UNITED STATES
NUCLEAR REGULATORY COMMISSION
REGION II
101 MARIETTA ST., N.W.
ATLANTA, GEORGIA 30323

Report Nos.: 50-327/88-34 and 50-328/88-34

Licensee: Tennessee Valley Authority
6N38 A Lookout Place
1101 Market Street
Chattanooga, TN 37402-2801

Docket Nos.: 50-327 and 50-328 License Nos.: DPR-77 and DPR-79

Facility Name: Sequoyah 1 and 2

Inspection Conducted: June 6 - July 11, 1988

Inspectors: K M Jenison 9/15/88
K. M. Jenison, Senior Resident Inspector Date Signed

J B Brady for 9/14/88
P. E. Harmon, Senior Resident Inspector Date Signed

Resident Inspectors: D. P. Loveless
W. K. Poertner
P. G. Humphrey
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Approved by: K M Jenison 9/15/88
K. M. Jenison, Acting Chief, Date Signed
Projects Section 1,
Division of TVA Projects
Office of Special Projects

Summary

Scope: This routine, announced inspection involved inspection onsite by the Resident Inspectors in the areas of operational safety verification including operations performance, system lineups, radiation protection, safeguards and housekeeping inspections; maintenance observations; surveillance testing observations; review of previous inspection findings; followup of events; review of licensee identified items; review of IENs; and review of IFIs.

Results: Three potential violations were identified.

Paragraph 7, (327,328/88-34-02)
Paragraph 8, (327,328/88-34-03)
Paragraph 9, (327,328/88-34-04)

*One unresolved item was identified.

Paragraph 4, (327,328/88-34-01)

No deviations were identified.

An Enforcement Conference summary pertaining to Violation 327,328/88-34-02 is contained in paragraph 7.

*Unresolved items are matters about which more information is required to determine whether they are acceptable or may involve violations or deviations.

There were no Unit 1 startup items identified in this report.

REPORT DETAILS

1. Persons Contacted

Licensee Employees

H. Abercrombie, Site Director
J. Anthony, Operations Group Supervisor
*R. Beecken, Maintenance Superintendent
J. Bynum, Vice President, Nuclear Power Production
M. Cooper, Compliance Licensing Manager
*D. Craven, Plant Support Superintendent
H. Elkins, Instrument Maintenance Group Manager
R. Fortenberry, Technical Support Supervisor
J. Hamilton, Quality Engineering Manager
J. La Point, Deputy Site Director
L. Martin, Site Quality Manager
R. Olson, Modifications Manager
J. Patrick, Operations Group Manager
R. Pierce, Mechanical Maintenance Supervisor
*M. Ray, Site Licensing Staff Manager
*R. Rogers, Plant Reporting Section
B. Schofield, Licensing Engineer
*S. Smith, Plant Manager
*S. Spencer, Licensing Engineer
C. Whittemore, Licensing Engineer

NRC Employees

M. Branch
A. Long

*Attended exit interview

NOTE: Acronyms and initialisms used in this report are listed in the last paragraph.

2. Operational Safety Verification (71707)

a. Plant Tours

The inspectors observed control room operations; reviewed applicable logs including the shift logs, night order book, clearance hold order book, configuration log and TACF log; conducted discussions with control room operators; verified that proper control room staffing was maintained; observed shift turnovers; and confirmed operability of instrumentation. The inspectors verified the operability of selected emergency systems, and verified compliance with TS LCOs. The inspectors verified that maintenance work orders had been submitted as required and that followup activit es and prioritization of work was accomplished by the licensee.

Tours of the diesel generator, auxiliary, control, and turbine buildings, and containment were conducted to observe plant equipment conditions, including potential fire hazards, fluid leaks, and excessive vibrations and plant housekeeping/cleanliness conditions.

The inspectors walked down accessible portions of the following safety-related systems on Unit 1 and Unit 2 to verify operability and proper valve alignment:

SYSTEMS

Auxiliary Feedwater System
Containment Spray System
Residual Heat Removal System
Safety Injection System
Upper Head Injection System

No violations or deviations were identified

b. Safeguards Inspection

In the course of the monthly activities, the inspectors included a review of the licensee's physical security program. The performance of various shifts of the security force was observed in the conduct of daily activities including: protected and vital area access controls; searching of personnel and packages; escorting of visitors; badge issuance and retrieval; patrols and compensatory posts.

In addition, the inspectors observed protected area lighting, protected and vital area barrier integrity. The inspectors verified interfaces between the security organization and operations or maintenance. Specifically, the Resident Inspectors:

(1) interviewed individuals with security concerns
(2) reviewed licensee security event report
(3) visited central or secondary alarm station
(4) observed power supply test
(5) verified protection of Safeguards Information
(6) verified onsite/offsite communication capabilities

No violations or deviations were identified.

c. Radiation Protection

The inspectors observed HP practices and verified the implementation of radiation protection controls. On a regular basis, RWPs were reviewed and specific work activities were monitored to ensure the activities were being conducted in accordance with the applicable

RWPs. Selected radiation protection instruments were verified operable and calibration frequencies were reviewed.

The following RWPs were reviewed:

88-01-12: Unit 1 Containment, All Areas.

88-00-07-01: All RWP Areas (chemistry personnel only).

No violations or deviations were identified

3. Sustained Control Room Observation (71715)

The inspectors observed control room activities and those plant activities directed from the control room for approximately 6 hours in each 12 hour shift for this report period. The observation consisted of one shift inspector per shift supported by one shift manager per shift and other OSP management. on 06/28/88 at 1700, 24 hour on-site shift coverage by the NRC was terminated. Normal inspection coverage was resumed at this time.

a. Control Room Activities Including Conduct of Operations

The inspectors reviewed control room activities to determine that operators were attentive and responsive to plant parameters and conditions; operators remained in their designated areas and were attentive to plant operations, alarms and status; operators employed communication, terminology and nomenclature that was clear and formal; and operators performed a proper relief prior to being discharged from their watch standing duties.

b. Control Room Activities Including Response to Transient and Emergency Conditions

The inspector witnessed the Unit 2 operations emergency personnel respond to adverse plant conditions created by a severe thunder and electrical storm that occurred on June 25, at 4:50 p.m. The storm caused a switchyard breaker to trip and resulted in an initiation of the "carrier received indicator " alarms and various other control alarms. At essentially the same time, it was reported that damage had occurred that had disabled the Safety and Security tower and winds had resulted in a parked semi-trailer overturning at the plant site. In addition, a fire alarm indicated that a fire had occurred in the turbine building. The responding emergency team determined the cause of the alarm to be a result of smoke entering the building from the auxiliary boiler exhaust via the roof ventilation.

The responses and evaluations of these situations by the operators were well managed by the shift personnel.

c. Control Room Manning

The inspectors reviewed control room manning and determined that TS requirements were met and a professional atmosphere was maintained in the control room. The inspectors found the noise level and working conditions to be acceptable. The inspectors observed no horse play and no radios or other non-job related material in the control room. Operator compliance with regulatory and TVA administrative guidelines were reviewed. No deficiencies were identified.

In addition, the control room appeared to be clean, uncluttered, and well organized. Special controls were established to limit personnel in the control room inner area.

d. Routine Plant Activities Conducted In or Near the Control Room

The inspectors observed activities which require the attention and direction of control room personnel. The inspectors observed that necessary plant administrative and technical activities conducted in or near the control room were conducted in a manner that did not compromise the attentiveness of the operators at the controls. The licensee has established a SOS office in the control room area in which the bulk of the administrative activities, including the authorized issuance of keys, takes place. In addition the licensee has established HO, WR, SI, and modification matrix functions to release the licensed operators from the bulk of the technical activities that could impact the performance of their duties. These matrixed activities were transferred into the WCC.

e. Control Room Alarms and Operator Response to Alarms

The inspectors observed that control room evaluations were performed utilizing approved plant procedures and that control room alarms were responded to promptly with adequate attention by the operator to the alarm indications. Control room operators appeared to believe the alarm indications. None were identified by the inspectors that were either ignored by the operators or timed-out.

f. Fire Brigade

The inspectors reviewed fire brigade manning and qualifications on a routine basis. Both manning and qualifications were found to meet TS requirements.

The inspector reviewed the training received by the new fire brigade crew to ascertain whether an appropriate amount of operations knowledge is imparted to the crews. The fire brigade is broken into a "composite crew" format which naturally lends itself to providing plant knowledge. The crew is composed of personnel with the following experience:

1 AUO

1 Steamfitter
1 Electrician
2 Firefighters

This crew then receives 12 weeks of intensive training. Two weeks of this training includes familiarization with all safe shutdown (Appendix R) systems. The training includes components, flowpaths, and safety significance. Additionally, the training includes two weeks of intensive training on fire protection systems in the plant.

Following the classroom training the crew completes system qualification cards for in-plant knowledge of the systems. Typical qualification card items are listed below:

- Locate the Upper Head Injection accumulator and surge tank
- State the cooling medium for the Spent Fuel Pit Cooling System
- State whether there is any radiation associated with the EGTS and describe how it is contained
- List the emergency supply for the 6900 V Shutdown Boards

The training received by the crews appears adequate and appropriate.

Additionally, the affected unit ASOS will respond with the crew and function as "incident command". This individual will control all non-fire protection plant equipment and make reccommendations concerning priority of plant equipment to be protected. Operation of plant equipment other than the fire protection systems by the composite crew is prohibited. This arrangement is consistent with established plant procedures and policies and appears appropriate to the fire brigade functions.

g. Shift Briefing/Shift Turnover and Relief

The inspectors observed that UOs completed turnover checklists, conducted control panel and significant alarm walkdown reviews, and significant maintenance and surveillance reviews prior to relief. The inspectors observed that sufficient information was transferred on plant status, operating status and/or events and abnormal system alignments to ensure the safe operation of the Unit. ASOS relief was conducted and sufficient information appeared to be transferred on plant status, operating status and/or events, and abnormal system alignments to ensure the safe operation of the Unit. ASOS were observed reviewing shift logbooks prior to relief.

Shift briefings were conducted by the offgoing SOS. Personnel assignments were made clear to oncoming operations personnel. Significant time and effort were expended discussing plant events, plant status, expected shift activities, shift training, significant surveillance testing or maintenance activities, and unusual plant conditions.

h. Shift Logs, Records, and Turnover Status Lists

The inspectors reviewed SOS, UO, ASOS and STA logs and determined that the logs were completed in accordance with administrative requirements. The inspectors ensured that entries were legible; errors were corrected, initialed and dated; logbook entries adequately reflected plant status; significant operational events and/or unusual parameters were recorded; and entry into or exit from TS LCOs were recorded promptly. Turnover status checklists for ROs contained sufficient required information and indicated plant status parameters, system alignments, and abnormalities. The following additional logs were also reviewed:

Night Order Log
System Status Log
Configuration Control Log
Key Log
Temporary Alteration Log

No discrepancies or deficiencies were identified.

i. Control Room Recorder/Strip Charts and Log Sheets

The inspector observed operators check, install, mark, file, and route for review, recorder and strip charts in accordance with the established plant processes. Control room and plant equipment logsheets were found to be complete and legible; parameter limits were specified; and out-of-specification parameters were marked and reviewed during the approval process.

4. Management Activities

TVA management activities were reviewed on a daily basis by the NRC shift inspectors, shift managers, and Startup Manager.

a. Daily Control of Plant Activities (War Room Activities)

The licensee conducted a series of plant activities throughout each day to control plant routines. These activities were referred to by the licensee as War Room activities. War Room activities were observed by the shift manager on a daily basis and were found to be an adequate method to involve upper level management in the day-to-day activities affecting the operation of the units.

b. Management Response To Plant Activities and Events

Review of the licensee's corrective actions associated with restart following the June 8, 1988, reactor trip:

The reactor trip of June 8, 1988, was the fifth in a series of reactor trips that occurred subsequent to the first Sequoyah Unit 2 restart on May 13, 1988. Following this trip the NRC requested that the licensee's post-trip review assess the four previous trips and determine if there were any common factors associated with the trips. Additionally, on June 13, 1988, the licensee met with the NRC in Rockville, MD, at a public meeting for the purpose of presenting their assessment and any corrective action planned. During the meeting, the licensee indicated that a major contributor to several of the trips was the material condition of the secondary plant as well as a lack of detailed procedures for steam generator (SG) level control.

On June 16, 1988, the Assistant Director for Inspection Programs, TVAPD, OSP/NRC, met with the Sequoyah management and discussed the details of the licensee's immediate and long term corrective actions. The licensee committed to the following corrective actions and evaluations prior to plant restart:

- Review and reduce the backlog of outstanding work requests (WRs) on secondary plant equipment and evaluate their possible contribution to reducing the risk of balance of plant (BOP) induced reactor trips.

- Revise operating instructions to enhance plant start-up activities to control feedwater flow and SG levels during low level power ascension.

- Require the Plant Operations Review Committee (PORC) to evaluate future plant trips and recommend procedural changes, where applicable, to reduce the probability of future plant trips.

- Shift operating crews will be trained on the Sequoyah simulator in using the revised operating instructions for startup of the feedwater control system.

The inspectors reviewed the procedural changes and training incorporated as a result of the licensee's commitments. Each was reviewed as to whether the commitment was implemented and that the plant would be in compliance with the safety analysis. The following summarizes this review and inspector comments:

- Training for the operating crews was observed and determined to be acceptable.

- General Operating Instructions, GOI-1, rev. 77, Plant Startup from Cold Shutdown to Hot Standby - Units 1 and 2, and GOI-2, rev. 56, Plant Startup from Hot Standby to Minimum Load - Units 1 and 2, incorporated the requirement for the shift operating supervisor (SOS) to make a systematic review of all open work activities relative to the respective units for the purpose of identifying maintenance activities that could affect system operability prior to mode change. NRC observation of this process indicated acceptable condition for Unit 2 operation. Observation of this review will be conducted by the inspectors during Unit 1 startup. Further changes were made to Administrative Instruction, AI-5, rev. 43, Shift Relief and Turnover, requiring that prior to assuming the watch, the oncoming shift personnel (SOS, ASOS,STA, and representatives from the radiological chemical laboratory, radiological control group, and the waste processing group) assemble in the work control center for a briefing on all work activities in progress and scheduled work activities to be performed during the upcoming shift for both units. The work activities must be approved by the SOS prior to implementation. The inspectors reviewed the changes pertaining to the above areas and found them acceptable. The inspector observed several shift turnovers conducted in the work control center to verify that proper briefings on work activities were presented.

GOI-2, rev. 56, incorporated changes for maintaining feedwater control and SG levels during plant startup activities that were developed through simulator validation. The changes provided instruction for switching from manual to automatic operation of the feedwater system. Additionally, the new method changed the SG levels that the operator must try to maintain at low power levels from the 33% programmed level to 48% in each SG.

The inspectors reviewed these changes and could not determine that the plant had been analyzed for a condition of a SG water mass increase of the magnitude required in the GOI-2 revision. The licensee was asked to provide the safety evaluation of this change. The licensee had only performed a USQD screening and determined that the FSAR supported the increase in SG level from 33% to 48% level at less than or equal to 3% reactor power. The inspectors requested that the licensee provide a more detailed analysis to support the level increase. The licensee corresponded with the nuclear steam system supplier, Westinghouse, who indicated that they did not have sufficient site specific information to support a SG level increase from 33% to 48% at 0% reactor power. Rather, Westinghouse indicated that the precautions, limitations, and setpoints document indicated that the control band for SG program level was plus or minus 5%. GOI-2 was again revised (rev. 57) to require the SGs to be operated at programmed level, plus or minus 5%, during startup and plant operations. The fact that Westinghouse could not support the licensee position that the plant accident analysis for a main steamline break was still bounded was of concern to the NRC. This item is identified as URI 327, 328/88-34-01. This issue will be reviewed further to determine whether a violation of NRC regulations occurred when the initial change was evaluated for compliance with 10 CFR 50.59 requirements. The inspector discussed this concern with licensee management prior to the actual implementation of GOI-2. The licensee agreed that further review was necessary and revised GOI-2 to delete the change to the programmed level.

AI-30, rev. 19, Nuclear Plant Conduct of Operation, incorporated the requirement that experienced dedicated coaching be provided by TVA for inexperienced operators during startup and transfer from manual to automatic operation of the feedwater control system. Although this dedicated coaching later appeared to not be fully necessary, actions taken by the licensee to allow the ASOS to directly supervise significant operations by unit operators were considered to be appropriate, effective, and acceptable.

AI-18, rev. 51, Plant Reporting Requirements, incorporated the requirement for the PORC to review and approve each plant trip report prior to restart of the plant. The inspector considered this practice to be a noteworthy improvement.

5. Engineered Safety Features Walkdown (71710)

The inspector verified operability of the containment spray system on Unit 1 by completing a walkdown of the system. This inspection was documented in the SSQE Inspection Report 327,328/88-29.

6. Shift Surveillance Observations and Review (61726)

Licensee activities were directly observed to ascertain that surveillance of safety-related systems and components was being conducted in accordance with TS requirements.

The inspectors verified that: testing was performed in accordance with adequate procedures; test instrumentation was calibrated; LCOs were met; test results met acceptance criteria requirements and were reviewed by personnel other than the individual directing the test; deficiencies were identified, as appropriate, and any deficiencies identified during the testing were properly reviewed and resolved by management personnel; and system restoration was adequate. For completed tests, the inspector verified that testing frequencies were met and tests were performed by qualified individuals.

The following activities were observed/reviewed:

SI-2: Shift Log - Units 1 and 2.

SI-3: Daily, Weekly, and Monthly Logs - Units 1 and 2.

SI-79: Power Range Neutron Flux Channel Calibration By Incore-Excore Axial Imbalance Comparison. This SI is required at least once per month when above 15% reactor power. The incore axial imbalance is obtained from a moveable detector flux map which is analyzed by the incore computer program.

SI-129.1: Safety Injection Pump Casing and Discharge Venting.

SI-137.1: Reactor Coolant System Unidentified Leakage Measurement.

SI-137.2: Reactor Coolant System Water Inventory.

No violations or deviations were identified.

7. Shift Maintenance Observations and Review (62703)

a. Station maintenance activities of safety-related systems and components were observed/reviewed to ascertain that they were conducted in accordance with approved procedures, regulatory guides, industry codes and standards, and in conformance with TS.

The following items were considered during this review: LCOs were met while components or systems were removed from service; redundant components were operable; approvals were obtained prior to initiating the work; activities were accomplished using approved procedures and inspected as applicable; procedures used were adequate to control the activity; troubleshooting activities were controlled and the repair record accurately reflected what actually took place; functional testing and/or calibrations were performed prior to returning components or systems to service; QC records were maintained; activities were accomplished by qualified personnel; parts and materials used were properly certified; radiological controls were implemented; QC hold points were established where required and were observed; fire prevention controls were implemented; outside contractor activities were controlled in accordance with the approved QA program; and housekeeping was actively pursued.

b. Temporary Alterations

The following TACFs were reviewed:

0-88-08-02: Condensate Storage Tanks. Temporary connections to drain valves to allow makeup water feed from a mobile vendor demineralizer.

No violations or deviations were identified.

c. Work Requests

The inspectors observed work in progress and reviewed work packages for the following work requests/work plans:

WR B245103: Repair of the "A" train main feedwater pump turbine speed control system to correct pump oscillations and provide a more controlled feed flow to the SGs.

WP E437A-01: Testing and repair of all safety-related room coolers due to the discovery of broken shafts on certain room cooler motors caused by improper fan belt tensioning. The inspector observed the work on the "A" and "B" trains of the Boric Acid Transfer & AFW Pump Coolers.

No violations or deviations were identified.

Subsequent to the management meeting held with TVA on June 13, the inspectors reviewed the scope of the maintenance work requests for Unit 2 that were pending when the reactor trips occurred on June 6 and June 8. The purpose of this review was to establish:

- Whether the approximately 128 WR's listed as "Startup Priority" was complete and conservative in bounding all necessary work to be performed prior to Unit 2 startup.
- Whether the screening criteria used in the "Startup Priority" determination was adequate and conservative.
- Selection of a representative sample of those WR's not determined to be "Startup Priority" and apply the screening criteria as an independent audit on the process.

The screening criteria used was a check list, which was applied to the total outstanding work list of 1308 items listed for Unit 2 and Common. Answering "Yes" to any one of the questions on the check sheet placed the WR in the "Startup Priority" category:

- Is the WR a Main Control Room-generated WR?
- If the WR is not completed, will the operators be required to use remote indications, manual controls or other compensatory measures?
- If the WR is not completed, could false indications cause the in-plant operators (AUO's) to notify the control room? (An example is a plugged/ dirty sight glass on a drain tank).
- If the WR is not completed, could controller problems develop that could cause instability in the secondary plant (BOP)?

- If the WR is not completed, could an identified problem worsen later and not be isolable/ workable at power? (e.g. a minor steam leak that could develop into a serious leak that is not isolable with 2 valve protection).

- Is the WR one of those identified by the Operations staff as one they consider necessary for restart?

The screening criteria was considered adequate by the inspector, and was then applied to 38 selected WR's that were not on the startup list. Each of the 38 were discussed with TVA staff familiar with the screening process. The inspector agrees with TVA staff's determination of non-startup category for each of the selected sample items. TVA completed all Startup Priority WR's prior to Unit 2 startup on June 23.

No violations or deviations were identified

d. Hold Orders

The inspectors reviewed various HOs to verify compliance with AI-3, revision 38, Clearance Procedure, and that the HOs contained adequate information to properly isolate the affected portions of the system being tagged. Additionally the inspectors inspected the affected equipment to verify that the required tags were installed on the equipment as stated on the HOs. The following HOs were reviewed:

Hold Order	Equipment
2-88-516:	"A" Train Main Feedwater Pump for work on the governor valve positioner.
2-88-463:	2B Annulus Vacuum Fan.
2-88-487:	2B 690 Elevation Penetration Room Cooler to repair a broken shaft.
2-88-520:	Positive Displacement Charging Pump to replace a plexi-glass cover gasket.

No violations or deviations were identified.

e. Maintenance Activities Affecting Plant Operations

On 07/05/88, at 2:30 p.m., Unit 2 operators received indication that the pressure indicator (2-PIS-87-21) for UHI isolation valve 2-87-21 was erratic and indicating high (4000 psig) when all previous readings were steady at approximately 3000 psig. The pressure indicator is the sole method on-line to monitor the condition of the isolation valve's actuator. The actuator is a hydraulic actuator pre-charged with nitrogen to 1400 psig, then hydraulically charged to

3000 psig. A bladder separates the nitrogen from the hydraulic side. A pre-charge of 1400 psig provides sufficient stored energy to stroke the UHI isolation valve shut when the UHI water accumulator reaches its low level setpoint during a LOCA event. This action assures delivery of sufficient water inventory to the core and prevents injection of UHI system nitrogen into the core.

The pressure indicator was removed from service and re-calibrated. After reinstalling the pressure indicator on 07/08/88 at 2:30 p.m., (a delay of 3 days), the actuator accumulator pressure was found to be reading below the alarm setpoint of 2970 psig. A Westinghouse analysis had previously been provided to allow a limited number of rechargings of the hydraulic side of this accumulator. Assuming that the pressure decrease was due to nitrogen leaks, a maximum of 4 rechargings was allowed before the nitrogen preload was considered less than that required to properly stroke the isolation valve. This is based in part on the volume and pressure of the compressed nitrogen and the assumed nitrogen loss to decrease pressure to the alarm point. After 4 such recharges, the licensee's procedure (SI 744) requires a stroke test of the isolation valve to verify operability. An originally installed weight indication method of determining the volume of nitrogen in the accumulator was unreliable and ineffective. Since only pressure could be read on-line, the alternate method of allowing 4 recharges and then providing positive assurance of operability by a stroke test was developed by the licensee and Westinghouse. This is considered a compensatory measure.

Licensee management (plant manager, maintenance manager, operations manager and PORS, among others) met at 4:30 p.m. on 07/08/88 and decided to determine valve operability by another method. The decision was to perform a pre-charge test instead, which was considered a more reliable method of determining that sufficient nitrogen was available. The pre-charge test requires declaring the isolation valve inoperable, draining the actuator's hydraulic side, and then measuring the nitrogen side pressure.

A plan of action was drawn up which included gathering any spares or replacement parts, a procedural change to SI 744 to allow the pre-charge test in lieu of the stroke test, and several contingency actions. The spares were not found and made available until 07/09/88, and the procedure was not changed until 07/10/88. By the time the licensee was ready to implement the test, the accumulator pressure alarm had been received and recharging accomplished a total of 7 more times. After the fourth recharge, at 1:30 p.m. on 07/09/88, the still-in-effect requirements of SI 744 required an immediate stroke test of the isolation valve. This was not done. By the time the licensee had finally performed an operability test by checking the pre-charge at 1:55 p.m. on 07/10/88, over 24 hours had elapsed since an operability determination had been required by SI 744. When the pre-charge test was finally performed, the nitrogen pressure was found to be 1165 psig, which is less than the minimum of 1300 psig specified as the lower limit to ensure operability.

The loss of nitrogen was determined to be due to a leaking nitrogen charging valve (Schrader valve). This valve was replaced, the nitrogen side recharged to 1400 psig, and the valve returned to service at 3:55 p.m. on 07/10/88.

While the management decision to perform a pre-charge test rather than the required stroke test was probably acceptable and would have adequately demonstrated operability, the execution of the plan was not well coordinated. Several delays were encountered in locating parts and changing the procedure. Although, several levels of management were involved in this evolution, the work was delayed for over 24 hours past the point when the valves should have been repaired or declared inoperable. In conjunction with these delays, it is considered that the licensee did not take appropriate actions when conditions (the 4th thru 7th low pressure alarm and recharging evolutions) indicated potential valve inoperability.

Subsequent to this event, TVA asked Westinghouse to provide an analysis to determine whether the valve would have performed its intended function with the as-found pressure of 1165. A Westinghouse analysis dated 7/12/88, asserted that the valve would have stroked closed in approximately 8 seconds, as opposed to 4 seconds with a fully charged accumulator. This asserted condition is stated to result in an additional injection of 120 cubic feet of UHI water to the core, bringing the total injected volume to 1170 cubic feet. This additional volume is within the accident analysis assumption of a maximum 1180.5 cubic feet. This suggests the valve may have been post facto operable, but does not relieve the licensee of their commitment to demonstrate operability by compliance with T.S. and their own procedures.

While the system arrangement provides a second, series valve operated by the opposite ESF train, which probably would have actuated properly, single failure criteria require redundant equipment to be operable.

T.S. 3.5.1.2 requires the UHI system to be OPERABLE (including the isolation valves) or, to restore the system to OPERABLE in 1 hour or be in HOT STANDBY within the next 6 hours. This action statement was not entered until 12:31 p.m., on 07/10/88, when work on the valve began. Since the valve is determined to be operable by performance of a verification test whenever 4 recharges have occurred, the valve should have been declared inoperable after the recharge performed at 1:30 p.m., on 07/09/88, when procedural actions to stroke time test the valve were not taken. The appropriate action statement was not entered on a system required for safe shutdown. This is considered a violation of T.S. 3.5.1.2, for failure to comply with a TS action statement. This item is identified as Violation 327,328/88-34-02.

On July 28,1988, the NRC held an enforcement conference with TVA at the Sequoyah Nuclear Plant to discuss concerns related to the apparent noncompliance with T.S. 3.5.1.2 described above. Attendees at the conference are delineated in the attachment to this report. The meeting was opened by J. Partlow, Director, Office of Special Projects, who along with F. McCoy, Assistant Director for TVA Inspection Programs, discussed the NRC concerns with this specific event. NRC management stated their concern that the licensee had failed to comply with procedures established to confirm UHI valve operability when conditions indicated a potential for valve inoperability. Additionally, given this set of circumstances, the licensee failed to enter the action statement of T.S. 3.5.1.2 until operability could be confirmed. NRC management questioned the conservatism and safety consciousness of TVA's actions with respect to this event.

TVA was asked to address their own investigation into the event and the specific concerns of the NRC. TVA presented their evaluation of the event and their conclusions as to how the the noncompliance with T.S. was allowed to occur.

TVA presented background information and details of the event which agreed with the NRC's evaluation in most instances. A copy of the material presented by TVA at this conference has also been included in the attachment to this inspection report. The Sequoyah plant manager acknowledged at the enforcement conference that the plant had been in violation of T.S. 3.5.1.2 for a period of approximately 23 hours, from 1:30 p.m. on 07/09/88 until 12:31 p.m., on 07/10/88. TVA presented an analysis performed by Westinghouse that supports their determination that the safety significance associated with this event was minimal and that the valve in question would have functioned if called upon during the time frame the plant was outside the T.S. TVA demonstrated at the enforcement conference that the event was caused by a lack of coordination among various site groups and was not a result of nonconservative management action.

8. Event Followup (93702, 62703)

At 11:59 p.m., on 6/29, a blackout signal was initiated on Unit 1 6900 volt shutdown board 1-B-B. The initiating event was the tripping of the feeder breaker to the shutdown board from the 6900 volt unit board. The feeder breaker (#1722) tripped when maintenance workers were attempting to replace a fuse in the breaker's position indicating light circuit. The circuit was inadvertantly grounded when maintenance workers were replacing the blown fuse, causing the breaker trip circuit to actuate. When the 1-B-B shutdown board was deenergized, all 4 EDG units started. The 1-B-B shutdown board was reenergized when the 1-B-B EDG came up to speed and tied onto the bus. The other EDG's did not tie on to their respective buses because those buses continued to be energized from the unit boards. After resetting the breaker 1722 trip circuit, the unit boards were paralleled with the 1-B-B EDG, and the EDG's were stopped. All systems performed as designed, and an ENS notification made to NRC at 12:08 a.m. on 6/30.

At 7:29 p.m., on June 3, 1988, EDG 1A-A was made inoperable for the performance of SI-307.1, Degraded Voltage Relay Response Time Testing and Timer Verification. At that time the Unit 2 UO logged in the LCO log that LCO for TS 3.8.1.1 was entered. At 10:40 p.m. on June 3, 1988, SI 307.1 was completed and EDG 1A-A was returned to service. During the subsequent shift turnover meeting at approximately 11:30 p.m. a discussion of the work performed for the previous shift resulted in the SOS realizing that the requirements of TS 3.8.1.1 had not been met. TS 3.8.1.1 requires that with an EDG inoperable, the operability of the remaining AC sources must be demonstrated by performance of SR 4.8.1.1.1.a and 4.8.1.2.a.4 within one hour and at least once per eight hours thereafter. Failure to meet the requirements of TS 3.8.1.1 is identified as Violation 327,328/88-34-03.

9. Followup on Previous Inspection Findings (92702)

(Closed) URI 327,328/88-26-03, Resolution of RCS Leak Rate Determination Process.

On April 6, at approximately 6:50 a.m., the licensee completed computations for Part 1 of SI-137.2, Reactor Coolant System Water Inventory. The results indicated an initial unclassified RCS leak rate of 1.09 gpm, which if considered unidentified, would have exceeded the TS limit of 1 gpm. As required by procedure, the chemistry laboratory was notified to perform Part 2 of SI-137.2. At the time, the SOS was at the shift meeting preparing for turnover of the watch to the oncoming shift crew. He informed the Assistant SOS, by phone, not to enter the LCO for RCS leakage because procedural problems had caused them to enter the same LCO unnecessarily in the past. This decision was made even though the operators had noted abnormal increases in the reactor building auxiliary floor and equipment drain sump levels throughout the shift.

At 7:55 a.m., the licensee entered LCO 3.4.5.2 for RCS leakage when a gasket on 2-PDT-62-47, the differential pressure transmitter on the #4 reactor coolant pump seal return line, was found to be leaking. A Notification of Unusual Event was not made within 5 minutes per IP-1, RCS Leakage, which required entry into the Radiological Emergency Plan if leakage exceeds the TS limit. At 8:20 a.m., licensee management personnel reviewed the decision and issued a NOUE. At 8:42 a.m., the differential pressure transmitter was isolated utilizing the root valves. At 9:11 a.m., the licensee notified NRC Headquarters in accordance with the one hour emergency reporting requirements. Although this notification was made within one hour of the management decision to enter the NOUE, the inspectors noted that this was accomplished approximately 76 minutes after entry into LCO 3.4.5.2 (which, by the licensee's radiological emergency procedures, required a declaration of unusual event) and nearly 2.5

hours after the operators had verifiable indication that leakage might be outside of TS limits.

AOI-6, Small Reactor Coolant System Leak (Modes 1, 2, & 3), had not been entered. AOI-6 states that one possible symptom of a small reactor coolant leak is receiving the "Reactor Building Auxiliary Floor and Equipment Drain Sump High" alarm, window 19 of XA-55-5A on panel 1-M-5. This alarm was received twice during the shift as stated above. Additionally, with the high leak rate as calculated in SI-137.2 and the discovery of 2-PDT-62-74 leaking the inspector considers that it would have been prudent to perform the actions of AOI-6. Although non-performance of the recommendations in AOI-6 does not appear to violate any licensee or NRC requirements, the inspectors have concern that the licensee's annunciator response procedures do not provide an initiation path for the AOI procedures.

At 5:45 p.m., the licensee exited the NOUE when a new performance of SI-137.2 indicated an acceptable leakage rate of 0.48 gpm. Subsequent performance of SI 137.5 Primary to Secondary Leakage via Steam/Generators, reflected that 0.16 gpm of this leakage rate was attributable to the tube leak in steam generator 3 discussed in Inspection Report 88-26. The licensee estimated that between 250-300 gallons of inventory had leaked during the entire event by estimating the leakage rate from 2-PDT-62-47 to be 0.61 gpm and by confirmation of the pocket sump levels. The licensee issued a statement to the press on this occurrence at 11:00 a.m. on April 6.

The delays in entering and reporting the NOUE and the LCO on RCS leak rate and the concerns involving initiation of AOI procedures were identified as Unresolved Item 88-26-03.

During this event TVA had used a cumbersome method to calculate unidentified RCS leakage and to determine what part, if any, that a primary to secondary leak played in this unidentified leakage value. Specifically, the licensee's RCS inventory measurement procedure SI-137.2 would perform an inventory balance and if the unclassified leakage was above a specific value they would then request that a primary to secondary leakage measurement be performed in accordance with SI-137.5. Performing a primary to secondary leakage calculation only to quantify unidentified leakage resulted in both a delay in completing the RCS unidentified leakage measurement and a lack of consistent primary to secondary leakage trending data. The staff considers that this methodology was a major contributor to the delays associated with entry into (and applicable reporting of) the NOUE and LCO, as identified in Unresolved Item 86-26-03.

Revision 22 of SI-137.2 revised the method to require that primary to secondary leakage measurement be performed every 72 hours and be a prerequisite to the inventory balance performed by SI-137.2. This new method should produce both consistent primary to secondary leakage trending data as well as expedite the determination of RCS leakage. This method also provides adequate corrective action to preclude raising questions such as those indicated under Unresolved Item 88-26-03 discussed above.

The NRC staff reviewed the event with respect to the utilization of SI-137.2. It was determined that the intent of LCO 3.4.5.2 was to consider any known leakage to be unidentified until an identification of the source was made. Therefore, unclassified leakage is unidentified leakage and LCO 3.4.5.2 should have been entered at 6:55 a.m. Although the inspector had earlier discussions with the licensed operators, it was determined that not entering the action statement was identified and resolved independently by the licensee management.

At 7:55 a.m., on April 6, the operators entered LCO 3.4.5.2 when the leak was actually observed. At this time the operations staff still did not enter a NOUE as required by the REP because the SOS had left instructions to the contrary. The inspector discussed this decision with the operators at the time.

The Sequoyah Radiological Emergency Plan IP-1, Emergency Plan Classification Logic which implements these requirements, requires that the operators enter a NOUE if the primary system leak rate is greater than that allowed in the TS. In addition, REP Implementing Procedure IP-1, also states, if there is any reason to doubt whether a given condition has actually occurred, the shift engineer or Site Emergency Director will proceed with the required notification without waiting for formal confirmation.

In addition, REP Implementing Procedure IP-1, also states, if there is any reason to doubt whether a given condition has actually occurred, the shift engineer or Site Emergency Director will proceed with the required notification without waiting for formal confirmation.

IP-2, Notification of Unusual Event, requires that the notification of the Operations Duty Specialist be made within 5 minutes after the declaration of the event.

Contrary to the above, on April 6, 1988 at 7:55 a.m. the licensee entered LCO 3.4.5.2 acknowledging that the RCS leakrate was greater than the TS allowable limits but did not enter a NOUE until 8:20 a.m. when licensee and NRC management reviewed the event. This is a violation of the above requirements and will be considered Violation 327,328/88-34-04. This portion of URI 88-26-03 is closed.

The inspector reviewed AI-4, Preparation, Review, Approval and Use of Site Procedures/Instructions, for guidance on use of AOIs. Section 16.3 states that:

AOIs and EIs are prepared to act as guides during potential emergencies. They are written so that a trained operator will know in advance the expected course of events that will identify the situation and will provide the immediate action to be taken.

It is the operator's responsibility to analyze and determine what the particular situation is. Once identified, the operator is to take prompt appropriate action to prevent or mitigate the consequences of a serious condition.

The inspector reviewed the operator training lesson plans associated with AOI-6 for new license training and requalification training including both classroom and simulator portions. Also, a selected number of additional AOI training lesson plans for licensed operators were reviewed. Training appeared to be adequate and appropriate for the procedure usages.

Initiating documents for AOIs are not provided at Seqouyah. The many unique situations which could occur in the plant are too numerous to provide instruction for every scenario. Therefore, the AOIs are designed as symptom based instructions. The operators are trained on what parameters may indicate a need to enter the procedure.

The inspector reviewed the event in question and determined that the operators had handled it in an appropriate manner. There is no requirement for an entry into the AOI. Furthermore, discussions with the operators and training personnel have shown that a more significant leakage event would have prompted AOI entry. This portion of URI 88-26-03 is closed.

Additional review of this event and licensee corrective actions and responses will be reviewed under Violation 88-34-04. Therefore, URI 327,328/88-26-03 is closed.

10. Exit Interview (30703)

The inspection scope and findings were summarized on July 18, 1988, with those persons indicated in paragraph 1. The Senior Residents described the areas inspected and discussed in detail the inspection findings listed below. The licensee acknowledged the inspection findings and did not identify as proprietary any of the material reviewed by the inspectors during the inspection.

Inspection Findings:

Three violations were identified in paragraphs 7, 8, an 9.
One URI was identified in paragraph 4.

No deviations or inspector follow-up items were identified.

During the reporting period, frequent discussions were held with the Site Director, Plant Manager and other managers concerning inspection findings.

No commitments were made by the plant manager or his designee during the exit meeting.

11. List of Abbreviations

ABGTS- Auxiliary Building Gas Treatment System
ABSCE- Auxiliary Building Secondary Containment Enclosure
AFW - Auxiliary Feedwater
AI - Administrative Instruction
AOI - Abnormal Operating Instruction
AUO - Auxiliary Unit Operator
ASOS - Assistant Shift Operating Supervisor
BIT - Boron Injection Tank
C&A - Control and Auxiliary Buildings
CAQR - Conditions Adverse to Quality Report
CCP - Centrifugal Charging Pump
CCTS - Corporate Commitment Tracking System
COPS - Cold Overpressure Protection System
CSSC - Critical Structures, Systems and Components
CVI - Containment Ventilation Isolation
DC - Direct Current
DCN - Design Change Notice
DNE - Division of Nuclear Engineering
DTVAP - Division of TVA Projects
ECCS - Emergency Core Cooling System
EDG - Emergency Diesel Generator
EI - Emergency Instructions
ENS - Emergency Notification System
ESF - Engineered Safety Feature
FCV - Flow Control Valve
FSAR - Final Safety Analysis Report
GDC - General Design Criteria
GL - Generic Letter
HIC - Hand-operated Indicating Controller
HO - Hold Order
HP - Health Physics
IN - NRC Information Notice
IFI - Inspector Followup Item
IM - Instrument Maintenance
IMI - Instrument Maintenance Instruction
IR - Inspection Report
KVA - Kilovolt-Amp
KW - Kilowatt
KV - Kilovolt
LER - Licensee Event Report
LCO - Limiting Condition for Operation
LOCA - Loss of Coolant Accident
MI - Maintenance Instruction
NB - NRC Bulletin
NOV - Notice of Violation

NRC - Nuclear Regulatory Commission
OSLA - Operations Section Letter - Administrative
OSLT - Operations Section Letter - Training
OSP - Office of Special Projects
PMT - Post Modification Test
PORC - Plant Operations Review Committee
PORS - Plant Operation Review Staff
PRO - Potentially Reportable Occurrence
QA - Quality Assurance
QC - Quality Control
RCS - Reactor Coolant System
RG - Regulatory Guide
RM - Radiation Monitor
RHR - Residual Heat Removal
RWP - Radiation Work Permit
RWST - Refueling Water Storage Tank
SER - Safety Evaluation Report
SG - Steam Generator
SI - Surveillance Instruction
SOI - System Operating Instructions
SOS - Shift Operating Supervisor
SQM - Sequoyah Standard Practice Maintenance
SR - Surveillance Requirements
SRO - Senior Reactor Operator
STI - Special Test Instruction
TACF - Temporary Alteration Control Room
TROI - Tracking Open Items
TS - Technical Specifications
TVA - Tennessee Valley Authority
UO - Unit Operator
URI - Unresolved Item
USQD - Unreviewed Safety Question Determination
WCG - Work Control Group
WP - Work Plan
WR - Work Request

Attachment:
Enforcement Conference Attendance
List and Licensee Slides

ATTACHMENT

TENNESSEE VALLEY AUTHORITY

SEQUOYAH NUCLEAR PLANT

EVENTS SURROUNDING THE 2-FCV-87-21 UHI ISOLATION VALVE ISSUE

JULY 28, 1988

COVER, 35

ATTENDANCE LIST

Enforcement Conference
July 28, 1988

Attendees

TVA

S. A. White	R. L. Gridley	J. R. Walker	Ken Meade
J. R. Bynum	N. C. Kazanas	M. A. Cooper	Ed Vigluicci
J. T. LaPoint	M. J. Ray	L. E. Martin	J. B. Brady
S. J. Smith	H. R. Rogers	B. Charleson	

NRC

J. Partlow	B. Pierson
P. Harmon	F. McCoy
K. Jenison	K. Poertner

SUMMARY OF EVENTS
UHI ISOLATION VALVE

02/15/88	SI-744 WRITTEN TO PROVIDE METHOD OF MONITORING CHARGES TO ACCUMULATOR BASED ON WESTINGHOUSE ANALYSIS
03/88	PRE-CHARGED 2-FCV-87-21 N_2 ACCUMULATOR TO 1382 psig PRIOR TO ENTRY TO MODE 3 AND VERIFIED VALVE OPERABILITY
07/05/88	OPERATIONS NOTED ERRATIC PERFORMANCE OF 2-PIS-87-21 (HYDRAULIC SYSTEM PRESSURE INDICATOR). WR B768800 WRITTEN TO REPAIR.
07/08/88	AT 1400, PORS HAD A DISCUSSION WITH NRC ON THE INOPERABLE PRESSURE INDICATOR (2-PIS-87-21)
07/08/88	AT 1430 EDT, PIS REPAIRED AND HYDRAULIC SYSTEM PRESSURE FOUND LOW (2647 psig). OPERATIONS RECHARGED TO 3034 psig. SYSTEM ENGINEER NOTIFIED AT 1530 EDT.
07/08/88	AT 1630 EDT, PLANT MANAGEMENT WAS INFORMED OF THE LOW HYDRAULIC SYSTEM PRESSURE AND DETERMINED A PRE-CHARGE CHECK WAS THE APPROPRIATE ACTION TO TAKE. MANAGEMENT DIRECTED SYSTEM ENGINEERING/MAINTENANCE TO ESTABLISH A PLAN OF ACTION TO PERFORM PRE-CHARGE
07/08/88	AT 1930 EDT AND AT 0450 EDT ON 07/09/88, HYDRAULIC ACCUMULATOR PRESSURE REACHED LOW SETPOINT (2970 psig) AND WAS RECHARGED BY OPERATIONS
07/09/88	AT 1100 EDT, SCHRADER VALVE N_2 BLADDER WAS CHECKED FOR LEAKS - SMALL LEAKAGE NOTED.
07/09/88	AT 1300 EDT, HYDRAULIC ACCUMULATOR PRESSURE REACHED THE LOW SETPOINT (2970 psig) AND WAS RECHARGED BY OPERATIONS. THIS WAS THE FOURTH PHYSICAL CHARGE AND IN HINDSIGHT SI-196 SHOULD HAVE BEEN PERFORMED AT THIS POINT.

SUMMARY OF EVENTS
UHI ISOLATION VALVE
(cont.)

07/09/88 AT 1800 EDT, CALLED NRC RESIDENT AT HOME TO DISCUSS AND GIVE THE STATUS OF THE ACTION PLAN FOR REPAIR OF 2-FCV-87-21.

07/09/88 AT 1820 EDT, AT 2100 EDT, AND AT 0333 EDT ON 7/10/88, HYDRAULIC ACCUMULATOR PRESSURE REACHED LOW SETPOINT (2970 psig) AND WAS RECHARGED BY OPERATIONS.

07/10/88 AT 0930 EDT, PORS TALKED WITH THE NRC TO INFORM THEM OF THE PROGRESS MADE AND THE ACTIONS REMAINING BEFORE VALVE REPAIR WAS COMPLETED.

07/10/88 AT 1231 EDT, ENTERED LCO 3.5.1.2 TO PERFORM PRECHARGE ON 2-FCV-87-21 AND PERFORM MAINTENANCE ON SCHRADER VALVE. NITROGEN PRESSURE WAS FOUND TO BE 1164.5 psig. LEAKAGE FROM THE SCHRADER VALVE WAS REPAIRED.

07/10/88 AT 1555 EDT, LCO 3.5.1.2 WAS EXITED. THE NITROGEN PRESSURE WAS LEFT AT 1387 psig.

07/10/88 DNE WAS REQUESTED TO EVALUATE AS-FOUND AFFECTS OF NITROGEN PRESSURE ON RESPONSE TIME OF 2-FCV-87-21 AND ACCIDENT ANALYSIS.

07/11/88 WESTINGHOUSE EVALUATED THE CONDITION AND CONCLUDED THE LOW NITROGEN PRESSURE AND SUBSEQUENT VALVE RESPONSE TIME IS BOUNDED BY THE CURRENT UNIT 2 CYCLE 3 UHI ANALYSIS.

CONCLUSIONS

- SI-196 "PERIODIC CALIBRATION OF UPPER HEAD INJECTION SYSTEM INSTRUMENTATION" IS THE INSTRUCTION WHICH RESPONSE TIME TESTS THE SUBJECT VALVES TO PROVE OPERABILITY.

- SI-744, "MONITORING OF UHI ISOLATION VALVE ACCUMULATOR PRESSURE," DID NOT CONTAIN SUFFICIENT INFORMATION TO PERFORM AN ADEQUATE ASSESSMENT FOR VALVE OPERABILITY.

- THE LEAKING SCHRADER VALVE CAUSED THE LOW NITROGEN PRESSURE AND RESULTED IN SEVERAL RECHARGES PRIOR TO VERIFICATION OF PRECHARGE.

- MANAGEMENT DETERMINED THAT A NITROGEN PRECHARGE WAS THE MOST ACCURATE AND EFFICIENT WAY TO DETERMINE SYSTEM STATUS WITH RESPECT TO ACCUMULATOR HYDRAULIC PRESSURE.

- MANAGEMENT INTERPRETED SI-744 TO INDICATE THAT A NITROGEN PRECHARGE CHECK WAS AN ALTERNATIVE TO THE RESPONSE TIME TEST AFTER THE FOURTH CHARGE.

- THE NITROGEN PRECHARGE CHECK WAS PLANNED BUT NOT EXPEDITIOUSLY PERFORMED.

- OPERATIONS PERSONNEL RELY ON SYSTEMS ENGINEERING TO DETERMINE THE NUMBER OF CHARGES TO EACH UHI ISOLATION VALVE ACCUMULATOR AND WHEN ACTION IS REQUIRED.

- BASED ON AN EVALUATION FROM WESTINGHOUSE, THE "AS FOUND" CONDITION OF LOW NITROGEN PRESSURE DID NOT REPRESENT A SAFETY CONCERN.

ASSESSMENT OF SAFETY SIGNIFICANCE

- 2-FCV-87-21 WAS CAPABLE OF PERFORMING ITS INTENDED FUNCTION.

- THERE WAS A MINIMAL EFFECT ON UHI ISOLATION VALVE STROKE TIME DUE TO THE LOW NITROGEN PRESSURE IN THE VALVE ACCUMULATOR. TESTING ON UNIT 1 INDICATED THE RESPONSE TIMES WERE APPROXIMATELY .2 SECONDS SLOWER DUE TO THE LOW PRESSURE.

- THE UNIT 2 CYCLE 3 ANALYSIS INDICATES THE "AS FOUND" CONDITION OF LOW NITROGEN PRESSURE IS BOUNDED EVEN IF A SINGLE FAILURE OF THE REDUNDANT ISOLATION VALVE IS ASSUMED.

- THE REDUNDANT UHI ISOLATION VALVE, 2-FCV-87-22 WAS OPERABLE DURING THIS EVENT.

- A SECOND UHI INJECTION PATH WAS OPERABLE DURING THIS EVENT

ACTIONS

1. SI-744 IS BEING REVISED TO PROVIDE ACTIONS TO AID IN THE DETERMINATION OF UHI VALVE OPERABILITY. A RESPONSE TIME TEST WILL BE REQUIRED AFTER A CERTAIN NUMBER OF CHARGES, DEPENDENT UPON THE ORIGINAL NITROGEN PRECHARGE.

2. OPERATIONS PERSONNEL WILL BE TRAINED ON HOW TO INTERPRET THE ACTIONS OF SI-744.

3. AN EVALUATION WILL BE MADE CONCERNING INCREASING THE NITROGEN PRESSURE IN THE ACCUMULATORS SUCH THAT ADDITIONAL CHARGES ARE ALLOWED BEFORE A PRECHARGE CHECK TEST IS REQUIRED.

4. THE NON-TS SIs WILL BE REVIEWED AND REVISED AS APPROPRIATE TO CLARIFY THE ACTIONS WHICH SHOULD BE TAKEN IN THE EVENT THE ACCEPTANCE CRITERIA ARE NOT MET.

5. THE UHI SYSTEM REMOVAL PLAN WILL BE PURSUED. WESTINGHOUSE HAS PERFORMED PRELIMINARY ANALYSIS WHICH INDICATES THE UHI SYSTEM CAN BE REMOVED AT SQN.

ACTIONS

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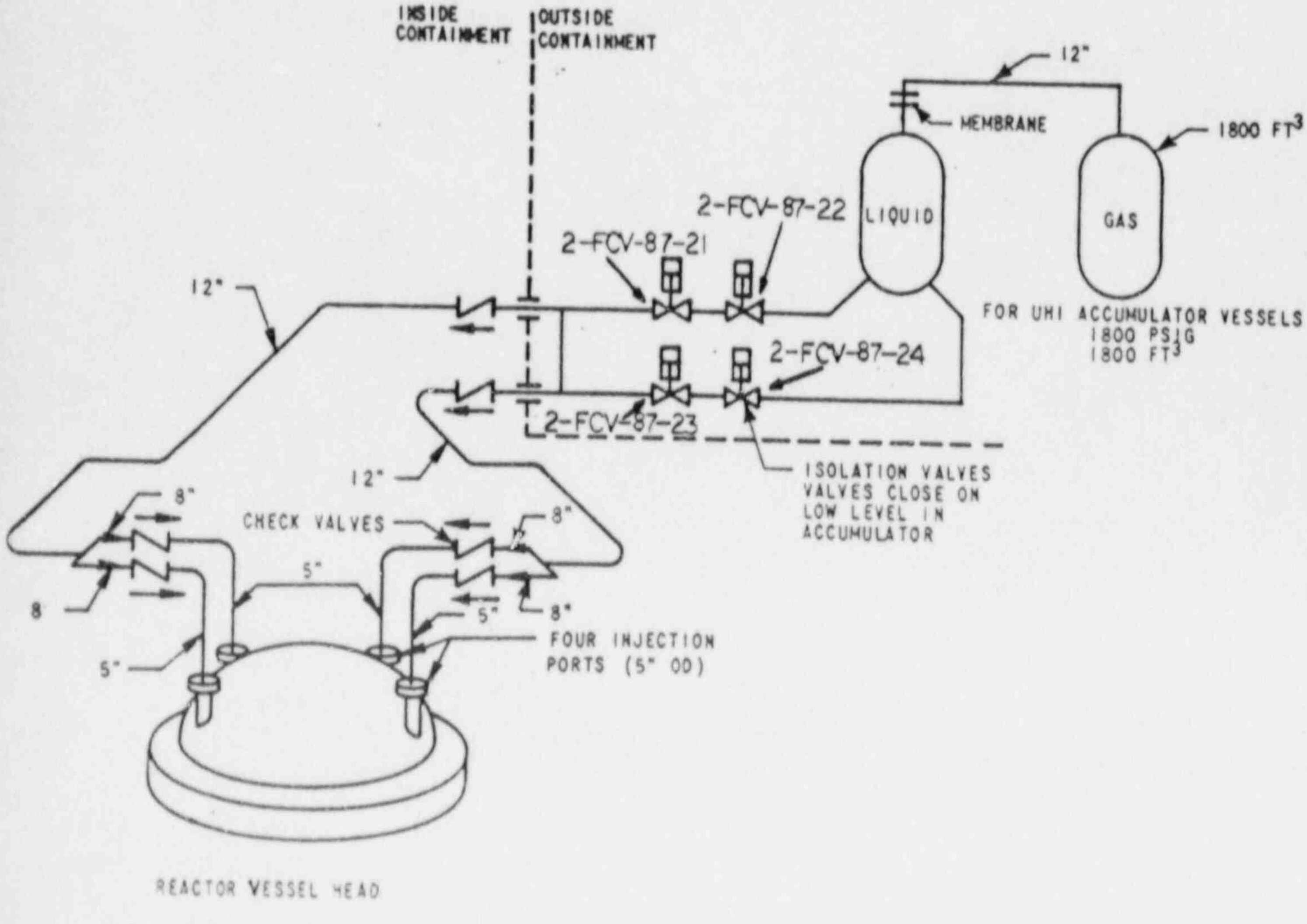
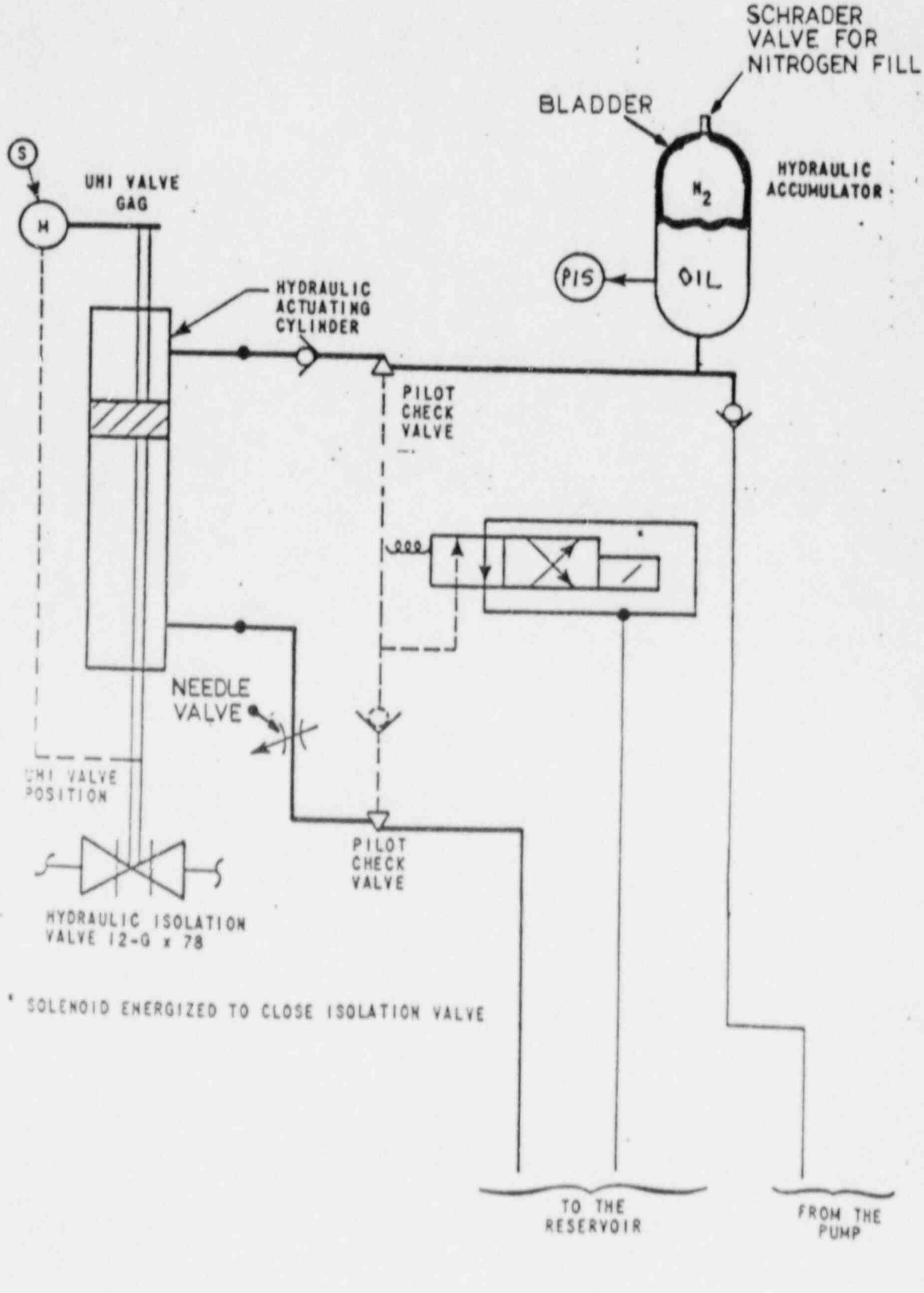


Upper Head Injection System Schematic



SCHRADER VALVE FOR NITROGEN FILL
BLADDER
HYDRAULIC ACCUMULATOR
N_2
OIL
PIS
S
M
UHI VALVE GAG
HYDRAULIC ACTUATING CYLINDER
PILOT CHECK VALVE
NEEDLE VALVE
UHI VALVE POSITION
PILOT CHECK VALVE
HYDRAULIC ISOLATION VALVE 12-G x 78
* SOLENOID ENERGIZED TO CLOSE ISOLATION VALVE
TO THE RESERVOIR
FROM THE PUMP