U. S. NUCLEAR REGULATORY COMMISSION
REGION I

DOCKET/REPORT NOS:	50-334/95-18 50-412/95-18
LICENSEE:	Duquesne Light Company Shippingport, Pennsylvania
FACILITY:	Beaver Valley Power Station
LOCATED AT:	Shippingport, Pennsylvania
INSPECTION DATES:	September 25 to October 5, 1995
INSPECTORS:	Michael Buckley, Reactor Engineer, RI Daniel Moy, Reactor Engineer, RI Michael Schlyamberg, Contractor

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Summary: Good management oversight of service water (SW) issues was evident. Sound, well tracked corrective actions, consistent with Generic Letter (GL) 89-13, "Service Water System Problems Affecting Safety-Related Equipment," were being implemented regarding the licensee's SW self-assessment previously performed July 5 to August 5, 1994. Good progress was made in resolving longstanding concerns regarding SW system flow margins and surveillance testing.

Comprehensive corrective actions were taken for a violation (VIO 50-334/94-03-01) concerning the longstanding issue of clogged Recirculation Spray Heat Exchangers. Also, inclusion of certain Emergency Diesel Generator air start valves in the inservice test program (VIO 50-412/94-09-01) was considered acceptable. Unresolved Item 94-07-02 (both units) was updated to reflect improvements in the heat exchanger performance monitoring process, specifically, the establishment of computer code validation and heat exchanger cleanliness criteria.

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TABLE OF CONTENTS

DETAILS

1.0 INTRODUCTION AND SCOPE

Duquesne Light Company conducted a service water (SW) system self-assessment from July 5 through August 5, 1994, using the guidance provided in NRC Temporary Instruction (TI) No. 2515/118, "Service Water System Operational Performance Inspection (SWSOPI)." The NRC conducted a monitoring inspection (See NRC Inspection Report Nos. 50-334 and 50-412/94-15) to review the licensee's SW self-assessment activities. The report indicated that the licensee's SW self-assessment accomplished the TI to a depth comparable to that of a full NRC SWSOPI team. The Duquesne Light Company self-assessment indicated that the following areas required review:

- System Flow Margin
- Heat Exchanger Testing and Inspection
- Piping Surveillance and Inspection

As part of the self-assessment inspection process, the licensee met with the NRC Region I staff on November 17, 1994, to discuss the results of the SW self-assessment, tracking of commitments, and the River/Service Water Task Force Strategic Plan, and to resolve and coordinate the corrective actions for the various findings. Also, the licensee discussed the status, results, apparent causes, and ongoing corrective actions at this meeting.

The purpose of this inspection was to evaluate the effectiveness of the licensee's corrective actions for the SW self-assessment findings and the concerns expressed in NRC Inspection Report 94-15, and to determine whether the corrective actions met the intent of Generic Letter (GL) 89-13. This inspection reviewed corrective actions for two violations (50-334/94-03-01 and 50-412/94-09-01), an unresolved item (94-07-02), and three other areas: (1) the ability of the traveling screens and the intake structures to assure the availability of the ultimate heat sink (UHS), (2) the ability of the backup coil to maintain the control room equipment within equipment qualification (EQ) limits, and (3) the single failure vulnerability review.

2.0 FINDINGS

2.1 System Flow Margin

The SW self-assessment identified a number of the issues related to low margin between the SW system performance test results in the design basis accident (DBA) configuration and the analyzed minimum flow required to meet SW system safety analysis limits (test acceptance criteria). Self-assessment Recommendations 50 and 52 of the self-assessment report addressed this problem. Recommendation 50 stated: "Identify all river water system parameters which have a low margin to the safety analysis limit. Include variables which have the impact on these parameters." Recommendation 52 stated: "Reduce measurement uncertainty or increase the parameter margin to the safety analysis limit to ensure that the design basis requirements are met." Related issues were documented in recommendations 28, 30 and 31. These recommendations dealt with the requirements to perform "as-found" DBA flow testing, and revision of the surveillance test acceptance criteria to provide instrument calibration data and correction for the river level elevation.

Subsequent to the SW self-assessment, the licensee initiated or completed corrective actions to address the recommendations. The inspectors reviewed these actions, which satisfactorily resolved most of the points in the self-assessment related to hydraulic margin, and had the following observations:

The licensee's review of the three SW Full Flow DBA tests performed during the tenth operating cycle showed that the following heat exchangers had small margins between the as-measured flow and the required safety analysis flow. The Recirculation Spray Heat Exchanger (RS HX) margins were: "A" RS HX - 6.2% and "B" RS HX - 5.4% . Diesel Generator Heat Exchanger (DG HX) margins were: "A" DG HX - 5.0% and "B" DG HX - 1.9%. Since these values did not account for instrument uncertainty and were not corrected for the DBA minimum river flow, the ability of these HXs to perform their safety-related function under the DBA conditions was indeterminate. To correct this condition the licensee modified SW piping, as described below.

The licensee installed Design Change Package (DCP) 2104 which replaced the supply piping from the SW headers to the DG HXs with a larger diameter pipe. Piping losses were reduced by using a more streamlined lay out. Further, the replacement piping was of a different material (AL6SN) that minimizes microbiologically-influenced corrosion (MIC) effects. This modification significantly increased flow to the DG HX. Post-modification testing indicated that DG HX flow rates had more than doubled. Flow increase resulted in three additional benefits, namely: (1) increase of the allowable fouling value for the DG HX, (2) increase of the flow to the RS HX, and (3) decrease of the minimum operating point for the SW pumps. The details are described below:

- Based on the results of post-modification tests, the DG HX minimum available flow increased from 260 gpm to 350 gpm. This change allowed the licensee to increase the allowable fouling factor of the heat exchanger for thermal performance monitoring, thus allowing a more "comfortable" range of operation between DG HX cleaning/inspections. The inspectors verified that the new fouling factors were properly established in Calculation 8700-DMC-3040, Revision 0.

- Prior to installation of DCP 2104, flow to the RS HXs was throttled in order to maximize the flow to the DG Hxs. Post-modification testing indicated that the RS HX flow rates now have an appreciable margin even after flow rates are corrected for river water elevation.

- Prior to installation of DCP 2104 the minimum operating point for the SW pumps was controlled by the system requirements and did not provide for the 10% flow allowed by Section XI of the ASME Code. Following installation of this modification, the required system flow rates are no longer the limiting consideration. Thus, full Section XI limits can be used to determine the need for pump maintenance. This results in less frequent maintenance activity and increases system availability. Prior to installation of this modification, the licensee considered modification of the SW pumps to increase the flowrates. The post-modification tests indicated ample flow margins and allowed the licensee to cancel the proposed pump modifications.

The inspectors confirmed that the licensee had made appropriate changes to the DBA test and acceptance criteria required to verify flow rates for alignments with and without the control room air conditioning condenser.

The inspectors noted that the following areas related to the system hydraulic margins needed additional improvements.

- Flow to the control room backup coils: the issues related to flow requirements and the available margin are addressed in Section 2.5.

- Impact of river level on acceptance criteria for the flow rates other than RS HXs.

As documented in the engineering memorandum 10488, the licensee was aware of the need to address the river level acceptance criteria issue, and revision to the acceptance criteria was being developed. However, no completion schedule existed at this time. The licensee plans to complete the analyses for river water level correction and to investigate flow limitations as necessary.

The inspectors concluded that the implementation of modification DCP 2104 significantly improved the ability of the SW system to perform its safety-related function. While this work was a substantial effort, the two issues discussed above also remained to be addressed.

2.2 Heat Exchanger Testing

The SW self-assessment identified a number of issues ranging from the adequacy/conservatism of the technique used to calculate DG Hx fouling (based on the test results) to the methods, frequency and lack of objective acceptance criteria for heat exchanger inspection and maintenance.

The licensee took comprehensive measures to address these issues and to meet the intent of GL 89-13 regarding heat exchanger testing, inspection, and maintenance. The inspectors reviewed these measures and had the following observations:

To address DG HX test concerns, the licensee undertook the following steps:

- Modification of the DG HX piping significantly improved the margin of safety for these heat exchanger by: (1) increasing the allowable fouling and (2) providing approximately 100% flow margin. These actions made the issue of the instrument uncertainty less critical. Additionally, the licensee revised the acceptance criteria by indicating increased frequency ranges based on the test results. Also, a requirement to notify operations of test results was added.

- The licensee performed tests to address questions about heat exchanger effectiveness calculation technique, i.e., why the calculated fouling decreased with a temperature increase. The licensee informed the inspectors that discussion with the test code vendor (Holtec) and the analysis of the test results confirmed, that at lower SW temperatures, the jacket water flows (shell side of DG HX) were reduced by the jacket water temperature control valve. This reduced flow manifested itself by artificially increasing calculated fouling. Since this increased "fouling" would assume less heat removal capability than actually available, the result is conservative. Therefore, the licensee elected not to revise the methodology.

- The licensee also performed a special DG HX full load test in August 1995 (high SW temperature). During this test the SW flow was throttled to a flow less than the minimum required by the Updated Final Safety Analys Report (UFSAR). The test demonstrated acceptable HX performance.

- The licensee established validation and verification requirements for the computer code used for analyzing HX test results.

To address the inspection and maintenance concerns noted in the self-assessment, the licensee undertook the following steps:

- The "as-found" inspections of all safety-related heat exchangers are performed in accordance with new, clearly-established criteria for cleanliness, macro and micro fouling, debris type and volume, percentage of blocked tubes/tubesheet, photographs, and biological sample. Similar appropriate inspection criteria were established for the shell/air side.

- For the heat exchangers (i.e., DG HX), for which the tube side differential pressure (macro fouling) was monitored, a flow comparison was included in the acceptance criteria. This allowed for monitoring of changes in resistance due to possible fouling.

- The licensee is currently developing additional improvements to the HX program that will extrapolate measured HX flowrates to DBA conditions, and procedure changes will be made to the test program to add independent design verification steps for calculation activities.

The inspectors concluded that the implementation of the changes to the HX test, monitoring, and maintenance program resulted in substantial improvement in the ability of the SW system to perform its safety-related function.

2.3 Piping Surveillance and Inspection

The self-assessment identified a need for: (1) more inspection points in areas susceptible to wall thinning, (2) improved guidance on trending and problem resolution, and (3) further evaluation of lines that have infrequent flow or emergency use. The inspector reviewed the recommendations and actions taken to strengthen the monitoring of service water piping to ensure it can perform its safety function.

The licensee identified several areas of the system with substantial external corrosion and wall thinning that were not part of the ultrasonic (UT) monitoring program. These areas were added to the program. There were 32 ultrasonic monitoring locations during the last outage. The licensee identified the locations in the A and B 24-inch supply headers as areas with reduced (but within required) wall thickness. An evaluation of these locations was done, and a monthly surveillance was established to determine a trend. The current trend would allow continued operation for 15 or more years. The licensee hopes to reduce the trend even further by changing the chemical injection point.

The licensee has also taken photographs of piping opened for maintenance. This process was developed to be able to objectively determine where the piping conditions were degrading over time.

The licensee has taken actions to initiate photographic and UT surveillance of previously unmonitored areas, evaluated system conditions, and established trend data on the service water piping. The inspectors concluded that these measures were satisfactory.

2.4 SW Traveling Screens and Intake Structure

The inspectors determined that the licensee's review of the SW traveling screens and intake structure addressed the ability of the nonsafety-related traveling screens to assure functionality of the ultimate heat sink (UHS) during a DBA. The self-assessment had not addressed man-made and natural challenges to the intake structure/UHS. An independent evaluation of these items was performed during this inspection.

Although the traveling screen system is not provided with Class 1E power, the Beaver Valley design requires the duration of a loss of offsite power (LOOP) to be four hours or less. The licensee also stated that the intake screens are actuated once a week. The inspectors questioned whether the design pressure drop across the screens four hours into the event could effect the structural integrity of the screens or the performance of the SW pumps (submergence, flow rates, etc) for one week plus 4 hours.

The licensee informed the team that historical information indicated that the heaviest screen fouling occurs in spring during the snow melt. In the course of refuel outage 9R in April and May 1993, extensive SW system work was performed which disabled the screen wash system. To compensate for this condition, the licensee provided an alternate water supply for the screen wash system. A temporary procedure was developed to perform screen washing on an as-required basis. The condition persisted for approximately 3 weeks; however, there was no need to use the screenwash system during this time. The inspectors considered the licensee's position to be acceptable.

The inspectors' review of the Beaver Valley UFSAR confirmed the ability of the UHS to withstand natural and man-made events consistent with Regulatory Guide 1.27, "Ultimate Heat Sink for Nuclear Power Plants." The review indicated that the intake structure is designed to withstand all natural events and most of the man-made events. Additionally, Beaver Valley has an auxiliary intake structure to provide shutdown cooling capability in the event that the main intake structure is disabled by a gasoline barge impact/explosion.

2.5 Control Room Cooling

The results of DCP 2104 post-modification testing indicated that flow to control room cooling coil "A" was only 103.5 gpm. Although the value was greater than the minimum required flow of 100 gpm, the as-measured flow did not reflect a DBA river level correction and was not corrected for instrument accuracy. Since these coils are the safety-related means of maintaining equipment qualification (EQ) limits in control room (the control room air conditioning condenser unit is not safety-related), the inspectors were concerned about the system's ability to maintain the EQ limits. The licensee informed the team that the piping connecting these coils to the SW headers is scheduled for replacement during the forthcoming 1996 outage. Because the original piping has been degraded by MIC, the licensee expects a significant reduction in system resistance and increased flowrates with the new AL6SN piping.

The inspector reviewed Calculation 8700-DMC-2362, Revision 1, "Control Room Cooling with River Water," to evaluate the licensee's methodology and to confirm cooling margins. The calculation used in the original design fouling factors of 0.001 and 0.0 for the tube (water) and air sides, respectively. Since this is a relatively new calculation (original 1991 and Revision 1, 1995), current TEMA and EPRI recommended water side fouling (0.002 to 0.003) should have been used. Also, since this is a water/air heat exchanger and the air side controls the heat transfer, use of 0.0 fouling for this HX was not considered conservative in light of recent inspection results which found insulation material covering the coil fins. The licensee took appropriate remedial actions by removing the insulation from the plenum; however, the effectiveness of this action was not assessed for the long-term, since no followup inspections have been performed.

The calculation assumes no tube plugging or blockage. The results of the HX inspections indicated the presence of some corgicula, but the licensee believed this not to be a concern in terms of flow area reduction or levels of fouling that are not bounded by the fouling factor. The licensee plans to investigate the potential blockage and account for this blockage, as necessary, in the calculation. The inspector considered this action to be appropriate.

A weakness was identified by the inspector in the independent verification of the engineering memorandum (EM) that provided the heat load input for the calculation. The heat load specified in the EM was based on calculations from data taken in 1984. The licensee committed to ensure that an independent verification that meets the requirements stated in ANSI N45.2.11 is performed as part of the update to the performance calculation.

The inspectors also noted that, at the time of the inspection, river water temperature was substantially lower than the design value of 90°F and would be decreasing until the outage. The licensee stated that it will review this calculation for conservatism and address the above concerns.

2.6 Single Failure Vulnerability Review

The inspectors noted that the self-assessment team's review of SW system single failure vulnerability did not sufficiently address the lack of formal documentation of the single failure analysis review. Furthermore, despite this condition, the self-assessment did not made any recommendation to formally document the self-assessment review. Initial discussions with the licensee and review of existing documentation indicated that there were no records of the single failure review as described in GL 89-13; the licensee's response to the GL 89-13 made a commitment to perform and document such a review. Further review of licensee activities and documentation promulgated during the inspection showed that a satisfactory review of single failure had been completed.

2.7 Inservice Testing Pumps and Valves Trend Report

Trending for IST pumps and valves for both units was included as part of the IST component trending done by the Maintenance and Engineering Assessment Department under Administrative Procedure Section 8.4.3, "Maintenance Program Unit Administrative Manual." The trending includes pump performance and valve stroke time data for a six month period in the ASME Section XI summary list of log books located in the control room. The data are recorded and compared to an established normal bandwidth for these parameters. This is done as an aid to establishing maintenance trends. The inspector reviewed the pump and valve trending for the period from April 1, 1994, to June 30, 1995, and found that each component had a set of parameters to be trended along with acceptance criteria. The trending data thus accumulated during the past year had been reviewed and evaluated, and corrective actions were taken when appropriate. The inspector concluded that DLC had established a good trending process.

2.8 SWSOPI Self-Assessment Action Items

The inspector observed and/or reviewed selected SWOPI self-assessment items from the licensee's commitment tracking system to verify that actions were consistent with technical specification requirements, were accomplished by qualified personnel in accordance with approved procedures, that instrumentation was calibrated, and that deficiencies were reviewed and appropriately resolved. One hundred seventy (170) action items originally were identified in the SW self-assessment, and 14 items were left to resolve at the end of this inspection. The inspector noted that the reviewed items were properly closed, and that system procedures were properly modified (or tested) before the returning the systems to service. These open item activities were conducted properly by qualified licensee personnel. Also, the recommendations from the self-assessment were tracked using the same system and with the same priority given to NRC commitments. No unacceptable conditions were identified.

Because of the number of items identified during the SWSOPI self-assessment that necessitated actions to improve and update the Valve Operating Number Diagrams, UFSAR, Operating and Surveillance Procedures, and Administrative procedures that govern these processes, the inspectors asked if a common problem could be implied. The licensee provided the configuration control group a copy of the SWSOPI self-assessment final report and requested a review for any possible generic configuration control problems. The configuration control group responded with a committal letter to review and respond to the report. The inspector considered this action appropriate.

2.9 Walkdown

During a walkdown of the new supply piping to the Unit 1 Emergency Diesel Generator (EDG) a trouble tag (#70610) was found on vacuum breaker valve RW-408 for EDG 1A cooler to identify valve leakage. A maintenance work request (MWR) was not outstanding to correct this problem. The licensee immediately wrote an MWR and subsequently a Problem Report to investigate how the original MWR was closed, leaving an outstanding trouble tag, and to correct the cause of the oversight. The licensee did an initial investigation, determined the cause, and wrote a problem report to seek a resolution to recurrence. A search for similar oversights was performed by the licensee, and none were found. The inspector concluded that this was an isolated case and that the licensee was taking actions to provide proper resolution.

2.10 Future SW System Inspection Activities

The inspector indicated areas for continued review by the NRC: (1) margin for the control room coolers; (2) instrumentation uncertainty and river water level during for test evaluation; (3) evaluation and trending of wall thickness and chemical injections; (4) monitoring of planned capital changes to system piping.

3.0 PREVIOUSLY-IDENTIFIED ITEMS

3.1 Clogging of the Unit 1 Recirculation Spray Heat Exchangers (Violation 50-334/94-03-01)

On March 9, 1994, the licensee was issued a Notice of Violation for inadequate corrective action to prevent clogging of the Unit 1 recirculation spray heat exchangers (RSHXs). The licensee stated in its response (April 13, 1994) that corrective actions would include the following:

> ".... a design change (DCP-2078) is being scheduled for the BV-1 tenth refueling outage (1R10) which will install a permanent flush line downstream of the existing dead legs. This flush line will bypass the RSHXs and will provide the capability to flush each train individually without flow through the heat exchangers. A flushing frequency will be established prior to plant startup from 1R10 to ensure that system operability can be maintained. In addition, a plan for verifying the effectiveness of system flushing will also be developed by the end of 1R10."

The licensee installed the flushing line during the 1R10 outage. The licensee used the flushing line to clear debris from the "A" river water header on a monthly basis and to clear debris from the "B" river water header on a quarterly basis, and it has been used very successfully for the pump surveillance tests since the outage. This violation item was updated in NRC inspection report 50-334/95-07. The report concluded that the flushing frequencies were reasonable based on the fouling history of the heat exchangers.

To ensure that the licensee developed a plan to verify the adequacy of the system flushing through the newly-installed bypass flushing line (design change package, DCP 2078), the Maintenance Engineering and Assessment Department (MEAD) performed river water full flow test, OST-30.12A, near the end of the third quarter of 1995. In August 1995, the effectiveness of flushing to prevent RSHXs flow blockage was demonstrated by a design basis accident (DBA) full flow test without immediate prior flushing through the bypass line installed by the DCP 2078. The inspector reviewed test assumptions, procedure cautions, and test acceptance criteria of "Train A Reactor Plant River Water System Full Flow" surveillance test, 1OST-30.12. The inspectors found that these procedures were well written. The inspector verified that the field data showed that the flow rate through RSHXs was 8700 GPM, as compared to the required flow rate (as a function of river water elevation) of 8420 GPM. The inspector concluded that licensee had performed an adequate assessment to address the effectiveness of river system flushing. This item is closed.

3.2 Skid-Mounted Components in the Inservice Testing Program (Violation 50-412/94-09-01)

During an April 1994 safety-related check valve inspection, a violation (94-09-01) was identified concerning ASME Code Class components in the Unit 2 diesel generator jacket water cooling and air start systems. Several small check valves were not properly included in the inservice testing (IST) program for pumps and valves. Duquesne Light Company's (DLC) response to the violation stated:

> " .... Skid-mounted components are not included in the Beaver Valley Power Station IST Programs because they are <u>not</u> considered as individual components, but rather as sub-assemblies of a major component. Individual testing of each "skid-mounted component" is also not considered required because they are tested with the major component of which they are a sub-assembly... If the operational readiness of the major component has been proven acceptable by testing, then it is assumed that the operational readiness of any sub-assembly is also verified acceptable."

In August 1994, DLC submitted to the NRC a proposal to revise the IST Program for both Units 1 & 2. This proposal consisted of ASME Code Class skid-mounted pump and valves that are not in the BVPS Unit 1 or Unit 2 IST program. These components are tested in conjunction with the parent pump or other component for which they provide support, as documented in the IST program basis document and applicable surveillance tests.
NRC staff reviewed the DLC proposal and agreed with its position (TAC Nos. M90464 and M90465, dated November 29, 1994); hence, the skid-mounted pumps and valves will not be listed in the IST program, but will be included in the IST program basis document and in the surveillance test procedures. These actions ensure that the function of the equipment is verified periodically commensurate with the safety function of the major components.

Additionally, the inspector verified that break check Valves 2EGA*118/119, "Air start Tank 21A/11A to Compressor Pressure Switch Class Break Excess Flow Check Valves" were included in the Unit 2 IST program as required by the 10 CFR 50.55a. The inspector therefore concluded that the licensee's corrective actions were acceptable, and this item is closed.

3.3 (Update) Heat Exchanger Performance Monitoring (Unresolved Items 50-334/94-07-02 and 50-412/94-07-02)

Unresolved Items 50-334/94-07-02 and 50-412/94-07-02 were opened because the licensee's heat exchanger monitoring program did not demonstrate that certain heat exchangers would perform satisfactorily under design basis conditions, as discussed below:

(a) The licensee did not have a preventive maintenance or surveillance program which ensures the effectiveness of their river water screen wash system.

NRC Inspection Report 94-07 stated that, "the licensee agreed that degraded performance of the screen wash system can affect system operability and stated that licensee would evaluate their preventive maintenance and surveillance program for improvement." System Engineering has reviewed the following documents associated with screen wash system:

1PMP-30CW-S-1A-B-C-D-1M, "Traveling Water Screen Inspection," Issue 4, Revision 1

Vendor Technical Manual 08700-02-075-0006, "Traveling Water Screens Service Manual," Rex Chem Belt Inc.

1OM-30.2, "River Water System Precautions, Limitations and Setpoints," Issue 4, Revision 0

After reviewing the documents, the licensee developed the following recommendations to improve the reliability of the screen wash systems:

- Preventive Maintenance Procedure 1PMP-30CW-S-1-A-B-C-D-1M should be revised to include checks for worn spray nozzles that can result in a distorted spray pattern. This procedure was revised to include a check of the drive unit for binding or excessive rubbing.

- As stated in vendor technical manual, the spray nozzle setpoint should be 80 psig to get the most effective cleaning action from the nozzles.

  The inspector reviewed the licensee's resolution of concerns involving the screen wash and river water systems. Traveling water screen Inspection Procedure 1PMP-30CW-S-1-A-B-C-D-1M was revised to account for both worn spray nozzle and unit binding or excessive rubbing checks. The inspector reviewed a setpoint change evaluation (TER 9426) for screen wash pressure switches PS-CW-105 A, B, C & D whose primary function is to transmit signals to the traveling screen water controller. The setpoints for these switches were 60 psig. This setpoint pressure did not provide the effective cleaning action to preclude the introduction of debris into the review water system. The manufacturer recommends a minimum of 80 psig to achieve the most effective results. Per MEAD's review of the system, nozzles C & D, PS-CW-105C & D switches were set at 70 psig. These nozzles will be replaced at the next scheduled outage for the traveling water systems.

(b) NRC Inspection Report 94-07 identified that the resistance temperature detector (RTD) associated with the river water temperature recorder that is used to ensure compliance with technical specifications had not been checked for proper calibration since 1974.

During this SWOPI followup, the inspector reviewed river water temperature loop calibration procedure 1LCP-31-T102, Issue 4, Revision 0. The purpose of this procedure is to calibrate the river water temperature instrument loop. The river water temperature loop recorder was calibrated every 18 months. However, the RTD to the recorder was not part of the loop calibration. On August 25, 1995, licensee calibrated the RTD to the loop recorder for the first time since 1974 and found that the RTD and temperature loop accuracies were within the acceptance limits of 0.5°F and ±2.0°F, respectively. The inspector reviewed the RTD calibration data sheet and the last river water temperature loop calibration, which was completed on March 28, 1994, and found it within acceptance limits as stated in above the calibration procedure.

The licensee has also modified the loop calibration procedure to include calibration of the RTD. Based upon the above review, the inspector concluded that the RTD calibration associated with the river water temperature recorder was acceptable.

(c) The concern that results of the periodic heat exchanger cleaning and inspection are not thoroughly documented was identified during previous NRC inspections. The inspectors reviewed documentation and interviewed personnel to verify that the results of heat exchanger cleaning and inspection was being captured.

The licensee has taken photographs and provided accompanying narrative describing the condition found during the cleaning and inspection of heat exchanger during the last outage. This process provides good objective documentation of the results of cleaning and inspection of river/service water heat exchangers. This method is considered acceptable.

(d) Combined NRC Inspection Report 50-334/94-14 and 50-412/94-14 documented the performance of a river water full flow surveillance test at Unit 1 during the unplanned outage. The test showed that the "B" emergency diesel generator heat exchanger was below the minimum required flow by 7 gallons per minute (gpm). The EDG flow rate was satisfactory after more flow was forced through the unit.

The licensee installed modification (DCP 2104), which replaced the supply piping to the DG HXs from the SW headers with a larger bore than previous lines and also reduced piping losses by using a more streamlined lay out. Furthermore, the replacement piping was of a different material (AL6SN) which minimizes the microbiologically-influenced corrosion (MIC) effects. This modification significantly increased the flow to the DG HX. The post-modification testing indicated that the DG HX flow rates had more than doubled. Based on the results of post-modification test, the licensee increased the DG HX minimum required flow from 260 gpm to 350 gpm, thus allowing a more confidence in the range of operation between the DG HX cleaning and inspections.

The inspectors considered the flow to the EDG to be sufficient to provide cooling under DBA conditions, and that this modification to the river water system was a significant improvement in overall system operation.

(e) The licensee had not developed any formal software validation requirements for the quarterly fouling factor calculations. The software which performs the calculations was validated before it was released for use, but there are no required validations beyond this, although the licensee has had a draft procedure for some time.

The inspectors reviewed this item and found that the licensee had adequately addressed this issue as indicated in Section 2.2 of this report.

4.0 MANAGEMENT OVERSIGHT

Good management oversight and support were demonstrated concerning the resolution of the licensee's service water self-assessment activities. This was demonstrated by the formation of a River Water Task Force, and decisions for capital investments such as the completed replacement of Emergency Diesel Generator supply piping, other piping replacements for next planned outage, and approved changes for chemical injection system. Also, the recommendations from the self-assessment were tracked using the same system and with the same priority given to NRC commitments. A QA audit was also performed from March to May 1995 that provided a good assessment of the licensee's current activities in meeting the intent of GL 89-13, with recommendations for even further improvement of SW system performance.

5.0 MANAGEMENT MEETINGS

The scope and purpose of the inspection were discussed at an entrance meeting conducted on September 25, 1995. During the course of the inspection, the inspectors' findings were discussed with various licensee representatives. On October 5, 1995, the inspector met with the principals listed below to summarize the preliminary findings. No proprietary information was expected to be included as part of this inspection report.

George Thomas	Div. VP, Nuclear Services
T. P. Noonan	Div. VP, Nuclear Operation/PLT Manager
Nelson Tonet	Manager, Nuclear Safety
Mike Siegel	Manager, Nuclear Engineering Department
Fred Schuster	Manager, MEAD
Gary Shildt	Supervisor, Systems Engineering