SEP 15 1986

Docket No. 50-412

Duquesne Light Company
ATTN: Mr. J. J. Carey
Vice President
Nuclear Group
Post Office Box 4
Shippingport, Pennsylvania 15077

Gentlemen:

Subject: Systematic Assessment of Licensee Performance (SALP) Report No. 50-412/85-98

This letter refers to the SALP evaluation of Beaver Valley Unit 2 conducted by the NRC staff on May 12, 1986. This report was discussed in a meeting held on July 9, 1986 at the Beaver Valley site.

The list of attendees is attached as Enclosure 1. The NRC SALP Report is provided as Enclosure 2. Our letter dated July 2, 1986 (Enclosure 3) forwarded the SALP Board Report and solicited comments within 30 days of the July 9 meeting. Your response of August 14, 1986 is attached as Enclosure 4.

Your August 14 response has been reviewed and your clarifications and additional information for Functional Area No. 8, "Preoperational/Startup Testing," are appreciated and have been noted. Based on these responses and dialogue during the July 9 meeting, no changes to the SALP Report are considered appropriate. We also noted your responses concerning actions taken or planned to be taken to address several of our concerns in Functional Areas 2, 4, 5, 6, and 9. Finally, in response to our concern that review and control activities are too narrowly focused on "back-end" activities rather than "front-end" activities, project initiatives discussed in your letter should help to improve your aggressiveness in self-identification of problems during "front-end" activities.

Our overall assessment of your facility has noted improvement from our last SALP assessment. Licensee/contractor activities initiated in response to weaknesses noted in previous SALP assessments have generally helped to resolve such problems. Specifically, management attention and involvement have resulted in Category 1 assessments in four Functional Areas. We encourage your continued management attention to provide for feedback and ongoing evaluation of your activities.

We believe that the interchange of information at our meeting was beneficial and improved our mutual understanding of your activities and the regulatory program.

No reply to this letter is necessary. Your actions in response to the NRC SALP program will be reviewed during future inspections of your facility.

1/1 IE40

Your cooperation is appreciated.

Sincerely,

Original signed by
Thomas E. Murley
Thomas E. Murley
Regional Administrator

Enclosures:
1. SALP Management Meeting Attendees
2. Region I SALP Report 50-412/85-98 dated May 12, 1986
3. Region I Letter, T. Murley to J. Carey, dated July 2, 1986
4. Duquesne Light Company Letter, J. Carey to T. Murley, dated August 14, 1986

cc w/encls:
E. J. Woolever, Vice President, Special Projects
E. Ewing, Quality Assurance Manager
R. J. Swiderski, Manager, Startup Group
J. P. Thomas, Manager, Engineering
R. E. Martin, Manager, Regulatory Affairs
C. O. Richardson, Stone and Webster Engineering Corporation
Chairman Zech
Commissioner Roberts
Commissioner Asselstine
Commissioner Bernthal
Commissioner Carr
Vandana Mathur, McGraw-Hill Publications (2 copies)
AP - News Desk (2 copies)
Ernest Tollerson, Inquirer-Trenton Bureau (2 copies)
Gabe Ireton, Pittsburgh Post-Gazette (2 copies)
Steve Weiss, Beaver County Times (2 copies)
Art McGuire, Construction Industry Litigation Reporter (2 copies)
Public Document Room (PDR)
Local Public Document Room (LPDR)
Nuclear Safety Information Center (NSIC)
NRC Resident Inspector
Commonwealth of Pennsylvania

bcc w/encl:
Region I Docket Room (with concurrences)
Management Assistant, DRMA (w/o encl)
DRP Section Chief
W. Troskoski, SRI, BV-1
P. Tam, NRR
T. Martin, DRSS
S. Ebneter, DRS
Robert J. Bores, DRSS
T. Murley, RI
J. Allan, RI
K. Abraham, RI (2 copies)
Management Meeting Attendees
E. Wenzinger, DRP
W. Kane, DRP

RI:DRP	RI:DRP	RI:DRP	RI:DRP	RI:DRP	RI:DRA	RI:RA
Urban/meo* 8/28/86	Tripp*	Wenzinger*	Collins*	Kane*	Allan	Murley 9/14

OFFICIAL RECORD COPY

*SEE PREVIOUS CONCURRENCE PAGE.

bcc w/encl:
Region I Docket Room (with concurrences)
Management Assistant, DRMA (w/o encl)
DRP Section Chief
W. Troskoski, SRI, BV-1
P. Tam, NRR
T. Martin, DRSS
S. Ebneter, DRS
Robert J. Bores, DRSS
T. Murley, RI
K. Abraham, RI (2 copies)
Management Meeting Attendees
E. Wenzinger, DRP
W. Kane, DRP

Jim Allan

RI:DRP	RI:DRP	RI:DRP	RI:DRP	RI:DRP	RI:DRA	RI:RA
Urban/meo	Tripp	Wenzinger	Collins	Kane	Allan	Murley
8/28/86	9/2/86	9/8/86	9/8/86	9/10/86	9/12/86	

OFFICIAL RECORD COPY

ENCLOSURE 1

SALP MANAGEMENT MEETING ATTENDEES

BEAVER VALLEY UNIT 2

JULY 9, 1986

1. Licensee Attendees

Duquesne Light Company

J. Arthur, Chairman of the Board
J. Carey, Vice President, Nuclear Group
R. Coupland, Director, Site Quality Control
C. Ewing, Manager, Quality Assurance
J. Hultz, Technical Assistant to Vice President, Nuclear
J. Martin, Manager, Regulatory Affairs
J. Sasala, Director, Nuclear Communications
R. Swiderski, Manager, Startup Group
J. Thomas, Manager, Engineering
N. Tonet, Manager, Nuclear Engineering and Construction Unit
R. Wallauer, Lead Compliance Engineer

Stone and Webster Engineering Corporation

W. Bohlke, Manager, Projects
H. Durkin, Superintendent, Engineering
H. Foley, Project Manager
J. Purcell, Assistant Project Manager, Engineering
H. Rashid, Assistant Project Manager
C. Richardson, Project Engineer
P. Wild, Executive Vice President

2. NRC Attendees

T. Murley, Regional Administrator
L. Tripp, Chief, Reactor Projects Section 3A
W. Troskoski, Senior Resident Inspector
L. Prividy, Resident Inspector
A. Asars, Resident Inspector
L. Rubenstein, Acting Deputy Director, PWR-A
P. Tam, Project Manager

ENCLOSURE 2

U.S. NUCLEAR REGULATORY COMMISSION

REGION I

SYSTEMATIC ASSESSMENT OF LICENSEE PERFORMANCE

REPORT 50-412/85-98

DUQUESNE LIGHT COMPANY

BEAVER VALLEY POWER STATION, UNIT 2

(Construction Phase)

ASSESSMENT PERIOD: APRIL 1, 1985 - MARCH 31, 1986

BOARD MEETING DATE: MAY 12, 1986

TABLE OF CONTENTS

TABLES

ATTACHMENT

I. INTRODUCTION

1. Purpose and Overview

The Systematic Assessment of Licensee Performance (SALP) is an integrated NRC staff effort to collect the available observations on a periodic basis and evaluate licensee performance based on those observations with the objectives of improving the NRC Regulatory Program and licensee performance.

The assessment period is April 1, 1985 through March 31, 1986. The prior assessment period was April 1, 1984 through March 31, 1985. Significant findings from prior assessments are discussed in the applicable Performance Analysis (Section IV) functional areas. Evaluation criteria used during this assessment are discussed in Section II below. Each criterion was applied using the "Attributes for Assessment of Licensee Performance," contained in the NRC Manual Chapter 0516.

2. SALP Board and Attendees

R. Starostecki, Director, Division of Reactor Projects (DRP) and SALP Board Chairman
W. Johnston, Deputy Director, Division of Reactor Safety (DRS)
T. Martin, Director, Division of Radiation Safety and Safeguards (DRSS)
W. Kane, Deputy Director, DRP
L. Rubenstein, Acting Deputy Director, PWR A, NRR
E. Wenzinger, Chief, Projects Branch No. 3, DRP
J. Durr, Chief, Engineering Branch, DRS
L. Tripp, Chief, Reactor Projects Section 3A, DRP
P. Tam, Licensing Project Manager, NRR

Other Attendees

L. Prividy, Resident Inspector, Beaver Valley Unit 2
R. Urban, Reactor Engineer, DRP

3. Background

Duquesne Light Company was issued a Construction Permit (CPPR-105) to build Beaver Valley, Unit 2, (Docket No. 50-412) on May 3, 1974. The Nuclear Steam Supply System (NSSS) is a 2660 MWt Westinghouse PWR with three loops; the Architect/Engineer (A/E) is Stone and Webster. At the end of this assessment period, fuel load was scheduled for May 1987. Construction was estimated by the licensee as 93.6 percent complete as of March 31, 1986.

a. Licensee Activities

In general, the work force increased in all areas during the assessment period. On March 31, 1985, there were 2,338 craft workers, compared to 2,845 craft workers on March 31, 1986; an increase of 21 percent. Total second and third shift activity increased from 570 to 630 during this period. Weekend activity increased from an average of 5 to 1050 workers total per day (mostly Saturdays). The licensee's Quality Control Department staffing increased from 361 to 450, an increase of 24 percent. Stone and Webster supervisory, engineering and administrative personnel on site increased 5 percent; from 650 to 683 people. At the end of the assessment period, Stone and Webster senior engineers in all disciplines were located on site.

Early in the assessment period, the licensee retained the services of the Management Analysis Corporation to review the project organization and to provide recommendations on the desirability of adding additional key personnel to assist in the completion of the project. As a result of this review, Duquesne Light Company made significant changes in the project organization in December, 1985. Several new positions were created and these positions were filled by experienced individuals. The Manager of Engineering and Construction was assigned to the site to report to the Vice President - Nuclear Group on all matters relating to Engineering, Construction Cost and Schedule. A Deputy Manager of Quality Assurance was assigned to the project with responsibility for QA/QC of startup activities and reports to the Manager of Quality Assurance. Coordinated with these management changes was the relocation to the site of the Duquesne Light Company Nuclear Construction Division.

During this assessment period, the major construction activities included installation, welding, examinations, flushing and hydrostatic testing of main steam, feedwater, residual heat removal, safety injection systems, and other large and small bore piping and supports; heating, ventilation, and air conditioning and fire protection systems continued to be installed; pumps, motors, control panels and residual heat removal pumps and motors were installed and connected. Electrical cable trays were installed and significant amounts of cable were pulled and terminated plus instrumentation sensing lines and associated hardware were installed. Insulation of tanks and piping continued during this assessment period. Painting/coating occurred throughout the site. Closure of the temporary construction opening in the containment building's exterior wall was accomplished in October 1985.

Transition of the project from the construction to the testing phase progressed steadily during the assessment period with system turnovers keyed to several major milestones - steam generator secondary side hydrostatic test (December 1985), initial operation of diesel generators (December 1985), and reactor coolant system cold hydrostatic test. As of March 31, 1986, of the total 473 subsystems required to be turned over, 292 subsystems have been turned over and accepted by the Duquesne Light Company Startup Group for proof testing. Preparations were being made at the end of the assessment period to conduct the reactor coolant system cold hydrostatic test in April 1986.

b. Inspection Activities

One NRC senior resident inspector and one resident inspector were assigned to Beaver Valley Power Station, Unit 2, for the entire assessment period. Also, the NRC senior resident inspector assigned to Unit 1 devoted part of his inspection efforts to the test program activities at Unit 2. Resident inspector activities included the accomplishment of assigned inspection requirements including observations of work in progress, follow-up of licensee events, reactive inspections and evaluation of licensee responses to NRC identified concerns.

Twenty-three inspections were performed during the assessment period; eleven were independently conducted by resident inspectors and twelve were conducted by region-based specialist inspectors. There were 2,444 hours of inspection of which 1,775 were by the resident inspectors and 669 were by region-based specialists. The specialist inspection activities were in the following areas: concrete construction pertinent to the containment building's exterior wall, preservice inspection program including welding and welder qualification, structural supports, electrical and piping supports, installation of mechanical equipment, installation of instrumentation and electrical equipment, installation of 125 V DC systems, preventive maintenance program for the emergency diesel generators and associated equipment, the quality assurance program for preoperational testing, and a review of the preoperational test programs.

c. Licensing Activities

The Safety Evaluation Report was issued in October, 1985, in advance of the ACRS full committee hearing which was held on November 8, 1985. Prior to the ACRS full committee hearing, the Beaver Valley, Unit 2 Subcommittee met on October 31 and November 1, 1985. At that time, the NRR staff had identified 11 open issues and 44 confirmatory issues. Since the ACRS meeting, NRR and DLC Licensing Division

personnel have continued correspondence and meetings to resolve many of these issues. This included site visits made by NRR personnel to observe the actual installed condition of the hardware.

II. CRITERIA

Licensee performance is assessed in selected functional areas, depending on whether the facility is in a construction, preoperational or operating phase. Each functional area normally represents areas significant to nuclear safety and the environment, and are normal programmatic areas. Special areas may be added to highlight significant observations.

The following evaluation criteria were used to assess each functional area.

1. Management involvement and control is assuring quality.

2. Approach to resolution of technical issues from a safety standpoint.

3. Responsiveness to NRC initiatives.

4. Enforcement history.

5. Reporting and analysis of reportable events.

6. Staffing (including management).

7. Training and qualification effectiveness.

Based upon the SALP Board assessment, each functional area evaluated is classified into one of three performance categories. The definitions of these performance categories are:

Category 1. Reduced NRC attention may be appropriate. Licensee management attention and involvement are aggressive and oriented toward nuclear safety; licensee resources are ample and effectively used so that a high level of performance with respect to operational safety or construction is being achieved.

Category 2. NRC attention should be maintained at normal levels. Licensee management attention and involvement are evident and are concerned with nuclear safety; licensee resources are adequate and reasonably effective so that satisfactory performance with respect to operational safety or construction is being achieved.

Category 3. Both NRC and licensee attention should be increased. Licensee management attention or involvement is acceptable and considers nuclear safety, but weaknesses are evident; licensee resources appear to be strained or not effectively used so that minimally satisfactory performance with respect to operational safety or construction is being achieved.

The SALP Board also assessed each functional area to compare the licensee's performance during the last quarter of the assessment period to that during the entire period in order to determine the recent trend for each functional area. The trend categories used by the SALP Board are as follows:

Improving: Licensee performance has generally improved over the last quarter of the current SALP assessment period.

Consistent: Licensee performance has remained essentially constant over the last quarter of the current SALP assessment period.

Declining: Licensee performance has generally declined over the last quarter of the current SALP assessment period.

III. SUMMARY OF RESULTS

1. Facility Performance

	Functional Area	Category Last Period (4/1/84-3/31/85)	Category This Period (4/1/85-3/31/86)	Recent Trend
1.	Containment and Other Safety-Related Structures	1	1	Consistent
2.	Piping Systems and Supports	2	2	Consistent
3.	Safety-Related Components	1	1	Consistent
4.	Support Systems	1	2	Consistent
5.	Electrical Power Supply and Distribution	2	2	Consistent
6.	Instrumentation and Control Systems	2	1	Consistent
7.	Licensing Activities	2	1	Improving
8.	Preoperational/Startup Testing	2	2	Insufficient Basis
9.	Assurance of Quality	2	2	Consistent

2. Overall Facility Evaluation

Some improvement in the overall level of performance was demonstrated during this assessment period. Licensee/contractor activities initiated in response to weaknesses noted in previous SALP assessments have generally helped achieve resolution of such problems. These initiatives include the Integrated Construction Support Group (ICSG), Constructability Review Teams (CRTs), Engineering Confirmation Program, Quality Improvement Management Program (QIMP), establishment of a separate Quality Assurance Group responsible for QA/QC of startup activities, adding a new position to be responsible for Engineering and Construction, and use of

an Electrical Plan to track and resolve outstanding electrical/instrumentation problems. Such programs appear to have been successful in responding to programmatic NRC concerns.

Notwithstanding the above, individual problems were noted in several functional areas during this assessment period which indicate that more attention to detail is needed by workers in many departments (i.e., Engineering, QC, craftsmen, etc.). Collectively, these problems indicate that additional attention and/or overview is needed before higher level performance can be sustained in several functional areas.

Although the licensee has shown more initiative during this assessment period in self-identification of problems, such as through the MAC reviews, most licensee initiatives were triggered by NRC expressed concerns. NRC continues to identify problems that should have been identified and/or prevented by licensee controls. Licensee evaluation, resolution, and followup in response to NRC identified concerns is typically very thorough. However, licensee overall review and control activities are too narrowly focused on "backend" activities (i.e., QC inspection to assure that installation is in accordance with specifications and drawings). "Frontend" activities that are often the root causes of problems do not always receive adequate review and management attention. For example, more emphasis should be placed on whether design/installation meets criteria and is capable of performing its intended function satisfactorily. More licensee aggressiveness in self-identification of problems with "frontend" activities should improve performance.

IV. PERFORMANCE ANALYSES

1. Containment and Other Safety-Related Structures (4%, 112 hours)

a. Analysis

No significant problems were noted in this area during the prior assessment period. Work on containment and other safety-related structures was generally of good quality. The licensee was thorough in followup corrective actions to NRC concerns by making required repairs to containment electrical penetration welds.

Three inspections were made in this area during this period. The major work activity performed during this assessment period was the closing of the containment building temporary construction access opening. The opening (30 feet by 31 feet) required welding in the containment liner and associated nondestructive examinations, installation of reinforcing bar and cadwelding to existing bars, and pouring of the concrete to form the wall. Concrete pours were completed in October 1985. NRC found that excellent controls were exercised during this assessment period with no major problems experienced. The work activities in this area are now substantially complete.

One instance was identified which indicated a possible weakness in the licensee's involvement in the design review process. The NRC expressed a concern that the 12-inch stagger of Cadweld mechanical splices between adjacent rebar in the temporary construction opening wall did not meet the more conservative stagger criteria given in the FSAR and that this change should be supported by engineering analysis. The licensee is in the process of addressing this concern.

Licensee actions demonstrated responsibility and assured management involvement and control. This was evident in the effective licensee action to oversee the quality of the remaining concrete used onsite. An offsite batch plant was utilized for concrete placements to close the containment building temporary construction access opening. The licensee provided for proper qualification of this offsite batch plant to supply concrete in accordance with engineering specifications. Another indication of licensee involvement and control in assuring quality was the licensee evaluation program relating to loosened expansion anchors. In a prior assessment period (December 1, 1982 through March 31, 1984), the NRC had identified a concern in this area since there was a lack of a formal procedure for control of Hilti expansion anchors following a loosening or removal of bolt nuts or baseplates during construction. The licensee instituted a positive program to ensure that any future baseplates which were loosened by construction would have anchor bolts retorqued and witnessed by QC. Existing supports with associated Hilti anchor bolts were evaluated by a systematic statistical

sampling program with appropriate retorquing in selected areas. The licensee performed a 100 percent reinspection of supports with other types of bolting. Licensee actions in this area have been effective.

In summary, this area has shown consistent management involvement and controls. The licensee has exercised proper controls as the project has progressed such that no major problems occurred this period.

b. Conclusion

Category 1, Consistent.

c. Board Recommendation

Licensee

None.

NRC

No further evaluations are needed in this functional area.

2. Piping Systems and Supports (25%, 606 hours)

a. Background

During prior assessment periods, the licensee and Stone and Webster implemented numerous programs in the engineering area to address concerns identified in those assessments. This included the formation by Stone and Webster Engineering of the "Integrated Construction Support Group (ICSG)" made up of engineers located in the Construction Buildings to provide easier access and instructions to the construction personnel. Another program implemented by Stone and Webster Engineering was the "Constructability Review Team (CRT)", to review mechanical and electrical drawings and assure they were precise and clear. A third program titled "Engineering Confirmation Program", involved both Stone and Webster Engineering and Duquesne Light Engineering and was implemented to review engineering specifications, calculations and other technical concerns. A fourth program titled "Quality Improvement Management Program (QIMP)" was implemented to concentrate efforts and control on the amount of rework on items such as piping and supports. This effort was directed toward items where trending indicated an increase in the reject rate.

The last SALP evaluation recognized these programs as strong corrective actions that should be effective in eliminating past identified weaknesses. However, at the time of that assessment, the implementation was too recent to assess effectiveness of these initiatives. Implementation has now been in effect during this entire assessment period.

During this assessment period, the licensee placed major emphasis on the completion of piping and installation of the associated pipe supports to support system turnover. This effort has been effective in the completion of many of the piping systems. Some piping supports, however, still remain to be installed even though the preliminary turnover of the system may have occurred. Hydrostatic testing has been completed on many of the major systems, including the piping associated with the secondary side of the steam generators. Flushing has also been routinely performed on many of the piping systems.

b. Analysis

This functional area received major inspection coverage. NRC inspections placed particular emphasis on reviews of the ICSG, CRT, QIMP, and Engineering Confirmation Program to assess their effectiveness in resolving and eliminating the Engineering/Construction interface problems discussed in prior SALP assessments.

Major improvements have occurred as a result of the implementation of the licensee and SWEC programs discussed above. Generally, the interpretation by construction of engineering drawings and specifications which could lead to construction problems was not a problem this period. This is attributed to the major past efforts of the CRT, the strengthening of the Engineering/Construction interface by ICSG personnel and updating of specifications. Also, good controls were exercised in the areas of weld material controls, radiography, design and installation of Category II seismic supports, and hydrostatic testing. Overall, quality of workmanship was found to be very good as noted during considerable NRC inspections/observations. Records to support the installation were also found to be acceptable. Periodic interviews with the craftpersons have found the workers morale positive regarding quality and no allegations were made regarding piping and supports. Overall management controls in this functional area were considered to be acceptable.

Notwithstanding the above, some minor problems were identified by NRC in this functional area which are attributed to lack of attention to detail to specific conditions or requirements rather than programmatic problems as identified in earlier SALP assessments. A violation was issued after construction replaced a valve and, in the replacement process, the piping was moved off location and permanently secured such that an installed, adjacent, and previously quality control accepted pipe support failed to meet the drawing requirements. This problem was attributed to poor work control on the part of the piping contractor. Another problem involved installation of safety-related piping under and through non-seismic designed stairs which was contrary to the commitments to Reg Guide 1.29. It was attributed to lack of attention to detail to technical requirements on the part of engineering. This problem is similar to the crane monorail issue discussed in Functional Area 4. Other concerns which further indicate a lack of attention to detail in meeting quality standards are as follows: (1) there was failure to specify or provide adequate clearance around the periphery of welds subject to inservice examinations; and (2) loose clamps on piping, loose lock nuts on rigid sway strut supports, and insufficient tightening of lock washers. Another example was the licensee submittal of a potential 50.55(e) item regarding installation of a safety related piping elbow that was not fabricated from safety-related material. Although indicative of problems in material identification and control, this item was subsequently determined to be of little safety significance and not reportable. The licensee has taken good corrective actions on each identified deficiency by implementing reinspection programs, rework measures and/or additional engineering evaluations where necessary. Collectively, the above items indicate additional attention and/or overview is needed to avoid these types of recurring problems.

Staffing for the PSI/ISI program was adequate for the existing workload. Individuals responsible for the program development were noted to be competent and qualified to perform the assigned duties. The licensee was actively involved in this area as evidenced by their efforts to resolve problems associated with the ultrasonic examination of weld overlays.

In summary, the licensee and Stone and Webster Engineering have implemented programs which have effectively addressed the prior SALP concerns regarding the Engineering/Construction interface problems. However, better controls are needed by engineering, construction, and QC to reduce the types of the concerns identified during this assessment period. More management focus on "frontend" engineering and installation activities is needed to achieve greater attention to detail if such identified deficiencies are to be avoided.

b. Conclusion

Category 2, recent trend consistent. Overall improvement has been shown in this functional area over the past several SALP assessments.

c. Board Recommendation

Licensee

Continue emphasis on attention to detail during engineering, construction, and inspection to further reduce deficiencies.

NRC

None.

3. Safety Related Components (17%, 427 hours)

a. Analysis

No significant problems were noted in this area during the prior assessment period. Work on safety-related components was found to be well controlled; a Category 1 rating was assigned.

Most of the inspection activities in this area were by the resident inspectors; six inspections performed by the resident inspectors included coverage of several facets of safety-related components. The licensee's work activities in this area included completion, trial fitting, and cleaning of the reactor vessel internals; completion and start-up of the emergency diesel generators; valve and pump installations, rework of the main steam isolation valves, hydrostatic testing of the steam generators (secondary side), and numerous other installations of safety-related components.

Good controls were in place for installation activities regarding reactor vessel internals, preparation for start-up of the diesel generators, fastening of the diesel generator exhaust silencers and fuel pool heat exchangers and shot peening and eddy-current testing of steam generator tubes. Records were complete and good controls were in place for maintenance and protection of component cooling pumps, pressurizer safety valves, and service water pumps. No violations were issued in this area.

The installation of safety-related mechanical equipment was well planned and involved all levels of management. For example, supervising personnel and crafts performing the work appeared well trained and knowledgeable in the performance of the task which involved extensive repair work in installing the main steam isolation valves. The work performed was effectively monitored by quality control personnel. The coordination and planning was evident in the resulting high quality workmanship by capable crafts personnel. Maintenance of installed equipment was being performed monthly as scheduled. Examination of diesel generator equipment areas indicated specified maintenance requirements were being met.

Historically, there has been a reluctance to report deficiencies when encountered at the construction site. For example, the reportability per the requirements of 50.55(e) for limitorque operator problems was questioned by the NRC which prompted the licensee to subsequently issue such a report. However, resolution of such deficiencies has typically been thorough; at the end of the assessment period, rework on the affected operators was being satisfactorily addressed. Another example of such thoroughness involved a previous Construction Deficiency Report (85-00-02). In this case, followup activities were expanded to reflect additional problems that had developed with the latching mechanisms for the main steam isolation

valves (MSIVs). When two (2) bearings failed due to material defects, the licensee was actively involved in problem resolution and ultimately directed its vendor to provide new bearings which will be proof-tested for acceptability.

One allegation was received in this area regarding the possibility of dirt and dust contaminating pumps and valves located in the Containment Building. NRC followup established that all equipment sensitive to dust and dirt, such as pumps and valve operators, was adequately protected by plastic covering to prevent entry of undesirable contaminants.

In summary, overall performance in this functional area was very good. The high performance levels noted in previous SALP assessments were maintained.

b. Conclusion

Category 1, Consistent.

c. Board Recommendation

Licensee

None.

NRC

None.

4. Support Systems (7%, 158 hours)

a. Analysis

No significant fabrication problems were identified in this area during the last assessment period. The licensee had good controls; a Category 1 rating was assigned.

The four inspections performed in this area were performed by the resident inspectors and covered HVAC supports, design of crane monorails and installation of HVAC fire dampers.

Good controls were found in these areas; however, some concerns were identified regarding Quality Control inspector error and design of crane monorails. A violation was issued when it was found by NRC that a Q.C. inspection report that documented inspection results of an HVAC support indicated no concrete anchors were installed in the support baseplates, but sixteen anchor bolts were actually installed. Licensee followup actions were typically thorough in checking work by this inspector to demonstrate that this error was apparently an isolated incident in that the quality of his other work was good. During the previous SALP assessment period, a 50.55(e) item also dealt with QC inspector error on HVAC supports. Although subsequently resolved through dismissal of personnel and rework of deficient welds, these incidents collectively indicate some continuing problems in this area.

NRC identified a problem with non-seismic designed and constructed monorails which were installed above safety-related equipment in various buildings. This indicated an engineering weakness in failing to ensure that potential adverse interaction between seismic and non-seismic components is avoided. This problem is similar to the safety-related piping through non-seismic stairwell issue discussed in Functional Area 2 and is another example of how NRC continues to find problems that should have been prevented and/or identified by licensee controls.

In summary, the licensee has adequate controls in this area.

b. Conclusion

Category 2, Consistent.

c. Board Recommendation

Licensee

More attention is warranted to assure Q.C. inspectors adequately perform their independent inspections. Also, as stated in Functional Area 2, engineering disciplines need to emphasize and provide

more attention to detail including commitments and specification requirements as well as assuring that systems are able to provide their intended functions under accident conditions.

NRC

None.

5. Electrical Power Supply and Distribution (15%, 362 hours)

a. Analysis

Construction and Quality Control inspection activities were considered to be under good control during the prior assessment periods. However, numerous lingering engineering/construction interface problems that affected hardware installation existed in this area during the last assessment. A noted improvement had occurred from the prior assessment period (December 1, 1982 through March 31, 1984) when a Category 3 rating was assigned.

Inspections during this evaluation period concentrated on the implementation of the ICSG, CRT, QIMP and Engineering Confirmation Program, described in Functional Area 2 (Piping Systems and Supports). These program objectives were to eliminate the Engineering/Construction interface concerns discussed in the previous SALP assessment. Other NRC inspections covered open items, storage of electrical equipment, 125 Volt distribution system, cable pulling, installation of condulets, installation of batteries and chargers, rework controls and environmental qualification of electrical equipment.

Cable trays, conduits and cable continued to be installed throughout the assessment period with the major activities being cable pulling and terminations. Reinspection and rework activity on electrical panels to meet Regulatory Guide 1.75 occurred throughout this period. As of February 26, 1986, of a total of 311 electrical panels in the program, 119 were final accepted by Quality Control inspections.

Staffing of technical and engineering positions related to the electrical area was good. QA personnel were adequately trained and carried out the QA program relative to the installation of electrical cables. Management was obviously concerned with and involved in assuring quality. QC management was observed to be very active in implementing good quality control of electrical related activities. Good response was shown with regard to the resolution of problems discussed in the previous SALP assessment. Management took positive steps to correct the previous problems in the areas of cable pulling, cable separation, terminations and installation and to prevent the recurrence of such problems. Engineering installation and construction procedures were revised to provide more detailed instructions in the areas of cable pulling (to properly calculate allowable pull tensions), to provide for cable sheath protection and proper separation, and to properly insulate taped splices. Installation and QC personnel were trained in the procedures. QC personnel were provided with on the spot stop-work authority for improper cable pulls. Management's aggressive efforts to revise construction and QA/QC

procedures to overcome problems in safety related cable installations, pull calculations and pull methods has resulted in improved performance in these areas.

Other items discussed in the last SALP evaluation received management attention and progressed satisfactorily during this period; springnut retorquing was completed in 36 of a total of 47 seismic areas; inspection for shims or the need to add shims, including tack welding of same, installed under electrical baseplate supports, was completed in 2 of 15 areas; identification of cable which exceeds the established criteria for unsupported length was performed during this period, and wrapping of external cable and installation of tray covers to meet Regulatory Guide 1.75 commenced.

One concern was identified by NRC that involved installation of commercial grade termination blocks in harsh environments where the specification had specified installation of qualified termination blocks. This problem occurred due to failure on the part of engineering to specify the correct termination block on field drawings. Other concerns identified during this period involved the field installation of loose oversize non-seismic condulets on instruments; planned installation of electrical cable splices located below the flood plane in containment (in the event of a LOCA) with splices that were unqualified for submergence; and installation of terminal blocks in a vented termination box in containment located below the flood plane (in the event of a LOCA) that was not qualified for submergence. Flex conduit containing electrical cables that were disengaged from their coupling was found installed and accepted by the licensee. These hardware deficiencies indicate some continuing problems in engineering in failing to provide specific and/or the correct instructions necessary for compliance with the requirements. One item, installation of a termination block in Containment that was not environmentally qualified, indicated a problem in the contractor's cable pull ticket (termination) office in failing to implement a "check" system to assure rework was actually performed in the field.

The licensee established an electrical plan and is in the process of reworking the items discussed above in a systematic way. The numerous program implementations, along with strengthening of management generally resolved the Engineering/Construction interface concerns, although some problems existed with engineering documents which incorrectly translated requirements as discussed above.

In summary, Engineering/Construction interface concerns were resolved through new program implementation. Management in the electrical area was significantly stronger than was apparent in previous assessments. Engineering performed considerably better in most areas, generally providing good technical direction to the field. Disposition and corrective actions on deficient items were excellent.

b. Conclusion

Category 2, Consistent.

c. Board Recommendation

Licensee

A strengthening of the program is needed which particularly addresses more attention to detail by both the engineering and installation contractors to eliminate the type of deficiencies discovered by NRC inspections (similar to Functional Area 2). Conduct additional independent overviews (design review) to eliminate these deficiencies before the hardware is installed. Need more aggressive self-identification of problems that could stop systems/components from performing their intended function(s).

NRC

None.

6. Instrumentation and Control Systems (15%, 364 hours)

a. Analysis

During the last assessment period, control of onsite construction and inspection activities in this area was generally considered satisfactory. A Category 2 rating was assigned.

Five inspections were performed in this area during this assessment period, two by the resident inspectors and three by Region-based specialists. The inspections covered reviews of open items, specification reviews, welding and general installation of instruments, lines and associated supports.

The licensee's installation of instrumentation and control systems continued throughout the site during the evaluation period. Activities in this area, with one exception as discussed below, were conducted in a well controlled manner as contrasted to the previous SALP assessment period when weaknesses were evident. Ongoing installation and problem resolution activities were tracked well in the Project Electrical Plan. Good management and QC involvement was evident. No major problems were encountered by the contractor and no 50.55(e) reports were issued. The lack of any substantial negative findings in this functional area despite considerable NRC attention is considered to be indicative of improved performance.

One minor violation was identified by NRC relating to missing impulse line slope requirements on instrument isometric drawings for three safety related flow and level transmitters for the auxiliary feed, component cooling water, and reactor coolant systems. This missing construction criterion and inadequate engineering design review of construction drawings is another example of inadequate attention to detail. Previous initiatives to tighten engineering controls appear to have been only partially effective as evidenced by the violation noted above. Subsequently, the licensee has concluded that the as-installed conditions are acceptable without the specified slope, but has clarified the specification to eliminate any possible future misinterpretations.

Previously identified open items were resolved through active management involvement and concern for safety issues. Licensee action through revised procedures, walkdown inspections and review of construction drawings for all previously installed impulse lines were properly documented and findings were satisfactorily dispositioned. No new significant concerns were identified in this area.

In summary, no major problems were identified in this area. Installation progressed well. Management and Quality Control were effective in assuring installation of a quality product. This area has shown a significant improvement during this assessment period. Good controls by engineering and construction are generally in place.

b. Conclusion

Category 1, Consistent.

c. Board Recommendation

Licensee

None.

NRC

None.

7. Licensing Activities

a. Analysis

This area was categorized as Category 2, improving, in the last SALP assessment. Although ratings with respect to individual criteria were variable, the licensee's performance in this area had been adequate and reasonably effective in addressing nuclear safety considerations.

Throughout the review process during this assessment period, DLC's activities generally exhibited evidence of prior planning and assignment of priorities. This was shown by the licensee's approach to resolving numerous open items identified in the staff's draft safety evaluation report (SER) to support issuance of the final SER. The licensee's tracking program continued to identify and track the status of each item and maintain internal schedules for resolving each open item. Generally, DLC management assigned the necessary technical people to develop complete, high quality responses. Also, DLC management has taken significant additional initiative to assure themselves that the design of the Beaver Valley Unit 2 station fully complies with the NRC regulations and licensing commitments. To provide this assurance, DLC has performed a number of technical design reviews using outside contractors, in-house DLC engineering personnel, and Stone and Webster (SWEC) engineering personnel.

DLC's management demonstrated awareness of the licensing issues by virtue of DLC's experience in the industry, technical expertise, and active participation in owners groups. The licensee's management also consistently exercised firm control over its design contractor's activities and maintained good communication between the contractor, his own staff, and the NRC staff.

Strong licensee management involvement at the Vice President level who is stationed at the site and is responsible for managing the design, construction, startup, operation, and maintenance of Unit 2, has produced positive results. Also, the DLC Regulatory Affairs and engineering staffs have recently been relocated to the site. As a result, in regard to licensing activities, there has been increasing evidence of a closer working relationship with the site staff.

The licensee continued to use a tracking system for resolution of licensing issues. The tracking system includes all SER outstanding and confirmatory issues, proposed license conditions, and TMI NUREG-0737 issues. In addition, any other major issues requiring resolution (i.e., design and FSAR changes that require revisions to the staff's safety evaluations) are also included. This tracking system has been very helpful in tracking and resolving the remaining licensing issues.

BV-2 is the lead plant in application of leak-before-break assumption to balance-of-plant piping. The licensee has held frequent meetings with the staff on this issue and has demonstrated good technical understanding and a cooperative attitude in these meetings.

The licensee, in cases where generic questions arise, has made use of industry owners groups to develop acceptable resolution to licensing issues, e.g., resolution of Salem ATWS issues.

Open and effective communication exists between the NRC and DLC's licensing staffs. Effective dialog between both staffs usually promotes prompt and technically sound responses to NRC initiatives. Conference calls with the staff are promptly established and included appropriate engineering, plant, and/or contractor personnel.

DLC staff demonstrated a good working knowledge of applicable regulations, guides, standards, and generic issues pertaining to their plant. This was evidenced by their positive attitude and responsiveness to the NRC staff in addressing unresolved SER issues. DLC staff has always been prepared to meet with the NRC staff in a short time frame to obtain the necessary understanding of NRC information needs and has been successful, by preparedness and aggressiveness, in expediting SER issue resolution in a timely manner. During meetings, the licensee demonstrated a thorough understanding of the technical issues and effectively used the services of its architect-engineer, SWEC, and other contractors as needed. DLC's promptness was especially demonstrated during its frequent meetings with the staff. The licensee kept the NRR project management generally informed regarding plant completeness status and major milestones.

The Regulatory Affairs group appears to be adequately staffed. Top management has extensive experience in the area of nuclear technology. The licensee has revised its organizational structure. The new organization was designed to provide close working relationship with Unit 1 staff, absorbing Unit 1's experience as an operating plant.

In summary, overall strong performance was observed in the functional area of Licensing Activities. The licensee's trend toward steady improvement in performance during the current rating period, specifically, good performance in resolving several major issues, increased responsiveness and cooperativeness with the staff, and aggressive approach in resolving issues are the main factors in this assessment.

b. Conclusion

Category 1, Improving.

c. Board Recommendation

Licensee

None.

NRC

None.

8. Preoperational/Startup Testing (17%, 415 hours)

a. Analysis

In the last assessment, only programmatic and staffing aspects were evaluated. Some weaknesses relating to personnel qualification and establishment of system turnover criteria were identified.

During this assessment, areas reviewed included preoperational program development and implementation, QA/QC interface and overview of test activities, development of test procedures, and conduct of construction proof and preoperational tests. During much of this assessment period, Beaver Valley Unit 2 was in the process of reorganizing from the construction phase to the preoperational phase. All levels of management were involved in defining the scope of the startup program, the organizational structure of the startup group, and the QA/QC interface during testing. The startup group was reorganized a second time. At the end of the period, the organization was well defined, but finalization of its line organization, division of responsibilities, and development of support group interfaces were slow; performance in these areas was weak.

The startup manual (SUM), which is made up of individual test procedures, was not completed when first reviewed by NRC in January, 1985. The SUM lacked an overall program description that would tie the individual test procedures into a comprehensive format. Presently, the individual test procedures tell the user how to execute the test program, but a program description is needed to consolidate the test program. The absence of a program description was considered a weakness in management's involvement and control in developing the SUM. The SUM did contain a good description of the startup organization and responsibilities for individuals in the test program.

Earlier and greater management oversight of the SUM development could have resulted in a stronger program in that several minor problems were allowed to be created. First, there was not a good match between the preoperational tests listed by the licensee and those committed to in the FSAR. The procedures were not true scheduling elements because some were so large that they had to be subdivided and performed over an extended period of time. Consequently, significant effort was needed to form an integrated work schedule. Secondly, some of the earlier procedures reviewed did not have good system restoration sections or double verification of realignment of critical components. Jurisdictional control over pre-test conditions appeared to lack definition. However, by the end of the assessment period, these concerns were receiving appropriate attention.

The QA/QC oversight of the early test program was not well defined in regard to phasing out the construction site QC (SQC) function and phasing in testing QC (TQC), or developing a QA surveillance program for test activities. The overlap between the two QC programs still needed management attention to override potential conflicts with regard to jurisdictional responsibilities for rework items on subsystems undergoing testing in that the break between the construction phase and proof test-preop test phase was not well defined. A final, formal policy that defines this break for rework, maintenance, and modifications needs to be developed and disseminated to the startup test engineers and QC organizations. The QA Surveillance Group was just established at the beginning of 1986. Development of an administrative manual and full staffing was not yet complete.

The construction proof (including flushing and hydrostatic tests) and preoperational tests were technically adequate and met FSAR commitments. Procedure developement proceeded at an acceptable pace and was improving in quality. The procedure review process to ensure that the latest commitments are forwarded to cognizant test engineers for inclusion in the test, and reviewed by Joint Test Group before approval with final authorization for test conduct, was functioning satisfactorily. Program requirements and station policy were well understood by the test engineers. The interface between construction and test groups during system flushes and hydros was satisfactory. The QA Surveillance Group actively observed much of the safety related test activities in 1986 and identified meaningful items dealing with both hardware and program controls.

In summary, the preoperational and startup testing program has now arrived at the initial stages of implementation. Delays in developing the final test organization and management controls hindered the development of a strong program although the one in place was satisfactory. The overall program appears adequate and capable of assuring that all required testing and performance requirements are met.

b. Conclusion

Category 2, no trend assigned (insufficient basis).

c. Board Recommendation

Licensee

Assure the QA Surveillance Group is adequately staffed and that a written policy is forwarded defining the division of responsibility between SQC and TQC.

NRC

Arrange management meeting to discuss planning for startup testing including philosophy on surveillance testing, transition from pre-operational testing to operations, and handling of test exceptions.

9. Assurance of Quality

a. Analysis

During this assessment period, Assurance of Quality is being considered as a separate functional area for the first time although a related area, Quality Assurance and Administrative Controls, was included in the last SALP assessment. Management involvement and control in assuring quality continues to be one evaluation criterion for each functional area.

The various aspects of Quality Assurance Program requirements have been considered and discussed as an integral part of each functional area and the respective inspection hours are included in each one. Consequently, this discussion is a synopsis of the assessments relating to the assurance of the quality of work conducted in other areas.

During this evaluation period, the licensee independently contracted for a "Management Analysis Corporation" (MAC) audit to assess the overall project status. It should be noted that this audit was partially prompted by an NRC concern that the DLC Quality Assurance Unit might not have sufficient independence from the engineering and construction activities. Through these audit findings, the licensee implemented several changes which effectively strengthened the overall management program. This includes the establishment of the separate QA/QC group with a strong manager overseeing SUG activities, the establishing and appointment of a senior person as Manager of Construction and Engineering, and the relocation of the DLC Nuclear Construction Division engineering and licensing staff to the site.

Another effective program being implemented is the scheduled weekly meeting which involves senior managers to ensure that potential interface problems are identified and that appropriate corrective actions are taken. These face-to-face scheduled discussions have been very effective in resolving problems. The Quality Improvement Management Program (QIMP) effort has also significantly strengthened the licensee's management controls. Implementation of the Electrical Plan was another effective tool used to control the resolution of problems; particularly, NRC identified concerns in the electrical area.

The licensee has placed major emphasis on resolving NRC identified items. Through implementation of a program titled "Next Step List" and appointment of senior management personnel to this task, many of the items have been completed and are ready for NRC review and closure. This program was very effective and significantly reduced the amount of NRC "open items."

NRC inspection coverage concentrated on Quality Control inspections during construction and for systems turned over to the Start-Up Group, Quality Assurance audits, timely disposition and closure of Nonconformance and Disposition (N&D) Reports, and responses to Generic Letters, Part 21 Reports, Information Notices, and Bulletins. Inspections also were performed of the licensee's activities regarding the Engineering Confirmation Program.

Two violations were issued that reflected on this functional area; Quality Control inspector error (see Functional Area 4) and failure to promptly correct and close N&Ds. The licensee implemented strong timely corrective actions for these violations.

NRC expressed concern during this period regarding QC inspection of systems turned over to the Startup Group (SUG). The licensee's original plans only established a surveillance program for work activities under control of SUG. This area has been strengthened by establishing a separate QA/QC group to perform audits, surveillance and QC inspections and witness points. This concern appears to have been resolved; however, the program was only recently implemented and therefore, it is premature to determine the effectiveness of the new QA/QC group.

A concern discussed in the last SALP report regarded the organizational arrangement wherein the QA/QC manager reported to the Nuclear Group Vice President, who also functioned as the DLC Project Manager. The licensee has resolved this concern through appointment of a Senior Manager as "Manager of Construction and Engineering" to resolve the daily onsite construction and engineering problems. This organizational structure eliminates any concern regarding Quality Assurance independence.

Generally, the licensee has demonstrated an adequate program for the assurance of quality. QA audits are scheduled and performed to cover all major activities. Corrective actions for audit findings are prompt and thorough, QA staffing is adequate; there is a large QC staff. QA/QC personnel are adequately qualified and received good training through company sponsored training films and lectures. Quality Control management in the construction area is strong and effective and responds in an effective manner to resolve all issues affecting quality. However, as illustrated above in the various examples and in the analyses of previous functional areas, problems continue to be identified by the NRC rather than by the licensee. This is indicative of a weakness in the direction of the licensee programs for the assurance of quality and engineering programs which tend to be reactive rather than aggressively identifying weaknesses in "frontend" activities which would help reduce the number of such recurrent deficiencies.

In summary, the various management changes which have occurred during this evaluation period have significantly strengthened the overall project and established a management team which is structured adequately to address safety issues. Implementation of other programs such as QIMP, CRT, the ICSG, and the Electrical Plan have also contributed to good performance. The self-initiated implementation of the MAC audit reflects the licensee's goal to build a quality plant. Implementation of a separate QA/QC group to inspect turned-over systems was a positive program to assure adequate QA attention after completion of construction. With some exceptions, such as QC inspector errors, untimely closure of N&Ds, and the need for a more aggressive approach to problem self-identification, the licensee's program has been effective. With the various management changes implemented during this evaluation period, proper management now is in place to systematically provide adequate assurance of quality for remaining construction and testing activities.

b. Conclusion

Category 2, Consistent.

c. Board Recommendation

Licensee

None.

NRC

Discuss with licensee plans for transferring engineering information to the site for use during plant operations.

V. SUPPORTING DATA AND SUMMARIES

1. Construction Deficiency Reports (CDRs)

Nine CDRs were submitted by the licensee during the assessment period. Six of the deficiencies were associated with vendor supplied hardware. Two CDRs (85-00-04 and 85-00-05) were associated with design deficiencies. One CDR resulted onsite due to installation of non-ASME material in a safety related application. One corrected CDR, 85-00-05, had acceptable corrective actions. Construction deficiency reports are listed in Table 1.

2. Investigation Activities

One allegation was received during the assessment period regarding a concern in the Containment Building about excessive dust and dirt. The allegation was evaluated by the NRC, but not substantiated. There were no open allegations at the end of the assessment period.

3. Escalated Enforcement Action

None.

4. Management Conferences

June 19, 1985 - A special, announced management meeting at NRC's request to discuss the results of the Region I SALP board convened to assess licensee performance from April 1, 1984 to March 31, 1985.

October 8, 1985 - A special, announced management meeting at licensee's request to specifically address the progress of corrective actions associated with the June 7, 1985, SALP Report and to discuss plans for licensing of reactor operators.

TABLE 1

CONSTRUCTION DEFICIENCY REPORT

(APRIL 1, 1985 - MARCH 31, 1986)

BEAVER VALLEY POWER STATION, UNIT 2

CDR NUMBER	DEFICIENCY	CAUSE CODE
85-00-03	Environmental qualification of core exit thermocouple system.	B
85-00-04	Cable tray hold-down clamps.	B
85-00-05	Insufficient thickness of insulating tape on 5KV cable terminations and splices.	D (Closed)
85-00-06	Westinghouse manufactured SA-1 relay problems.	B
85-00-07	Damage of BBC K-line circuit breakers.	B
86-00-01	Improperly rated cables terminated in solenoid valves.	B
86-00-02	Non-ASME elbow installed.	Determined not to be reportable.
86-00-03	Paul Monroe snubber material defective.	B
86-00-04	Limitorque valve operator deficiencies.	B

Cause Codes

A - Personnel Error
B - Design/Fabrication Error
C - External Cause
D - Defective Procedure
E - Component Failure
F - Site Construction Error

TABLE 2

VIOLATIONS

(APRIL 1, 1985 - MARCH 31, 1986)

BEAVER VALLEY POWER STATION, UNIT 2

A. Number and Severity Level of Violations

1. Severity Level

Severity Level I	0
Severity Level II	0
Severity Level III	0
Severity Level IV	5
Severity Level V	1
Deviations	2
TOTAL	8

B. Violation vs. Functional Area

	Functional Area	Deviations	Severity Level IV	Severity Level V
1.	Containment and Other Safety-Related Structures.			
2.	Piping Systems and Supports	1	1	1
3.	Safety-Related Components			
4.	Support Systems	1		
5.	Electrical Power Supply and Distribution		1	
6.	Instrumentation and Control Systems		1	
7.	Licensing Activities			
8.	Preoperational/Startup Testing			
9.	Assurance of Quality		2	
	TOTAL	2	5	1

TABLE 3

INSPECTION HOURS SUMMARY (4/1/85 - 3/31/86)

BEAVER VALLEY POWER STATION, UNIT 2

	FUNCTIONAL AREA	HOURS	% OF TIME
1.	Containment and Other Safety-Related Structures.	112	4
2.	Piping Systems and Supports	606	25
3.	Safety-Related Components	427	17
4.	Support Systems (HVAC)	158	7
5.	Electrical Power Supply and Distribution	362	15
6.	Instrumentation and Control Systems	364	15
7.	Licensing Activities	**	**
8.	Preoperational/Startup Testing	415	17
9.	Assurance of Quality	*	*
	TOTAL	2444	100

*Included in other functional areas.

**Does not include NRR time.

TABLE 4

INSPECTION ACTIVITIES

BEAVER VALLEY POWER STATION, UNIT 2

Report Number	Inspector	Areas Inspected
85-08	Specialist (36 hours)	Pre-operational test program
85-09	Resident (155 hours)	Reviews of information notices, electrical cable routing, cadwelding, instrumentation welding, welder qualifications, excessive feedwater transient analysis and daily site tours.
85-10	Specialist (66 hours)	Review of activities relating to installation of electrical/instrumentation components and associated circuits.
85-11	Specialist (0 hours)	Inspection cancelled.
85-12	Specialist (38 hours)	Inspection of work in progress and completed work associated with mechanical equipment, reviews of previously identified items, QA/QC involvement, and discussions with supervisory and work force personnel.
85-13	Resident (195 hours)	Inspection of activities pertaining to previously identified items, 50.55(e) reports, information notices, seismic design of items important to safety, inspection of piping supports, rigid sway struts, rework and/or disassembly control of components, disposition of nonconformance and disposition reports, review of welding and associated weld procedures, and daily site tours.
85-14	Specialist (36 hours)	Inspection of licensee's action on previous inspection findings, and preservice inspection program activities.
85-15	Specialist (64 hours)	Inspection of licensee's actions and status of previous inspection findings in the electrical area.

Report Number	Inspector	Areas Inspected
85-16	Resident (269 hours)	Inspection of activities pertaining to previously identified items, 50.55(e) reports, information notices, inspection of piping supports, instrumentation tubing installation, material and equipment control with associated training information, preoperational testing of station batteries, review of licensee response to bulletins, information notices, generic letters and Part 21 reports, corrective action on nonconformance and disposition reports, 5 KV cable terminations, separation distance of cable from hot piping, off-center socket bore on globe valves, review of welding and associated weld procedures & daily site tours.
85-17	Specialist (0 hours)	Inspection Cancelled.
85-18	Specialist (77 hours)	Inspection of Quality Assurance Program for Preoperational Testing.
85-19	Resident (126 hours)	Inspection of activities pertaining to previously identified unresolved items, Part 21 Reports, inspection of pipe supports, rework control on systems turned over to Start-Up Group, eddy-current inspection of steam generator tubes, review of Quality Assurance Audits and daily site tours.
85-20	Specialist (37 hours)	Inspection of construction requirements and controls pertaining to concrete construction for closure of the temporary construction opening in the containment building exterior wall, of licensee response to NRC/IE Bulletin 79-02 relating to the installation of drilled-in concrete expansion anchors for pipe supports, review of previously identified inspection items relating to the above bulletin and review of settlement monitoring records. Additionally, the licensee's QA/QC interactions pertaining to the first two items identified above were reviewed.
85-21	Resident (175 hours)	Inspection of activities pertaining to previously identified unresolved items and violations, inspection of HVAC supports, flex conduit and condulet installation, weld material control, concrete placement in the reactor containment exterior wall and daily site tours.

Report Number	Inspector	Areas Inspected
85-22	Specialist (35 hours)	Inspection of activities pertaining to previously identified items, preventive maintenance program for the emergency diesel generators and associated equipment.
85-23	Specialist (73 hours)	Inspection of activities pertaining to previously identified items, work observations and documentation relative to the installation of instruments and electrical equipment.
85-24	Specialist (35 hours)	Inspection of licensee's action on unresolved items and violations in the area of structural, piping and electrical supports.
85-25	Resident and Project Engr. (174 hours)	Inspection of activities pertaining to previously identified unresolved items, inspection of electrical terminations and monorail systems, environmental qualification of safety-related junction boxes, electrical rework control, review of radiographic films of main steam piping field welds and inservice inspection procedures, review of licensee action on Information Notices, Part 21 Reports, Bulletins and disposition of Nonconformance and Disposition Reports and daily site tours.
85-26	Resident (188 hours)	Inspection of activities pertaining to previously identified unresolved items, 50.55(e) reports, deficient limitorque operators, lay-up of installed equipment, QA/QC program in proof-testing activities, design/construction of main steam piping to auxiliary feedwater turbine, preservice examinations, fire protection system supports and daily site tours.
86-01	Resident (54 hours)	Inspection of licensee's activities pertaining to Pre-operational testing.
86-02	Resident (253 hours)	Inspection of activities pertaining to previously identified unresolved items, environmental qualification of electrical termination blocks and Raychem splices, installation of flexible conduit, cleanliness controls of equipment during flushing activities measurement of pipe support clearances, reviews of steam generator shot peening, rework controls, technical reviews of engineering disposition and daily site tours.

Report Number	Inspector	Areas Inspected
86-03	Specialist (104 hours)	Inspection of activities pertaining to previously identified items, installation of instrumentation tubing and reviews of voltage profiles.
86-04	Resident (62 hours)	Inspection of licensee actions on previous inspection findings, preoperational test program implementation, emergency diesel generator testing and review of several preoperational test procedures.
86-05	Specialist (68 hours)	Inspection of licensee's action on previous inspection findings and Preservice Inspection activities.
86-06	Resident (124 hours)	Inspection of licensee actions on previous inspection findings, preoperational test program implementation, and review of several preoperational test procedures (CILRT and recirculation and quench spray).

ATTACHMENT 1

ENFORCEMENT DATA

Report Number	Subject	Severity Level	Functional Area
85-13-01	Safety-related piping routed under and through non-seismic stairs.	Dev.	2
85-13-02	Final Quality Control inspected pipe off location.	IV	2
85-14-01	Insufficient clearances around welds for performing inservice inspection.	V	2
85-16-01	Promptly correcting and closing Nonconformance and Disposition Reports.	IV	9
85-21-01	Quality Control Inspector Error.	IV	9 AND 4
85-23-01	Slope of instrumentation tubing not in compliance with requirements.	IV	6
85-25-01	Non-nuclear grade terminal blocks installed on feedwater isolation valve.	IV	5
85-25-02	Non-seismic monorails installed above safety-related components.	Dev.	4

UNITED STATES
NUCLEAR REGULATORY COMMISSION
REGION I
631 PARK AVENUE
KING OF PRUSSIA, PENNSYLVANIA 19406

ENCLOSURE 3

JUL 02 1986

Docket No. 50-412

Duquesne Light Company
ATTN: Mr. J. J. Carey
Vice President
Nuclear Group
Post Office Box 4
Shippingport, Pennsylvania 15077

Gentlemen:

Subject: Systematic Assessment of Licensee Performance (SALP) Report No. 50-412/85-98

The NRC Region I SALP Board has assessed the performance of activities at the Beaver Valley Power Station, Unit 2, for the period April 1, 1985 - March 31, 1986. The SALP Board Report is enclosed. A meeting to discuss this assessment has been scheduled for July 9, 1986. This meeting will be held at the Beaver Valley site, Shippingport, Pennsylvania.

At the meeting, you should be prepared to discuss the SALP assessment and your plans for managing the transition from completion of construction to preoperational testing and operations. The meeting is intended to be a candid dialogue wherein any comments you may have regarding our report may be discussed. Additionally, you may provide written comments within 30 days after the meeting.

Your cooperation with us is appreciated.

Sincerely,

Thomas E. Murley

Thomas E. Murley
Regional Administrator

Enclosure: Region I SALP Report 50-412/85-98

8607070376
2PP

cc w/encl:
E. J. Woolever, Vice President, Special Projects
E. Ewing, Quality Assurance Manager
R. J. Swiderski, Manager, Startup Group
J. P. Thomas, Manager, Engineering
R. E. Martin, Manager, Regulatory Affairs
C. O. Richardson, Stone and Webster Engineering Corporation
Public Document Room (PDR)
Local Public Document Room (LPDR)
Nuclear Safety Information Center (NSIC)
NRC Resident Inspector
Commonwealth of Pennsylvania

ENCLOSURE 4

Duquesne Light

Beaver Valley No. 2 Unit Project Organization
S.E.G. Building
P.O. Box 328
Shippingport, PA 15077

2NRC-6-089

(412) 643-5200
Telecopy (412) 643-5200 Ext. 160

August 14, 1986

United States Nuclear Regulatory Commission
Region I
631 Park Avenue
King of Prussia, PA 19406

ATTENTION: Dr. Thomas E. Murley
Administrator

SUBJECT: Beaver Valley Power Station - Unit No. 2
Docket No. 50-412
Systematic Assessment of Licensee Performance (SALP)
Report No. 50-412/85-98

Gentlemen:

Thank you for your meeting with us on July 9, 1986 to discuss the Beaver Valley Power Station Unit No. 2 SALP Report for the period of April 1, 1985 through March 31, 1986.

In addition to the items discussed at the July 9th meeting, the following items summarize the actions taken or planned to be taken to address the concerns which were identified in your letter of July 2, 1986.

Functional Area No. 4, Support Systems and Functional Area No. 9, Assurance of Quality

The incident of Inspector error is described in these functional areas. The project has always been concerned with the potential of inspector error; but since the incident reported during the previous SALP period (where we initiated a 10CFR50.55(e) report), we have increased our attention to the re-verification and sampling of inspectors' work. Formal summaries of our results have been transmitted to Senior management for their review and information.

We have re-inspected 7,601 attributes previously accepted by QC Inspectors. This re-inspection resulted in 7,511 acceptable conditions and 90 unsatisfactory conditions. For information, 1,832 of the attributes given related to the complete re-inspection of supports for all welding attributes.

8608270199
7pp

Each unsatisfactory condition is uniquely investigated by re-verifying the previous work accepted by that inspector. Thus, we establish whether or not we have an isolated error. Dependent upon the type of error found, we re-train the inspector, clarify our procedures/techniques, or if minor and isolated, admonish and remind the inspector of his duties.

In the specific incident mentioned in the SALP Report, (85-98) the error was completely out of character with reference to the individual's past performance as confirmed by an extensive review of his past work. We believe that this is the first time that an inspector error was reported by the NRC during the 10 years of Duquesne Light Company Site Quality Control's existence.

The effectiveness of our actions to contain and correct potential inspector error has recently been confirmed by the independent site NRC Inspection Group, June 1986, where 42 supports and 94 hilti installations were re-inspected by random selection with no findings or errors being reported. This confirmed the previous independent NRC Inspection where 151 pipe welds, 30 supports and 97 hilti installations were also re-inspected with no findings or errors being reported.

We regretfully accept that inspector error will occur, but we believe that our training programs, supervisory actions and re-verification/sampling programs are sufficient to contain this problem.

Functional Area 2 - Piping System and Supports,
Function Area 5 - Electrical Power Supply and Distribution,
Functional Area 6 - Instrumentation and Control System

These three areas each discussed one or more inspector identified violations in which more attention to detail in either engineering or construction activities would have prevented the occurrence of the violation.

We acknowledge both the accuracy of the inspectors findings and the conclusion drawn by the SALP board.

As a result of these findings, we have taken steps to ensure that future installations will be performed in such a manner that similar problems will not occur.

We have also concluded that in some instances our field engineering personnel have had a tendency to rely upon the Hazards Analysis Walkdown group and the Environmental Qualification Survey team to identify situations in which reliable operation of equipment could be threatened by seismic events, piping failures, or high ambient temperatures, radiation, moisture and submergence to which the installed equipment might be exposed.

In addition to numerous procedural changes, we have taken steps to improve our performance in these areas which are discussed in a summary at the end of this response.

Functional Area No. 8, Preoperational/Start-up Testing

A) Concerning the QA/QC Surveillance Group which was formed in 1985 and was being staffed by the beginning of 1986, approximately 40 people had been assigned to the Quality Assurance Surveillance Group by July 1, 1986. Additional personnel from the Operations Quality Control Department will be incorporated in the Group September 1, 1986, after completion of the Beaver Valley Unit 1 refueling outage. A written policy describing the division of responsibility between Site Quality Control and Test Quality Control was issued on May 16, 1986 by the Quality Assurance Manager. Additional clarification was provided in a subsequent letter dated June 27, 1986, issued by the Director of Site Quality Control and the Deputy Quality Assurance Manager.

B) The wording of Section 8, Preoperational Startup Testing implies that many changes were made to the Startup Program and Manuals due to NRC Audits. However, most discrepancies were resolved by further verbal discussions/clarifications with the various NRC Inspectors. The following are examples:

1. Paragraph 3 states, "The Startup Manual (SUM), which is made up of individual test procedures, was not completed when first reviewed by NRC in January, 1985."

   Comment: While this statement is correct that the SUM was not totally complete when the NRC first reviewed it, the statement is incorrect in stating that the manual is made up of individual test procedures. This was subsequently discussed with the NRC to explain that the SUM is not test procedures but the Administrative Program/Procedure for the Startup Group (i.e., how the test procedures are written and performed, and other areas of Startup Group activities, etc.).

2. Paragraph 3 further states, "The SUM lacked an overall program description that would tie the individual test procedures into a comprehensive format. Presently, the individual test procedures tell the user how to execute the test program, but a program description is needed to consolidate the test program."

   Comment: The intention of the SUM (not test procedures) is to direct the individual on how to execute the test program and not to provide an overall program description. The FSAR, Section 14, Initial Test Program provides the overall program description. During subsequent meetings/discussions with the NRC Inspectors it was agreed that since the FSAR provides the overall program description and the SUM (which references the FSAR) are the Administrative Procedures used to comply with the FSAR, no changes were needed.

3. Paragraph 4 states, "The procedures were not true scheduling elements because some were so large they had to be subdivided and performed over an extended period of time. Consequently significant effort was needed to form an integrated work schedule."

   Comment: With the exception of a few test procedures (i.e. Hot Functional Test Procedure, Power Ascension Test, etc.) the test procedures were not intended to be scheduling documents. Also, it was further explained to the NRC Inspectors that the reason for performance over an extended period of time was the need for different plant conditions (i.e., initial system performance cold and during hot plant conditions).

4. Paragraph 4 further states, "Secondly, some of the earlier procedures reviewed did not have good system restoration sections or double verification of realignment of critical components."

   Comment: The NRC Inspector was looking at a specific section of the procedure entitled "Restoration". It was demonstrated to the Inspector that restoration was accomplished by the procedures as written by either specific steps throughout the procedure, specific steps at the end of the procedure or as directed by Operational needs through other procedures.

5. Paragraph 4 also states, "Jurisdictional control over pre-test activities appeared to lack definition."

   Comment: This appeared to have been an early concern of the NRC that was subsequently closed through better understanding of the Startup Group Programs.

6. Paragraph 4 is ended by, "However, by the end of the assessment period, these concerns were receiving appropriate attention."

   Comment: Most items of concern were resolved through discussions with or better understanding of the Startup Group Programs by the NRC Inspectors. Few changes were made.

SUMMARY

The SALP suggests that "overall review and control activities are too narrowly focused on 'backend' activities" and that there should be "more licensee aggressiveness in self-identification of problems with 'frontend' activities." The NRC staff should be aware of numerous project initiatives which have been directed specifically to the early identification and resolution of problems.

Configuration Control/Advance Change Notice Systems:

Project Procedure 2BVM-56A has been developed to obtain complete configuration control through management of design change; to provide to construction, inspection, and test personnel information sufficient to schedule implementation of changes; and to provide to test and operations personnel, documents which are current and reflective of as-built, as-tested conditions. The program utilizes an engineering checklist which requires that the engineer consider the impact of the change upon each discipline. Thus, interface with other disciplines are identified "up-front".

Piping Systems and Supports:

Examples of self initiated "frontend" engineering activities which were directed towards concerns related to catalog hanger components included: i) testing of clamp anchors to evaluate the localized effect of the clamping action , ii) oversized clamp holes were identified and a program was established to test and evaluate the condition, and iii) cracked spherical bearings were also identified as a potential problem and a program has been implemented to examine the installed condition.

Pre-Cable Pull Walkdown:

The entire routing of installed raceway for planned cable pulls is walked prior to the issuance of cable pull tickets to craftsmen. This step supplements the documentation research in identifying and correcting any deficient conditions prior to initiating the cable pull.

Raceway Installation Support Program (RISP):

The RISP personnel are located in the buildings. They interface directly with the craft to resolve interferences and questions related to conduit installation. In addition, the RISP reviews conduit drawings for possible problems.

Dry-Fit Programs:

Instrument tubing is fit up in the "dry" condition. Thus, field interferences are identified and corrected prior to permanent installation.

Field Investigation of New Design (FIND):

Field personnel walkdown newly issued design drawings. This group was utilized for both mechanical and electrical installations. The group identifies potential field problems with the drawings and resolves these problems.

Start-Up Support Group (SUSG):

These engineers have the responsiblity of providing engineering support to the DLC/SUG construction proof testing and Pre-Op/SOV testing programs. Working with the DLC/SUG test and system engineers, SWEC-SUSG provides engineering direction and works with the SEG in reviewing and resolving DLC/SUG test program concerns. Once the testing priorities are established, the SUSG will initiate or follow through with the SEG on all issues which require engineering support or action.

Quality Improvement Management Programs:

Under the QIMP, installation inspection results are closely reviewed to recognize the factors consistently contributing to inspection "unsats" and implementing appropriate corrective measure to improve the inspection acceptance of installations.

Since the program initiation, significant improvement has been attained in the final inspection acceptance of pipe and instrumentation raceways and terminations.

Also, under this program compliance with the Rework Control Procedure is closely monitored. Any adverse trends are addressed at the Construction Supervisor level for appropriate correction, including termination of workers found disregarding the control procedural requirements.

In Conclusion

We are generally pleased with the SALP Board's assessment of our performance and have discussed with site personnel your observations which would be of benefit to the overall excellence of project activities.

DUQUESNE LIGHT COMPANY

By J. J. Carey

J. J. Carey
Vice President

RJW/ijr

cc: Mr. P. Tam, NRC Project Manager
Mr. W. Troskoski, NRC Senior Resident Inspector
Mr. L. Prividy, NRC Resident Inspector
NRC Document Control Desk