U.S. NUCLEAR REGULATORY COMMISSION

REGION III

Report No. 50-255/85016(DRSS)

Docket No. 50-255 License No. DPR-20

Licensee: Consumers Power Company
212 West Michigan Avenue
Jackson, MI 49201

Facility Name: Palisades Nuclear Generating Plant

Inspection At: Palisades Site, Covert, Michigan

Inspection Conducted: August 19-22, and September 20, 1985

Inspectors: J. Patterson J. Patterson 10/4/85
Team Leader Date

Linda L. Kers 10/7/85
L. Kers Date

Norman R. Williamsen 10/7/85
N. Williamsen Date

M. Marks 10/4/85
M. Marks Date

Approved By: M. P. Phillips, Chief 10/7/85
Emergency Preparedness Section Date

Inspection Summary

Inspection on August 19-22, and September 20, 1985 (Report No. 50-255/85016(DRSS))
Areas Inspected: Routine, announced, inspection of the Palisades Nuclear Generating Plant emergency preparedness exercise involving observations by eight NRC representatives of key functions and locations during the exercise. The inspection involved 185 inspector-hours onsite by four NRC inspectors and four consultants.
Results: No violations of NRC requirements, deficiencies, or deviations were identified; however, six weaknesses were identified which are summarized in the Appendix. Most of these weaknesses and the licensee's proposed corrective actions were discussed at the September 20th meeting.

DETAILS

1. Persons Contacted

a. Exercise

NRC Observers and Areas Observed

F. Victor, Control Room
G. Arthur, Technical Support Center (TSC)
N. Williamsen, Operational Support Center (OSC) and Post Accident Sample Monitoring (PASM)
J. Martin, TSC and Emergency Operations Facility (EOF)
L. Kers, EOF
M. Marks, EOF
H. Larson, Offsite Radiological Monitoring Teams
J. Patterson, TSC, OSC and EOF
E. Swanson, Control Room and TSC

Consumers Power Company Personnel

J. Firlit, General Manager, Palisades Plant
*D. VanderWalle, Director, Nuclear Licensing-Corporate
P. Loomis, Emergency Planning Administrator-Corporate
D. Fugere, Emergency Planner-Corporate
G. Van Hoof, Superintendent, Nuclear Fuels Department-Corporate
A. Katarsky, Senior Nuclear Planner, Chief Exercise Controller-Corporate
J. Fontaine, Supervisor, Nuclear Operations Training Department
J. Lewis, Technical Director
R. Rice, Operations Manager
J. Brunet, Emergency Planning Coordinator-Palisades
R. Marusich, Staff Engineer
G. Slade, Director, Quality Assurance-Corporate
C. Axtell, Health Physics Superintendent
M. Hobe, Emergency Planning Trainer
J. Werner, Emergency Planning Coordinator, Big Rock Point Plant
P. Slaughter, General Emergency Planner-Corporate
T. Hollowell, Staff Engineer
K. Haas, Reactor Engineering Superintendent
R. Orosz, Engineering and Maintenance Manager
L. Kenaga, Staff Health Physicist
R. Christie, General Engineer
H. Esch, Administration Superintendent
J. Bouwens, Senior Engineer
R. Fenech, Technical Engineer
B. John, Emergency Planning Trainer
G. Butera, Shift Technical Adviser-Consultant
T. Chartrand, Senior Chemistry Technician

*Denotes those not attending the exercise exit meeting on August 21, 1985.

b. Management Meeting at Region III on September 20, 1985

Consumers Power Company Personnel

J. Firlit, General Manager, Palisades Plant
P. Loomis, Emergency Planning Adminstrator-Corporate
T. Bordine, Staff Engineer-Plant Licensing-Corporate
L. Kenaga, Staff Health Physicist-Palisades

NRC Personnel

J. Hind, Director, Division of Radiation Safety and Safeguards (DRSS)
W. Shafer, Chief, Emergency Preparedness and Radiological Protection Branch, (EP&RPB), DRSS
M. Phillips, Chief, Emergency Preparedness Section, EP&RPB, DRSS
L. Cohen, Senior Health Physicist, EPS -Headquarters
J. Patterson, Emergency Preparedness Analyst, EPS
L. Kers, Emergency Response Coordinator
M. Smith, Emergency Preparedness Specialist

2. Licensee Actions on Previously-Identified Items

(Open) Open Item No. 255/84-18-01: Additional drills and training for the Post Accident Sample Monitoring (PASM) teams, with emphasis on initial response functions, presampling requirements, and surveying of sampling equipment was needed. Performance of the PASM Team in this 1985 exercise showed some improvements in these areas, but not enough to warrant closing this item. Specific information is provided in Section 5.d.

(Closed) Open Item No. 255/84-18-02: The use of Teletectors for plume monitoring should be discontinued. A more suitable radiation monitoring device which could measure beta-gamma as well as gamma radiation was used. This new radiation measuring device had been installed in the offsite monitoring emergency kits. This item is considered closed.

(Closed) Open Item No. 255/84-18-03: EI-9 should be revised to include guidance on radiation surveying for exposure rates for teams passing through the plume, and Attachment 1 should be more specific in identifying instruments and other items. A review of procedural guidance, including guidance for offsite monitoring teams while passing through the plume, and specific identification of radiation monitoring instruments and other items needed by these teams, concluded that the new EI-9, Revision 3 dated January 29, 1985 was satisfactory. In addition, the team appeared to follow this revised procedure, particularly in plume tracking and identifying the centerline of the plume. This item is considered closed.

(Closed) Open Item No. 255/85016-08: Activation of Emergency Plan on May 23, 1985. Based on a review of logs, the inspector concluded that the event was correctly classified. Also, the review of licensee documentation confirmed that notifications to State and local governments were made within the required time. This item is considered closed.

(Closed) Open Item No. 255/85016-09: Activation of the Emergency Plan on June 21, 1985. The inspector evaluated the emergency conditions and related EAL for classification as an NUE and found them correct. Also, a review of the chronology of events determined that the NRC, State, and Van Buren county were notified in the required time. This item is considered closed.

(Closed) Open Item No. 255/85016-10: Activation of the Emergency Plan on June 22, 1985 when an oil leak was discovered on one of the Diesel Generators during a surveillance test. Technical Specifications 3.7.i was exceeded since the diesel generator had an inoperable safety feature component. The Shift Engineer and the Duty and Call Superintendent decided to classify the event as an NUE. The EAL referred to, should have been the one on page 19 of 32 of the EAL table; however, the SE used another reference. The inspector concluded that the event was conservatively classified. Necessary notifications were all made in a timely manner. This item is considered closed.

3. General

An exercise of the Palisades Plant Site Emergency Plan and Emergency Implementing Procedures (EIPs) was conducted on August 20, 1985. The exercise tested the response of the licensee to a hypothetical accident scenario, resulting in a major release of radioactive material to the environment. Attachment 1 describes the scenario. This exercise was a full-participation exercise for Van Buren and Allegan counties, and a partial-participation exercise for Berrien County and the State of Michigan.

4. General Observations

a. Procedures

This exercise was conducted in accordance with 10 CFR Part 50, Appendix E requirements using the Palisades 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 in a separate report.

d. Critique

The licensee held a critique at the Palisades Plant on August 21, 1985. The NRC critique followed immediately after the licensee's critique. Personnel who attended are listed in Section 1. The licensee and NRC each identified weaknesses in their respective critiques as detailed in this report. The NRC Team Leader presented the exercise findings in a joint public critique with FEMA-Region V at Lawrence, Michigan on August 22, 1985.

5. Specific Observations

a. Control Room

This portion of the exercise was conducted from an office adjacent to the Control Room. It was not possible to utilize the Control Room display panels due to reactor operations conducting critical path procedures prior to startup. A chronological event log with key information was maintained throughout the exercise in the Control Room.

Technical Specifications, Operating Procedures, Emergency Operating Procedures, and the Emergency Plan Implementing Procedures were utilized properly in most instances throughout the exercise by cognizant Control Room staff including the Shift Engineer/Shift Technical Advisor (SE/STA). Notifications to offsite agencies were made within the required 15 minutes for both Notification of Unusual Events (NUEs) and the Alert declaration. Emergency Implementing Procedure EI-3 and its notification form were followed each time. Information exchange and coordination of effort within the Control Room (CR) was effective. Operational and technical problems were thoroughly analyzed prior to decisionmaking.

Transition of command from the Shift Engineer as initial Site Emergency Director (SED) to the Plant General Manager as SED in the TSC was done in a clear, effective manner. Meaningful discussions on plant conditions were held on several occasions between the SS, SE, and Operations Supervisor of the CR, and their counterparts in the TSC. However, several requests from the TSC for actions to mitigate the event were not only challenged by the Control Room, but actually rejected. One example was when the SED ordered the contaminated steam generator dump valve opened to cool down the plant. This action was rejected by the CR. However, the final resolutions of the TSC's proposed actions or counter suggestions were not communicated back to the SED in the TSC and his operations and technical staffs. The TSC and Control Room personnel did not adequately coordinate efforts to mitigate the accident.

The second NUE declared at approximately 0835 was correctly classified based on release of a toxic gas/aerosol (H_2SO_4) which could affect plant operations. At 0845, the Control Room controller notified the SE that "For purposes of the drill, toxic gas is

sufficient to call an Alert." This Controller message preempted CR emergency personnel from being allowed to analyze and evaluate this information, relate it to the proper EAL, and make a classification decision. This obvious prompting by a controller is an exercise weakness. (Open Item No. 255/85016-01).

Although chemical analyses were frequently requested by the CR to confirm that the boron concentration in the primary coolant was high enough to maintain a sub-critical condition, the results were never received by the CR staff. As late as 1215, some of the CR staff thought that both steam generators had significant primary to secondary leaks, while actually only the "B" steam generator had a primary to secondary leak.

Although internal communications and interchange of information within the Control Room were excellent, communications with the TSC, which were overly dependent on using the TSC Operations Support Group Leader as a runner, were not always adequate.

b. Technical Support Center (TSC)

The TSC was officially activated in less than 15 minutes; however, several key participants were already in the TSC prior to the Alert being declared. Some of the participants prematurely present had exercise-identifying arm bands on prior to TSC activation. A more disciplined, realistic approach to activation is recommended for future exercises. Assembly, accountability, and evacuation were initiated and completed successfully within approximately 35 minutes after the Alert was declared. Briefings by the SED were held several times an hour with the support group leaders. However, not all TSC personnel were adequately informed by the SED on all plant problems, or which objectives were being pursued by the TSC.

Primary to secondary leak rate was not determined by the TSC, either by the Operations Support Group or the Engineering and Maintenance Support Group. Primary plant temperatures and pressures, subcooling temperatures, and steam generator temperatures and pressures were all in various states of uncertainty during most of the exercise. There was no trending of these parameters, at least prior to 1030. Trend graphs for plotting were available, but were too small in size and too large in scale to be effective. They were located against a wall, below waist level, where they were very awkward to use. Clocks in the TSC were never synchronized. The problem with the five stuck control rods did not appear to be actively pursued by the TSC, although it occurred about 1000 hours. The SED's meeting with his support teams at 1040 did not address this event.

Some of the exercise data sheets were confusing to the participants. The pressure operated relief valves (PORVs), closed in the early stages of the exercise, were opened at 1002, whereas plant data sheets had these closed for the entire exercise.

Prior to declaring the Site Area Emergency and the General Emergency there were good discussions and evaluations of the EALs by the SED and his support group leaders. Notifications to State and Counties, as well as the Coast Guard for the General Emergency, were completed within 15 minutes. A Protective Action Recommendation (PAR) was correctly issued by the SED and included sheltering up to 2 miles and also downwind 2-5 miles to include two adjacent sectors within the 10 mile EPZ. This initial PAR followed the PAR Flow Chart of Procedure EI-6.13. Good rumor control was demonstrated by the SED in following up on a rumor that an injured man was found at the site of the toxic gas/acid spill about 0906.

The general design and layout of the TSC area, although used adequately in earlier annual exercises, appeared awkward and somewhat inefficient this time. The cubicle design limits the communications within the TSC and definitely hinders eye contact between SED and his staff.

The following weakness was identified:

- Lack of coordination between the support groups, as well as with their counterpart groups in the Control Room, was evident. Examples of these include: lack of addressing critical plant parameters such as primary to secondary leak rate determinations, how to release the five stuck control rods, and lack of trending vital plant temperature and pressure parameters. (Open Item No. 255/85016-02).

In addition to the above weakness, the following items should be considered for improvement:

- The activation process for the TSC should be better disciplined and coordinated by <u>all</u> participants, including strict adherence to Emergency Implementing Procedure EI-1 and EI-2.1.

- Graphs and charts needed for trending should be mounted where they can be better utilized by the TSC support groups.

c. <u>Dose Assessment and Other Health Physics Related Activities</u>

The Health Physics (HP) Support Group Leader in the TSC gave a good briefing to this team on the radiological conditions as they related to operational activities of the emergency. The dose assessment staff in the TSC recognized the potential threat of an offsite release of toxic gas and set up a stability Class E isopleth to project a plume. An onsite survey team was dispatched which included a Chemistry Technician with a toxic gas monitor to survey onsite conditions. Habitability surveys were made in the TSC. Also, the HP leader alerted the offsite survey teams to prepare for deployment in the field. The technical aspects of the emergency were actively considered in anticipation of a probable radioactive release. The TSC Communicator for the offsite monitoring teams provided plant status information and meteorology data as requested.

Functions were transferred from the TSC to the EOF in a timely manner, while ensuring that no loss in data or continuity would occur. Recommendations following the General Emergency were immediately communicated to the State of Michigan. Following the radiation release at 1100, the initial PAR was properly and promptly revised. The offsite teams were properly positioned.

Due to elevated dose rates near the EOF, location and staffing of an alternate EOF was discussed, as well as preparation for sheltering within the EOF. Dosimetry and potassium iodide were brought in for the EOF staff. This aspect of the exercise was well done. The HP group in the EOF, recognizing the higher radiation exposure rates in the field, requested reduced sampling times for collecting air samples, and based on contamination and ALARA considerations, did a good job in attempting to reduce exposure to field teams. Soil, vegetation, water, and smear samples were not taken during the exercise; but were recognized as being needed during the recovery stage.

The EOF Director and his support group leaders caucused about 2:00 p.m., and summarized the plant status and took action to terminate the exercise. This concluding portion of the exercise was a joint effort of all EOF staff and was well done.

The weakness in the EOF dose assessment activities related to the failure to meet to Objective No. 9 of the exercise, which was to demonstrate the ability to monitor, assess, and trend radiological field data. Although the basic technical abilities to monitor and assess radiological data were demonstrated, the magnitude, location, and composition of the radioactive plume were not adequately characterized.

Between 11:00 a.m. and 2:00 p.m., the HP Group continually tried to assess plume centerline dose rates, but they succeeded only once. At other times, they assumed the reported dose rates were centerline values, when in fact the teams were not at the centerline of the plume. This meant that in some cases, the assumed centerline data were more than a factor of 1,000 lower than the actual maximum centerline values. This led the HP Group to believe that the maximum dose rates, as well as the iodine and particulate concentrations, were much lower than the scenario data. The offsite monitoring data were not tabulated, plotted, or otherwise trended in a way that could have revealed this significant underestimate of the plume's intensity. Smear data collected later was not recognized as suggesting that iodine and particulate concentrations must have been higher than earlier considered.

The release rate at 11:00 a.m. was estimated from the steam dump area monitor reading to be about 9200 Ci/sec. The HP Group recognized that the release was via an unmonitored pathway and they planned to use field radiation data to back-calculate the release rate. This was not accomplished in a timely or accurate manner. Since the release

rate was virtually undefined, dose projections and assessments were infrequent and inadequate. Neither the field survey data nor the dose projections adequately characterized the plume; therefore, it was impossible to compare the protective action recommendations with the EPA protective action guides. It was also difficult to resolve conflicting protective action recommendations with the State of Michigan, because they were basing their dose projections on the 9200 Ci/sec release rate for a duration of about 1½ hours. This unrealistically high release rate would have warranted evacuation out to 25 miles.

The EOF-HP group recognized that the offsite monitoring teams would be grossly contaminated from the release, but directions to the offsite teams from the EOF-HP Communicator regarding decontamination plans were apparently never transmitted to the teams because they failed to report to the designated location for decontamination. This is further discussed in Section 5.f of this report. The following weakness was identified:

- The EOF-HP support group failed to adequately demonstrate assess and trend radiological field data, including the magnitude, location, and composition of the plume. (Open Item No. 255/85016-03).

d. Operational Support Center (OSC)

Assembly, activation, and check out of radiation monitoring and sampling equipment was adequately performed. OSC Communicators kept the onsite, and initially the offsite, monitoring teams well informed of plant conditions as well as the current status of the emergency. Radiation survey data was promptly reported by portable radio to the OSC office. Status boards were well maintained, with one noteworthy exception. There was no status board for equipment out of service. Both the OSC Director and his counterpart in the Maintenance Support Center, showed good command and control.

The in-plant Health Physics Supervisor demonstrated good knowledge of her emergency duties, and briefed and directed the inplant teams effectively. The inplant Communicator, and the person handling records of inplant radiation level and emergency personnel exposure information, were efficient. Messages completed by the Communicator were never signed nor initialed by anyone. Adequate radiation monitoring techniques were followed by the HP technicians accompanying maintenance teams.

No Controller was present with the team sent out to repair one of the charging pumps. One of the maintenance specialists called the OSC after a ½ hour time lapse and reported the job had been completed. After a Controller determined that this repair job on the charging pump should have taken three hours per the scenario, he then corrected the time with the OSC. However, the failure to have a Controller with each team caused the Control Room to be told initially that this

charging pump was repaired in a ½ hour. This uncoordinated event (pump on vs pump available) also caused confusion in the TSC.

Another weakness was slipshod, erratic self-monitoring techniques, as demonstrated by the OSC teams prior to reentry to the OSC. Even after the double doors to the OSC were closed and a sign was posted, indicating that the frisking station was moved to the Low Level Counting Room, participants still persisted in trying to enter the OSC through the south doors without frisking. In addition, the radiation counter and probe were placed on a chair as a frisking station. A more realistic set-up with radiation-type magenta/yellow tape should be used in conjunction with a qualified individual posted there to assure that no one stepped into the clean area without self-monitoring or "frisking" their person. This weakness is an indication of inadequate training, poor emergency-related attitudes, and a breakdown of the discipline needed in a real emergency environment. The aforementioned examples of inadaquate contamination control provisions and practices are an exercise weakness. (Open Item No. 255/85016-04).

The PA system could not be heard in the OSC or the MSC, and the respective Directors did not always follow these PA initiated announcements with a voice announcement. Also, the TSC was never informed that PA announcements could not be heard inside the OSC.

Two or three procedural steps were in error or incorrectly done by the team that was taking liquid and air samples (PASM). As a result, the inspectors could not determine whether a sample could have actually been collected since this activity was simulated. These steps involved improper flow meter setting, improper handling of the inner cask lifting device, and improper sequence in following the procedure. The radiological precautions, protective clothing donning, and use of correct dosimetry including finger dosimeters were demonstrated satisfactorily. The total elapsed time from the initial request to giving the results to the Chemistry Supervisor, was approximately 3½ hours, or slightly more than the three hours recommended by NRC guidance.

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

- The PA system should be re-tested to assure reception in certain areas near the OSC and MSC offices.

- All messages, external or internal to the OSC, should be initialed or signed.

- Sufficient controllers should be provided so that no teams are dispatched without a controller.

e. Emergency Operations Facility (EOF)

Prior to complete activation of the EOF, which included primarily corporate personnel, an interim position of EOF Leader was established, per Procedure EI 4.3. As interim Emergency Director, this EOF Leader did not exercise his authority and responsibility satisfactorily to make an effective transition with the EOF Director and the permanent EOF staff. The initial General Office Emergency Response Team arrived about 1022, which is about 70 minutes after the Alert was declared and within the guidelines of Procedure EI-4.3. However, because of the sporadic arrival times and poor exercising of authority by the EOF Leader, it was difficult for the NRC observer to accurately assess the activation time of the EOF. It took 21 minutes after the Emergency Director's arrival for him to assume command. All support teams were staffed at 1030, and the official activation was not declared until 1050. This activation process should be better coordinated for future exercises.

The administrative and clerical support, as part of the initial contingent prior to activation, performed their functions adequately; however, the clerical procedure checklist should include all EOF positions to ensure that logbooks, message forms, telephone listing, and supplies are available. The time clocks should have been synchronized prior to EOF activation.

Although status briefings were held frequently by the EOF Director, their content and direction did not put enough emphasis on follow-up on PARs to determine what actions were taken and would be taken by State and local agencies in conjunction with the plant's recommendations. The communications with key State of Michigan personnel appeared too infrequent. Reports on plant conditions and related communications with the TSC, particularly on major problems were well done. However, the Emergency Director in his briefings did not always solicit input from the Team Leaders. The public address system speaker in the Public Affairs/NRC room was erratic in performance.

Status board information, as posted, reflected the time this information was sent to the State of Michigan, not the time it was generated. Meteorological data was updated about every fifteen minutes. No records were kept of who received dosimetry or potassium iodine in the EOF.

The South Haven Conference Center EOF does not presently meet NUREG-0696 guidance for minimum space and communications for NRC use. This document states that office space for at least five NRC personnel shall be made available and working space for nine NRC and one FEMA personnel shall also be made available. It also states that at least three dial telephone lines shall be made available for NRC use. Also, additional HPN and ENS telephones should be relocated at the communications table in the main EOF room, so that communicators will have ready access to plant status and HP data. This is an exercise weakness. (Open Item No. 255/85016-05)

About 1130, additional offsite monitoring teams were requested from the D.C. Cook Nuclear Plant. However, the decision was made to delay their meeting the licensee's offsite teams until 2:00 p.m. This resulted in Team No. 1 not being used effectively for significant periods of time from 1130 to 1400. Also, the EOF offsite monitoring team's communicator was already having difficulty in managing the movements of the licensee's own two teams. It is doubtful that he could have handled two more teams. Provisions should be made for one more communicator where more than two teams are to be effectively used simultaneously in the field.

Requests to obtain approval for sending the two Cook Plant teams led a communicator to reference the Mutual Agreement with the other utility. This agreement listed a Vice President as contact. The communicator telephoned that number, but later realized he should have gone direct to Procedure EOF-4. This procedure did not list the D.C. Cook Plant or the correct telephone number. Procedure EOF-4, Page 12 of 16 should be updated to include the appropriate D.C. Cook Plant telephone number.

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

- The position of EOF Leaders should be clarified, adequate training provided, so that the Leader will function as intended prior to the EOF Director's arrival.

- For future drills and exercises, the communications between the Emergency Director and his support teams should go both ways; particularly the ED should always solicit their input as well as providing his input to them.

- Procedure EOF-4 should be revised to include the utility name and telephone contact for assistance under the Mutual Agreement Policy.

f. Offsite Monitoring Teams

Assembly, activation, and check-out of monitoring and sampling equipment were well done at the teams' assembly point in the OSC. The EOF and OSC communicators kept the teams informed of changing plant status and the current emergency classification. Victoreen monitoring equipment, although not calibrated, was used instead of Teletectors, which had been used in the 1984 exercise. Self-reading dosimeters and calculated doses were checked and reported to the OSC and EOF. Air samples were correctly taken. In most cases, cross contamination was avoided. Protective clothing was worn at all times. The team moved out of the plume after taking air samples which demonstrated good ALARA practices.

The most serious weakness was not decontaminating the van before returning to the site. This would have resulted in the spread of contamination at the site, in addition to other potential contamination control problems. This is an exercise weakness. (Open Item No. 255/85016-06).

The EPZ map and data sheets provided were difficult to work with in a moving vehicle. Drawers in the cabinets in the van should be secured to prevent equipment damage, as well as possible injury to the occupants of the van.

6. Management Meetings

a. Exit Meeting - August 21, 1985

The inspectors met with licensee representatives denoted in Section 1 at the conclusion of the inspection to present the NRC's preliminary findings. Licensee representatives agreed to consider the items discussed. In addition, the inspector discussed the likely content of the inspection report. The licensee did not identify any of the materials discussed as proprietary or safeguards information.

b. Management Meeting Held in NRC Region III on September 20, 1985

Prior to this meeting an initial meeting was held at the Palisades Plant on September 5, 1985 to discuss Region III's concern over the plant's general performance in emergency preparedness and in particular the plant's performance in the August 20, 1985 annual emergency exercise, (Reference Meeting Report No. 50-255/85022). As a result of the initial meeting, the licensee was instructed to present their goals and commitments for improving their emergency preparedness program with a specific time line at the September 20, 1985 meeting at Region III offices.

These goals and planned corrective actions by the licensee are included as Attachment 3 to this report, subject to the understandings described.

It is our understanding that Issue No. 1 of the corrective action will include a review of all Emergency Action Levels (EALs) for clarity. For Issue No. 2, the staff understands that, in reorganizing the TSC organization, the Control Room will report through the Operations Support Group to the SED and either the position of Operations Supervisor or Operations Manager will be eliminated. For Issue No. 4 we understand all the radiation services department personnel and chemistry personnel associated with PASM will be included in the table-top exercises/discussions. For Issue No. 6 we understand that a generic list of performance standards will be issued to all plant staff in the emergency organization and not just to recent exercise participants. For Issue No. 14 we understand that, for interim measures, only qualified Health Physicists will be used as offsite team communicators. The July, 1986 completion date refers to the long term plan to develop and implement a new method of controls to review and revise, as necessary, team procedures. For Issue No. 15, we understand

that the frequency of the planned seminars will be a minimum of twice per year. In addition, we understand that to support a date of June, 1986 to complete the computer calculations point, the following milestones will be met: (1) tech. manual and human factors review will be completed by the end of October, 1985; (2) the maintenance manual, users manual, and technical review will be completed by the end of November, 1985; (3) the software manual will be completed by the end of December, 1985; (4) the appropriate procedures at Big Rock Point and Palisades (26 total) will be revised by the end of January, 1986, with Plant Review Committee approval completed by the end of February, 1986; (5) the appropriate training modules will be revised by the end of March, 1986; and (6) all training will be completed on the new procedures using the new module by the end of June, 1986.

NRC Region III will closely monitor all of the licensee's proposed actions and milestones as described above and in Attachment 3 to this report. The licensee representatives were instructed to notify NRC Region III at the earliest possible time if a commitment or milestone would not be met and provide adequate justification.

Attachments:
1. Exercise Sequence of Events and Narative Summary
2. Exercise Scope and Objectives
3. 1985 Palisades Evaluated Exercise Corrective Actions

2.0 SCOPE AND OBJECTIVES

2.1 SCOPE

A simulated abnormal radiological incident at the Palisades Plant will escalate to a General Emergency, and will involve planned response and recovery actions that include emergency classification, notification of offsite organizations, notification of plant personnel, simulated actions to correct the emergency conditions, initiation of accident assessment and protective action recommendations as to cope with the accident. The emergency will then de-escalate, the recovery phase will be initiated and the exercise will be terminated.

2.2 OBJECTIVES

The major objective of the exercise is to evaluate the integrated capability and a major portion of the basic elements existing within the onsite emergency plans and emergency response organizations. Specific objectives of the exercise to be demonstrated in various phases are listed below. The "free play" aspect of the exercise will be emphasized where practical. The exercise will:

1. Demonstrate the adequacy of the Site Emergency Plan (SEP) and the Site Emergency Plan Implementing Procedures to ensure compliance with 10 CFR 50.47 and NUREG-0654.

2. Demonstrate the activation, staffing and operation of emergency response facilities.

3. Demonstrate proficiency in recognizing and classifying emergency conditions.

4. Demonstrate the notification network to State, local, Federal, corporate and plant personnel.

5. Demonstrate a familiarity with Protective Action Guides (PAGs) and determination of protective actions.

6. Demonstrate the mobilization of onsite and offsite radiological monitoring teams.

7. Demonstrate the capability to utilize the post-accident sampling system.

8. Demonstrate the capability to coordinate news releases, and handle public inquiries in a timely and accurate fashion.

9. Demonstrate the ability to monitor, assess and trend radiological field data.

10. Demonstrate the capability of performing a site assembly and accountability of personnel within 30 minutes.

SEQUENCE OF EVENTS AND NARRATIVE SUMMARY

The plant is operating at 98% power supplying 750 MWe and has been operating the equivalent of 200 full power days. Primary Coolant System I-131 DEQ activity has been at 1.1 μCi/g since 0810 Saturday (LCO condition reached at 0810 today). Latest primary sample showing 1.1 μCi/g taken at 0830 on Monday. Primary Coolant System leakage is 0.3 gpm unidentified, 0.2 gpm identified and 0.01 gpm primary to secondary. One of the three charging pumps (P-55A) is inoperable due to normal preventive maintenance. "B" charging pump is in service and "C" is the backup. P-66A high-pressure safety injection pump (HPSI) is inoperable due to broken oil filter.

At 0810, an Unusual Event is declared as a result of exceeding 1 μCi/g Iodine-131 DEQ for more than 72 hours. Plant shutdown continues.

At 0815, maintenance repairman, while loading gas bottles, knocks over several cylinders of propane with a forklift truck. The valve is severed on one of the cylinders. The cylinder is propelled through the metal wall of the Feedwater Purity Building, striking the sulfuric acid tank. A hole is punched in the tank about half way up. The sulfuric acid runs to the floor from the hole. The acid reacts with the water on the floor, causing sulfuric acid fumes. Toxic sulfuric acid fumes fill the Feedwater Purity Building as a result of the leaking sulfuric acid reacting with the water in the containment area around the acid tank.

At 0820, the repairman calls Control Room to report the accident and the Auxiliary Operator notifies Control Room of toxic gas release (Alert).

At 0830, Control Room notifies Chemistry of toxic gas release.

At 0835, the acid tank has drained down to point of break. (Leak is secured.)

Between 0835 and 0930, Chemistry neutralizes spill, the Auxiliary Operator establishes ventilation and cleanup begins.

At 0930, Charging Pump P-55B trips. P-55B tripped due to a pressure controller (PC-0216B) ruptured (broke off at connection). This caused the pump to trip on low oil pressure. P-55C starts but trips immediately due to seized pump motor caused by low seal cooling flow.

At 0940, Auxiliary Operator notifies Control Room that Feedwater Purity Building is now habitable; toxic sulfuric acid fumes have dispersed (possible de-escalation).

At 0950, HPSI Pump P-66B fails due to a damaged Y-Phase overcurrent relay damage. The damage resulted when a maintenance man inadvertently bumped the breaker with some tools while on his way to fix the charging pumps. Now there are no HPSI pumps or charging pumps.

At 1000, the cap on the main steam isolation valve on Steam Generator B opened up (modelled as a 1.0 ft^2 break). At the same time, 5 steam generator tubes

ruptured (modelled as a 0.02 ft^2 LOCA. Primary coolant and steam generator fluid are released to the environment via the door to the roof of the Auxiliary Building (the door is about seven feet away and five feet above the damaged MSIV). Steam and radionuclide also gather in all floors of the Component Cooling Water Room (the MSIVs are on the second floor; the door to the roof is on the third floor of this room). In the opinion of the scenario writers, a General Emergency condition exists due to the loss of two of three fission product barriers, with potential for the loss of the third. The potential loss of the third is indicated (in the scenario writers' view) by the plant high radiation alarms. In fairness to the plant, they may believe that the high radiation is coming from the activity in the primary coolant with an iodine/noble gas spike, and not from additional failed fuel rods. Therefore, breach of the third barrier is not imminent and the event is a Site Area Emergency. The Consumers Power Company evaluators and NRC evaluators will determine if the reasoning not to classify the vent as a General Emergency is adequate. An additional consideration is that there is an Emergency Action Level of Site Area Emergency, which is defined as a steam line break and greater than 50 gpm primary to secondary leak rate and indication of fuel damage, all of which occur here.

At 1000 and 15 seconds, there is a reactor trip on high reactor power followed quickly by low pressurizer pressure and low steam generator pressure trip signals. All but five control rods insert so that the reactor remains critical.

At 1002, the primary pressure has bottomed out above the low-pressure safety injection (LPSI) pump head. At this point, there is no safety injection as bottom HPSI pumps and all three charging pumps are out and the primary system pressure is too high for LPSI flow or safety injection tank flow. The pressurizer is empty and steam is coming out of the break. Since power generation is now greater than combination of energy being released out of the break and the energy transferred to the steam generators, the primary pressures begin to rise.

At 1020, the primary system pressure has peaked at 2400 psi and the pressurizer has refilled due to expansion of the primary coolant.

At 1030, the reactor goes subcritical due to the primary system heatup (negative moderator coefficient of reactivity) and now the energy transferred out the break and to the steam generators is greater than decay heat. The primary coolant begins to cool off, and the pressure and temperatures begin to fall.

At 1100, the core is uncovered and fuel is overheating and failing. HPSI Pump P-66A is fixed but, by itself, can only stabilize level (flow in = flow out).

The plant can be cooled in one of three ways. One is to wait for the second HPSI pump to be fixed (should be fixed about 1200) and reflood. A second way is to open the bypass around the MSIV and cool using the good steam generator and turbine bypass valve (or atmospheric dump valves), and a third is to open the PORVs and depressurize down a pressure at which the LPSI pumps can provide injection flow. The scenario writers did not think that the PORVs would be

used (based on the advice of our simulator instructor) or that the atmospheric dump valves would be used. Therefore, the scenario was written based on the plant staff waiting for the second HPSI pump to be fixed. If the plant staff elects to use the turbine bypass valve, the cooldown is so slow that the scenario, as we have drawn it, will not change much. The controllers are prepared, however, to allow the plant staff to cool in any of the three ways described above.

At 1200, the other HPSI pumps is fixed and plant cooldown can commence. The core is covered quickly after the second HPSI is put into service.

Between 1330 and 1400, the drill ceases with the core cooled and covered, and the release stopped (although the path still exists).

1985 PALISADES EVALUATED EXERCISE

CORRECTIVE ACTIONS

EP0985-0001C-NC08

1985 PALISADES EVALUATED EXERCISE
CORRECTIVE ACTIONS

● ISSUE-1

The scenario controllers in the control room had to prompt the players to issue the "Alert" classification.

CAUSE

Procedural deficiency and scenario deficiency.

RESOLUTION

1. A comprehensive review of the EALs is progressing. This issue will be used as an example of where a problem exists and the next revision of the EALs will reflect the resolution.

2. A review of the PALEX 86 scenario will be performed to ensure the scenario events clearly define the desired actions and to ensure that proper contingency messages are present to allow the controllers to perform satisfactorily.

COMPLETION DATE

1. December 31, 1985
2. July 5, 1986

● ISSUE-2

There was a lack of feedback from the control room to the TSC on the steam dump issue.

CAUSE

Communications deficiency
Procedural deficiency.

RESOLUTION

1. A table top exercise/discussion will be conducted between all potential SEDs, Shift Supervisors and Shift Engineers. The purpose is to increase awareness of the need for the facilities to rely upon each other and use each other in an emergency situation.

2. A procedural change will be made to streamline the reporting mechanism between the SED and control room.

COMPLETION DATE

1. November 30, 1985
2. September 16, 1985

● ISSUE-3

There was too much "simulation" on the part of the players. This resulted in players neglecting certain aspects that would normally have been done had they not simulated.

CAUSE

Exercise concept deficiency

RESOLUTION

1. The appropriate SEP training lesson plans will be revised to emphasize avoiding simulation.
2. 1986 drills and exercises will require performance of tasks that have heretofore been simulated. Such tasks may be requiring the use of anti-C's, respirators, expanding maintenance activities, etc.

COMPLETION DATES

1. January 15, 1986
2. Ongoing

● ISSUE-4

There was poor contamination control practice. The HP group from the OSC did not address the simulated contamination problem caused by the plume. Step-off pads were not used, and contamination and radiation boundaries were not set up. There appears to be a general lack of understanding of the real contamination consequences of a plume.

CAUSE

Player performance deficiency

RESOLUTION

1. An on-going effort will be made to stress the reduction in simulation during drills and exercises and to improve "drillsmanship".
2. A table-top exercise/discussion of the radiological impact of the PALEX 85 scenario with TSC/OSC HP staff will be conducted. Emphasis will be placed upon enhancing player understanding of the events and the resultant radiological hazards. Analytical approach to problems associated with detection and quantification of these hazards will be presented.

COMPLETION DATE

1. Ongoing
2. Octobe. 31, 1985

● ISSUE-5

Post-accident samples were not obtained in a timely fashion.

CAUSE

Player performance deficiency
Controller deficiency

RESOLUTION

1. Revise the formal SEP training module lesson plan to stress the need for OSC Director to obtain priorities from TSC HP group leader.
2. Ensure there is a sufficient number of controllers for future drills and exercises to avoid delays in player performance.

COMPLETION DATE

1. October 5, 1985
2. November 15, 1985

● ISSUE-6

Players were observed to exhibit a poor attitude toward the evaluated exercise. In a few cases, players appeared to be distracted from the primary role of emergency response by discussing non-work-related matters.

CAUSE

Player expectations not clearly defined

RESOLUTION

1. A generic list of "performance standards" that is expected of all players will be distributed to the plant staff. These standards will be geared to improve "drillsmanship".
2. The "Objectives" of PALEX 86 will be distributed to the plant staff in advance of the evaluated exercise.

COMPLETION DATE

1. November 30, 1985
2. July 30, 1986

- ISSUE-7

The Public Address (PA) System cannot be heard in the MSC or OSC.

CAUSE

Equipment deficiency

RESOLUTION

1. A speaker will be installed in the MSC.
2. The speaker system in the OSC will be upgraded by putting in an additional speaker or increasing the range of the "volume control" of the installed speaker.

COMPLETION DATE

(1) and (2) December 31, 1985

- ISSUE-8

The physical layout of the TSC is not conducive to good communication. The installed room dividers appear to be a barrier to the team leadrs and prevent easy access and communication.

CAUSE

TSC design

RESOLUTION

An evaluation will be conducted to determine if the room dividers should be removed.

COMPLETION DATE

December 31, 1985

- ISSUE-9

The trend graphs in the TSC are located at an awkward height. In addition, they are too small and of insufficient scale to be effectively used.

CAUSE

Equipment deficiency

RESOLUTION

The trend graphs will be relocated to a more acceptable height. The actual graphs will be enlarged and modified to accommodate a larger scale.

COMPLETION DATE

December 31, 1985

- ISSUE 10

Exercise controllers need to be better trained concerning their performance during practice drills and evaluated exercises.

CAUSE

Training deficiency

RESOLUTION

A more comprehensive training program will be provided each controller prior to the first practice drill at Palisades in August 1986. A thorough discussion will be conducted with each controller regarding the scenario package prior to the evaluated exercise.

COMPLETION DATE

1986 Scenario Committee established: October 20, 1985
Controller position organization: November 15, 1985

Draft PALEX 86 objectives: November 30, 1985
Comprehensive controller training completed by July 29, 1986
Controller training on practice scenario specifics by July 29, 1986
Controller discussion regarding exercise specifics by August 15, 1986

- ISSUE 11

Lack of controllers in the Maintenance Support Center and Operations Support Center.

CAUSE

Controller organization deficiency

RESOLUTION

Lessons learned from PALEX 85 will be incorporated into the 1986 scenario controller organization; additional personnel will be assigned.

COMPLETION DATE

November 15, 1985

- ISSUE-12

The utility, state and local government representatives in the Joint Public Information Center did not act as a team (sharing all appropriate information, working out inconsistencies, etc.) behind the scenes (in the Command Center) prior to scheduled briefings.

CAUSE

Player performance

RESOLUTION

This will be stressed with Consumers Power Company personnel during regularly scheduled training and again during practice drills scheduled with state and local officials prior to the August 1986 Palisades exercise.

COMPLETION DATE

July 29, 1986

- ISSUE-13

Responsibilities and authority within the Emergency Operations Facility (EOF) were misunderstood by some personnel; ie, EOF Director, HP Team Leader.

CAUSE

Procedural deficiency
Training deficiency

RESOLUTION

1. Procedure EOF-1 (Emergency Officer) assigns to the Emergency Officer responsibility for resolving differences between the Site Emergency Director (SED) and the EOF Director. This responsiiblity will be listed under actions to be performed (it is not currently); an organizational diagram of reporting relationships and communications will be incorporated into Procedure GEN-1 (Overview). EOF-2 (EOF Director) will be revised to stress priority of responsibilities.

2. Emergency Planning personnel will conduct hands-on training with appropriate management personnel who work within the EOF to ensure a clear understanding of individual and facility responsibilities/authority.

3. The EOF Management Training Module will be enhanced to include more specifics concerning management roles within the facility.

COMPLETION DATE

1) December 1, 1985
2) December 13, 1985
3) January 1, 1986

● ISSUE-14

The magnitude, location and composition of the radioactive plume were not adequately characterized by the EOF health physics team to satisfy Objective 9, "Demonstrate the ability to monitor, assess, and trend radiological field data."

CAUSE

1. Inexperienced offsite team communicator in the EOF.
2. Lack of a well-defined methodology for controlling offsite monitoring teams.
3. Current procedure for trending offsite monitoring team data with calculated offsite doses is not effective.

RESOLUTION

1. Involve EOF health physics team members from the General Office in the plant's offsite monitoring team drills to more thoroughly acquaint them with the functions and actions of the offsite teams as well as the data being provided by the teams.
2. A more efficient and more practical methodology for controlling the offsite teams can be developed. To this end, a meeting between the EOF health physics team leader and the Palisades offsite monitoring team members was held on September 12, 1985 to discuss problems with the current approach.
3. Revise the current emergency implementing procedure comparing offsite survey data to calculated offsite doses so that it provides an effective means for trending offsite dose information.
4. Use knowledgable health physics personnel as offsite team communicators.

COMPLETION DATES

1. October 15, 1985
2. July, 1986.
3. July, 1986
4. December, 1985

● ISSUE-15

The EOF health physics team failed to properly perform required dose assessment functions resulting in confusion between the utility and the State of Michigan on source term, calculated dose rates, and adequate size for the protective action area.

CAUSES

1. Health physics team was not managed effectively by team leader.
2. Team members were not completely familiar with their roles and functions.
3. Health physics team did not communicate well with the State of Michigan health physics group.
4. The current manual dose assessment procedures did not allow the health physics team to complete the dose calculations in a timely manner.

RESOLUTION

1. A table top discussion of the PALEX-85 scenario has been scheduled with the health physics staff from both the plant and General Office and the State of Michigan. The intent of this table top is to 1) review the radiological aspects of the scenario; 2) review actions taken by the health physics teams and management of the teams by the leaders; and 3) discuss what areas need to be improved and how to improve them.
2. Enchance the current dose assessment classroom training with additional training seminars for key personnel.
3. Include, as a minimum, the EOF health physics team in the Palisades TSC drill scheduled in March/April. (Evaluate need for full EOF participation during this drill.)
4. Computerize the current manual dose assessment procedures for calculating source terms, decay factors, dose calculations, and notification form completion.

COMPLETION DATES

1. October 3, 1985
2. First seminar during first quarter, 1986
3. March or April, 1986
4. June, 1986

● ISSUE-16

No one was in charge of the EOF until the EOF Director arrived from General Office.

CAUSE

Player performance deficiency
Procedural deficiency

RESOLUTION

1. The plant person designated as EOF Administrator will assume control of EOF personnel until arrival of management from General Office. Responsi bilities prior to arrival of General Office personnel will be delineated in EOF-3, EOF administrator. Heretofore, initial EOF leader responsibilities were not identified in a procedure.

2. Emergency Planning personnel will conduct hands-on training with appropriate management personnel who work within the EOF to ensure a clear understanding of individual and facility responsibilities/authority.

3. The EOF Management Training Module will be enhanced to include more specifics concerning management roles within the facility.

COMPLETION DATE

1. December 1, 1985

2. December 15, 1985

3. January 1, 1986

1985 SEP IMPROVEMENT ITEMS

- More structured SEP training and self study
- Development of a plant staff SEP training matrix
- Fully defined and trained emergency response organization
- Extensive post-accident sampling training for technicians
- Increased offsite monitoring team training
- Review and revision of SEP and EIPs to new organization
- Increased EAL/NUE training for Shift Supervisors and Shift Engineers
- Indepth EAL review
- Procurement of two (2) new emergency vans
- FEMA approval of Public Warning System
- Increased management support for emergency planning
- Improved relations with State Radiological Health Department