor scrammed on high drywell pressure, the operators removed the operating reactor feed pump (Pump A) from service. When the operators attempt to restart any pump, A, B or C, they fail to start. The Standby Gas Treatment System starts automatically on high drywell pressure and operates properly.

Phase 4 -- General Emergency

The fourth phase of the scenario (General Emergency) is the result of the recirculation suction line downstream 4" decontamination connector breaking off and unanticipated failures of the HPCI, core spray, RHR and feedwater systems.

The HPCI system attempts to start automatically, but the downstream feedwater chack valve (58 B) fails to open and prevents water injection to the vessel. Reactor vessel pressure is now below 400 psig, but the RHR discharge valves do not open because they have not been reset after the automatic isolation from shutdown cooling.

The Reactor Core Isolation Cooling (RCIC) system starts on low low water but injects only 400 gpm (its design capacity). The RHR pumps start and recycle against the closed discharge valves which have not yet had the isolation signal reset which would allow the valves to open.

The Core Spray system starts and appears to be pumping 3600 gpm per loop but does not increase reactor vessel water level because the Pump Test Line Valves 4A and B are leaking badly and water is recirculating back to the torus.

Fuel damage occurs due to low Reactor Vessel Water Level resulting in inadequate core cooling. Significant quantities of radioactive noble gases and halogens are released to the drywell atmosphere through the broken 4" decontamination pipe.

The rapid increase in drywell pressure which occurred when the 4" line broke has caused the rubber seal on the 20" drywell purge line to partially blow out and there is some leakage from the drywell to the Reactor Building Normal Exhaust causing the Reactor Building process radiation monitor to go into high alarm.

Offsite doses are projected to be greater than 1 rem whole body and/or greater than 5 rem thyroid out to a distance of about 1.5 miles.

The core is presently partially uncovered.

Phase 5 -- Stabilization

The fifth phase of the scenario (Stabilization) occurs when the operators recognize that the isolation signal to the RHR valves has not been reset. The signal is cleared and the breaker problems are repaired. RHR begins to operate at full capacity and the core is recovered with water.

The drywell sprays have caused drywell pressure and temperature to decrease. Radioactive releases subside and the reactor is stabilized.

Phase 6 -- Termination

The sixth and final phase of the scenario (Termination) involves stand down actions, termination of the emergency, estimation of the integrated offsite dose to the public and appropriate notifications. Any action by the operators to close the suction and discharge valves on the A recirculation loop effectively isolates the 4" pipe break.

III. Exercise Observers:

The complement of exercise observers will consist of members of BECo Nuclear Departments, volunteers from other utilities, and representatives from state and federal agencies. Unique and obvious identification will be provided for all exercise observers.

BECo exercise observers only will be authorized to provide simulated data to exercise participants. All relevant and necessary data on plant conditions and instrument readouts will be available to all exercise observers to allow ongoing comparison with participant performance. Exercise Observer checklists will be provided for all observers and will include key actions expected of participants to assist observers who are not totally familiar with the BECo Emergency Plan in performing their evaluations.

IV. Exercise Execution:

The drill will begin at 8:00 AM on March 3, 1982. Auxiliary operating personnel will be on duty so that the normal complement of operations personnel will not be distracted from routine but vital operating responsibilities. Exercise observers will be prepositioned at key areas and locations. All activities, including escalation throughout the various phases will be under control of the Exercise Coordinator. Escalation through the phases will not occur at pre-established times but at the discretion of the Exercise Coordinator who will insure that adequate time is allocated to each phase so that a comprehensive evaluation can occur. Exercise Drill Coordinator will supply simulated plant conditions and instrument readings by exercise participants. The Exercise Coordinator or the Manager of Nuclear Operations each have the authority to terminate the Exercise at any time should plant conditions warrant such action.

V. Evaluation:

Evaluation of the performance of participants in the exercise will be performed by the exercise observers both during the exercise (according to the exercise observer check lists) and subsequent to the exercise at a post-exercise conference. No report or evaluation other than the check lists will be required, however, all relevant observations, evaluations and comments will be solicited and accepted in writing from any and all observers, representatives and participants.