AUG 2 1 1984

Docket Nos. 50-334; 50-412

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

Gentlemen:

Subject: Systematic Assessment of Licensee Performance (SALP) and Duquesne Light Company Letter dated June 29, 1984 (Report Nos. 50-334/84-13; 50-412/84-06)

This refers to the SALP for the Beaver Valley Power Station, Units 1 and 2, conducted by this office on May 14, 1984, and discussed with members of the Duquesne Light Company (DLC) staff at meetings on June 12, 1984. The lists of attendees at the meetings are attached as Enclosures 1 and 2. The NRC SALP Reports are attached as Enclosures 3 and 4 and contain evaluations of performance for the period December 1, 1982 through March 31, 1984. Our letter dated May 18, 1984, which forwarded the SALP Board Reports, and your letter dated June 29, 1984, which described improvement actions and comments on these reports, are attached as Enclosures 5 and 6.

With regard to Unit 1, our overall assessment is that your performance was acceptable and was directed at assuring safe operation of the facility. Steady or improved performance was observed in each functional area, and we attribute this improvement to the continued senior management attention and involvement in activities at the plant.

With regard to Unit 2, we found that your overall performance in managing the design and construction of the plant has been only minimally satisfactory. Problems in the area of design and engineering continue to arise and are not dealt with promptly and decisively. Our experience in Region I has shown that it is essential for the licensee to have strong management involvement and control of design and construction activities, and we believe it is a lack of management control that has led to the problems described in this SALP Report. You outlined, in your June 29 letter, several actions you are taking to address performance weaknesses and to strengthen Duquesne Light Company control of the project. We believe that, if implemented successfully, these actions should preclude recurrence of the types of problems noted in the past. Nonetheless, we intend to increase the frequency of our discussions with you and Stone & Webster (S&W) to assure there is a mutual understanding of NRC concerns and that they are being addressed adequately.

Although your June 29 response did thoroughly address the issues contained within our SALP Report, successful implementation and completion of key DLC/S&W initiatives such as the RG 1.75 Action Plan, the efforts of the recently established constructability review group at the site, and the Engineering Confirmation Pro-

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gram are vital to assure satisfactory project construction completion so that the plant is licenseable. Therefore, we request DLC periodically inform this office of progress in these areas by written submittals and/or briefings. To that end, a meeting to discuss your progress in resolving such problems and improving performance in minimally satisfactory areas is tentatively planned for September, 1984 in the Region I office.

After reviewing your response letter, we have concluded that it is not necessary to modify or supplement our SALP Reports except for a typographical correction as listed in Enclosure 7. Accordingly, we are issuing the reports together with your response, lists of SALP meetings attendees, and our previous letter forwarding the SALP Reports to you. In accordance with 10 CFR 2.790(a), a copy of this letter and its enclosures will be placed in the NRC Public Document Room.

No reply to this letter is required. Your cooperation with us is appreciated.

Sincerely,

Original Signed By:

Thomas E. Murley
Regional Administrator

Enclosures:
1. SALP Management Meeting Attendees, Beaver Valley Unit 1

2. SALP Management Meeting Attendees, Beaver Valley Unit 2

3. NRC Systematic Assessment of Licensee Performance, Duquesne Light Company, Beaver Valley Power Station, Unit 1, 50-334/84-13, May 14, 1984

4. NRC Systematic Assessment of Licensee Performance, Duquesne Light Company, Beaver Valley Power Station, Unit 2, 50-412/84-06, May 14, 1984

5. NRC Letter, R. W. Starostecki to J. J. Carey, February 23, 1984

6. Duquesne Light Company Response Letter, J. J. Carey to R. W. Starostecki, June 29, 1984

7. SALP Board Errata Sheet for Report 50-412/84-06

cc w/encls:
F. Bissert, Manager, Nuclear Support Services
C. E. Ewing, QA Manager
W. S. Lacey, Station Superintendent
R. Druga, Chief Engineer
R. Martin, Nuclear Engineer
J. Sieber, Manager, Nuclear Safety and Licensing
T. D. Jones, Manager, Nuclear Operations
R. M. Mafrice, Nuclear Engineer
N. R. Tonet, Manager, Nuclear Engineering
M. Coppula, Superintendent of Technical Services
J. J. Carey, Vice President, Nuclear Group
R. J. Washabaugh, Project Manager
E. J. Kurtz, Jr., Manager, Regulatory Affairs
H. M. Siegel, Manager, Engineering
P. RaySircar, Stone and Webster Engineering Corporation
Public Document Room (PDR)
Local Public Document Room (LPDR)
Nuclear Safety Information Center (NSIC)
NRC Resident Inspector, Beaver Valley Unit 1
NRC Resident Inspector, Beaver Valley Unit 2
Commonwealth of Pennsylvania

bcc w/encls:
Region I Docket Room (with concurrences)
DPRP Section Chief
Senior Operations Officer (w/o encls)
SALP Management Meetings Attendees
K. Abraham (2 copies)
T. Murley, RI
T. Elsasser, RI

RI:DPRP	RI:DPRP	RI:DPRP	RI:DRA	RI:RA
for Tripp/meo	Wenzinger	Stanostecki	Allan	Murley
7/31/84	8/8/84	8/16/84	8/17	8/20
8/2				

ENCLOSURE 1

U.S. NUCLEAR REGULATORY COMMISSION

SALP MANAGEMENT MEETING ATTENDEES

Licensee: Duquesne Light Company
Post Office Box 4
Shippingport, Pennsylvania 15077

Facility: Beaver Valley Power Station, Unit 1

Meeting At: Shippingport, Pennsylvania

Meeting Conducted: June 12, 1984

1. Licensee Attendees

R. Balcerek, Technical Assistant to Vice President
J. Carey, Vice President, Nuclear Group
C. Ewing, Manager, Quality Assurance
T. Jones, General Manager, Nuclear Operations
W. Lacey, Station Superintendent, Beaver Valley, Unit 1
J. Sieber, General Manager, Nuclear Services Unit
J. Sasala, Public Information Department
R. Swiderski, Startup Manager
N. Tonet, General Manager, Nuclear Engineering and Construction
E. Woolever, Vice President, Nuclear Construction

2. NRC

D. Johnson, Resident Inspector, Beaver Valley, Unit 1
M. Ley, NRR Project Manager, Beaver Valley, Unit 2
T. Murley, Regional Administrator, Region I
R. Starostecki, Director, Division of Project and Resident Programs
P. Tam, NRR Project Manager, Beaver Valley, Unit 1
W. Troskoski, Senior Resident Inspector, Beaver Valley, Unit 1
L. Tripp, Chief, Projects Section 3A
S. Varga, Chief, Operating Reactors Branch No. 1, NRR

3. Other

D. Dean, Energy Consultants
C. Richardson, Engineering Manager, Stone and Webster Engineering Corporation

ENCLOSURE 2

U.S. NUCLEAR REGULATORY COMMISSION

SALP MANAGEMENT MEETING ATTENDEES

Licensee: Duquesne Light Company
P. O. Box 4
Shippingport, Pennsylvania 15077

Facility: Beaver Valley Power Station, Unit 2

Meeting At: Shippingport, Pennsylvania

Meeting Conducted: June 12, 1984

1. Licensee Attendees

L. Arch, Site Engineer
J. Bajuszik, Director, Construction Engineering
R. Balcerek, Technical Assistant to Vice President
G. Beatty, Lead Licensing Engineer
R. Caldwell, Instrument and Control Supervisor
J. Carey, Vice President, Nuclear Group
F. Cavalier, Manager, Project Controls
R. Coupland, Director of QC, Beaver Valley, Unit 2
C. Davis, Director of QA, Beaver Valley, Unit 2
C. Ewing, Manager of QA
S. Hall, Senior Project Engineer
E. Horvath, Site Engineer
J. Hultz, Construction Liaison
T. Jones, General Manager, Nuclear Operations
J. Konkus, Project Engineer
J. Sasala, Public Information Department
J. Sieber, General Manager, Nuclear Services Unit
H. Siegel, Engineering Manager, Beaver Valley, Unit 2
R. Swiderski, Startup Manager
N. Tonet, General Manager, Nuclear Engineering and Construction
R. Washabaugh, Project Manager, Beaver Valley, Unit 2
E. Woolever, Vice President, Nuclear Construction

2. NRC

D. Johnson, Resident Inspector, Beaver Valley, Unit 1
M. Ley, NRR Project Manager, Beaver Valley, Unit 2
T. Murley, Regional Administrator, Region I
R. Starostecki, Director, Division of Project and Resident Programs
P. Tam, NRR Project Manager, Beaver Valley, Unit 1
W. Troskoski, Senior Resident Inspector, Beaver Valley, Unit 1
L. Tripp, Chief, Project Section 3A
S. Varga, Chief, Operating Reactor Branch No. 1, NRR
G. Walton, Senior Resident Inspector, Beaver Valley, Unit 2

3. Other

C. Bishop, Construction Manager, Stone and Webster Engineering Corporation
W. Bohlke, Project Manager, Stone and Webster Engineering Corporation
D. Dean, Energy Consultant
B. Miller, Ohio Edison
P. RaySircar, Project Engineer, Stone and Webster Engineering Corporation
C. Richardson, Engineering Manager, Stone and Webster Engineering Corporation
A. Timme, Toledo Edison
P. Wild, Director of Engineering, Stone and Webster Engineering Corporation
J. Williams, Senior Construction Manager, Stone and Webster Engineering Corporation

Report No. 50-334/84-13

ENCLOSURE 3

U.S. NUCLEAR REGULATORY COMMISSION

REGION I

SYSTEMATIC ASSESSMENT OF LICENSEE PERFORMANCE

DUQUESNE LIGHT COMPANY

BEAVER VALLEY POWER STATION, UNIT 1

MAY 14, 1984

TABLE OF CONTENTS

TABLES

ATTACHMENTS

I. INTRODUCTION

1.1 Purpose and Overview

The Systematic Assessment of Licensee Performance (SALP) is an integrated NRC staff effort to collect the available observations on an annual 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 December 1, 1982 through March 31, 1984. The prior SALP assessment period was December 1, 1981 through November 30, 1982. Significant findings of this assessment are provided in the applicable Performance Analysis Functional Areas (Section IV).

Evaluation criteria used during this assessment are discussed in Section III. Each criterion was applied using the "Attributes for Assessment of Licensee Performance" contained in NRC Manual Chapter 0516.

1.2 SALP Board

R. Starostecki, Director, Division of Project and Resident Programs (DPRP)
T. Martin, Director, Division of Engineering and Technical Programs (DETP)
S. Varga, Chief, Operating Reactors Branch No. 1, NRR
L. Tripp, Chief, Reactor Projects Section 3A, DPRP
P. Tam, Licensing Project Manager, NRR
W. Troskoski, Senior Resident Inspector

Other Attendees

K. Murphy, Technical Assistant, DPRP
G. Meyer, Project Engineer, Reactor Projects Section 3A, DPRP
D. Johnson, Resident Inspector

1.3 Background

a. Licensee Activities

The plant had no major unplanned outages during the assessment period. It generally operated at power except for the following trips and shutdowns.

Three unrelated malfunctions from main switch yard relays resulted in a partial loss of offsite power (unusual events) on January 7 and 14, and May 28, 1983. The first and third events involved isolation of the No. 1, 138 KV supply through the 1A Station System Service Transformer to 4 KV buses, 1A and 1B. This power interruption caused reactor trips as the normal bus supply through the 1C

Unit System Service Transformer was out of service. The second event involved the temporary isolation of the No. 2, 138 KV supply, and did not result in a power interruption to the 4 KV system.

A safety injection actuation due to low steam line pressure occurred while at power on February 12, 1983. A sweated fitting on the air supply line to the B main steam line trip valve failed, allowing actuator air to bleed off and the valve to close. The unusual event (ESF actuation) was terminated a short time later after the plant was stabilized.

The licensee shut down the plant on June 10, 1983, for a fourteen week refueling and modification outage, which included snubber modifications and inservice inspection and testing, replacement of control rod guide tube split pins, steam generator inspections, Emergency Response Facility tie-ins, and TMI related modifications.

During installation of the reactor upper internals package, new fuel assembly K-2 was damaged by a misaligned guide tube that crushed the RCCA spider nozzle. The misalignment was not identified during split pin QC checks and resulted in a partial core offload in order to inspect for damage. Reactor startup and low power physics testing began on September 23, 1983.

Throughout the assessment period, the reactor was manually shutdown or tripped ten additional times; one through an inadvertent manual safety injection on January 25, 1984. Several significant power reductions were undertaken by the licensee to repair main feedwater regulator valves and to correct secondary water chemistry problems caused by main condenser tube leaks.

b. Inspection Activities

One NRC Resident Inspector was assigned until October, 1983, at which time the incumbent was assigned as the Senior Resident Inspector. A second resident inspector was later assigned to the site on February, 1984. Total NRC inspection hours for the period was 2,851 hours (resident inspector and region-based), with a distribution in the assessment functional areas as shown on Table 3.

NRC inspection activities and violations issued during the period are tabulated in Tables 4 and 2, respectively. Specific enforcement data is presented in Attachment 1.

An NRC Emergency Preparedness Inspection was conducted during the licensee's annual emergency exercise held on February 16, 1983. The states of West Virginia, Pennsylvania, and Ohio participated.

II. SUMMARY OF RESULTS

FUNCTIONAL AREAS	BEAVER VALLEY POWER STATION, UNIT 1		
	CATEGORY 1	CATEGORY 2	CATEGORY 3
1. Plant Operations		X	
2. Radiological Controls Radiation Protection Radiation Waste Management Transportation Effluent Control & Monitoring	X		
3. Maintenance	X		
4. Surveillance (Including Inservice and Preoperational Testing)		X	
5. Fire Protection		X	
6. Emergency Preparedness	X		
7. Security and Safeguards	X		
8. Refueling/Outage Activities		X	
9. Licensing Activities	X		

Overall Summary

The overall safety performance of BVPS Unit 1 has continued to improve during this assessment period. For those safety problems that did occur, including an unplanned exposure of 1.7 Rem to an operator, an inoperable residual heat removal system and inoperable river water subsystem, corrective actions undertaken by the licensee were unusually prompt, thorough, and technically sound. They should prevent recurrence. This was due in large part to the onsite presence and involvement of Corporate level management in plant operations.

Increased emphasis on procedure adherence and control of shift turnover activities during the assessment period should be effective in improving future performance. Continued attention to operating detail and conduct of operations from the Control Room is still needed to achieve sustained high level performance. Current management programs that are planned or already in place are expected to contribute to this goal.

During the past year, foreman and engineering staffing levels have increased enabling a better distribution of the work load. The number of licensed reactor operators and senior reactor operators have increased significantly alleviating

previous serious shortages. In-plant implementation for fire protection controls improved over that noted in the last assessment period. Improvements were also noted in the licensee's emergency response capabilities. Continuing strong performance was observed in the licensing and security functional areas.

III. CRITERIA

The following evaluation criteria were applied to each functional area:

1. Management involvement in 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 effectiveness and qualification.

To provide consistent evaluation of licensee performance, attributes associated with each criterion and describing the characteristics applicable to Category 1, 2, and 3 performance were applied as discussed in NRC Manual Chapter 0516, Part II and Table 1.

The SALP Board conclusions were categorized as follows:

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 such 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 are reasonably effective such 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 appeared strained or not effectively used such that minimally satisfactory performance with respect to operational safety or construction is being achieved.

IV. PERFORMANCE ANALYSIS

4.1 Plant Operations (41%)

Continuous coverage by the resident inspector, with periodic assistance from a region-based project engineer and four inspections by region-based specialists, provide the basis for this analysis. Functional activities inspected were: compliance with license, technical specifications, and procedure requirements; facility modifications and start-up testing of NUREG-0737 TMI Action Plan Items; refueling activities; Quality Assurance and Quality Control; IE Bulletin Followup; licensed and non-licensed training.

General operating performance improved during the assessment period, especially after the September, 1983 events involving an inoperable residual heat removal system and an inoperable river water system. This is due in a large part to the commitment and onsite presence of corporate management. The licensee is successfully fostering a good attitude toward safety at all levels of the operations staff which should result in further improvement through the next assessment period.

Present management involvement in plant operations is strong. Identified problem areas receive appropriate attention and follow through. Resolutions are thorough and technically sound as evidenced by the in-depth corrective actions undertaken in response to the September, 1983 events. The licensee has demonstrated good initiative and resolve to prevent recurrence of similar events. Shift turnover procedures are unusually comprehensive and thorough.

Continued management attention toward conduct of operations from the Control Room is necessary. Prior to and during the third refueling outage, the Control Room was cluttered and often excessively noisy due, in part, to the amount of work and number of people present. This condition detracted from the atmosphere needed to carry out operational activities in an orderly, disciplined and safe manner, and partially contributed to the two events of September, 1983, that resulted in an Enforcement Conference (50-334/83-27) and subsequent Level III Violation (no CP). First line supervision must receive continued encouragement to exercise firm control over the conduct of operations in the Control Room. Also, methods to identify and direct unnecessary congestion during periods of high activity must receive further consideration.

During 1983, 11 new reactor operator and 12 senior reactor operator licenses were obtained, alleviating the previous assessment concerns over the ability of the licensee to meet training commitments while meeting NRC guidelines on shift overtime. However, this led to the identification of two weaknesses in the training program for licensed operators.

The first item was identified as a common link in the Severity Level III problems. Prior to assuming duties, newly licensed personnel did not adequately understand their responsibilities and authorities in regard

to the conduct of operations. In the past, the practice of placing a new individual on an experienced shift crew had been adequate in providing on-the-job training. However, this informal system did not function adequately when several new operators were placed on the same shift, and were expected to coordinate their activities with minimal guidance. The second problem, identified by an NRC License Examiner, concerned on-the-job training. Personnel assigned to a shift for such training prior to taking an NRC license exam, did not actively participate in operational activities. These two areas indicate that better communication between the Operations and Training departments is needed to assure each understands and carries out its assigned role in qualifying new licensed operators.

Attention to operating detail needs further improvement. Personnel errors led to an inadvertent manual safety injection, interruption of an offsite power source, an SI accumulator fill line containment isolation valve being left open after use, and an inoperable river water pump due to improper circuit breaker racking. In separate events, supervisory inattention to basic plant conditions allowed an inoperable residual heat removal system and river water subsystem to each go undetected for two shifts prior to discovery by outside sources. Station management is addressing this problem by implementation of a progressive discipline program to hold personnel accountable for their individual performance.

The licensee has a good problem identification system in place. Reportable and non-reportable events receive reviews by appropriate plant groups. Corrective actions have been well implemented. Over the past two assessment periods, the number of repetitive or causually linked events continued to trend down. NRC/AEOD review of LERs for informational content and compliance with reporting criteria identified no significant deficiencies.

Licensee response to NRC initiatives is generally timely, technically sound and reasonable. The previous SALP identified a concern over personnel deviating from approved procedures. Aggressive management involvement in disseminating procedure adherence requirements has been effective in reducing this problem. Other examples of licensee responsiveness to NRC initiatives include review of the post trip procedures, testing and valving in the reactor head vent system prior to the date required (fourth refueling outage), and prompt actions on numerous inspector concerns during the assessment period.

The Duquesne Light Company is currently in the midst of planning a company-wide reorganization with the objective of running with a leaner, more efficient management organization. The reorganization would gradually take effect through 1984 and would bring all responsibility for the Beaver Valley Power Station, Units 1 and 2 under a single Vice President, while reducing the number of managers reporting to him. Because of the planned continued corporate presence on site, no deletion of management oversight capability is expected.

Licensee performance in the area of committees improved during this assessment period. Committee and sub-committee interfaces and the manner of accomplishing their respective tasks have recently been clearly delineated in much improved administrative procedures. Both the Onsite (OSC) and Offsite (ORC) committees are composed of members with excellent qualifications. Management involvement and control in assuring quality through the Onsite and Offsite Review committees is evident. This is especially evident by the quality of the technical reviews performed by the various ORC sub-committees. Solutions and proposed actions are in keeping with a good safety philosophy.

Conclusion

Category 2

Board Recommendations

Continue normal inspection coverage. See board recommendation in Section 4.8, Refueling.

4.2 Radiological Controls (16%)

Resident inspector review of on-going radiological control activities and eight inspections by region-based specialists, includuing one special inspection, form the basis of this assessment. One report of a receipt inspection by a state representative at a disposal site was received for in-office review and appropriate action. Program areas examined included radiation protection, radioactive waste management, effluent monitoring and control, and transportation. Three violations were identified.

As in the previous SALP, the Radcon Department continued to perform well in meeting various radiation protection program requirements. Personnel are aggressively involved with all aspects of plant operational activities that could impact radiological conditions. No violations indicative of a programmatic problem or trends that are adverse to safety occurred. This is indicative of the continued high level of importance that DLC attaches to radiological safety.

One Level III violation was issued when an operator received an unplanned 1.7 Rem exposure while working in solid waste. This was caused by the failure of a radcon technician to perform a pre-job survey and provide meter coverage of the job in a posted high radiation area, as required by established procedures. Management recognition of the potential hazards was evident by the immediate notification to the resident inspector, and the unusually prompt and rigorous corrective actions taken to prevent recurrence.

The responsibilities and authorities of the various positions in the radcon organization are well defined in the Radiological Controls Manual. In turn, these positions are staffed with individuals who have received good initial training, and meet established qualification criteria. This includes the contracted radiation protection personnel used to augment the station organization during outages. Formalization of the contractor training program and inclusion of new and revised procedures in the existing training format are underway. This is evidence of a willingness on the licensee's part to commit the resources necessary to assure that well qualified personnel are available to carry out program requirements.

Corrective action systems related to radiological concerns have functioned well. Actions in response to Quality Assurance audits, operational events and NRC concerns are taken in a timely manner with acceptable resolution. This is evidenced by the ongoing evaluation of the effluent ventilation monitoring system due to be completed by December 31, 1984. As a result, only four NRC identified open items remain unresolved.

The licensee's radiation protection facilities and equipment are adequate to support normal operations. Calibration and issuance of instrumentation is adequately controlled. Posting and access control of radiation and high radiation areas and control of radioactive and contaminated material was implemented per program requirements.

Through lessons learned from overexposure incidents at other facilities (such as in the reactor instrumentation pit) and past events at BVPS (unplanned operator exposure in solid waste), rigorous requirements have now been built into the radcon program to prevent similar events from occurring. This is typified by the full time assignment of a radcon foreman and technician to cover any work activities in the solid waste area. These actions effectively reduce the risk to personnel working in areas that have had a high incidence of events associated with them.

A comprehensive review of the licensee's As Low As Reasonably Achievable (ALARA) Program was performed. Major tasks were adequately planned and scheduled. Documentation of ALARA reviews indicated prior planning for steam generators, control rod drive split pin and snubber removal operations. With regard to routine man-rem tasks, ALARA reviews were generally timely, but criteria for performing on-job review and criteria for post-job reviews was not documented, and there is no effective measurement system to determine the degree of success of the ALARA program. Management pursued development of a corporate ALARA procedure by December 31, 1983, with full program implementation expected by September, 1984. This should result in further ALARA program improvements beyond the current acceptable level.

The licensee is implementing an effective radioactive waste management program. Requirements were developed and implemented, on schedule, to meet 10 CFR 61, Land Disposal of Radioactive Waste. Routine resident inspections of the liquid waste system identified no deficiencies and no unplanned releases occurred. BVPS effluent technical specifications were amended to bring them in line with the NRC's standard radiological effluent technical specifications. The transition was smooth and all requirements were rigorously adhered to.

The inspection conducted by the state representative in November, 1982, identified free-standing liquid in one drum of a shipment of seventy 55-gallon drums. NRC Region I issued a violation for the occurrence, and the licensee took adequate corrective action. There were no problems indicative of a programmatic breakdown in the transportation area. Routine resident inspections indicate that adequate resources are directed to this area.

An effective effluent monitoring and control program is being implemented at BVPS. No deficiencies were identified during resident inspections of ongoing activities or by a region-based specialist review of the program. Operations are conducted as prescribed.

Conclusion

Category 1

Board Recommendations

None.

4.3 Maintenance (3%)

Resident inspector observations of safety-related maintenance activities provide the basis for this assessment.

The previous assessment identified concerns attributed to personnel errors and procedure adherence. Strong management action in assuring the development and dissemination of plant policies in this area has been effective. The emphasis on assuring procedure compliance led to a reduction in the number of plant events attributed to maintenance personnel errors. There was only one inadvertent reactor trip during the past 16 month assessment period caused by technician error. No other reportable events or violations occurred. Resident inspector observations indicated that a high regard toward administrative and procedure requirements has developed.

The attitude of individual mechanics and technicians toward safety is good. The licensee has instituted a systems training program for non-licensed personnel that should provide the dual benefits of reinforcing an overall positive safety attitude and of further reducing the likelyhood of personnel error.

Currently, there is no backlog in the preventive maintenance program. The number of outstanding corrective maintenance work requests remains at about the same moderate level as last year, with adequate resources allocated to the high priority items. This indicates that an adequate staffing level of mechanics, foreman and engineers is being maintained. Future demands for experienced personnel to support Unit 2 startup efforts are not expected to have an adverse impact during the next assessment period.

The quality and level of detail contained in both the corrective (CMP) and preventive (PMP) maintenance procedures is good. Activities are well controlled and new procedures are developed as needed. Operational experience is routinely factored into the preventive maintenance program as part of DLC's corrective action system to identify causally linked component failures. PMPs are scheduled and tracked by a computerized system.

Quality Control involvement in the maintenance program is also good. QC routinely reviews all maintenance work requests, PMPs and CMPs. All safety related maintenance activities receive some level of independent QC review and/or field inspection, including verification of procedure adherence.

During the past assessment period, the licensee consistently demonstrated adequate prior planning and good control of all maintenance activities. Events that occur at other facilities, such as the Salem reactor trip breaker failures, have received prompt attention that preceeded utility notification by the NRC. For long term improvement, the licensee ac-

tively participates with industrial groups to upgrade their program with identified good maintenance practices. No programmatic weaknesses are evident. The conduct of the maintenance program at BVPS has become a strong point.

Conclusion

Category 1

Board Recommendation

Reduce routine inspection coverage. Monitor effect of impending QC organizational changes.

4.4 Surveillance (12%)

The analysis of this functional area is based on four inspections performed by region-based specialists and routine observations by the resident inspector. Activities covered in those inspections included: refueling startup testing, calibration, inservice inspection (ISI) and testing (IST) programs, surveillance program control and test implementation.

The overall surveillance program remained sound throughout the assessment period. Management is strongly involved in correcting identified deficiencies and in taking prudent actions to ensure that all commitments are adequately addressed in their program.

In recognition of several NRC identified concerns related to technical specification surveillance test scheduling, the content of the procedures used to implement those tests, and the adverse experiences of other licensees in this area, an in-depth program was instituted to review all surveillance requirements and identify applicable procedures in matrix form. This matrix will then be updated as amendments are issued. The program is expected to be complete by mid-1984, and should provide the basis for simplifying the current test program by removing redundant test requirements and providing a verification that all revisions to the BVPS Technical Specifications are addressed in appropriate procedures or logs. This detailed review demonstrates a commitment by the licensee to assure that thorough, technically sound solutions are imposed for potential problems, and should result in excellent program schedule control.

Problems were encountered in scheduling non-routine tests needed to meet such off-normal requirements as special refueling mode tests and increased ASME Section IX tests of pumps and valves. The cause was due to poor indoctrination of the Shift Technical Advisory personnel appointed to serve as the surveillance scheduling coordinator. To effectively correct the situation, an experienced senior reactor operator was appointed to the position. No further difficulties have since been encountered.

Management oversight and control of the ISI and IST program was found to be weak. Administrative controls were not developed to explicitly define the responsibilities and authorities necessary to effectively implement these programs. This resulted in the 10 year ISI Program documents not being distributed in a controlled manner, nor reviewed or approved by authorized personnel. Additionally, the IST program did not always identify and appropriately implement those relief requests that were granted, modified or denied by the NRC. Increased attention from corporate management was directed to this area.

Past QA involvement in auditing surveillance activities has not been effective in either identifying the depth of the above problems or in expeditiously resolving them. Ample evidence existed in past audits that should have indicated a more detailed review of the areas was warranted.

The previous SALP identified a weakness in implementing approved surveillance procedures. In particular, initial conditions necessary to perform surveillance tests were not always being met. Strong, direct management involvement was successful in correcting this deficiency. Overall procedure adherence is now good.

During this assessment period, several problems were encountered concerning the adequacy of some surveillance procedures. Refueling frequency tests lacked guidance for restoring normal system alignments, which contributed to the Level III Violation issued for the September, 1983 events. ESF loss-of-power relay test procedures lacked steps to positively assure compliance with technical specification action statements. Also, some ECCS valves were not stroke tested on the frequency specified by either the technical specifications or IST program. Each violation was promptly corrected. Comprehensive procedure reviews by the licensee have not indicated that the adequacy of surveillance procedures is a generic problem.

Other than the above problems, the surveillance test procedures, including those used for Cycle 4 startup physics testing, were generally well written, and continued to improve through the normal review process. Test data received adequate review from knowledgeable personnel. The testing program is successful in identifying component problems, both individual failures and long term component degradation, which, in turn, receive appropriate attention.

The overall performance in this area is similar to the previous SALP assessment; however, actions taken in response to the above problems should be effective in addressing them. No other programmatic problems are evident and mechanisms are currently in place to improve performance.

Conclusion

Category 2

Board Recommendation

Continue normal inspection coverage.

4.5 Fire Protection and Housekeeping (4%)

This assessment is based on one region-based inspection and routine resident inspector tours of the plant.

During the current assessment period, the licensee continued to implement the corrective actions initiated at the end of the previous SALP period. The majority of these corrective actions are already completed, and the remainder are either in progress, or are scheduled to be completed shortly. The two full-time fire protection engineers are actively involved in the followup of these actions on an on-going basis. Final implementation should improve the plant's fire protection and safety features during the next assessment period.

Licensee actions in improving or maintaining other aspects of the plant overall fire protection posture were noted in the following areas: strong management involvment and support for the fire protection effort by devoting considerable resources for upgrading or maintaining fire protection equipment and facilities; improvements in administrative controls by way of timely revision and updating of fire protection implementing procedures to reflect current status of equipment and facility; fire protection engineers' involvement in day-to-day fire protection activities including reviewing plant procedures and modifications affecting fire protection; tracking and timely performance of maintenance and surveillance tests of fire protection equipment; generally complete and thorough annual, biennial and triennial quality assurance audits as required by Technical Specifications; generally complete and well maintained fire protection records; accurate and timely reporting of events; adequate staffing and training; good understanding and resolution of fire protection issues from a safety standpoint; and progress made in complying with NRR Branch Technical Position 9.5-1 and 10 CFR 50 Appendix R.

The licensee continued to maintain emphasis on good general plant cleanliness and appearance during the assessment period. During the third refueling outage, housekeeping and tool control were maintained at acceptable levels inside containment and around the spent fuel pool. The licensee also adopted a good practice of identifying equipment that could be left inside containment prior to establishing containment integrity. When the outage was concluded, additional effort was directed toward returning plant housekeeping to normal. Appropriate concern over the impact that housekeeping practices could have on safety related equipment is evident in the river water intake structure, where Unit 2 tie-in work is underway. Construction activities are closely monitored to maintain acceptable conditions for Unit 1 equipment. These actions demonstrate an understanding of the necessity to closely monitor and maintain plant cleanliness conditions that could impact safety.

Conclusion

Category 2

Board Recommendation

None.

4.6 Emergency Preparedness (12%)

This assessment is based upon one NRC team inspection of the full scale emergency exercise conducted on February 16, 1983, two routine inspections by region-based specialists and routine observations by the resident inspector.

As a result of the exercise, the licensee demonstrated that within the limitations of the exercise scenario, their emergency response capabilities would provide adequate protection of public health and safety. In addition, the licensee's emergency response organization demonstrated acceptable implementation of their Emergency Plan and Emergency Implementing Procedures. This is indicative of the high level of management involvement, adequate allocation of human resources and the dedication of the licensee's organization. Throughout the past year, all levels of the licensee's staff have received extensive training and participated in drills. Personnel are well versed in their responsibilities to fulfill specific functions within the Emergency Plan.

An emergency preparedness inspection conducted on July 25-28, 1983, verified installation of the Prompt Public Notification/Warning System. This system provides administrative and physical means for alerting and promptly instructing the public within the plume exposure pathway EPZ. A second emergency preparedness inspection conducted on January 31 - February 3, 1984, evaluated the emergency program. Additional hardware installation of pole mounted sirens and mini-sirens was verified to be complete in the counties of Pennsylvania, Ohio, and West Virginia. The new and upgraded emergency response facility was completed and required equipment for the EOF and TSC was installed. All related systems are scheduled to be fully functional by the fourth refueling outage. It was noted that appropriate emergency organization personnel had received training regarding the changes in location and equipment for the TSC and EOF. From these findings, it is evident that the licensee is continuing to strengthen their overall emergency preparedness program.

The licensee was responsive to NRC initiatives and acceptable resolutions were proposed and implemented on a timely basis. Specifically, the licensee had implemented the following:

- A lesson plan for eight hours of training on Emergency Action Levels including work shops and testing.

- A data system for tracking deficiencies observed during drills, audits, and the annual exercise including commitment items resulting from NRC inspections. These items cannot be closed until Nuclear Safety and Licensing has reviewed the documentation and concurred with the corrective measures.

- The Emergency Planning Group also has a data system for tracking the status of program improvement items identified during the performance of their job functions.

In summary, the licensee has dedicated sufficient management and hardware resources, and demonstrated the ability to perform effectively during an emergency event. No programmatic weaknesses or significant individual problems are evident.

Conclusion

Category 1

Board Recommendation

None.

4.7 Security and Safeguards (4%)

Two unannounced physical protection inspections were performed during the assessment period by region-based inspectors. Routine resident inspections continued throughout the assessment period. No violations were identified by these inspections. The licensee submitted one security event report pursuant to the requirements of 10 CFR 73.71 during the assessment period. The description of the event was clear and the corrective actions taken were adequate.

Licensee management resources were adequate and effective in administering the security program. Corporate management involvement in site activities was evident, as exhibited through the annual corporate security audit, diligent oversight of the daily records and activities of the contract security force, and improvement in various aspects of the security program. Audits were comprehensive and timely, and effective corrective actions were taken for audit findings.

Security management conducted a review of their various plans and submitted to NRC Region I an excellent consolidation of the Physical Security Plan, which included the Contingency Plan and the Training and Qualification Plan.

As evidence of management's awareness and prior planning, a larger and more efficient entry facility was provided as the primary site access point to alleviate overcrowding conditions. The improved facility enabled the licensee to close one of two other access portals. A complete new security radio system was installed in August, 1983, to enable the licensee to use additional portable radios, establish a base station and eliminate transmission dead spots on the site. The program was demonstrated during a major refueling and modification outage which was completed with no significant security problems. The security force contractor provided their supervisors with a 40-hour course in supervisory management with the expectation that it will enhance operation of the security program. A firearms range has been established that is closer to the site and features increased safety and improved facilities. A low 7.3% attrition rate is an indication of job satisfaction. Key licensee positions were identified and their duties and responsibilities are well defined. Good personnel stability, good morale, and a well defined and implemented security personnel training and qualification program contributed to a security program that improved during this reporting period.

Conclusion

Category 1

Board Recommendation

None.

4.8 Refueling and Modification (6%)

The assessment of this area is based on routine resident inspections conducted during the third refueling and modification outage (June 11 to September 22, 1983), and a one week maintenance outage (March 10, 1984).

The licensee exercised adequate management control over the modification work and refueling activities. Major undertakings includes inservice inspection of steam generators (and retrival of several loose parts on the secondary side), modification and testing of shock suppressors and snubbers, replacement of the control rod guide tube split pins, and emergency response center instrumentation tie-ins.

This was the first plant where the split pins were replaced using the Westinghouse supplied method. While replacing the core upper internals package, a new fuel assembly was damaged due to a misaligned guide tube. The misalignment occurred because quality control checks specified in the vendor's procedures were not adequate to always detect such a condition. A feeler gage checked only one position of the tube and a second check 180° from the first is necessary to assure alignment. The problem was self-identifying and not indicative of a programmatic breakdown. It received prompt attention from management and the Engineering Department. Technical solution, which included a second partial off-loading of the core and reshuffle of several assemblies to replace the damaged one was sound and timely.

Control of contractor personnel was generally adequate throughout the refueling outage. Problems that did occur included work on an uncleared emergency electrical bus, misidentification and attempted removal of an expansion joint on the river water header which was required to be operable, and incorrect use of maintenance surveillance procedures. Each event involved unrelated errors by personnel from the Construction Department (CDN). In each case, CDN Management became quickly involved in assessing the cause, implementing corrective action and insuring that all craft personnel were aware of plant policies and requirements. Measures taken to ensure that proper electrical clearances were in place prior to performing work under applicable design packages were effective in preventing any recurrences. Corrective actions for the other two unrelated events were also appropriate. Throughout the outage, NRC concerns were promptly addressed by CDN.

Coordination of outage activities among work groups continued to be satisfactory. Identification and control over systems and equipment removed from service for maintenance and testing was good during the refueling outage. Administrative controls were understood and followed by the responsible personnel.

During the March, 1984 maintenance outage at the end of the assessment period, the licensee experienced two problems with potential safety significance to personnel. The first resulted from the misidentification

of a leaking flange in the reactor coolant system and subsequent attempt to perform maintenance on a pressurized 3" line. Though the flange was not broken, a serious potential for personnel injury and an unisolable primary coolant leak existed. The second problem concerned industrial safety for work inside a subatmospheric containment. After a minor personnel contamination incident, all personnel entering containment were required to wear plastic suits in addition to chem-ox packs (devices used to increase the available oxygen to the lungs). This resulted in several people suffering heat exhaustion. In both instances, the potential consequences were immediately recognized by the licensee as evidenced by the level and depth of management involvement in the ongoing investigation of the events. This demonstrates that high level management is close to, and involved with plant operations.

Conclusion

Category 2

Board Recommendation

Perform inspection of Safety Parameter Display System and Appendix R acitivites now and during the fourth refueling outage.

4.9 Licensing Activities (2%)*

This assessment was based on input from NRR personnel who have had substantial contact and involvement with licensing personnel at Beaver Valley, Unit 1, and from Region I personnel who have been assigned various licensing actions.

The licensing program is well managed. The staff consistently demonstrates a willingness to work with NRC on significant activities in a constructive manner. Responsiveness in all aspects of licensing is impressive, and it is obvious that management capability is strong.

Throughout the year, there has been no need for the staff to issue Technical Specification amendments under emergency conditions. Only a few licensing actions necessitated direct management input through meetings and telephone calls. From these experiences, it is evident that decisions were promptly made at an appropriate level and that prior planning and assignment of priorities was effective in ensuring that licensing activities are addressed in a timely manner.

The overall technical competence of the licensee staff in dealing with licensing issues is good. Sound technical bases and conservatism are generally provided to support the licensee's positions. These attributes were demonstrated in response to the actions on the rod position indication, N-1 loop operation and NUREG-0737 TMI required Technical Specification changes. In particular, items submitted to the Region for action have been completed ahead of schedule and without a need for additional information. For other actions, responses were always on time and advance notice was invariably provided to the project manager.

The licensee is aggressive in pursuing the closeout of open issues and in maintaining constant open dialogue with the NRC project manager. Verbal commitments were always ahdered to and followed up in writing, as underscored by placement of the reactor head vent system in operation in advance of the date approved by the staff.

The licensing organization, under the Superintendent of Licensing, is well staffed with qualified technical personnel who have an adequate understanding of the regulatory requirements and technical issues. The licensee further supplements its licensing capability by active participation in various nuclear industry groups and committees.

In summation, the licensee continued to demonstrate the same high level of performance in this functional area as they did during the last assessment.

*This percentage refers to man-hour expenditure by Region I personnel only. The evaluation of Licensing Activities is primarily based on observations by NRR personnel.

Conclusion

Category 1

Board Recommendation

None.

V. SUPPORTING DATA AND SUMMARIES

5.1 Licensee Event Reports

Tabular Listing

A.	Personnel Error	8
B.	Design/Mfg/Constr/Install	6
C.	External Cause	1
D.	Defective Procedures	3
E.	Component Failures	21
X.	Other	8
	TOTAL	47

Licensee Event Reports Reviewed

Unit 1: Reports 82-59 through 84-02 (83-21 was cancelled).

Causal Analysis

Four sets of causally-linked events were identified.

-- 4 LERs (82-59, 83-14, 83-18, and 83-36) involved missed surveillance testing of pumps and valves. Two events resulted from improper test scheduling, and two from inadequate surveillance procedures that omitted several valves.

-- 4 LERs (82-61, 83-27, 83-33, and 84-02) were caused by operator error. Each involved failure to follow established procedures.

-- 3 LERs (83-12, 83-24, and 83-41) concerned ongoing reliability problems with the core subcooling monitor.

-- 6 LERs (83-02, 83-04, 83-15, 83-16, 83-20, and 83-27) were the result of interruption of normal power. Four events concerned a partial loss of offsite power (1 of 2 sources), while the other two challenged an emergency diesel generator. Personnel error was responsible for three of the above events and unrelated relay failures caused the other three.

5.2 Investigation Activities

None.

5.3 Escalated Enforcement Actions

3.1 Civil Penalties

None.

3.2 Orders

None.

3.3 Confirmatory Action Letters

None.

5.4 Management Conferences

(Enforcement Conferences, SALP Meetings, etc.)

SALP Cycle III Management Meeting at Beaver Valley Power Station on February 15, 1983.

Enforcement Conference at NRC Region I Office, September 1, 1983, regarding a special radiation protection inspection.

Enforcement Conference at NRC Region I Office, October 11, 1983, regarding plant operations.

TABLE 1

TABULAR LISTING OF LERs BY FUNCTIONAL AREA

BEAVER VALLEY POWER STATION - UNIT 1

	Area	Number/Cause Code					Total
1.	Plant Operations	2/A	3/B	1/C	10/E	3/X	19
2.	Radiological Controls					1/X	1
3.	Maintenance				1/E		1
4.	Surveillance	5/A	2/B	2/D	10/E	4/X	23
5.	Fire Protection		1/B	1/D			2
6.	Emergency Preparedness						
7.	Security and Safeguards						
8.	Refueling	1/A					1
9.	Licensing Activities						
						TOTAL	47

Cause Codes:

A - Personnel Error

B - Design, Manufacturing, Construction, or Installation Error

C - External Cause

D - Defective Procedures

E - Component Failure

X - Other

TABLE 2

VIOLATION (12/1/82 - 3/31/84)

BEAVER VALLEY POWER STATION - UNIT 1

A. Number and Severity Level of Violations

Deviations	0
Severity Level I	0
Severity Level II	0
Severity Level III	2
Severity Level IV	8
Severity Level V	2
TOTAL	12

B. Violations Vs. Functional Area

FUNCTIONAL AREAS	Severity Levels I	II	III	IV	V
1. Plant Operations			1	1	1
2. Radiological Controls			1	1	
3. Maintenance					
4. Surveillance				5	
5. Fire Protection					
6. Emergency Preparedness					
7. Security and Safeguards					
8. Refueling				1	1
9. Licensing Activities					

TABLE 3

BEAVER VALLEY POWER STATION - UNIT 1

INSPECTION HOURS SUMMARY

December 1, 1982 - March 31, 1984

		Hours	% of Time
1.	Plant Operations	1154	41
2.	Radiological Controls	460	16
3.	Maintenance	95	3
4.	Surveillance	349	12
5.	Fire Protection	110	4
6.	Emergency Preparedness	329	12
7.	Security and Safeguards	122	4
8.	Refueling/Outage Activities	180	6
9.	Licensing	52*	2
	TOTAL	2851	100.0

*This refers to inspection of licensing activities performed by Region I personnel only. Time expended by Headquarters personnel on licensing matters are not included here.

TABLE 4

INSPECTION REPORT ACTIVITIES

BEAVER VALLEY POWER STATION - UNIT 1

REPORT	INSPECTOR	AREAS INSPECTED
82-29	Resident	Routine
82-31	Specialist	Radioactive Waste - Confirmatory Measurements
83-01	Resident	Routine
83-02	Specialist	Waste Burial
83-03	Specialist	Emergency Preparedness
83-04	Resident	Routine
83-05	Specialist	Health Physics
83-06	Specialist	Environmental
83-07	Resident	Routine
83-08	Resident	Routine
83-09	Specialist	Security and Safeguards
83-10	Resident	Routine
83-11	Specialist	Health Physics
83-12	Resident	Routine
83-13	Specialist	Health Physics
83-14	Resident	Routine
83-15	Specialist	Emergency Preparedness Inspection
83-16	Specialist	Health Physics Event Followup
83-17	Specialist	Health Physics
83-18	Specialist	Quality Assurance/Quality Control

REPORT	INSPECTOR	AREAS INSPECTED
83-19	Resident	Routine
83-20	Resident	Routine
83-21	Specialist	IE Bulletin Followup
83-22	Specialist	Security and Safeguards
83-23	Resident	Special Event Followup
83-24	Specialist	Startup Testing
83-25	Resident	Routine
83-26	Specialist	Fire Protection
83-27	Resident	Enforcement Conference
83-28	Specialist	Training
83-29	Resident	Routine
83-30	Specialist	Health Physics
83-31	Specialist	Quality Assurance
84-01	Resident	Routine
84-02	Specialist	Inservice Inspection Program
84-03	Specialist	Emergency Preparedness
84-04	Resident	Routine
84-05	Specialist	Non-Radiological Chemistry
84-06	Specialist	Inservice Testing Program
84-07	Specialist	Surveillance and Calibration
84-08	Resident	Routine

ATTACHMENT 1

ENFORCEMENT DATA
BEAVER VALLEY POWER STATION - UNIT 1
DECEMBER 1, 1982 - MARCH 31, 1984

Inspection Number	Date	Subject	Req.	Sev.	Area
83-02	2/18/83	Transfer of by-product material in a form the recipient was not authorized to receive.	10 CFR 30.41	IV	2
83-07	4/20/83	Failure to provide supplemental LER information.	TS	V	1
		Failure to use an approved procedure for inspection of new fuel assemblies.	TS	V	8
83-08	5/23/83	Failure to demonstrate ECCS valve operability within the specified surveillance interval.	TS	IV	4
83-14	8/23/83	Failure to obtain equipment clearance prior to removing the A river water header from service.	TS	IV	8
83-16	8/19/83	Failure to conduct a survey of radiological conditions in a high radiation area.	TS	III	2
83-23 (19)	10/3/83	Failure to follow administrative and managerial controls specified by TS 6.8.1 and Reg Guide 1.33.	TS	III	1
83-27	10/11/83	Enforcement Conference to discuss the inoperable RHR system and an inoperable river water pump while the reactor was in Mode 3. (Inspection Nos. 83-19 and 83-23.)			
83-29	1/16/84	Failure to perform ISI required stroke tests of selected valves.	TS	IV	4
		Failure of ESF relay surveillance test to specify limiting conditions.	TS	IV	4
84-01	2/14/84	River water pump inoperable due to failure to follow procedure for racking 4 KV breakers.	TS	IV	1

Inspection Number	Date	Subject	Req.	Sev.	Area
84-02	3/13/84	Failure to control the Ten Year In-service Inspection Plan.	TS	IV	4
84-06	2/17/84	Failure to control certain aspects of the Inservice Testing Program.	TS	IV	4

Report No. 50-412/84-06

ENCLOSURE 4

U.S. NUCLEAR REGULATORY COMMISSION

REGION I

SYSTEMATIC ASSESSMENT OF LICENSEE PERFORMANCE

DUQUESNE LIGHT COMPANY

BEAVER VALLEY POWER STATION UNIT 2

(Construction Phase)

MAY 14, 1984

TABLE OF CONTENTS

TABLES

ATTACHMENT

I. INTRODUCTION

1.1 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 December 1, 1982 through March 31, 1984. The prior assessment period was December 1, 1981 through November 30, 1982. 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 III below. Each criterion was applied using the "Attributes for Assessment of Licensee Performance," contained in the NRC Manual Chapter 0516.

1.2 SALP Board and Attendees:

Review Board Members

R. Starostecki, Director, Division of Project and Resident Programs (DPRP)
T. Martin (part time), Director, Division of Engineering and Technical Programs (DETP)
S. Ebneter (part time), Chief, Engineering Programs Branch, DETP
S. Varga, Chief, Operating Reactors Branch No. 1, NRR
L. Tripp, Chief, Reactor Projects Section 3A, DPRP
G. Walton, Senior Resident Inspector, Beaver Valley, Unit 2
M. Ley, Licensing Project Manager, NRR

Other Attendees

K. Murphy, Technical Assistant, DPRP
W. Troskoski, Senior Resident Inspector, Beaver Valley, Unit 1
G. Meyer, Project Engineer, Reactor Projects Section 3A, DPRP
D. Johnson, Resident Inspector, Beaver Valley, Unit 1

1.3 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 NSS is a 2660 MWt Westinghouse PWR with three loops. At the end of this assessment period, the fuel load date was scheduled for December, 1985 and the commercial operation date was May, 1986. On April 2, 1984, the licensee revised the estimated commercial operation date until approximately the end of 1986. Stone and Webster Engineering estimated

the construction at 77.5 percent complete as of March 27, 1984, as compared to 63.3 percent complete as of the end of the last assessment period (November 30, 1982).

a. Licensee Activities

Activity increased throughout the assessment period with the craft work force increasing from approximately 1800 on November 30, 1982, to 2412 on March 31, 1984. Second shift activity was increased from 193 on November 30, 1982, to 423 on March 31, 1984. Third shift has a minimal amount of work activities with 24 assigned people. Weekend activity has increased with an average of 1746 manual and non-manual people working on Saturdays. Sundays have minimal activity. The licensee increased manpower in the site Quality Control Department by 85 percent. Since the last assessment period, Stone and Webster supervisory, engineering and administrative personnel onsite have increased 41 percent to 485 people. There has also been an increase in other contractors' management and drafting personnel.

Some safety related equipment has been turned over to Duquesne Light Company Construction Start-Up Group. This includes the storage batteries in two battery rooms, six electrical panels, isolation cabinets and 480 volt Bus 2 G with associated equipment which have been completed.

The service water system was the first piping system scheduled for turnover to the DLC Construction Start-Up Group. The planned turnover of this system during the period of January - February, 1984, did not occur by the end of the assessment period. The contractor was still performing some of the activities necessary for a turnover. Hydrostatic testing was completed, and witnessed by the NRC on portions of this system. Other hydrostatic tests are scheduled in the near future on this system and others, and must be completed before turnover occurs.

During this assessment period, the major construction activities included installation, welding and testing of the primary coolant piping, main steam, feedwater piping, large and small bore piping and associated supports; HVAC systems were installed; pumps, motors, control panels and storage batteries were set. Electrical cable trays were installed, cable was pulled and terminated. Painting occurred throughout the site on piping, walls, floors, ceiling and other items.

In summary, the construction of Beaver Valley, Unit 2, is entering the phase of system checks and turnovers, with construction approximately 78 percent complete. The construction work of some of the contractors discussed in this SALP and in the last SALP report is virtually completed. The containment contractor, Pittsburgh Des

Moines, the structural contractor, Dick Corporation and the tank contractor, Richmond Engineering Company, although still on site, have completed the majority of their work on safety related items. Most of the concrete work is also completed. A significant amount of work is still to be performed on pipe supports, electrical cable pulling and terminations. Installation of instrumentation and associated supports is presently in progress. As construction on each system is completed and turned over to DLC, the licensee will be taking a more active role in the site activities. The NRC has observed the licensee's organizational structure and personnel buildup in this area and recently performed a preliminary inspection of turnover and startup activities.

b. Inspection Activities

Resident inspector activities involved accomplishment of assigned inspection requirements including observation of work in progress, followup of licensee events, reactive inspection and evaluation of licensee responses to NRC identified concerns. In addition, the resident inspector participated in a Construction Team Inspection (CTI) conducted by NRC Region I.

Twenty inspections were performed during the assessment period; nine independently by the senior resident inspector, two jointly by the senior resident inspector and region-based specialist inspectors, and nine by region-based specialist inspectors. Sixty-five percent of the inspection coverage was performed by the resident inspector. The other thirty-five percent was performed by region-based specialist inspectors. The specialist inspection activities were in the following areas: electrical, instrumentation, welding, cable trays and conduit, quality assurance, design control, equipment storage, environmental protection program, drawing control, and record reviews of construction activities.

c. Licensing Activities

Licensing activity increased during the assessment period. The licensee issued the Final Safety Analysis Report (FSAR) on January 26, 1983. Five amendments were also issued to the FSAR during the assessment period. There was a heavy work load involving the DLC Licensing Division responding to NRR staff questions. There is also continuous activities associated with generating the draft "Safety Evaluation Report." Numerous meetings were held between DLC Licensing and NRR on these matters.

NRC conducted a combined site visit and held a public meeting on September 28-29, 1983. This involved an environmental site visit in preparation for issuance of the Operating Licensing Stage Draft

Environmental Statement. The public meeting allowed the public to participate in the proceedings and make the NRC aware of any environmental concerns.

On January 27, 1984, the Atomic Safety and Licensing Board in the operating license proceeding issued a Report and Order on the Special Prehearing Conference denying all intervention petitions and dismissing the proceeding.

II. SUMMARY OF RESULTS

		BEAVER VALLEY POWER STATION, UNIT 2		
	FUNCTIONAL AREA	CATEGORY 1	CATEGORY 2	CATEGORY 3
1.	Soils and Foundations	Insufficient Bases for Assessment		
2.	Containment and Other Safety-Related Structures	X		
3.	Piping Systems and Supports (Includes Welding, NDE and Preservice Inspection)			X
4.	Safety-Related Components (Includes Vessel, Internals, and Pumps)	X		
5.	Support Systems (Includes HVAC, Radwaste, Fire Protection)	X		
6.	Electrical Power Supply and Distribution			X
7.	Instrumentation and Control Systems		X	
8.	Licensing Activities		X	
9.	On-Site Storage	X		
10.	Engineering/Construction Interface			X

See Errata Sheet

Overall Summary

Design and engineering effort for Beaver Valley Unit 2 continues to be the area of most concern. It does not appear that design documents are receiving adequate constructability reviews before they are sent to the field for implementation. This has led to numerous problems because of unclear or missing design details or incorrect application of design criteria. In particular, a large number of design changes and reinspections of piping supports have been necessary because of such deficiencies. Cable separation problems and the slow progress in achieving acceptable resolution are also attributed primarily to engineering deficiencies. The on-going engineering confirmation program and organizational changes made after the assessment period are intended to address such engineering problems; management must continue to aggressively address this area since it represents the root cause of many of the most significant project problems.

CORRECTED PAGE

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6. Electrical Power Supply and Distribution			X
7. Instrumentation and Control Systems		X	
8. Licensing Activities		X	
9. On-Site Storage	X		
10. Engineering/Construction Interface			X

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Design and engineering effort for Beaver Valley Unit 2 continues to be the area of most concern. It does not appear that design documents are receiving adequate constructability reviews before they are sent to the field for implementation. This has led to numerous problems because of unclear or missing design details or incorrect application of design criteria. In particular, a large number of design changes and reinspections of piping supports have been necessary because of such deficiencies. Cable separation problems and the slow progress in achieving acceptable resolution are also attributed primarily to engineering deficiencies. The on-going engineering confirmation program and organizational changes made after the assessment period are intended to address such engineering problems; management must continue to aggressively address this area since it represents the root cause of many of the most significant project problems.

Construction activities by craft personnel have continued to be generally successful. The QC program continues to be strong with aggressive QC efforts as previously noted in the 1982 and 1983 SALP assessments. QC inspections are generally accomplished by well qualified and knowledgeable personnel in accordance with a program that is well conceived, thorough, and well executed. However, some problems have occurred with QC inspections of piping supports which have contributed to the large number of reinspections in this area.

A marked improvement in onsite storage and housekeeping was noted as a result of actions taken in response to earlier NRC concerns in this area. The pace of licensing activities increased significantly with the docketing of the FSAR; they continued to be generally acceptable although some problems with timeliness and missing information were encountered.

III. CRITERIA

The following criteria were used as applicable in evaluation of each functional area:

1. Management involvement in 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 50.55(e) and Part 21 items.

6. Staffing (including management).

7. Training effectiveness and qualification.

To provide consistent evaluation of licensee performance, attributes associated with each criterion and describing the characteristics applicable to Category 1, 2, and 3 performance were applied as discussed in NRC Manual Chapter 0516, Part II and Table 1.

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 such that a high level of performance with respect to operationals 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 are reasonably effective such 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 appeared strained or not effectively used such that minimally satisfactory performance with respect to operational safety or construction is being achieved.

IV. PERFORMANCE ANALYSES

4.1 Soils and Foundations (1%)

Analysis

The major portion of all safety related work on soils and foundations was completed before this assessment period started. No safety related foundations were placed. Some work on soils occurred on site during this assessment period. A culvert was placed in Peggs Run and the ravine was filled with dirt. Also, the bank adjacent to the cooling tower was graded and seeded.

No major problems were experienced by the licensee in the activities discussed above; there were no 50.55(e) reports submitted. An NRC inspection of soils and soil runoff found no significant items of regulatory concern.

As discussed in prior SALP assessments, licensee and contractor performance has consistently been strong in this functional area.

Conclusion

Insufficient bases for assessment.

Board Recommendation

None.

4.2 Containment and Other Safety Related Structures (6%)

Analysis

Seven inspections were performed in this area; five by the resident inspector and two by the resident inspector and a region-based inspector. The inspections performed in this area were of completed work and follow-up inspections of previous 50.55(e) reports and identified noncompliances. During this assessment period, the batch plant was disassembled and removed from the site. The miscellaneous concrete poured was obtained from an offsite contractor. The construction opening in the containment building has not yet been closed.

One problem was identified by NRC during the assessment period which resulted in a violation. The problem involved a potential hardware deficiency. The licensee failed to identify the requirements for bolted connections of structural steel joints with long slotted holes (i.e., the use of 5/16 inch thick plate washers). As a result, these type connections exist throughout all safety related buildings onsite with structural steel connections. It has been determined by the licensee that the connections will perform their intended function in the as-installed condition. This omission resulted because the licensee and contractors failed to perform adequate specification and code reviews before issuing and approving the field procedures.

An area identified as a violation in the last SALP assessment and followed up during this period was the omission of the required volumetric examinations of electrical penetrations. Inspection by the licensee of the electrical penetrations revealed that sixty-nine of seventy-eight welds contain indications which exceed the acceptance standards of the ASME Code. Repairs of the unacceptable indications recently commenced on three of the penetrations. Failure to identify the test requirements prior to releasing the requirements to the field was identified in the last SALP report as a program weakness. The major repairs which are required could have an impact on the structural integrity test and terminations of electrical connections in the penetration area. This item must receive increased management attention so that quality repairs are performed in a timely manner.

No 50.55(e) reports were issued in this functional area. Other than the problems noted above, licensee performance in this area was acceptable with no significant problems reported. Overall performance in this functional area has generally been satisfactory, but the high performance levels noted in the previous SALP assessments have not been maintained.

Conclusion

Category 2

Board Recommendation

4.3 Piping Systems and Supports (36%)

Analysis

Fourteen inspections were performed in this area, eight by the resident inspector, four by specialist inspectors and two by the resident inspector and region-based specialist inspectors.

The work activities in piping and supports has increased during this assessment period. Installation and welding occurred on the primary loop piping, main steam and feedwater lines, large and small bore piping and supports. Five violations and one deviation were issued during this assessment period. These and other findings by NRC as discussed below, indicate problems in the Engineering, Construction and Quality Control areas, and have a direct impact on the quality of the hardware. Major reinspections are continuing by the licensee to determine if unacceptable conditions exist.

The items found by the NRC which have a direct impact on the installed hardware are:

-- Large bore piping was being installed without either permanent or temporary supports installed to support the pipe weights. Subsequently, procedures were written to establish acceptable spacing of supports and for the installation of temporary supports, where required. It was necessary to perform reinspection on all piping systems; nonconforming conditions were identified for disposition. This omission of requirements indicates a weakness in the licensee/contractor's program in failing to impose needed requirements. It also indicated a weakness in the construction discipline in failing to recognize the lack of good construction practices and to take proper action to remedy the deficiency.

-- The NRC found there were inadequate procedures for the control of repairs to base materials. The licensee corrected this omission by issuing a repair procedure. The NRC also found inadequate procedure controls for planned onsite post weld heat treatment (PWHT) of piping welds. The procedure required a major revision to comply with the code requirements. The deficiencies found indicate a program weakness in the review and issuance of field welding procedures.

-- The NRC identified that correct piping wall thicknesses and weights were not considered when designing the supports for the emergency diesel generator exhaust piping and significantly overweight conditions would have existed on the designed spring hangers. Follow-up indicated that a potential generic problem exists with oversize fitting in piping systems which could have an impact on equipment nozzle loads and piping restraints due to thermal expansion loadings. This omission could have impact on piping construction. As directed

by NRR, it will require some reinspections to determine actual wall thicknesses and reanalysis to determine its impact on thermal expansion.

-- The NRC found that vendor supplied piping had not received the required post weld heat treatment (PWHT). The rise and fall temperatures were not controlled in accordance with the code rules. Re-PWHT is required on at least six welds to assure code compliance. This indicated a weakness in the vendor program and the licensee's/contractor's monitoring thereof. In addition, a discrepancy was found in the specification requirements versus the FSAR commitments. The specification allows less restrictive post weld heat treatment requirements than the code specified in the FSAR allows. This item is not resolved.

-- In the last assessment period, the NRC found that support baseplates for HVAC supports were not being installed in accordance with the design requirements. As a result of that findings and questions raised by NRC regarding it applicability to pipe supports, it has now been determined that baseplate attached by anchor bolts for pipe supports are also deficient. The Stone and Webster Engineering Department failed to provide installation tolerances and/or shimming provisions to assure they were installed in accordance with assumptions used in design calculations. Failure to supply sufficient and/or clear design detail for use by the Construction and QC Departments has been a recurring problem; it indicates that adequate attention is not being devoted to constructability review of design documents during their preparation. The licensee must now reinspect all supports and install shims where necessary. The licensee committed to commence a reinspection of these items by a certain date, but failed to start the program until a "Deviation" was issued by the NRC. This appeared to be an isolated occurrence in that the licensee has generally been responsive in meeting other commitments.

A high number of changes are being made to items after Quality Control has inspected and dispositioned them. On pipe supports alone, in excess of 6,600 pipe supports must be reinspected to some degree, many because design changes were made after Quality Control inspected the supports. These changes are implemented by issuance of EDCRs, drawing changes, field construction procedure changes, and QC inspection procedure changes. They address such things as baseplate shims, Hilti locking devices, Hilti exposed bolt length, Hilti retorquing, large and small bore attachment location, weld from edge of plate distance, bolt to edge of concrete distance, Hilti bolts to edge of embedment plate distance, spacing between Hilti bolts and fillet weld size and lengths. These changes generally indicate a lack of proper instructions for installation and inspection of the original item. These deficiencies generally were found through audits by INPO, Stone and Webster QA, and NRC. They indicate weaknesses on the part of Engineering and, in some cases, omissions on

the part of Duquesne Light Company Quality Control Department. The high number of such required reinspections are surprising in that most of these areas were treated extensively in IE Bulletin 79-02 and its Supplements. This is indicative of a failure to properly assimilate the "lessons learned" from earlier experiences.

Duquesne Light Quality Control Department has increased its inspection staff from 152 inspectors at the end of the last assessment period to the current level of 281 to provide needed inspection coverage. Recently, QC established a group of 10 inspectors to perform reinspections in the areas discussed above, which should help alleviate the large numbers of backlogged reinspections. However, even with the increased QC manpower, normal inspection coverage is strained. Increased management attention is necessary to assure adequate coverage is provided.

A problem was identified by NRC that involved a failure to properly control interim "Hold" Tags. This had the potential to cause confusion in that they were not always being removed when required. This item was corrected and no actual hardware deficiencies were created. Another problem identified by the NRC involved a failure of the licensee to perform calibration of a torque wrench. This was noted to be more of a procedural problem than an actual hardware deficiency because calibration was being performed in accordance with the standard calibration cycle, but it was not being performed in accordance with a modified calibration requirement.

Another problem involved the fabrication of pipe restraints intended to be in accordance with AWS D1.1, but engineering exceptions were taken to AWS D1.1 without documented justification. Engineering exceptions taken in this area include: (1) use of base metals not listed in AWS D1.1, (2) utilizing a general 1/32-inch undercut rule, and (3) utilizing a flare bevel effective throat rule not conforming to AWS D1.1. Acceptance of such exceptions without adequate documented justification is indicative of a weakness in engineering review which has an adverse effect on the quality of work.

Licensee and contractor management appears to be committed to improvement of controls in this functional area with improvements noted in some problem areas which were identified in the last SALP report. For example, improvement was noted in the welding area, particularly in the qualification of welding procedures since the last SALP assessment. However, the multitude of problems identified by NRC and others which directly involve hardware indicate that still more attention is necessary. When the above problems were individually identified, corrective actions generally involved additional QC staffing and reinspections to correct the effects of such deficiencies. However, the root cause of many of the problems has not received adequate attention. In particular, increased emphasis is needed by the licensee to assure that basic documents are correct and contain sufficient and clear details and require-

ments before they are issued to construction. This would reduce the high number of design changes and errors caused by inadequate design/ installation documents as well as reduce Quality Control reinspections.

In summary, with the increased work activities which occurred during this SALP period, a marked increase in deficiencies and errors were noted. These are occurring at the level of generation and approval of the basic documents. When basic documents are deficient, this jeopardizes the hardware acceptance and causes increased reinspections and rework of the hardware. Significantly increased licensee and contractor attention to this area is needed. Additional discussions on engineering weaknesses are included in Functional Area 10.

Conclusion

Category 3

Board Recommendation

Continued normal inspection coverage plus special emphasis on increased inspection(s) of the engineering effort as discussed in Functional Area 4.10.

4.4 Safety Related Components (9%)

Seven inspections were performed in this area, five by the resident inspector, one by a region-based specialist, and one by a region-based specialist and the resident inspector.

The major NSSS components were successfully set during the last SALP period. Work activities on these items was generally limited to piping connections by welding to the components. The licensee experienced cracking on several steam generator to pipe welds because Westinghouse had installed an inconel weld band on the outside surface of the nozzles adjacent to the field weld. Westinghouse failed to identify this inconel band on the drawings. As a result, the field welded on this inconel band and cracking occurred. The NRC issued a violation on this item for failure to have a properly qualified weld procedure, but the underlying problem was a failure of the vendor to reflect the as-fabricated condition of the weld area.

Modification to the steam generator feedwater nozzles and thermosleeves was successfully made by the contractor. Inspection by the NRC found good management controls, extensive nondestructive examinations, and good Quality Controls in this area.

Fabrication and welding commenced on numerous storage tanks during this assessment period. Richmond Engineering Company (RECO) is the contractor performing the work. Audits conducted by the NRC in the areas of program, weld procedures, radiography, welding and hydrostatic test found that the contractor has excellent controls. Qualified management is involved and minimal problems were encountered.

A discrepancy was found in the storage specification versus the FSAR commitments. The specification and construction of the storage tanks are to a code addendum that has less restrictive requirements than the code specified in the FSAR. This open item has not been resolved. Similarly, a review of the FSAR versus the ordering requirements for the spent fuel racks found the ordered racks are different than described in the FSAR. The licensee stated that the correct description will be included in the next amendment to the FSAR. FSAR inaccuracies are discussed further in Section 4.8.

Three 50.55(e) reports, all vendor related, were issued during this assessment period. The corrective actions for one was reviewed and found acceptable by the NRC.

In conclusion, the licensee, the contractor who performed the steam generator feedwater modifications, and the tank fabricator, through planning, training, extensive quality controls, and management involvement, have insured that good controls were in place in this functional area. These controls have been successfully implemented as demonstrated by quality work with minimal problems.

Conclusion

Category 1

Board Recommendation

None.

4.5 Support Systems (9%)

Analysis

Four inspections were performed in this area, three by the resident inspector, and one by a region-based specialist and the resident inspector. Work continued throughout the assessment period with no significant problems reported by the licensee or identified by NRC.

A violation discussed in the last SALP report was corrected on schedule and in a very conservative manner. The concern regarded duct to duct connections. The corrective actions taken were to remove all accessible duct to duct bolts and replace them with new bolts and washers. Approximately 51,000 new bolts with washers were installed. This indicates a strong licensee commitment to correct deficiencies when identified.

Inspections were made in several areas of HVAC installation. Vendor records, general construction, and detailed inspections of HVAC supports were included. Good controls were found in each of these areas. An item identified in the last SALP report regarding HVAC supports and concrete anchor bolts is still open. Reinspections were performed and are being evaluated by Engineering.

In summary, the inspections found that the licensee and contractor have good controls in this area and no significant fabrication problems have occurred. Quality Control inspections of this area are especially good. Problems previously noted with engineering documents in this area did not recur.

Conclusion

Category 1

Board Recommendation

None.

4.6 Electrical Power Supply and Distribution (12%)

Ten inspections were made in this area, five by the resident inspector, four by region-based inspectors, and one by the resident and a region-based inspector.

Cable trays, conduits, and cable continued to be installed throughout the assessment period. 6,179 safety related cables have been pulled, 53 percent of the total. 985 safety related trays are installed (99 percent of the total), and 3,847 safety related conduits are installed (58 percent of the total). 99 percent of the ducts are installed.

Cable separation and compliance with Regulatory Guide 1.75 continue to be a concern to the NRC. Resolution of problems initially identified by NRC in this area did not receive adequate prioritization. Two meetings were held during this assessment period between Duquesne Light Company, Stone and Webster, and NRC to discuss progress and planned corrective actions. The licensee's planned program to meet Regulatory Guide 1.75 and internal documents appears to be an after-the-fact fix versus complying with the requirements during installation. As a result, the desired quality may be jeopardized. It appears that there will be areas where compliance with Regulatory Guide 1.75 will not be possible. Furthermore, NRC expects that this program will have an adverse impact on plant completion and operation schedules. Additional focused management attention on this problem area is warranted.

Two violations and several significant unresolved items were identified during this assessment period. One violation involved the attachment of an electrical tray support leg to a baseplate. This resulted from inadequate controls specified on drawings. As a result, the attachments were made outside the boundaries used for the calculations. Reinspections, recalculations and possibly rework of numerous supports are planned to correct this deficiency. This deficiency indicates weaknesses in the preparation and review of drawings and instructions before they are issued to the construction forces as also discussed in Section 4.3.

Another violation and an unresolved item identified that electrical cable which leaves a tray and extends unsupported for certain distances could exceed the loadings specified for tray rungs. This occurred because of omissions by two departments. QC failed to correctly interpret the engineering requirements for measuring unsupported armored cable and Engineering failed to correctly specify how unsupported cable for all cable applications would be measured.

As discussed in Functional Areas 4.3, Piping and Supports, and 4.5, HVAC Supports (previous SALP assessment), problems were identified in the support installation for those systems. Similar problems were also identified for electrical supports. No criteria existed (except for in containment) for inspection and installation of shims where needed between

the baseplate and concrete. Corrective actions are being taken, procedures have been issued and reinspection is finding that twenty-one percent of the supports inspected do not meet the specified criteria. Good corrective actions are being taken; however, again as discussed in Functional Area 4.3, a deficiency in basic documents is indicated in failing to identify these requirements before installation commenced.

One 50.55(e) report dealt with a QC inspector who accepted conditions contrary to the requirements. Excellent corrective actions were taken by the licensee in reinspecting all of this QC inspector's work, sampling the work of other QC inspectors, and restructuring reponsibilities of QC supervisors so as to allow more time for overviewing field work. These actions were inspected and accepted by the NRC.

Other items identified, and not yet resolved, involve control of hole sizes on tray to tray connections, raceway fills, welding versus bolting of process panels and as-built controls on cable lengths. A high number of problems and concerns have been identified in this Functional Area; they mostly pertain to engineering issues.

The electrical contractor has consistently demonstrated a technically sound approach to safety issues and no major problems have occurred in the construction and installation of cables and cable trays in accordance with specifications and procedures. The problems identified and discussed above are attributed primarily to inadequate specifications or procedures prepared by Engineering. QC inspectors, craft personnel, and supervisors are well qualified and knowledgeable of work requirements, good construction practices, specifications, and procedures. The training program was well conceived, thorough and well executed. QC management showed evidence of good planning by increasing and training personnel in anticipation of an increase in workload. They are aware of generic problems, identify them to management, and are actively involved in their resolution.

In summary, it appears that day to day construction by the contractor is good. QC inspection is good with minor exceptions and minimal problems are occurring in this phase. Deficiencies in documents used for field work (primarily documents generated by Engineering) have led to problems in that they often have insufficient information and/or are not fulfilling design requirements. Major reinspection and rework are a result of these omissions. The licensee/contractor has been very slow in developing and implementing an approach that will meet cable separation commitments and requirements so as to resolve widespread cable separation problems to achieve acceptable cable installations.

Conclusion

Category 3

Board Recommendation

Obtain licensee commitments for implementation of a systematic program with a timely schedule for resolution of cable separation problems.

4.7 Instrumentation and Control Systems (9%)

Analysis

Five inspections were performed in this area, one by the resident inspector and four by region-based specialist inspectors. Work commenced in this area during the assessment period. Terminations in control panels have occurred throughout the site. The storage batteries were placed, charged and turned over to the DLC Construction Start-Up Group. Several miscellaneous electric panels were also turned over to the DLC Construction Start-Up Group. Wiring and terminations are proceeding in the Control Building.

Inspection in the area of wiring, crimping, and terminations has found that the contractor is doing a good job. Workmanship of onsite work is evident and Quality Control inspection is good. Training and qualification of QC inspectors, craft personnel, and supervisors are as described in Section 4.6. No significant problems were reported in this area.

One violation and other unresolved items identified problems in the wiring of numerous electrical panels supplied by four different vendors. A large number of cables in process control cabinets were terminated improperly. The licensee is presently analyzing and performing sample inspections of such components. 50.55(e) reports were submitted for work performed by three of the vendors. The problem with components supplied by the fourth was only recently identified. The cause of this problem appears to be a lack of specificity in the ordering specification and a lack of commitment to quality on the part of the vendors. Three other 50.55(e) reports were issued regarding fabrication error or component failure for vendor supplied equipment. Two were for Westinghouse supplied equipment and the third was a General Electric product. Most 50.55(e) reports from this licensee involved instrumentation and control equipment indicating that more problems with vendor supplied equipment occurred in this area than with any other type of vendor. More licensee attention needs to be devoted to vendor control, audits, receipt inspections, etc., for such vendors.

In summary, the onsite construction activities in this area appears to be well controlled, quality control inspections are good and no major problems at the site were identified in this area. Items fabricated offsite and now inplace onsite will require significant reinspections and probably rework. More attention by management is needed in this area to assure that high quality products are being obtained from vendors.

Conclusion

Category 2

Board Recommendation

Discuss with licensee management the desirability of 100% reinspection of vendor supplied items.

4.8 Licensing Activities (3%)

Analysis

The Final Safety Analysis Report (FSAR) was issued January 26, 1983, and docketed on May 18, 1983. Since its submittal, five amendments to the original were issued.

The primary basis for this assessment was the interaction between the staff and DLC associated with generating the BVPS-2 draft SER. Communication was primarily devoted to staff questions and DLC responses. In addition to the safety aspects of licensing activities, an environmental site visit and public meeting were also held during this period.

Throughout the review process, DLC's activities exhibited evidence of prior planning. The applicant provided a computer terminal for the PM's use to expedite communications. Open issues in the Draft Safety Evaluation Report were predominately areas under rev ew by the staff and not actual technical disagreement or the staff's need for additional information. DLC management involvement was evident in resolving identified issues in that, for the most part, supplied information was timely, thorough and generally technically sound. The applicant provided adequate management and technical representation from corporate offices, site staff and NSS vendor staff. Management and technical involvement are also evident by positions the applicant has taken in a number of areas which question staff practices.

Resolutions to questions were generally acceptable. With few exceptions, DLC provided timely written and oral responses to the staff's requests for additional information. Responses to NRC initiatives have been, thus far, timely and generally sound and thorough. However, the applicant has not provided the necessary information for the staff to conclude that the following training program requirements have been met:

a. initial training program

b. simulator training program

c. requalification prog-am

d. TMI Action Plan Items I.A.2.1 and I.A.2.3

e. cross-training program (between 2 BVPS Units)

f. STA training program

The applicant has indicated that program necessary to meet these requirements are in place and operating and proposes to provide this information during a staff site visit which will permit detailed review of the complete documentation, hardware, and discussions with training

staff and students. The lack of submittal of information during the review period in the area of training is a cause for concern because of delays introduced in the licensing process.

As discussed in Functional Areas 4.3 and 4.4, an onsite inspection was made by the senior resident inspector, on a sampling basis, to determine if the hardware is being purchased, fabricated, inspected, and installed in accordance with the minimum requirements and commitments of the FSAR. Three deficiencies were found. In two cases, post weld heat treatment of main steam lines and nondestructive examinations of safety related storage tanks were performed using addenda of the ASME Section III Code which are less restrictive than committed to in the FSAR. In the other instance, the spent fuel racks were ordered with requirements different than described in the FSAR. Corrective actions are being taken in these areas which should resolve these differences. The licensee needs to strengthen their program for review and updating the FSAR to assure that it consistently and accurately reflects the as designed/constructed plant since the FSAR represents the primary input to NRC during the on-going review to determine if an OL should be issued.

In summary, the licensee has taken positive management actions in this functional area as evidenced by prior planning with a thorough and technically sound approach to licensing questions. Responses are generally timely and exhibit a conservative approach. The licensee's lack of adequate responses to staff questions in the area of training requires increased management attention in order to assure that it is not a critical path item for the licensing process.

Conclusion

Category 2

Board Recommendation

None.

4.9 Storage of Safety Related Components (7%)

Analysis

In addition to the resident inspector's daily site tours, five inspections were performed in this area; four by the resident inspector, and one by the resident inspector and a region-based specialist.

This area is listed as a separate functional area because this area has been assessed in the last two SALP reports as a weak functional area.

On January 15, 1983, the licensee implemented major changes in this program in order to correct the previously identified concerns. These changes involved consolidation of the storage program under a construction supervisor with authority to implement proper storage requirements. In addition, special cleanliness zones for sensitive equipment were established. Only one storage problem was identified in this assessment period. It involved storage of the spent fuel transfer bellows in that this item was not included in the storage requirements. Corrective actions are being taken by the licensee.

Except for the problem with the spent fuel transfer bellows, the inspection of storage conditions throughout the site has found storage conditions and controls to now be excellent, representing a complete reversal of the conditions noted during the last SALP period. A strong program has now been established and is being properly implemented. The revised program properly addresses previously identified problems in this area. The Construction Team Inspection (CTI) also included concentrated inspection efforts in this area and concluded that storage and maintenance is a strength of the project. Similarly, other specialist inspectors who have recently been onsite have found this area well controlled.

Based on the licensee's program changes and their successful implementation as found in the CTI inspection, as well as the inspections performed by the resident and other NRC inspectors, we find this area to now be well managed and controlled.

Conclusion

Category 1

Board Recommendation

None.

4.10 Engineering/Construction Interface (8%)

Analysis

In the last SALP assessment, it was concluded that, based on the violations identified in inspection of other functional areas where the root cause was deficiencies in design information provided to the field, certain weaknesses existed in the AE's engineering effort. Additional licensee involvement and overview of engineering was recommended to assure that regulatory requirements and the SAR design bases are properly incorporated into the actual plant design.

During this assessment period, the CTI identified weaknesses in the licensee's and contractor's programs in two areas. The licensee's engineering department lacked direction, performed very little if any design review, and did not document any design reviews performed. The AE's site engineering group did not identify qualified reviewers, did not properly identify approval of design changes, was deficient in control of training and did not identify design inputs.

On October 21, 1983, at DLC's request, a meeting was held with Duquesne Light Company, Stone and Webster, and NRC to discuss the planned program to address concerns in this area as expressed by NRC. The proposed "Engineering Confirmation Program" program involved both DLC and S&W Engineering. The overall objective of the program was to assure that the installation met the design requirements. If effective, it should resolve many of the concerns about the type of engineering deficiencies described in the last SALP and the numerous ones found during this assessment period. The deficiencies identified in the SALP reviews occurred before implementation of the present program; therefore, the effectiveness of corrective actions cannot yet be assessed. This SALP assessment does, however, reinforce concerns about this area. As discussed in Section 4.3 and 4.6, engineering documents frequently failed to contain sufficient and/or information that is clear enough for field use by Construction and QC personnel. Problems similar to those noted in the last SALP recurred. Performance by the AE in this area has not been commensurate with the generally good performance which has been characteristic of other major project groups such as QC and Construction. The positive action in increasing DLC involvement in engineering by assigning two full time engineers to the onsite S&W engineering office is noted. Their presence in day to day engineering discussions has also been noted.

In summary, the ratings in the two Category 3 functional areas were affected by the numerous deficiencies in the contents of design related documents issued by vendors or contractors. The "Engineering Confirmation Program" could help alleviate concerns in this area if results demonstrate that such deficiencies are not widespread and do not adversely affect the overall integrity of safety related systems. Effec-

tive corrective actions to improve performance in the engineering area would lead to increased confidence in plant design/construction as well as favorably affecting future SALP ratings in other functional areas.

Conclusion

Category 3.

Board Recommendation

In view of the continuing NRC concerns in this area, implementation and results from the "Engineering Confirmation Program" should be closely monitored by NRC. The licensee should be requested to propose a program for resolution of engineering/construction interface problems.

V. SUPPORTING DATA AND SUMMARIES

5.1 Construction Deficiency Reports (CDRs)

Thirteen CDRs were submitted by the licensee during the assessment period. Ten of the deficiencies were associated with vendor supplied hardware. Three corrected CDRs, 83-00-02, 83-00-04, and 83-00-07 were reviewed by the inspector during this period, with corrective actions considered acceptable. Deficiency reports are listed in Table 1.

5.2 Investigation Activities

There were no investigation activities during this assessment period.

5.3 Escalated Enforcement Action

None.

5.4 Management Conferences

February 15, 1983 - A special, announced management meeting at NRC request to discuss the results of the Region I SALP board convened to assess licensee performance from December 1, 1981 to November 30, 1982.

October 21, 1983 - A special meeting, at NRC Region I, held at licensee's request, to discuss the Duquesne Light Company and Stone and Webster Engineering confirmation programs and plans for confirming quality of the engineering effort for Beaver Valley, Unit 2.

TABLE 1

CONSTRUCTION DEFICIENCY REPORTS

(December 1, 1982 - March 31, 1984)

BEAVER VALLEY POWER STATION, UNIT 2

CDR NUMBER	DEFICIENCY	CAUSE CODE
83-00-01	Westinghouse Gate Valves	B
83-00-02	Quality Control Acceptance of Nonconforming Conditions	A
83-00-03	Reactor Trip Switchgear Undervoltage Attachments	B
83-00-04	Bergin Paterson Clevis Welds	B
83-00-05	Determined by the licensee to be non-reportable	
83-00-06	Defective Circuit Cards in 7300 Process Protection System	E
83-00-07	Diesel Generator Thermostatic Control Valve "O" Ring	B
83-00-08	Heavy Wall Thickness on Diesel Generator Exhaust System	B
83-00-09	Diesel Generator Themostatic Control Valve Loading Spring	B
84-00-01	Clamp Anchor Assemblies with Undersized Welds	B
84-00-02	Wiring of Gould 480V Motor Control Center	B
84-00-03	GE Type HEA Lock-out Relays	B
84-00-04	Wiring of York and System Control	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

(December 1, 1982 - March 31, 1984)

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	8
Severity Level V	2
Deviations	2
TOTAL	12

B. Violations vs. Functional Area

	Functional Area	Deviations	Severity Level IV	Severity Level V
1.	Soils and Foundations	0	0	0
2.	Containment and Other Safety Related Structures	0	1	0
3.	Piping Systems and Supports	1	3	2
4.	Safety Related Components	0	1	0
5.	Support Systems (HVAC)	0	0	0
6.	Electrical Power Supply and Distribution	0	2	0
7.	Instrumentation and Control Systems	0	1	0
8.	Licensing Activities	0	0	0
9.	Storage of Safety Related Components	0	0	0
10.	Engineering	1	0	0
	TOTAL	2	8	2

TABLE 3

INSPECTION HOURS SUMMARY (12/1/82 - 3/31/84)

BEAVER VALLEY POWER STATION, UNIT 2

	Functional Area	Hours	% of Time
1.	Soils and Foundations	16	1
2.	Containment and Other Safety Related Structures	136	6
3.	Piping Systems and Supports	858	36
4.	Safety Related Components	221	9
5.	Support Systems (HVAC)	210	9
6.	Electrical Power Supply and Distribution	282	12
7.	Instrumentation and Control Systems	202	9
8.	Licensing Activities	70	3
9.	Storage of Safety Related Components	162	7
10.	Engineering	207	8
	TOTAL	2364	100%

TABLE 4

INSPECTION ACTIVITIES

BEAVER VALLEY POWER STATION, UNIT 2

Report Number	Inspector	Areas Inspected
83-01	Specialist 33 Hours	Welding, nondestructive testing, quality assurance and quality control on reactor coolant pressure boundary piping and vessels, and other safety related piping.
83-02	Resident & Specialist 167 Hours	Electrical cable, tray connections, installation of spare penetration covers, repairs to piping, control of contaminates on stainless steel.
83-03	Specialist 30 Hours	Installation of safety related cables, cable trays/conduits and equipment.
83-04	Resident 161 Hours	Record review of shop fabricated piping and HVAC fire dampers, supports and piping installation; inspection of concrete.
83-05 (CTI)	Specialist & Resident 608 Hours	Construction Team Inspection of construction management, quality assurance, design control, equipment storage and maintenance, electrical construction and installation of piping and supports.
83-06	Specialist 16 Hours	Environmental protection program for construction phase.
83-07	Resident 148 Hours	Pressure testing of piping systems, program review of tank fabricator and FSAR commitments.
83-08	Specialist 30 Hours	Piping installation and review of related QC records.
83-09	Resident 177 Hours	Quality Control training, procedure reviews, document review of shop fabricated piping, site modifications and torquing of supports.
83-10	Specialist 30 Hours	Installation of safety related electrical/instrumentation equipment.

Report Number	Inspector	Areas Inspected
83-11	Resident 182 Hours	Postweld heat treatment of piping welds, material certifications, specification and field procedure review, storage, weld qualifications, weld material controls, welding on storage tanks, cable tray installation, battery placement, DLC engineering and regulatory activities.
83-12	Specialist 30 Hours	Installation of safety related instrumentation, associated wire/cable circuits.
83-13	Resident 83 Hours	Installation of structural steel, nondestructive examination of electrical penetrations, personnel qualifications.
83-14	Specialist 24 Hours	Installation of safety related electrical/instrumentation equipment.
83-15	Resident 79 Hours	Electrical support installation, piping fabrication, mechanical shock arrestors, record review of pipe welding and Quality Control inspection of electrical supports, seismic classification of piping system and vendor documentation.
83-16	Specialist 15 Hours	Stainless steel piping outside diameter (OD) weld buildup effects on corrosion performance, the use of Gap-O-Lets for socket fillet weld joints and review of safety related pipe support welding.
83-17	Resident 190 Hours	Nondestructive examination, hydrostatic test, fabrication processes, installation of supports, welding interpass temperature checks, storage of batteries, pumps and heat exchangers.
84-01	Resident 160 Hours	FSAR Description, PWHT, storage, piping, installation.
84-02	Specialist 61 Hours	Welding of supports, resolution of unresolved items, drawing control.
84-03	Resident 140 Hours	Electrical, hydro, welding, supports, startup and storage.
20 Inspections	2364 Hours	

ATTACHMENT 1

ENFORCEMENT DATA

Report Number	Subject	Severity Level	Functional Area
83-01	Welding to inconel with stainless steel GTAW on SG lower HD Nozzle - insufficient information to construction of nozzle detail.	IV	4
83-04	Piping installed without supports.	IV	3
83-05	Failure to calibrate a torque wrench calibration fixture within the required due date and use of uncalibrated fixture.	V	3
	Failure to comply with ANSI-N45.2.11 for design control.	Deviation	10
83-07	Failure to correctly consider "dead weight" when performing calculations for pipe supports.	IV	3
83-08	Failure to comply with the requirements of the QA procedure for the control of "Hold Tags."	V	3
83-09	Failure to meet a commitment date for performing inspections of pipe supports for excessive baseplate gaps.	Deviation	3
83-11	Failure to perform postweld heat treatment in accordance with procedures.	IV	3
83-13	Failure to install washers over long slotted holes in structural steel.	IV	2
83-15	The omission of tolerances on drawing details resulted in installation of supports which do not have calculations justifying their installed conditions.	IV	6
84-03	Failure to secure wiring to panel.	IV	6
84-03	Failure to properly inspect electrical cable.	IV	7

ENCLOSURE 5

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

Docket Nos. 50-334; 50-412 MAY 18 1984

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

Gentlemen:

Subject: Systematic Assessment of Licensee Performance (SALP); Report Nos. 50-334/84-13; 50-412/84-06

The NRC Region I SALP Board has reviewed and evaluated the performance of activities at the Beaver Valley Power Station, Units 1 and 2, for the period December 1, 1982 through March 31, 1984. Separate SALP Board meetings were conducted for each unit; the results are contained in the enclosed reports dated May 14, 1984. Meetings to discuss these assessments have been scheduled for June 12, 1984. These meetings will be held in Shippingport, Pennsylvania, near the plants.

The Unit 1 SALP Board concluded that satisfactory or higher levels of performance occurred in all functional areas. It was also noted that steady or improved performance occurred in each area. In contrast, for Unit 2, it was concluded that only minimally satisfactory performance had occurred in some functional areas in that numerous problems were noted and progress in resolving the root causes(s) of such problems was inadequate.

At the SALP meetings, you should be prepared to discuss our assessment and your plans for improvements, particularly for Unit 2 in the areas of piping systems and supports, electrical power supply, and distribution and engineering/construction interface. Specifically, we want to discuss the following topics for Unit 2:

-- The number and nature of deficiencies that have been identified in the piping area (many of which were identified by our inspectors). These appear to be primarily due to deficient engineering documents supplied to the field for use by construction and QC personnel. This has been a recurring problem at Beaver Valley, Unit 2 in that it was also noted in the last SALP report. Of particular concern is the apparent failure of licensee and contractor internal processes and reviews to discover such problems before they are found by our inspectors. Are any changes in approach contemplated in view of the failures of present management control system(s) to detect and prevent such deficiencies? You should be prepared to discuss why such failures have occurred plus any plans/programs to determine if similar problems have occurred in other areas.

-- The continued slow progress in resolving electrical cable separation problems remains an NRC concern. Although Duquesne Light Company did commit to comply with Regulatory Guide 1.75 in the December, 1983 meeting with NRC, many deviations from RG 1.75 (and even from earlier engineering specifications) al-

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ready exist. Additional deviations have occurred during installation work since December while plans were being made to implement these commitments. We regard the lack of appropriate progress in this area to be indicative of inadequate management attention and/or priorization. You should have, and be prepared to discuss, a systematic program with a timely schedule for resolution of cable separation problems. In particular, your program should demonstrate the proper management commitment to resolve these problems.

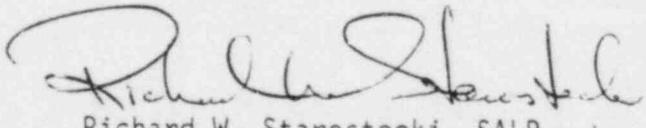
-- Many of the problems in the engineering area appear to be due to difficulties that occur at engineering/construction interfaces. In particular, several engineering documents prepared at your architect-engineer's home offices have apparently not received adequate "constructability reviews" before they are transmitted to the site for use. When problems are encounted in the field, resolution is often cumbersome. Furthermore, corrective actions usually involve additional inspections, but fail to identify and correct the root cause(s) of such problems. You should be prepared to discuss how you plan to improve the engineering/construction interface.

-- In late April, 1984, changes were made in the functional project organization wherein it appears that Duquesne Light Company has reduced their involvement in day-to-day construction activities with a commensurate increase in Stone and Webster's responsibility. We consider it essential that licensees have strong involvement and control in all areas involving licensed activities. You should also be prepared to discuss the intent of these organizational changes and describe how adequate Duquesne Light control and involvment is to be maintained.

The meetings are intended to be a dialogue wherein any comments you may have regarding our reports may be discussed. Written response(s) addressing the above areas are requested within 20 days of the meeting.

Your cooperation is appreciated.

Sincerely,



Richard W. Starostecki, SALP
Board Chairman
Director, Division of Project
and Resident Programs

Enclosures: As Stated

cc w/encls:
Public Document Room (PDR)
Local Public Document Room (LPDR)
Nuclear Safety Information Center (NSIC)
NRC Resident Inspector
Commonwealth of Pennsylvania

cc w/Report No. 50-334/84-13
F. Bissert, Manager, Nuclear Support Services
C. E. Ewing, QA Manager
W. S. Lacey, Station Superintendent
R. Druga, Chief Engineer
R. Martin, Nuclear Engineer
J. Sieber, Manager, Nuclear Safety and Licensing
T. D. Jones, Manager, Nuclear Operations
R. M. Mafrice, Nuclear Engineer
N. R. Tonet, Manager, Nuclear Engineering
M. Coppula, Superintendent of Technical Services

cc w/Report No. 50-412/84-06
E. J. Woolever, Vice President
C. E. Ewing, QA Manager
R. J. Washabaugh, Project Manager
E. F. Kurtz, Jr., Manager, Regulatory Affairs
H. M. Siegel, Manager, Engineering

bcc w/encl:
Region I Docket Room (with concurrences)
Senior Operations Officer (w/o encl)
DPRP Section Chief
T. Martin, RI