



CONNECTICUT YANKEE ATOMIC POWER COMPANY

HADDAM NECK PLANT

362 INJUN HOLLOW ROAD • EAST HAMPTON, CT 06424-3099

October 23, 1996

Docket Nos. 50-213
B15938

U. S. Nuclear Regulatory Commission
Attention: Document Control Desk
Washington, DC 20555

Haddam Neck Plant Readiness To Commence With Mode 6

The purpose of this letter is for Connecticut Yankee Atomic Power Company (CYAPCO) to provide the NRC with the status of the readiness of the Haddam Neck Plant (HNP) to proceed to Mode 6 operation.

CYAPCO takes very seriously the recent events which were the subject of the Augmented Inspection Team (AIT). CYAPCO has reviewed the findings of the AIT and its own assessments of the causes which contributed to those events, and developed the corrective actions described in this letter which in aggregate provide assurance that the core offload will be conducted safely.

CYAPCO assembled the various reports and studies done on the Labor Day weekend event and other recent events. These included the AIT exit minutes, the root cause assessment from the Independent Review Team (IRT), Nuclear Safety and Oversight (NSO) recommendations and Management Review Team (MRT) assessments. Additionally, an independent investigation of CYAPCO's compliance to the NUMARC 91-06 guidelines and to Generic Letter 88-17 for mid-loop operation requirements was conducted.

While there were many areas in need of improvement, four broad areas deserve discussion here, they are:

- material condition,
- procedural adequacy and usage,
- operator performance, and
- management performance.

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In addition, to the following discussion of these four areas, other corrective actions specific to the areas categorized by the AIT are included in Attachment 1 to this letter.

1) Material Condition

Those material condition deficiencies specific to the AIT inspection which can be corrected with the current mode of operation have been completed. These include items such as the adequacy of the reactor head vent system and the seized "B" RHR pump. Some deficiencies such as the rebuilding of the "A" RHR pump and refurbishing CVCS valves are more safely performed with the core offloaded.

In addition to fixing the specific deficiencies noted, CYAPCO took a broader look by performing system engineering reviews for all systems supporting Mode 5 and 6 operations. These reviews were designed to ensure that no significant outstanding material deficiencies exist which would impact the safe conduct of the core offload. A number of problems have been identified in these reviews and correction of these will occur prior to Mode 6 or core offload, depending on the mode of operation which the specific system supports.

CYAPCO's shutdown risk profile indicates that having the plant with a filled refueling cavity is a lower risk condition than operating RHR with the reactor head on. Accordingly, a priority has been placed on disassembling the reactor and filling the cavity.

2) Procedural Adequacy and Usage

The procedural adequacy issues uncovered by these events stem primarily from a lack of procedures for extended Mode 5 operation and a lack of detail in those procedures that did exist. Accordingly, operations and maintenance tasks to support Modes 5 and 6 have been identified and procedures generated or revised to provide the proper level of guidance to safely perform these tasks.

The Operations Department has formed a new procedure group which includes a dual-licensed contracted Senior Reactor Operator (SRO) to ensure that the department obtains an outside perspective of the operating procedures.

In response to the procedure usage problems identified, management has issued requirements, via Operations Department Instruction, ODI 1, "Conduct of Operations," defining the need to have written procedural guidance including the following:

- If a procedure exists for an evolution, it shall be used.
- Any items considered "skill of the trade" are formally documented.
- If the activity is listed in Regulatory Guide 1.33, Appendix A, a Plant Operations Review Committee (PORC) approved procedure is required.
- If an evolution affects the key safety functions for shutdown conditions, a PORC approved procedure is required.
- Otherwise, equipment may only be manipulated under the administrative controls of Work Control Manual procedure, WCM 2.4-1, "Equipment Tagging," or surveillance procedure SUR 5.1-126, "Locked Valve Checklist."

Coincident with the procedures being upgraded, management has reinforced the expectation to all personnel that procedures will be followed, and that if a procedure cannot be followed, the person will stop, place the equipment in a safe configuration, and get the procedure changed.

CYAPCO is confident that providing improved detailed procedures for all activities associated with Mode 5 and 6 operations coupled with the explicit procedure compliance expectations above, and the monitoring actions described in the next section, will result in a high level of assurance that these activities will be conducted in a safe manner.

3) Operator Performance

The operator performance problems revealed by these events are related primarily to low standards (particularly for procedural use and adequacy), lack of a questioning attitude, and informality (particularly job briefs). As indicated in Attachment 1, specific actions have been taken to clearly define new expectations for operator performance. In order to ensure that these new expectations are met, monitoring and coaching are required.

CYAPCO intends to provide monitoring and coaching in two ways. First, CYAPCO will be placing SROs from other sites on shift with the operations crews around the clock from the time Mode 6 is entered until the core offload is complete. The external SRO support may be temporarily interrupted should CYAPCO opt to delay core offload activities once the cavity is flooded. If this occurs, the shift mentors will be reestablished prior to the initiation of core offload. These individuals will act as shift mentors, and their responsibility is to: 1) bring an outside perspective to the crew's conduct of business, 2) monitor compliance with management's expectations for the conduct of operations, and 3) suggest improvements in the way CYAPCO conducts control room operations.

In addition to the 24-hour shift support provided by the shift mentors, senior CYAPCO management will be present in the control room or the plant to monitor selected sensitive evolutions, such as reactor vessel drain down to the refueling reference level. The senior management individuals will be familiar with the standards for conduct of operations, and their responsibility will be to monitor shift performance against those standards.

4) Management Performance

The Labor Day weekend event has also revealed weaknesses in the management performance of CYAPCO. As previously detailed in correspondence with the NRC, CYAPCO has agreed that the initial response to the event was weak, and recovery was not timely. Additionally, the decision to suspend core offload activities over the Labor Day weekend was not adequately assessed from a shutdown risk perspective.

CYAPCO management has outlined new expectations to the operating crews and itself relative to response to off normal conditions. Of specific concern are issues where the operating crew is in need of technical and/or management assistance. Simply put, CYAPCO has lowered the threshold significantly for issues where the operating shift is to seek assistance. The new response philosophy has been used a number of times in recent weeks, most recently for the indication on the service water supply to the spent fuel cooling system. The rapid and successful resolution of the issues using this approach has validated the need for new expectations.

Relative to the decision to stop the core offload, the shutdown risk procedure has been revised to require a formal risk assessment for any decision to delay the outage schedule. This revised procedure has been implemented and used twice to assess the delays in core offload caused by the need to resolve issues identified by the Mode 5 and 6 system engineering reviews.

Conclusion

In addition to the corrective actions described in this letter, there is a list of recommendations provided by the NSO organization which has been shared with the NRC resident inspectors. Many of the items on the list are addressed within this letter. CYAPCO has developed a database and files which provide the detailed disposition of each of these recommendations. CYAPCO plans to have the PORC and the NSO organization review and concur with the disposition of these recommendations prior to the condition for which they apply (i.e., either Mode 6 entry or the initiation of core offload).

In summary, CYAPCO believes that the actions described in this letter provide assurance that the issues identified by the Labor Day weekend event have been properly evaluated and addressed as they relate to Mode 6 operations. CYAPCO notes that some actions such as the rebuilding of the "A" RHR pump are more safely performed with the core offloaded. Finally, CYAPCO notes that placing the core in the spent fuel pool places it in a safer configuration. Therefore, CYAPCO will continue to pursue this goal in a deliberate, timely fashion.

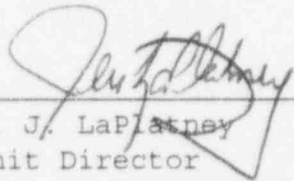
If you should have any questions, please contact Mr. G. P. van Noordennen at (860) 267-3938.

Very truly yours,

CONNECTICUT YANKEE ATOMIC POWER COMPANY

FOR: T. C. Feigenbaum
Executive Vice President and
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BY:



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cc: H. J. Miller, Region I Administrator
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Docket Nos. 50-213
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Attachment 1

Haddam Neck Plant

Readiness To Commence With Mode 6

October 23, 1996

INTRODUCTION

The format of Attachment 1 is as follows:

- The attachment lists the eleven "Contributing Causes for Events" discussed at the NRC Public Exit Meeting (October 2, 1996) for the Haddam Neck AIT on Decay Heat Removal System Challenges (NRC Inspection 50-213/96-80).
- Under each of the eleven causes, CYAPCO has listed the corrective actions which address that particular cause.

1. Procedure Quality was Poor

CYAPCO corrective actions:

The Operations Department formed a procedure upgrade group on September 11, 1996 to address programmatic deficiencies identified by the event review teams.

Mode 5 and 6 tasks have been identified using Regulatory Guide 1.33 and ANSI 18.7, and detailed procedures are being generated/revised accordingly.

Specific examples include providing detailed guidance for performing the reactor coolant system (RCS) draindown, revising the vent header procedure to provide adequate detail and accurately address the system, revising the residual heat removal (RHR) purification procedure to ensure adequate signoffs and attachments exist to prevent misunderstandings of where a particular task begins and ends, and revising the RHR system operating procedure to provide guidance on system limitations. This also includes the Westinghouse refueling procedure.

Additionally, Administrative Control Procedure ACP 1.2-5.3, "Evaluation of Activities/Evolutions Not Controlled by Procedure," has been cancelled.

All licensed operators are being trained on the appropriate new or revised Mode 5 and 6 procedures prior to performing the RCS draindown to support entry into Mode 6.

2. Failure to Implement Procedures

CYAPCO corrective actions:

The major causes for the failure to implement procedures within the Operations Department was the lack of operating procedures for prolonged operation in Mode 5 in conjunction with the lack of adequacy for those procedures which did exist.

The Operations Department has formed a new procedure group which includes a dual-licensed contracted Senior Reactor Operator (SRO) to ensure that the department obtains an outside perspective of the operating procedures.

Management has issued requirements, via Operations Department Instruction, ODI 1, "Conduct of Operations," defining the need to have written procedural guidance including the following:

- If a procedure exists for an evolution, it shall be used.
- Any items considered "skill of the trade" are formally documented.
- If the activity is listed in Regulatory Guide 1.33, Appendix A, a Plant Operations Review Committee (PORC) approved procedure is required.
- If an evolution affects the key safety functions for shutdown conditions, a PORC approved procedure is required.
- Otherwise, equipment may only be manipulated under the administrative controls of Work Control Manual procedure, WCM 2.4-1, "Equipment Tagging," or surveillance procedure SUR 5.1-126, "Locked Valve Checklist."

Normal Operating Procedure NOP 2.4-7, "Return of a Loop to Service with the Plant Shutdown," which is used for unisolating reactor coolant loops, has been revised to ensure the 30 minute criterion for obtaining a boron sample is clearly met prior to opening the loop stop valves.

A contributing cause to the failure to implement procedures was the failure to conduct adequate pre-evolution briefs. A new Operations Department Instruction, ODI 193, "Pre-Evolution Briefings," has been issued which requires briefs be performed including discussions on associated procedures, and roles and responsibilities. Additionally, the instruction requires procedures in progress to be in-hand during the brief to preclude misunderstandings of start/stop points.

3. Lack of a Questioning Attitude

CYAPCO corrective actions:

ODI 1, "Conduct of Operations," has been revised to identify the need for a questioning attitude as well as the need to call in external assistance/support to ensure a multi-disciplined approach for off normal events. Operators will be trained in these expectations prior to going to Mode 6. Additionally, lessons learned from the events surrounding September 1, 1996 have been shared with all operators by operations management.

Specific to reactor coolant system level anomalies, a new Operations Department Instruction, ODI 190, "RCS Inventory in Modes 5 and 6," was issued on September 1, 1996 to record and trend RCS level readings and consumption of gasses on site. Additionally, procedures for performing a RCS drain down include steps for calculating an inventory balance and following through on comparing expected results with predicted results.

The Operations Department will utilize Senior Reactor Operators (shift mentors) from other units to provide an independent, external perspective and questioning attitude from the draindown to the refueling reference level to completion of the core offload. The external SRO support may be temporarily interrupted should CYAPCO opt to delay core offload activities once the cavity is flooded. In addition, these shift mentors will monitor compliance with the new standard for the conduct of operations.

Additional CYAPCO senior management oversight will be provided for key activities including the following:

- The RCS draindown to the refueling reference level
- The head lift
- The cavity fill
- The upper internals lift
- Initiation of core offload (first bundle moved) to the spent fuel pool

4. Inappropriate Decision Making

CYAPCO corrective actions:

As a result of the September 4, 1996 RCS draindown event (i.e., RCS inventory was diverted to the containment sump), which occurred in the midst of a stop work order on all activities that may potentially effect RCS inventory, a complete stop work order was issued. The stop work order imposed tight controls on the release of work, including Senior Reactor Operator (SRO) reviews, Outage Manager or Operations Manager review and approval, and Unit Director review and approval. This stop work order has been effective in preventing the recurrence of challenges to the RCS inventory.

In light of the draindown event, a new Operations Department Instruction, ODI 191, "Shutdown Risk Awareness," was generated to increase the awareness of the five key safety functions, including associated procedural controls and operational philosophies, among plant operators. All operators have been required to read the instruction and training on it is included in the present cycle of licensed operator regualification training.

Normal Operating Procedure NOP 2.3-4, "Hot Standby to Cold Shutdown," which is in the approval process will include guidance not to isolate the reactor coolant loop overpressure relief valves in the event of suspected inleakage from the reactor coolant loops when draining down the reactor coolant system.

The shift mentors will monitor the decisions made by the shifts and provide coaching and feedback as appropriate.

5. Pre-Job Briefings Were Inadequate

CYAPCO corrective actions:

As previously discussed, a new Operations Department Instruction, ODI 193, "Pre-Evolution Briefings," has been issued. Formal training on the instruction is in the process of being conducted including an integrated Job Performance Measure (JPM) to be evaluated by the Operations Manager or designee.

The ODI is specific on the requirements to be addressed during the briefing, and requires written documentation of the brief on an attachment.

6. Lack of Instrumentation

CYAPCO corrective actions:

Subsequent to the events of September 1, 1996, jumpers were installed to provide one train of reactor vessel level indicating system (RVLIS) indication and to provide two core exit thermocouple (CET) readings to control room operators. The jumpers are procedurally required to remain installed for the maximum duration possible prior to the head lift.

Additionally, a recorder has been installed under bypass jumper controls for pressurizer cold calibrated level trending.

7. Training Not Adequate

CYAPCO corrective actions:

Pre-outage operator regualification training was not conducted prior to shutdown due to the shutdown occurring prematurely on July 22, 1996 for containment air recirculation (CAR) fan two-phase flow concerns. Subsequent to the decision to start the refueling outage, one full day of simulator and classroom training for refueling outage licensed operator regualification was conducted.

Following the events of September 1, 1996 all licensed operators were formally trained on the reactor vessel level instrumentation including the limitations imposed by the design as well as the reactor head and pressurizer vent header limitations.

All licensed operators are being trained on the appropriate new or revised Mode 5 and 6 procedures prior to performing the RCS draindown to support entry into Mode 6.

8. Poor Equipment Condition

CYAPCO corrective actions:

Recently several valves found leaking had not been previously identified due to the prior practice of maintaining the reactor coolant system pressurized in a solid condition. The new philosophy to maintain the RCS depressurized was directly related to reducing challenges to the RCS low-temperature overpressure (LTOP) relief valves. As an interim measure, the Operations Manager has instructed control room staff to pre-plan chemical and volume control system (CVCS) makeups to the RCS via a multi-discipline team, such that potential RCS diversion paths or dilution paths are minimized. All known leaking valves have been identified as requiring repair via submittal of Trouble Reports. Refurbishment of these valves is most safely accomplished with the core offloaded.

The temporary reactor head vent system has been modified to utilize larger capacity hose, relocate the tap for the vacuum compensation transmitter, and provide a jumper for reactor head vacuum indication in the control room. Normal Operating Procedure NOP 2.9-6, "Primary Vent Header Operation," has been revised to include daily operational checks of the vent system to maintain proper operation.

For the entry to Mode 6, system engineering reviews have been conducted for Mode 5 and 6 systems. These reviews included walkdowns and assessments of outstanding work activities to provide confidence that the systems will function as required.

The repairs to the spent fuel pool cooling system and the repairs to the spent fuel building ventilation system will be completed prior to fuel being transferred from the reactor to the spent fuel pool.

The RHR system has both trains operable as a result of the repairs on the "B" RHR pump (completed September 25, 1996) and the NRC relief from the ASME Code (dated October 7, 1996) transmitted to CYAPCO for valve RH-V-791A.

9. Poor Implementation of Generic Information

CYAPCO corrective actions:

The previous review and disposition to NRC Information Notice 94-36 has been reevaluated and appropriate controls incorporated into Normal Operating Procedures NOP 2.3-4, "Hot Standby to Cold Shutdown," NOP 2.6-6, "Volume Control Tank Operation," and NOP 2.6-11, "Makeup to the RCS During Modes 5 and 6." The latter two procedures have been PORC approved and the first procedure will be PORC approved prior to performing the RCS draindown to facilitate entry into Mode 6.

10. Weak Use of Technical Support

CYAPCO corrective actions:

Operations Department Instruction ODI 1, "Conduct of Operations," has been revised to convey the expectation that outside assistance be solicited when off normal events exist. Guidelines for soliciting assistance include entry into emergency or abnormal operating procedures, annunciator procedures requiring additional assistance, non-voluntary entry into Technical Specification action statements, high priority trouble reports, situations that jeopardize the key safety functions during shutdown conditions, and at the Shift Manager's discretion.

Additionally, the Operations Department will utilize Senior Reactor Operators (shift mentors) from other units to provide an independent, external perspective and questioning attitude from the draindown to the refueling reference level to completion of the core offload. The external SRO support may be temporarily interrupted should CYAPCO opt to delay core offload activities once the cavity is flooded. In addition, these shift mentors will monitor compliance with the new standard for the conduct of operations.

11. Inappropriate Planning and Scheduling

CYAPCO corrective actions:

Work Control Manual procedure, WCM 1.2-9, "Outage Planning, Scheduling and Implementation," has been revised to require significant delays and work stoppages to be processed as an outage schedule change which includes an assessment as to whether the change is significant to shutdown risk.

The September 4, 1996 stop work order remains in place. All work being released requires SRO review for impact on the key safety functions, Outage Manager or Operations Manager review and approval, and Unit Director review and approval.

Plant operators have been sensitized to the need to protect the key safety functions via the new Operations Department Instruction, ODI 191, "Shutdown Risk Awareness," and conveyance of CYAPCO management expectations.