U. S. NUCLEAR REGULATORY COMMISSION
REGION III

Report No. 50-305/92007(DRP)

Docket No. 50-305 License No. DPR-43

Licensee: Wisconsin Public Service Corporation
Post Office Box 19002
Green Bay, WI 54307-9002

Facility Name: Kewaunee Nuclear Generating Plant

Inspection At: Kewaunee Site, Town of Carlton, WI

Inspection Conducted: March 9 - 13, May 5, and June 9, 1992

Inspectors: C. E. Brown
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C E Brown for 7/02/92

Approved By: R. A. Hasse, Chief DATE
Technical Support Staff

Inspection Summary

Inspection from March 9 - 13, May 5, and June 9, 1992 (Report No. 50-305/92007(DRP))
Areas Inspected: Routine announced inspection by regional inspectors of licensee practices to maintain reliable decay heat removal during outages and feedback of operational experience information. No Safety Issues Management System (SIMS) items were reviewed.

Results: No violations or deviations were identified in the areas inspected.

The strengths, weaknesses, and one open item are discussed below:

Strengths:

- Good communications between departments on RHR S/D risk.

- Good controls to ensure special tasks don't impact RHR
- Computer visual aid in control room monitoring RHR parameters
- Shutdown safety assessment (SSA) checklist
- Infrequently performed test or evolution (IPTE) process
- Limiting other tasks during reduced inventory
- Strong operational experience assessment program

Weaknesses:

- No procedural guidelines on when and how to set the alarm points during plant drain down.
- Level of Administrative Control - too much reliance on past experience rather than comprehensive procedures.
- No outage scheduling process instruction.
- Training - Contractors are given general employee training which doesn't appear to cover industry events.
- Excessive backlog of OEA items.

Open Item:

The failure to effectively implement the OEA program, as indicated by the excessive backlog of open items to be assessed, is considered an open item. This is discussed in paragraph 3.

Details

1. Persons Contacted

Wisconsin Public Service Corporation (WPSC)

M. Marchi, Plant Manager
T. Webb, Plant Licensing Supervisor
D. Masarik, Plant Operations Assessment
P. Fenneman, Risk Assessment Engineering Supervisor
K. Weinhauer, Assistant Manager, Plant Operations

Nuclear Regulatory Commission (NRC)

P. Castleman, Senior Resident Inspector
K. O'Brien, Resident Inspector

All personnel listed were present at the Management Interview on March 13, 1992.

Other members of the plant staff were contacted during the inspection period.

2. Operational Safety Verification (TI 2515/113)

The inspectors obtained information required by TI 2515/113 on licensee practices for maintaining reliable decay heat removal during outages.

Administrative Measures

Two administrative measures have recently been implemented to address review and approval of special test procedures and operations during plant outages. One -- the Shutdown Safety Assessment (SSA) Checklist -- is a checklist which is used to determine the plant margin of safety during an outage; the other is referred to as the Infrequently Performed Tests and Evolutions (IPTE) process.

The SSA checklist was used both as an independent review of the planned outage schedule and as a living document during the outage. A set of SSA checklists corresponding to the planned outage schedule was presented to the Plant Onsite Review Committee (PORC) prior to initiating refueling shutdown activities. The SSA checklist requires evaluation of reactivity, core cooling, electrical power availability, containment, reactor coolant system (RCS) inventory, RCS integrity, and the overall Kewaunee Nuclear Power Plant (KNPP) safety condition which is a composite of the preceding areas. In each area, the evaluation results in a condition rating of green, yellow, orange, or red; with green representing maximum redundancy and red indicating no redundancy. Although the PORC may approve entry into an

orange condition (minimum redundancy), immediate actions are required upon discovery of an unapproved orange condition or a red condition. Completed SSA checklists were required to be routed to the outage manager and distributed with the operations shift turnover checklist. Several "orange" conditions were approved by the PORC in the pre-outage SSA checklist review. During the outage, the SSA checklist was required to be completed twice daily. The inspectors looked at a sample of these checklists.

Maintenance tasks that are infrequently performed which have a potential to significantly degrade the plant's margin of safety were referred to as IPTE tasks which are defined in Administrative Control Directive (ACD) 5.2, "Maintenance Procedures," (ACD 5.2 also provided guidance on special actions regarding those tasks). ACD 5.2 defined an IPTE as any activity that has a potential to significantly degrade the plant's margin of safety, which requires development of a procedure for activities not already covered by an existing procedure (as a minimum this includes Special Test, Special Operating and Design Change Procedures), or that is covered by an existing procedure which is typically performed every refueling or less often and is of a complexity such that it meets ... [certain identified requirements]. It is the assistant manager - plant maintenance's responsibility to determine which maintenance procedures fall into the IPTE definition. However, in practice, the person writing the procedure, those reviewing the procedure, and , if safety related, the PORC, would also have input on the IPTE determination. Maintenance procedures designated as IPTE procedures are identified as such on the first page of the procedure. For IPTE procedures, the licensee required that "where practicable, an IPTE Checklist should be filled out prior to IPTE procedure performance ... to ensure personnel performing procedures are familiar with the activities to be performed." This checklist established what, if any, briefings, walkdowns, simulator demonstrations, or additional PORC involvement would be needed.

The IPTE process is a new program which will only be fully implemented when all procedures have been updated per routine periodic review (up to 2 years from now). However, the plant operations superintendent pointed out that, "the IPTE process merely formalized what had always been standard practice at Kewaunee." The assistant manager-plant maintenance stated that, "in addition to the IPTE process, risky jobs aren't scheduled for performance during mid-loop operations. This minimizes the chance of loss of RHR." However, administrative control directive (ACD) 10.1, Appendix A, "Reduced Inventory Condition," states that work on the following systems should be reviewed to ensure it will not result in a RCS perturbation ...," (one of the systems listed is 'DC and Emergency AC'). During the second mid-loop operation, the B-Diesel Generator was scheduled to be out of service however this was reviewed and rescheduled to occur outside of the reduced inventory window.

The level of administrative controls could be stronger (Exceptions - New IPTE program, SSA checklists). There is a fairly heavy reliance on past experience. The actual method of operating is more conservative than procedures dictate. Examples are given in the following table:

Procedure Requirements	Actual Practices
RCS temperature must be maintained below 200°F during reduced inventory conditions	RCS temperature is maintained at 110°F during reduced inventory conditions
Containment Integrity: Each containment penetration shall be closed or operable during reduced inventory. Each open penetration must be capable of being closed within a certain time limit or before the RCS reaches 200°F.	Containment Integrity: Only containment isolation valves which can be closed from the control room are permitted to be open during reduced inventory.
For an IPTE Procedure, the checklist to specify appropriate briefings, etc., related to the Procedure's performance are only required "where practicable".	Since this is a new program, the extent to which the checklists will be used remains to be seen.
Electrical Power Sources: During refueling operations 2 offsite and 1 onsite or 1 offsite and 2 onsite supplies must be maintained.	Electrical Power Sources: During the initial mid-loop operation 3 offsite and 2 onsite supplies are maintained.

Procedures require that reactor coolant temperature be maintained below 200 degrees F during reduced inventory conditions. However, actual practice is to maintain the temperature at 110 degrees F. This actual practice was indicated on a hand-written refueling shutdown schedule which was created by a control room supervisor and was reviewed by the Plant Operations Superintendent. The schedule was not required and had no signatures on it, but the inspectors were told that it was standard Kewaunee practice to create it. The inspectors were also told that even if an error was made in the checklist such that a value other than 110 degrees F were specified, the operators, through past experience, would know to question it. In the development of the refueling outage schedule, there is heavy reliance on operator's past experience. Work requests drive the creation of a large wall mounted "Plan-A-Log" board. Most work requests for this refueling outage were available 1 month prior to the outage, but perhaps 10 to 15 percent were received during the last month prior to the outage. A computerized activities list, which can be sorted in several

ways, was also created. The "Plan-a-Log" board and the computerized activity list were the primary scheduling tools for the refueling outage. Guidance governing how these scheduling tools should be created was minimal. The schedule contains windows for performing work activities. A PORC review is required if work activities move outside of their assigned windows. The schedule is updated twice a day based upon input received from supervisors.

Maintaining Containment

Containment isolation valves are occasionally opened during reduced inventory:
- one valve last outage
- one valve during the current outage (to drain a steam generator by five percent).
In both cases the valves were opened momentarily, but the valves were operable and could be remotely closed from the control room. Per the plant operations superintendent, the operators won't allow opening of any other types of valves (i.e. no locally operated isolation valves would be allowed to be open). This is because, if containment had to be isolated, based on time constraints, it would not be possible to close anything but valves that can be operated from the control room. Although the operators won't allow locally operated containment isolation valves to be open during reduced inventory, procedures do not prohibit it.

There are reviews taking place that are apparently not required, but are happening nonetheless (eg: creation and review of an operation's shutdown schedule) There is a special computer display in the control room for the operators use. This is a single group function of selected parameters on the "Safety Assessment System" (SAS). This provides a comprehensive ability to both monitor and alarm all RHR system parameters and to display trends in the parameters. It is an easily understood and especially user friendly system.

Training

Per the assistant manager - plant maintenance, a month before the refueling outage, there was an outage safety meeting and most of the plant personnel required to have the training attended (anyone that did not attend is required to do equivalent required reading). The meeting addressed shutdown issues, NUMARC guideline implementation, and safety margin color coding (eg: the new shutdown safety assessment checklist).

The plant operations assessment supervisor screens all industry events and NRC generic issues and makes recommendations based on the screening and department heads review and concur on the recommendations. Each quarter, mechanical and electrical maintenance personnel attend an industry events training session. Typically

an attempt is made to hold one of these just before a refueling outage. The day that the Prairie Island loss of decay heat removal event occurred, the assistant manager - plant maintenance discussed it with appropriate first-line supervisors. The Prairie Island event was also discussed at two of the morning meetings. The nuclear licensing supervisor provided a presentation to Kewaunee Department Heads regarding the Prairie Island event. She had gone to Prairie Island shortly after the event to offer assistance and to glean information for Kewaunee. There were many differences between Prairie Island & Kewaunee practices, all of which were on the conservative side for Kewaunee. The nuclear licensing supervisor briefed the superintendent - plant operations who then briefed the shift operators. A technical staff and management training session regarding the Prairie Island event was also planned.

According to the assistant manager - plant maintenance, outage contractors work with Kewaunee personnel most of the time when they perform maintenance. If they are going to work on their own, they are given the training to do so. The same two contractors are used year after year during refueling outages. These contractors have supervisors onsite year round who attend all the onsite safety meetings and pass information on to the contract workers. A sample lesson plan used for training of contractors for the refueling outage included a section on mid-loop operations.

Substation workers were given training that reminded them not to bump into anything with a crane.

Post-outage debriefings are held which involve both plant and contractor personnel.

However, an informal survey of plant personnel from both the day and swing shift revealed that only the supervisory level or above could relate any of the industry events associated with loss of RHR without excessive prompting. This included a broad spectrum of personnel, both licensee and contractor. Once prompted about an event, most of the people queried could recall some of the facts about it. Only one of the people interviewed was familiar with the increased hazards associated with the loss of RHR under outage conditions. There was a strong emphasis on mid-loop operations but not on the outage as a whole. There seemed to be a complacency among the personnel interviewed about the risk of loss of RHR except during mid-loop. Shutdown probabilistic risk assessment training did not appear to have been provided to applicable plant staff. Contractor general employee training doesn't appear to cover the industry events covered in the regular licensee training. The only exposure the contractor employees get is the briefings by their supervisors who are onsite year round.

Procedure Review

The inspectors reviewed the procedures pertaining to maintaining forced circulation

decay heat removal. Both normal and abnormal operating procedures were available, including procedures addressing reduced inventory, mid-loop operations, and loss of RHR. The licensee does not currently have a procedure or plan to use natural circulation as a normal means of RHR. The licensee stated that the procedures are being updated and industry experience is being factored into them as needed.

Electrical Power Supplies

Supply and distribution of electric power to the decay heat removal system and supporting systems and the results of the inspections are as follows:

- The licensee's procedures require two offsite and one onsite power source to be available at all times during refueling. The schedule shows a minimum of three offsite sources and both emergency diesels (EDGs) available during reduced inventory operations. One EDG was scheduled for maintenance during the second period of reduced inventory but this was rescheduled such that both EDGs were available. Reduced inventory operations with less than two onsite and two offsite power sources requires PORC approval.

- The licensee's procedures require a fully capable dc power source whenever battery testing or maintenance is performed.

- The licensee has a comprehensive analysis of all likely nonstandard lineups with assurance that they can carry sufficient loads and can properly activate protective circuitry. The inspector questioned control room and electrical auxiliary operators about these lineups. All operators questioned were able to demonstrate good knowledge of the possible alternate power supplies and the procedures to operate them.

- When various scenarios were proposed to the operators, all questioned were able to propose and produce the operating procedure for manually controlling the power sources. This included both control room and auxiliary operators.

- Although the licensee ensured that none of the diesel generators would be out of service (OOS) during the first reactor vessel drain down to mid-loop, during the second drain down to mid-loop the schedule permitted the B-diesel generator to be out of service. However, work was scheduled during the outage so as to prevent the necessity of having an EDG out of service during the second reduced inventory operations.

- An EDG is declared inoperable if any support system to it is removed from service for maintenance including the field flashing source.

No safety concerns or violations were found and the inspectors have no further comment.

3. Feedback of Operational Experience Information (IP 90700)

The licensee's operating experience assessment (OEA) program is a non-technical specification program developed with a stated primary objective of ensuring that lessons learned from industry operating experience are translated into corrective actions to improve plant safety and reliability. Additionally, the program is to ensure that plant personnel are apprised of industry events through briefings, training sessions, and employee newsletters. Organizationally, the program is located within the Safety System Engineering Group. The Vice-President Nuclear has overall responsibility for ensuring effective operation of the OEA program with the plant manager being responsible for ensuring effective implementation and use of the OEA program at the plant.

The documents assessed under the program include NRC and industry publications as well as vendor, other nuclear utility, and internal communiques. The licensee had an excellent program in place with an extensive computer based cross-referencing system and monthly status meetings. The government information data exchange program (GIDEP) was a recent addition to the information sources for the OEA program. The licensee's OEA program was considered a strength; however, there was an excessive backlog of open assessment items.

The number of 1990 and 1991 open items, on April 11, 1991, was compared to the number of open items for 1990 and 1991 on March 05, 1992. The total number of open items had increased from 133 to 272 (38 - 1990 and 204 - 1991 items still not assessed). The inspector reviewed the open items and found several that could potentially be safety significant. In particular, OEA 91-005, dated March 13, 1991, on electrical and physical separation of bus 1-1 and 1-2 UV/UF relays was closed out by being included on Engineer Support Request (ESR) 90-150 on reactor protective system racks and input signals. ESR 90-150 has been in evaluation since October 9, 1990, and had not been completely assessed.

The inspector reviewed a representative sample of the 1118 reports screened for 1991 and a sample of the detailed assessments that had been completed. Results of the evaluations appeared to be soundly based. Recommendations were found to be well focused and included consideration of plant specific issues through the involvement of plant staff during the evaluation process.

Feedback to plant staff did not appear to be very effective regarding specific OEA items. An informal survey of approximately 15 plant employees conducted by the inspector revealed that only the shift supervisor could recall any OEA item without extensive prompting. When questioned directly about specific plant relevant OEA items, most could not recall any pertinent details -- but they were generally aware of the safety significant aspects of the issues.

The inspector interviewed the Plant Operation Assessment Manager about the OEA program and its implementation weakness. He stated that the lack of adequate staffing in this area was the primary cause for the large backlog.

In summary, the inspector found the OEA program was a strength as written but had implementation weaknesses. The current backlog has existed for an excessively long time. This failure to effectively implement the program is an open item (50-305/92007-01).

4. Quality Verification Effectiveness

An audit of the OEA program conducted by an independent contractor in early 1990 found --

That evaluations are not being completed in a timely manner;
That corrective actions are not being completed in a timely manner or are not effective;
That there is a lack of management involvement; and
That the program was marginally effective in getting industry experience to plant employees.

An internal QA audit conducted in July 1991 noted that problems still existed relative to completing screening and assessments in a timely manner. The inspector was told by the plant Operation Assessment Manager that additional personnel had been hired to decrease the backlog of open items, but had been promoted or transferred and not replaced. He also informed the inspector that the offsite review committee (NSRAC) had issued a concern about the backlog.

The inspector concluded that the licensee was effective in identifying the problems with the implementation of the OEA program but was ineffective in implementing corrective action due mainly to a lack of effective management involvement.

5. Exit Interview

The inspector met with licensee representatives -- denoted in paragraph 1 -- on March 13, 1992, to discuss the scope and findings of the inspection. Open item 50-305/92007-01 (noted in paragraph 3) was discussed fully. In addition, the likely informational content of the inspection report with regard to documents or processes reviewed by the inspectors during the inspection was also discussed. The licensee did not identify any such documents or processes as proprietary. Additional information of actual work performance versus work planned was obtained and reviewed by the inspector on May 5, and June 9, 1992. This additional information was discussed with the plant licensing supervisor on June 16, 1992.