U. S. NUCLEAR REGULATORY COMMISSION

REGION III

Report No. 50-263/84-27(DRSS)

Docket No. 50-263 License No. DPR-22

Licensee: Northern States Power Company
414 Nicollet Mall
Minneapolis, MN 55401

Facility Name: Monticello Nuclear Generating Plant

Inspection At: Monticello Plant, Monticello, MN

Inspection Conducted: December 4-6, 1984

T. Ploski
Inspectors: T. Ploski
Team Leader — 12/26/84 Date

M. Smith
M. Smith — 12/26/84 Date

T. Ploski for G. Brown — 12/26/84 Date

W. G. Snell for
Approved By: M. P. Phillips, Chief
Emergency Preparedness Section — 12/26/84 Date

Inspection Summary

Inspection on December 4-6, 1984 (Report No. 50-263/84-27(DRSS))
Areas Inspected: Routine, announced inspection of the Monticello Nuclear Plant emergency preparedness exercise involving observations by eight NRC representatives of key functions and locations during the exercise. The inspection involved 105 inspector-hours onsite by three NRC inspectors and five consultants.
Results: No items of noncompliance or deviations were identified. Exercise weaknesses, which require a written response regarding corrective actions, are identified in the report and in the Appendix to the report's transmittal letter.

DETAILS

1. Persons Contacted

NRC Observers and Areas Observed

T. Ploski, Emergency Operations Facility (EOF)
G. Brown, EOF
M. Smith, Joint Public Information Center (JPIC)
G. Bethke, Control Room
M. Good, Control Room, Technical Support Center (TSC)
L. Munson, Operational Support Center (OSC), In-Plant Teams, Access Control Point (ACP)
L. Munson, OSC, In-Plant Teams, ACP
R. Traub, TSC, Offsite Survey Teams

Northern States Power Company Personnel

D. Gilberts, Senior Vice-President, Power Supply, Executive Spokesperson, JPIC
*L. Eliason, General Manager, Nuclear Power Plants, Emergency Manager, EOF
W. Shamla, Plant Manger, Emergency Director, TSC
M. Clarity, Emergency Director, TSC
*R. McGillic, Lead Controller, Control Room
R. Feidler, Shift Supervisor
R. Rohland, Shift Supervisor
M. Lechner, Site Superintendent, Control Room
*G. Earney, Chief Controller, TSC
*M. Agen, Controller/Observer, TSC, EOF
*M. Offerdahl, Controller, TSC
*L. Waldinger, Radiological Emergency Coordinator, TSC
M. Holms, Radiation Chemist, TSC
W. Anderson, Maintenance Group Leader, TSC
D. Goranson, Engineering Group Leader, TSC
D. Antony, Operations Group Leader, TSC
J. Kreoer, Security Group Leader, TSC
*R. Brevig, Health Physics Staff, TSC
*D. Whitcomb, Lead Controller, OSC
K. Tabbert, OSC Coordinator, OSC
*L. Nolan, EOF Coordinator, EOF
*G. Mathiasen, Radiation Protection Support Supervisor, EOF
J. Brandt, Technical Support Supervisor, EOF
*G. Hudson, Controller, EOF
D. Horgen, Controller, EOF
*B. Schmitt, Support Staff, EOF
*W. Scholberg, Observer, Quality Assurance Staff
R. Paso, Offsite Survey Team Controller
T. LaPlant, Offsite Survey Team Controller
J. McNewley, Offsite Survey Team Controller

*Indicates those licensee personnel present at the December 6, 1984 exit interview.

2. General

An off-hours exercise of the licensee's Emergency Plan was conducted at the Monticello Nuclear Generating Plant on December 5, 1984. The exercise tested the licensee, State, and counties emergency organizations' capabilities to respond to a hypothetical accident scenario resulting in a radioactive release. The scenario is summarized in the attachment to this report. The exercise was integrated with a test of the state of Minnesota, Sherburne County, and Wright County Emergency Plans. This was a partial-participation exercise for the State of Minnesota and a full-participation exercise for Sherburne and Wright counties.

3. General Observations

a. Procedures

This exercise was conducted in accordance with 10 CFR Part 50, Appendix E requirements using the Monticello Nuclear Generating Plant Emergency Plan and associated implementing procedures.

b. Coordination

The licensee's response was generally coordinated, orderly, and timely. If these events had been real, actions taken by the licensee would have been sufficient to permit State and local authorities to take appropriate actions.

c. Observers

Licensee observers monitored and critiqued this exercise, as did eight NRC observers and observers from the Federal Emergency Management Agency (FEMA). FEMA observations on the responses of State and local authorities will be provided separately from this inspection report.

d. Critique

The licensee held critiques following the exercise on December 5, 1984. A verbal summary of those critiques was presented to the NRC on December 6, 1984. The NRC critique was also held on that date at the licensee's Training Center. The NRC and licensee identified weaknesses during their respective critiques. Weaknesses identified by the NRC are provided in the text of this report.

4. Specific Observations

a. Control Room

Exercise participants were a Site Superintendent, Shift Emergency Communicator (SEC), a Shift Supervisor (SS), and two Reactor Operators (ROs). A shift change involving the SS and RO positions was satisfactorily demonstrated during the exercise. Although the Site Superintendent (Interim Emergency Director) properly classified

scenario conditions as an Alert, he did exhibit some unfamiliarity with Emergency Action Levels (EALs) found in procedure A.2-101. He was eventually assisted in locating an appropriate EAL by the SEC tasked with drafting the Emergency Notification Report form. Elapsed time to classify the emergency was about fifteen minutes. The on-duty Shift Technical Advisor (STA), who was onsite but not required to be in the Control Room, was summoned but did not arrive to lend assistance until the emergency had been classified. Initial offsite notification calls to the State and both counties were completed in a timely manner. While the Site Superintendent reviewed the initial notification form, he neglected to sign it to document his approval. The NRC was initially notified of the Alert declaration within the required time period.

Initial notifications involved separate telephone calls by the SEC to the State and each county. Per the Alert Procedure A.2-103, activation of the tone alert radio system utilized to accomplish initial notification of key personnel in the licensee's emergency response organization did not begin until almost 0540 hours, after all State and county initial notification calls had been completed. The individual assigned to activate the licensee's tone alert radios had some difficulty in utilizing the equipment, resulting in an approximate five-minute delay. Despite the lower priority given staff augmentation, as contained in Procedure A.2-103, and an individual's difficulties in activating the tone alert radios, the Technical Support Center (TSC) was fully operational one hour after the Alert declaration and the Operational Support Center (OSC) was fully operational within seventy minutes after the Alert declaration.

Control Room personnel quickly determined that abnormal radiation levels in the Reactor Building were caused by a steam line break in the High Pressure Coolant Injection (HPCI) system. The appropriate onsite protective action, reactor building evacuation, was promptly initiated. The Health Physics technician stationed at the Access Control Point (ACP) soon ascertained that all exercise participants were outside the reactor building. The technician reported to the SS that building evacuation was accomplished well within thirty minutes of the evacuation decision.

The SS's log was not well maintained during the first few hours of the exercise. Examples of key events and decisions not logged included: the source of reactor makeup water; the changed decision to depressurize the vessel using the main condenser and not safety relief valves; the Alert declaration; and several early attempts to determine the cause of the isolation valve's failure to close. Logkeeping did improve about the time of the shift change.

Three controllers were in the Control Room. Multiple instances of improper controller technique were observed. While the lead controller was engrossed in issuing scenario messages, his assistants failed to observe several corrective actions being simulated by the operators. Later, when made aware of these actions, controllers had to disallow some of them to avoid deviating from the scenario. Operators occasionally asked controllers for current values of several plant parameters. These data were available on graphs in the scenario

manuals. On several occasions, a controller displayed the entire graph of a parameter to a player while reading the graph to obtain the requested current value. Additional examples of improper controller technique are provided in Paragraph 4d.

Based on the above findings, the following items should be considered for improvement:

- The Site Superintendent should receive additional familiarization training on procedure A.2-101.

- All Emergency Notification Report forms should be signed prior to issuance by the individual responsible for making the emergency declaration decision.

- Initiation of staff augmentation by licensee personnel arriving from off-site locations should not be delayed until after notifications of State and county emergency organizations have been completed.

- An adequately detailed log of significant decisions and activities should be maintained in the Control Room during emergency plan activations.

b. Technical Support Center (TSC)

In response to a Control Room request, the on-shift Radiation Chemist arrived in the TSC and completed an initial offsite dose assessment utilizing the Meteorological Information and Dose Assessment System (MIDAS) within twenty minutes of the Alert declaration. The licensee's tone alert radio system was activated from the TSC several minutes afterwards. Persons having group leader responsibilities began arriving in the TSC at 0600 hour. The interim Emergency Director (ED) was relieved by the TSC's ED following a thorough discussion of scenario events and ongoing response activities. The ED briefed his staff and declared the TSC fully operational about sixty minutes after the Alert declaration.

TSC work groups were aggressive in seeking to determine the existence of core damage, generating offsite dose projections based on the gradually increasing release rate, determining the cause of the condensate pump trip, and issuing follow-up messages to offsite authorities at roughly thirty minute intervals. However, actions taken to shut the HPCI steam line isolation valve were authorized using an "emergency work form," which has not been proceduralized, instead of the Work Request Authorization (WRA) form described in Administrative Procedure 4 ACD-3.6. Proper use of the "emergency work form", should be proceduralized. The procedure should address which individuals have the authority to sign the form, and under what circumstances it can be used instead of a WRA form.

TSC personnel were kept adequately informed of scenario events and each other's progress on assigned tasks through periodic briefings conducted by the ED. Status boards were generally kept current, but contained several inaccuracies. The Operations Status Board indicated 6000 gallons per minute of condensate flow during a period when there was no flow. Later, this status board incorrectly listed the torus cooling pumps as being in operation.

Later in the exercise, relief of the ED was demonstrated by simulating that he had suffered a heart attack. The simulated event was not intended to initiate a medical drill, but was just a means to accomplish the change in Emergency Directors. The relief ED ensured that onsite medical attention was summoned to the TSC and effectively managed the facility for the remainder of the exercise.

Based on the above findings, the following item should be considered for improvement:

- Information displayed on status boards should be accurate.

- The "emergency work form," which was used instead of the WRA should be proceduralized, including who has the authority to issue the form and under what circumstances it may be used instead of the WRA form.

c. Operational Support Center (OSC)/Access Control Point (ACP)/ In-Plant Teams

The on-shift Health Physics (HP) technician manned the ACP shortly after 0530 hours. He promptly activated a Continuous Air Monitor (CAM) and set up barriers and signs at entrances to the reactor and turbine buildings. He also phoned several HP technicians at home to assist him in providing adequate support for in-plant survey and maintenance tasks. These personnel began arriving at the ACP approximately fifty minutes after the Alert declaration.

Activation of the OSC commenced approximately twenty to twenty-five minutes after the Alert declaration, when a recorded message was broadcast to those personnel equipped with pagers. The OSC Coordinator arrived at his duty station about forty minutes after the emergency declaration and improperly stated that the facility was activated, since at that time he was the only exercise participant in the room. The coordinator then began calling personnel at their homes to supplement several onsite technicians who were just entering the OSC. By 0630, roll call had been taken and sufficient staff were available in the OSC to respond to in-plant maintenance requests from the TSC.

At approximately 0612, a CAM was activated in the hallway to monitor radioactivity in the TSC/OSC area; however, its air pump was not started until about fifteen minutes later. During the exercise, the CAM alarmed on a number of occasions. No one assumed responsibility for initiating equipment checks on the CAM. Instead, different

personnel were observed at various times to be clearing the alarm or adjusting the alarm set point, which was not specified in the TSC Activation Procedure, A.2-106. Contamination control was inadequately demonstrated at the ACP. Not all persons returning from controlled areas frisked prior to entering the clean area. Expended air bottles utilized by one in-plant team were not surveyed prior to removal to the clean area. Even after replacement bottles were brought to the ACP, the Scott Air Pacs already worn were not surveyed prior to being returned to service. Further examples of improper contamination control practices are noted in Paragraph 4d.

In-plant teams utilized emergency Radiation Work Permits (RWPs) prior to all entries into controlled areas. A key corrective action in this exercise was the manual closure of an isolation valve for the HPCI steam line. Simulated closure was delayed, since the team utilized bottled air for about fifteen minutes while the team remained at access control, checking their dosimeters and equipment and completing their briefing. Consequently, the team did not make maximum progress to close the valve before their air supplies were depleted, forcing their return to access control. The valve closure task could also have been expedited by having a second team ready to relieve this initial team.

Communications between teams and the ACP were satisfactory with respect to frequency and audibility. Teams reported their results prior to leaving controlled areas. However, during one fifteen-minute period, at least four radio calls from in-plant teams went unanswered at access control while the dedicated communicator left his duties without someone properly relieving him. This situation was rectified by the participants when one team telephoned the ACP to ask why no one was answering its radio calls. There were also accountability problems at the ACP and the OSC. It had been understood that only exercise personnel and selected maintenance workers would be allowed past the ACP during the exercise and that such personnel would be identified by armbands. However, a number of persons without armbands went through the ACP and the OSC, which caused confusion to players, controllers, and NRC observers.

Since the reactor vessel was not pressurized, a liquid sample was not drawn and analyzed during the exercise. Instead, a grab sample from the plant stack was obtained and analyzed.

In addition to the Exercise Weakness, the following items should be considered for improvement:

- An emergency response facility should not be declared operational until sufficient personnel have arrived and are ready to assume their duties.

- Responsibility for ensuring proper use of the CAM should be assigned in an implementing procedure. Activation instructions, including the desired alarm set point, should be readily available to TSC and OSC personnel.

- Personnel manning the ACP should ensure that in-plant teams follow proper contamination control procedures when exiting a controlled area.

- In-plant teams should conserve bottled air prior to entry into controlled areas.

- Exercise participants should be readily distinguishable from exempt personnel in the OSC and at the ACP.

d. Emergency Operations Facility (EOF)

The EOF was activated following the Alert declaration, as required by the Monticello Emergency Plan. The EOF Coordinator was the first arrival and satisfactorily completed his initial responsibilities, including: activating the facility's emergency ventilation system and CAM; establishing communications with the TSC; and notifying administrative support personnel to report to the EOF. Per the Plant and Corporate Emergency Plans, the EOF became fully operational approximately two hours after the Alert had been declared. Although the EOF could have been declared operational fifteen to thirty minutes earlier, the EOF's Emergency Manager (EM) and the ED correctly agreed to allow TSC staff to complete a follow-up message to offsite authorities and related actions prior to EOF personnel assuming overall command and control, plus responsibilities for dose assessment, offsite communications, and direction of offsite survey teams. Transfer of these responsibilities was smooth and evident to participants in the EOF, TSC, and the survey teams.

In contrast to the previous exercise, the capability to generate and evaluate dose projections using the MIDAS system was adequately demonstrated in the EOF by the Radiological Protection Support Supervisor (RPSS) and his staff. The initial RPSS was a member of the Monticello Plant's Emergency Response Organization (ERO), who was later relieved by a qualified member of the Corporate ERO. The former appropriately remained for a time as another assistant to the incoming RPSS. The RPSS staff did a good job in procuring current scenario meteorological data; trending release rate information; interfacing with EOF technical staff to obtain the latest revised estimate of release duration; incorporating such revised estimates in dose projections; and in directing and plotting offsite survey team movements. Dose projections were done in a correct and timely manner with one exception. When a projection was done for a release of twelve-hour expected duration, current meteorological data were utilized instead of forecast meteorological information. The RPSS's staff had already adequately demonstrated the capability to procure actual current and forecast weather data from a computerized weather information service. The staff simply neglected to use the readily available forecast information. The scenario did not include a forecast of all meteorological parameters needed in offsite dose projections. These data could have been issued by exercise controllers after participants had demonstrated their ability to acquire actual forecast information.

The EOF Technical Support Staff adequately interfaced with their TSC counterparts as demonstrated by their continued concern over developing revised estimates of release duration based on progress made in closing the steam line isolation valve and the time needed to process the reactor building's entire atmosphere through the Standby Gas Treatment System. The staff also graphically trended several plant parameters of particular importance for this scenario.

The EM/ED interface was well maintained during the exercise, especially regarding the potentials for emergency reclassification or issuance of an offsite protective action recommendation. Based on scenario events, no such recommendation was necessary and none was issued. The EM effectively managed his staff. He conducted periodic briefings, including having key aides provide verbal updates on their staff's activities to all EOF personnel. The EM reviewed and signed all follow-up message forms transmitted by facsimile machine to the HQEC and JPIC, and by communicators to the State and counties' emergency operations centers. These message forms have been designed to satisfy Criterion 4 of Planning Standard E in NUREG 0654, Revision 1. However, in order to expedite completion and transmittal of these messages, the licensee's procedures do not require that an entry be made for each item on the form. EOF personnel took advantage of this procedural provision, as virtually every transmittal message form had multiple items left blank, even if the appropriate entry would have been a simple "no change", "not applicable", "none", etc. This could confuse message recipients.

The Radiation Protection status board was kept current. While it had predesignated spaces for posting survey team reports, dose projections, protective action recommendations, current release rate, some current weather data, and miscellaneous information, this board did not have predesignated space for forecast weather; indicating the presence of precipitation in current weather conditions; post-accident sample analyses results; and trending release rates. As a result, former release rates were listed on the predesignated space for protective action recommendations, while the following information was never plotted, even on the boards's miscellaneous information section - forecast weather and post accident sample analyses. While the technical staff trended certain plant parameters, values were not plotted on a nearby blank status board that was readily visible to the EM and most of his principal aides. Events chronology information was plotted on a flip chart, with completed sheets later being hung along one wall of the room.

During the exercise, entry into the EOF was switched to an entrance where a security and frisker station had been established. This post was staffed by a guard and an individual tasked with ensuring that arriving personnel properly checked themselves and their possessions for contamination. This individual had been inadequately prepared to perform his assignment, as evidenced by the EOF Security and Services Superintendent having to explain to the individual how persons should check themselves, how the instrument's alarm would signal that significant radiation levels had been detected, and by the individual subsequently failing to stop several personnel from entering the EOF

who had improperly checked themselves and their belongings. One person used the instrument only to check his shoes prior to entering the facility. Another person removed a jacket prior to frisking his hands and feet and then entered the EOF without checking the jacket for contamination. A third individual completed a whole body frisker check in about forty-five seconds. Inadequate contamination control practices at the ACP and EOF's entrance constitute an Exercise Weakness. (263/84-27-02)

Improper controller technique was evident in the EOF. Participants had requested that reactor coolant and stack effluent samples be taken. When simulated results were provided to participants, the controllers issued entire scenario data sheets showing about six sets of sample analysis results valid at thirty minute intervals for periods before and after these simulated samples had been requested. The results corresponding to the sample collection times had merely been circled on the data sheets. Later, a controller was observed to be sitting at the EM's table with a scenario manual left open showing a narrative summary page of future scenario events. On several occasions, controllers were observed asking participants such leading questions as: How much timelag did they expect before the Alert was terminated; what were the number and current locations of State survey teams; and what were current radiation levels in the reactor building; and had surveys been conducted North of the plant. While controllers and NRC observers have a need to determine players' understanding of such topics, questions must not be phrased in such a manner as to lead players to take actions they may not have otherwise taken. In summary, the following types of improper controller techniques evident in the Control Room and EOF, constitute an Exercise Weakness (50-263/84-27-01): displaying or distributing scenario data or other information that had not been specifically requested by participants; and the improper phrasing of questions to participants which may have led them to take actions that they might not otherwise have taken.

In addition to the exercise weaknesses, the following items should be considered for improvement:

- Forecast meteorological conditions should be factored into dose projections for time periods for which current meteorological conditions are no longer representative.

- Future scenarios should contain forecasts of meteorological parameters utilized in dose assessments. Such forecasts should only be issued upon request for such information by participants who have already demonstrated an ability to acquire actual meteorological data.

- Each item on follow-up message forms transmitted from the licensee's emergency response facilities should have an entry to maximize information transmittal and to reduce confusion of message recipients.

- EOF status boards should have provisions for plotting forecast weather; precipitation on current observations; and post accident sample analysis results.

e. Offsite Survey Teams

Four teams were deployed during the exercise - two comprised of personnel from the Monticello Plant and two teams from the Prairie Island Plant. The licensee also utilized couriers to transport samples collected by the teams to the EOF and to bring any needed supplies to the teams. The use of couriers increased the amount of time available for the teams to perform surveys and collect samples.

One team from each plant was observed during the exercise. Teams checked their field kits for completeness and equipment operability prior to dispatch. The driver of one team was not, however, provided with personal dosimetry. Teams were provided with Emergency Planning Zone (EPZ) maps and exhibited no difficulty in locating sampling points to which they were directed. Air samples were properly collected. Filter cartridges were adequately labeled for future identification. Beta/gamma surveys were conducted. Team successfully defined the approximate plume boundaries and maximum plume concentrations. No significant communications reception problems were noted, other than a temporary problem with one vehicle's portable radio antenna. Teams and their communicators in the TSC or EOF repeated their transmissions to ensure messages were properly understood, and minimized confusion by clearly reporting all survey results in units of millirems. Teams received updates on meteorology and plant status. However, communicators in the TSC and EOF and the various teams often did not include the sentence "this is a drill" in their radio transmissions. Teams adequately documented survey results in addition to reporting them to persons directing their movements.

Based on the above findings, the following items should be considered for improvement:

- All personnel assigned to offsite survey teams should be provided with adequate personal dosimetry.

- Field teams and their controllers should use the words "this is a drill" or their equivalent in their communications during drills and exercises.

f. Joint Public Information Center (JPIC)

The JPIC was activated in a timely manner following the Alert declaration. Press releases were frequent, with twelve being issued within approximately four hours. Approval of all press releases was apparent from the signature of a Senior Vice President who also functioned as the Executive Spokesperson at the JPIC. Press release content was developed from discussions between that individual, the person in charge of the Headquarters Emergency Center, and the Emergency Manager at the EOF.

There were several inaccuracies in press releases' content. Although onsite personnel had recognized an increasing radioactive release through the plant stack by 0600 hours, press releases issued prior to 0730 hours inaccurately indicated that there had been no abnormal release to the environment. While the first press release correctly stated that personnel had evacuated the reactor building, two subsequent releases incorrectly stated that all non-essential personnel had been evacuated from the plant. Although the initial press release adequately described the HPCI system's function, the "Alert" emergency classification was never defined. The press releases did, however, provide adequately detailed and factual information regarding the status of onsite injuries and workers' radiation exposures, the release point; update on attempts to manually shut the HPCI isolation valve and the resulting decrease in radioactive releases, and the satisfactory replacement of the ED following the original ED's simulated heart attack.

In addition to hardcopy press releases, the licensee also conducted several press briefings at the JPIC. These briefings were satisfactorily coordinated with State personnel. The briefings were generally understandable and timely. A schematic drawing was used to help explain the steam line break problem confronting emergency response personnel. This drawing was, however, too technical in nature and somewhat difficult to see from the audience to be of real benefit as a briefing aid to media representatives.

Telephoned questions and rumor control activities were handled by personnel in the Headquarters Emergency Center, which was not observed during this exercise.

Based on the above findings, the following items should be considered for improvement:

- The licensee should define all terms used in press releases, such as emergency classification definitions, and ensure that all information is adequately detailed and factual.

- Simplified plant systems diagrams, which are readily visible from media seating areas, should be used in press briefings.

5. Exit Interview

On December 6, 1984, the inspectors met with licensee representatives, denoted in Paragraph 1, to discuss the preliminary findings of the NRC. The licensee agreed to consider corrective actions for the findings discussed.

Attachment: Scenario
Narrative Summary

MONTICELLO NUCLEAR GENERATING PLANT
EMERGENCY PLAN EXERCISE
December 5, 1984

Exercise Scenario

Time	Event/Condition
0445	Initial Conditions:

1. Monticello Nuclear Generating Plant is operating at full power.

2. All identified leakages = 0.75 gpm and unidentified leakages = 0.5 gpm (and steady).

3. The plant has been experiencing problems with leaking fuel.

   ° For the third consecutive day, reactor coolant sample analysis has indicated 0.5 μCi/gram I-131 dose equivalent.

   ° Offgas Rad Monitor had slowly increased to 2500 mR/Hr over the last two weeks.

4. Wind is out of the NNE (27°) at 4 mph and temperature is +10°F. No precipitation is in the forecast.

5. The plant has been experiencing occasional icing problems at the intake.

0500 Low Level Reactor SCRAM is initiated by loss of feedwater flow due to loss of condensate pump due to spurious trip on #11 condensate pump. SGTS is initiated by Reactor Low Level.

0505 Reactor Low-Low Level initiates HPCI and RCIC.

Due to a slug of water in HPCI steam line, HPCI steam line drain pot breaks (equivalent to a 2" diameter break) releasing steam to HPCI room area. Steam flow to room is initially at 57 lbm/sec. (204000 $\frac{lbm}{hr}$) with an equivalent activity release rate of 1.4E5 μCi/sec to the HPCI room area.

HPCI steam line area Hi temperature alarm is received initiating closure of isolation valves. HPCI steam isolation valves fail to completely close. Outboard HPCI isolation valve is partially closed and the inboard isolation valve fails open. Flow is only restricted by the 2" diameter break.

Exercise Scenario (continued)

Time	Event/Condition
0505	It is realized that a full SCRAM did not occur. Two (2) non-adjacent control rods are not completely in the core.
0510	The feedwater system is restored to service.
0520	Radioactive material is being released through the SGTS out the Off-gas Stack. The stack release rate has reached a maximum of 1.4E5 µCi/sec. This results in an off-site W.B. dose rate of about 0.3 mR/Hr Gamma at site boundary. An ALERT should have been declared based on A.2-101 Guideline 5, "Main Steam Line Break" or Guideline 29, "Other Plant Conditions", or Guideline 2 "In Plant Radiation Levels".
0600	Steam continues to flow through leaking HPCI isolation valves and HPCI steam-line break. Atmospheric release continues via the Offgas stack. Operators have depressurized reactor vessel to decrease steam flow out of HPCI steam line break.
0630	Operators have established maximum Torus cooling (4 RHR pumps).
0645	Hi traveling screen dP alarm received due to icing problem.
0845	ED experiences chest pain, nauseau, and sweating. (heart attack)
0900	ED has been relieved by another ED. The HPCI outboard isolation valve has closed in the steam chase. The release of steam is terminated. Reactor Building radioactive inventory continues to be depleted by SGTS and released to atmosphere.

Exercise Scenario (continued)

Time	Event/Condition
1000	Exercise stopped: 1-DAY TIME ADVANCE BRIEFING.

Update of Plant Parameters/Conditions and Environmental Parameters.

* Plant is at Cold Shutdown Condition.
* Reactor core is on RHR cooling and stable.
* The emergency is still at the ALERT level.
* It was discovered that a slug of water in the HPCI steam line broke the HPCI steam line drain pot upon HPCI initiation yesterday. The HPCI steam line remains isolated.
* There are areas of the Reactor building that are Contaiminated due to the steam break, but all airborne activity has been purged out of the Reactor building.
* SBGT continues to operate, but offsite release rates are below normal operating levels (10 micro Ci/sec).
* Offsite surveys have verified that dose rates from the release were only slightly above normal background readings. Total gaseous release is estimated to be about 13000 micro Ci Noble Gas.
* No iodine was detected from field survey sampling.
* The initial ED is reported in stable condition at the Monticello Big Lake Community Hospital after experiencing a heart attack yesterday.

1010 Exercise Resumes - Time 1010, Thursday, December 6, 1984

After ED and EM discuss conditions of plant, they decide to close out the emergency but continue to perform some off-site environmental monitoring and clean up in-plant.

1030 Final news releases are issued and close out at JPIC.

Close out all other Emergency Operating Centers.

E X E R C I S E I S T E R M I N A T E D.