Docket No. 50-213
B14710

Attachment 3

Haddam Neck Plant

Seismic Evaluation Report

January 1994

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Seismic Evaluation Report

January 1994

SEISMIC EVALUATION REPORT FOR CONNECTICUT YANKEE

IN RESPONSE TO:

NRC GENERIC LETTER 87-02/USI A-46

VERIFICATION OF SEISMIC ADEQUACY OF MECHANICAL AND ELECTRICAL EQUIPMENT IN OPERATING REACTORS

PREPARED FOR:

NORTHEAST UTILITIES SERVICE COMPANY
P.O. BOX 270
HARTFORD, CT 06141-0270

REPORT NUMBER:	03-0240-1353
JOB NUMBER:	0240-099
REVISION:	0
DATE:	12/17/93

1.0 INTRODUCTION

The requirements for seismic design of nuclear power plants have evolved over the years from the application of commercial building codes earlier in the 1960's, to more sophisticated methods being used today. In view of the extent of these changes in design requirements, the NRC initiated Unresolved Safety Issue USI A-46, "Seismic Qualification of Equipment in Operating Plant," in December 1980. In early 1982, the Seismic Qualification Utility Group (SQUG) was formed to develop cost effective means of verifying the seismic adequacy of equipment in operating plants. The results of the industry efforts in this area, have culminated in the issuance of Revision 2 of the Generic Implementation Procedure (GIP-2) and a number of supporting documents and reports. Subsequently the USNRC has documented its review of the GIP in Supplemental Safety Evaluation Report No. 2 (SSER-2) and issued Supplement No. 1 to Generic Letter (GL) 87-02. Northeast Utilities provided their response to GL87-02 in a letter dated September 21, 1992 (Reference 5.1.9) outlining their proposed schedule and approach.

The objective of this report is to provide the necessary documentation of the A-46 effort at the Haddam Neck Plant referred to hereafter as Connecticut Yankee (CY). It will consolidate the documentation required for the Seismic Evaluation Report.

2.0 SCOPE/METHOD

The primary objective of the A-46 program at CY, as outlined in NU's Program Manual [5.2.8], is to verify the seismic adequacy of mechanical and electrical safe shutdown equipment. This program will provide a successful resolution of USI A-46, in addition, NU will utilize the key elements and results to streamline the seismic qualification process for the life of the plant. As discussed in Reference 5.1.9, CY intends to comply with the SQUG commitments set forth in GIP-2 [5.2.2], including the clarifications, interpretations, and exceptions identified in SSER-2 [5.1.2].

The essential features of the SQUG approach, for the resolution of A-46, is the use of earthquake experience data, and generic equipment qualifications and fragility test data. To use these sources of data, SQUG and EPRI have collected and organized the associated information and have developed guidelines and criteria for its use. The GIP-2 summarizes the technical approach and provides detailed implementation and documentation requirements for the application of experience data to verify the seismic adequacy of the safe shutdown equipment. Implementation of the GIP requirements at CY was performed by ABB Impell in accordance with the Project instructions listed in Reference 5.2.6. The peer review was conducted in July 1993 by Drs. R. P. Kennedy and J. D. Stevenson and concluded that the ABB Impell walkdowns were conducted in a very competent manner and results were in accordance with the GIP (Attachment D). The results and observations of the peer reviewers were consistent with the findings of the SRT.

The GIP approach for verifying the seismic adequacy of mechanical and electrical equipment is consistent with the intent of Generic Letter 87-02, "Verification of Seismic Adequacy of Mechanical and Electrical Equipment in Operating Reactors, Unresolved Safety Issue (USI) A-46", including NUREG-1030 (Reference 5.1.3) and NUREG-1211 (Reference 5.1.4). The approach is also consistent with the EPRI Seismic Margins Assessment Program (SMA) described in Reference 5.2.1. The four major steps used for the majority of the equipment to be evaluated are listed below:

- Selection of Seismic Evaluation Personnel
- Identification of Safe Shutdown Equipment
- Screening Verification and Walkdown
- Outlier Identification and Resolution

Several types of individuals, their qualifications, and their responsibilities for implementing this procedure are described in Section 2 of the GIP. These individuals include: (1) Systems Engineers who identify the methods and the equipment needed for bringing the plant to a safe shutdown condition, (2) Plant Operations Personnel who have a comprehensive understanding of the plant layout and the function and operation of the equipment and systems in the plant and who compare the plant operating procedures to the safe shutdown equipment list for compatibility, (3) Seismic Capability engineers who perform the Screening Verification and Walkdown of the safe shutdown equipment, and (4) Relay Evaluation Personnel who perform the relay functionality review.

The Seismic Capability Engineers must exercise sound engineering judgement during the Screening Verification and Walkdown. Therefore the selection and training of qualified Seismic Capability Engineers for participation on the Seismic Review Teams (SRTs) is an important element of the A-46 program.

The resumes and training records, of key individuals from the ABB Impell staff that participated in the completion of the A-46 effort at CY, are included as Attachment C.

The Safe Shutdown Equipment List (SSEL) Report, and the Relay Evaluation Report are documented in ABB Impell Reports 03-0240-1351, and 03-0240-1352 (References 5.3.3 & 5.3.4). This report will provide, by reference or as attachments, all the documentation associated with the Seismic Evaluation Report.

3.0 PLANT DESCRIPTION AND DESIGN BASIS

3.1 General Plant Description

The Haddam Neck Plant uses a pressurized water reactor. The plant is designed to produce 1,825 MW of thermal power and 590 MW of gross electrical power. This plant provides electrical power to all sponsoring utilities in New England.

Westinghouse Electric Corporation was responsible for design and fabrication of all nuclear steam supply and auxiliary systems and equipment, as well as design and supply of all secondary plant mechanical and electrical equipment which it normally manufactures. Stone and Webster Engineering Corporation was responsible for site development, design of buildings and secondary systems, and all plant construction. Each of these contractors was responsible to Connecticut Yankee Atomic Power Company for tasks performed in their respective areas of design and construction. Plant checkout, core loading, plant start-up and operation are the responsibility of Connecticut Yankee Atomic Power Company.

Haddam Neck incorporates a 4-loop closed-cycle pressurized water type nuclear steam supply system (NSSS); a turbine generator and electrical systems; engineered safety features; radioactive waste systems, fuel handling systems; structures and other on-site facilities; instrumentation and control systems; and the necessary auxiliaries required for a complete and operable nuclear power station. The site plans (Figures 5.1-3 and 5.1-4 of the UFSAR) show the general arrangement of the unit.

3.2 Site Location

The Haddam Neck Plant is located in the town of Haddam, on the east bank of the Connecticut River. The site consists of 525 acres. The minimum distance from the reactor containment to the site boundary is 1,740 ft. and the distance to the nearest residence is over 2,000 ft. Except for several small towns and villages and a portion of Middletown, the area within a 5.3-mile radius is predominantly rural. About 80% of this area is wooded, with the remaining open area devoted to general farming, resorts and some minor industry.

3.3 Site Geology and Seismology

The Haddam Neck Plant is located in the general area designated as Cove Meadow on the United States Geological Survey, Deep River Quadrangle, Connecticut Sheet. It lies within a belt of metamorphic rock formations consisting of schists, gneisses and amphibolites. These formations strike in a north-south direction with local variations of 15° to 30° to the west and dip to the east at 65° to 75°. These rock types are exposed in outcrops on the high ground at the site.

The site lies on the eastern shore flood plain of the Connecticut River within the Piedmont Atlantic Coastal Province. Geologically, this province is characterized by a Precambrian basement overlain by early Paleozoic metamorphic rocks which are locally intruded by plutons of Paleozoic age.

Excavations for the plant structures were not geologically mapped during construction. Original site geological information was developed from literature about the region and from results of borings taken at the site and at the CANEL site. Several major faults or fault systems have been recognized in the site region. No evidence has been found indicating a capable fault. Many of these faults have been recently identified and mapped during the NRC-sponsored New England Seismotectonic Research Program. This study began in 1978 and was completed in 1983 under the direction of the Weston Observatory of Boston College.

Seismicity within the Piedmont Atlantic Coastal Gravity Province is of moderate level. The seismicity of the immediate site region (50 km) is characterized as low to moderate. The majority of the events are in the III-IV Modified Mercalli (MM) scale intensity range with several earthquakes of Intensity V (MM) and one, that of May 16, 1791, with an Intensity VI-VII (MM) as reported by Reverend Daniel Linehan. There has been a noticeable decrease in the frequency of earthquakes over the past 300 years. The areas were depressed by the weight of ice during the Pleistocene period and is slowly rising following removal of this ice. Occasional minor earthquakes have been felt in the New England area and the most commonly accepted explanation of these is adjustment of the crust following removal of the ice of the Pleistocene period.

An extensive and carefully coordinated program of seismic exploration and borings were developed. Although it was the consensus of seismologists that Connecticut is a seismically stable area, structures and systems essential to the safe shutdown of the nuclear plant have been designed for a moderately strong earthquake having a maximum zero period ground acceleration of 0.17g.

3.4 Structures

The major structures of the Haddam Neck Plant are the containment structure, Primary Auxiliary Building, Fuel Building, Turbine Building, Service Building, Control Building, Diesel Generator Building, Screenwell, Service Boiler Room, Training Building, New Switchgear Building, new office/warehouse, and various warehouses. Figure 1 provides a representation of the general site layout. Attachment B contains excerpts that provide additional detailed descriptions and figures of these structures.

The Reactor Containment consists of a containment structure designed for an internal pressure of 40 psi gage. The containment is designed to limit the consequences of any release of radioactive material resulting from a loss of reactor coolant. The containment structure is a right circular cylinder with a hemispherical dome and a flat base. The inside diameter is 135 ft. and the straight height is 119.5 ft. The construction is reinforced concrete with an interior steel liner which acts as a leakage barrier. The liner is 1/4-in. thick at the bottom, 3/8-in. thick on the cylindrical walls and 1/2-in. thick on the dome. Access to the containment structure is through a double door personnel hatch.

3.5 Plant Seismic Design Basis

Attachment A contains a reproduction of appropriate sections from the Haddam Neck Plant UFSAR which provide a comprehensive description of the plant seismic design basis. A brief summary description of the Haddam Neck Plant Seismic Design Basis is presented here.

The Haddam Neck Plant was designed in mid-1960. As discussed earlier, Stone & Webster Engineering Corporation was responsible for site development and design of buildings and secondary systems; Westinghouse Electric Corporation was responsible for design of the NSSS and other auxiliary systems and secondary plant equipment. The Full Term Operating License (FTOL) was issued December 27, 1974 and the provisional operating license was issued in June 1967; the plant was designed and licensed prior to the issue of the Nuclear Regulatory Commission (NRC) General Design Criteria (GDC) for nuclear power plants as listed in Appendix A to 10CFR50. Strict compliance with the GDC is generally not required.

3.6 Original Design Basis Seismic Input

The Haddam Neck Plant was one of the earlier facilities for which dynamic analysis of structures, systems, and components was conducted. All safety-related structures and systems were designed for a horizontal peak ground acceleration (PGA) of 0.17g and the balance of the plant was designed for a PGA of 0.03g. Housner ground response spectra scaled to the specific PGAs were used as seismic input for the analysis and design.

Vertical ground accelerations were taken as equal to 2/3 of horizontal ground accelerations, and were assumed to act non-concurrently with these accelerations.

Figure 3.7-1 of the UFSAR provides the plots for the spectra. The curves cover structural or equipment periods from 5.01 to 5.2 seconds and damping from 0% to 10% of critical.

3.7 Original Design and Analysis of Structures and Systems

All safety-related structures and systems were designed for a horizontal PGA of 0.17g and the balance of the plant was designed for a PGA of 0.03g. The structures and systems were checked to show that no vertical seismic loadings were added in the final design. For the analysis of most safety-related structures, the buildings were modeled as a single degree of freedom, lumped mass-spring systems with fixed bases for calculating the natural frequency of each building; then, the corresponding spectral accelerations were used for performing the equivalent static analyses and design. No floor response spectra were generated for the design of piping systems and components; instead, the ground response spectra with lower damping values were used. Housner ground response spectra scaled to the specific PGAs were used as seismic input for the original plant analysis and design.

The original plant design criteria, in so far as seismic considerations are concerned, are described below:

1. All structures and elements of the plant are designed in accordance with sound engineering practice and are considered capable of withstanding seismic forces corresponding to a ground acceleration of at least 0.03g, in addition to normal loads, without damage or loss of function.

2. An analysis has been made of the main steam piping outside the containment, up to and including the turbine stop valves, to demonstrate that the design meets the requirement of Criterion 1, above, without exceeding allowable working stresses for the materials involved. Seismic forces included in this stress analysis were derived for a ground acceleration of 0.03g.

3. The following typical components and systems, which are important from the standpoint of nuclear safety, are among those designed to meet the requirement of Criterion 1:

   - The reactor containment vessel and its penetrations
   - The containment air recirculation and filtration system
   - The containment spray system
   - The waste gas storage sphere and waste liquid storage tanks
   - The spent fuel storage pit

In addition, these components and systems are designed so that steady state stress, or stresses resulting from hypothetical accident conditions where applicable, combined with seismic stresses, do not exceed the yield point of the materials involved. Also, they would not suffer loss or impairment of function because of deflection or distortion.

The following equipment, also important from the standpoint of nuclear safety, is designed so that the combination of operating loads with the 0.17g maximum ground acceleration, using the spectrum analysis, results in stresses within the allowable working stress range, as permitted by appropriate codes and standards, and in sufficiently small deflections so that normal operation is not prevented:

- The reactor coolant system (piping, reactor vessel and reactor internals)
- The safety injections and core deluge systems

Details on the reanalysis performed in response to the Systematic Evaluation Program (SEP) are provided in Section 3.7 of the UFSAR (Appendix A pages 3.7.8 through 3.7.60).

3.8 A-46 Seismic Input

The Seismic Input used in the A-46 effort is the same input used in the seismic re-evaluation program for CY. Figure 2 shows the seismic design ground spectrum currently in use; this spectrum, and the corresponding floor spectra generated as part of this aforementioned SEP program, were used in conducting the A-46 reviews.

For most structures, the effective grade was taken at 21'-6" (top of the grade). For the Intake Structure, effective grade was taken at -18'. Similarly, the effective grade for the Internal Structure was taken at the base of Containment (elev. 0'-6").

Attachment B contains excerpts from the SEP seismic re-evaluation reports which provide additional descriptions of the structures and corresponding schematic representations of the buildings which house the SSEL components.

4.0 RESULTS

In general, the overall plant equipment was found to be well anchored and seismically rugged. Electrical equipment anchorages benefited from the SEP program upgrades. The general housekeeping practices were found to be satisfactory with very few exceptions.

The seismic screening of components is documented on Screening Evaluation Work Sheets (SEWS) in accordance with the requirements of the GIP, and provided as Attachment E. The SEWS are sorted by equipment class. The results are further condensed and summarized on Screening Verification Data Sheets (SVDS), also sorted by class and presented as Attachment F. Three ABB Impell Seismic Capability Engineers had the primary responsibility for the screening and anchorage evaluations (Messrs. Abou-Jaoude, Guglielmino, and Saber). The anchorage evaluations are documented in the calculations listed in Reference 5.3.6. The plant Cable Tray and Conduit Raceway reviews were conducted on an area basis, a sample was selected for limited analytical reviews; the results demonstrated the seismic adequacy of the raceway systems and are documented in Reference 5.3.7. Large flat bottom storage tanks were evaluated using the detailed evaluation methods of EPRI NP-6041 [5.2.1] as documented in Reference 5.3.8. Other tanks and heat exchangers were evaluated in References 5.3.5 and 5.3.6. Summaries of the Tanks and Heat Exchangers reviews are included with the class 21 SEWS (Att. F).

Outliers were identified as a result of the equipment screening effort. All outliers are documented on Outlier Seismic Verification Sheets (OSVS) and have been included as Attachment G. Each outlier has been verified to be in compliance with the plant licensing basis and none were found to present any significant risk to public health and safety.

A proposed resolution has been provided for each outlier. All outliers have not yet been resolved using the outlier resolution procedures of GIP-2, Part II, Section 5. CY will continue to evaluate these outliers. In case any outlier remains unresolved, that outlier will be incorporated into the Plant Integrated Safety Assessment Program (ISAP).

5.0 REFERENCES

5.1 Codes, Standards and Regulatory Documents

5.1.1 USNRC Generic letter 87-02, Supplement 1, issued May 22, 1992.

5.1.2 Supplemental Safety Evaluation Report No. 2 (SSER No.2) on Revision 2 of the Generic Implementation Procedure (GIP-2), May 22, 1992.

5.1.3 NUREG-1030, "Seismic Qualification of Equipment in Operating Nuclear Power Plants, Unresolved Safety Issue A-46," U.S. Nuclear Regulatory Commission, Washington, D.C., February, 1987.

5.1.4 NUREG-1211, "Regulatory Analysis for Resolution of Unresolved Safety Issue A-46, Seismic Qualification of Equipment in Operating Plants," U.S. Nuclear Regulatory Commission, Washington, D.C., February 1987.

5.1.5 Not Used

5.1.6 IEEE 344-1975, "IEEE Recommended Practice for Seismic Qualification of Class 1E Equipment for Nuclear Power Generating Stations," Institute of Electrical and Electronics Engineers. 1975

5.1.7 NRC Regulatory Guide 1.100, Revision 1, Seismic Qualification of Electrical and Mechanical Equipment for Nuclear Power Plants," U.S. Nuclear Regulator Commission, August 1987.

5.1.8 Alan Waring (USNRC) letter to John F. Opeka (Northeast Utilities), Docket 50-213, dated November 25, 1992.

5.1.9 J.F. Opeka (Northeast Utilities) letter to the U.S. Nuclear Regulatory Commission, "Resolution of Unresolved Safety Issue A-46," NU Letter B14244, Docket 50-213, dated September 21, 1992.

5.2 Technical Criteria and Design Basis Documents

5.2.1 EPRI NP-6041-SL R "A Methodology for Assessment of Nuclear Power Plant Seismic Margin," August 1991.

5.2.2 "Generic Implementation Procedure (GIP) for Seismic Verification of Nuclear Plant Equipment," Revision 2, as corrected on February 14, 1992.

5.2.3 Connecticut Yankee Atomic Power Company, Haddam Neck Plant Updated Final Safety Analysis Report.

5.2.4 Not Used

5.2.5 Not Used

5.2.6 ABB Impell Project Instructions 0240-099-02, 03 & 04 latest revision.

5.2.7 ABB Impell Project Quality Plan 0240-099, latest revision.

5.2.8 "Program Manual for Resolution of USI A-46 and Generic Letter No. 87-02," Rev. 0, Northeast Utilities, Berlin, CT, dated December 1995.

5.3 Evaluation Reports and Calculations

5.3.1 "Connecticut Yankee Atomic Power Station, Haddam Neck, CT, Final Report, Mechanical and Electrical Equipment Seismic Re-evaluation Program", Stevenson and Associates, Cleveland, OH 44125 (10 Volumes) September 1983.

5.3.2 Seismic Re-evaluation of Major Structures of the Connecticut Yankee Atomic Power Plant URS/JAB, April 1983.

5.3.3 ABB Impell Report 03-0240-1351, Rev.3

5.3.4 ABB Impell Report 03-0240-1352, Rev.0

5.3.5 ABB Impell Calculation 0240-099-CCWHX, Rev. 0

5.3.6 ABB Impell Calculations
0024-0099-CV-01, Rev. 0
0024-0099-CW-01, Rev. 0
0024-0099-DG-01, Rev. 0
0024-0099-PAB-01, Rev. 0
0024-0099-CE-01, Rev. 0
0024-0099-SB-01, Rev. 0
0024-0099-TT-01, Rev. 0
0024-0099-YD-01, Rev. 0

5.3.7 ABB Impell Calculation 0024-0099-RCWY-01, Rev. 0

5.3.8 Stevenson and Associates Calculations
91C2648-C002, Rev. 0
91C2648-C003, Rev. 0
91C2648-C004, Rev. 0

FIGURE 1

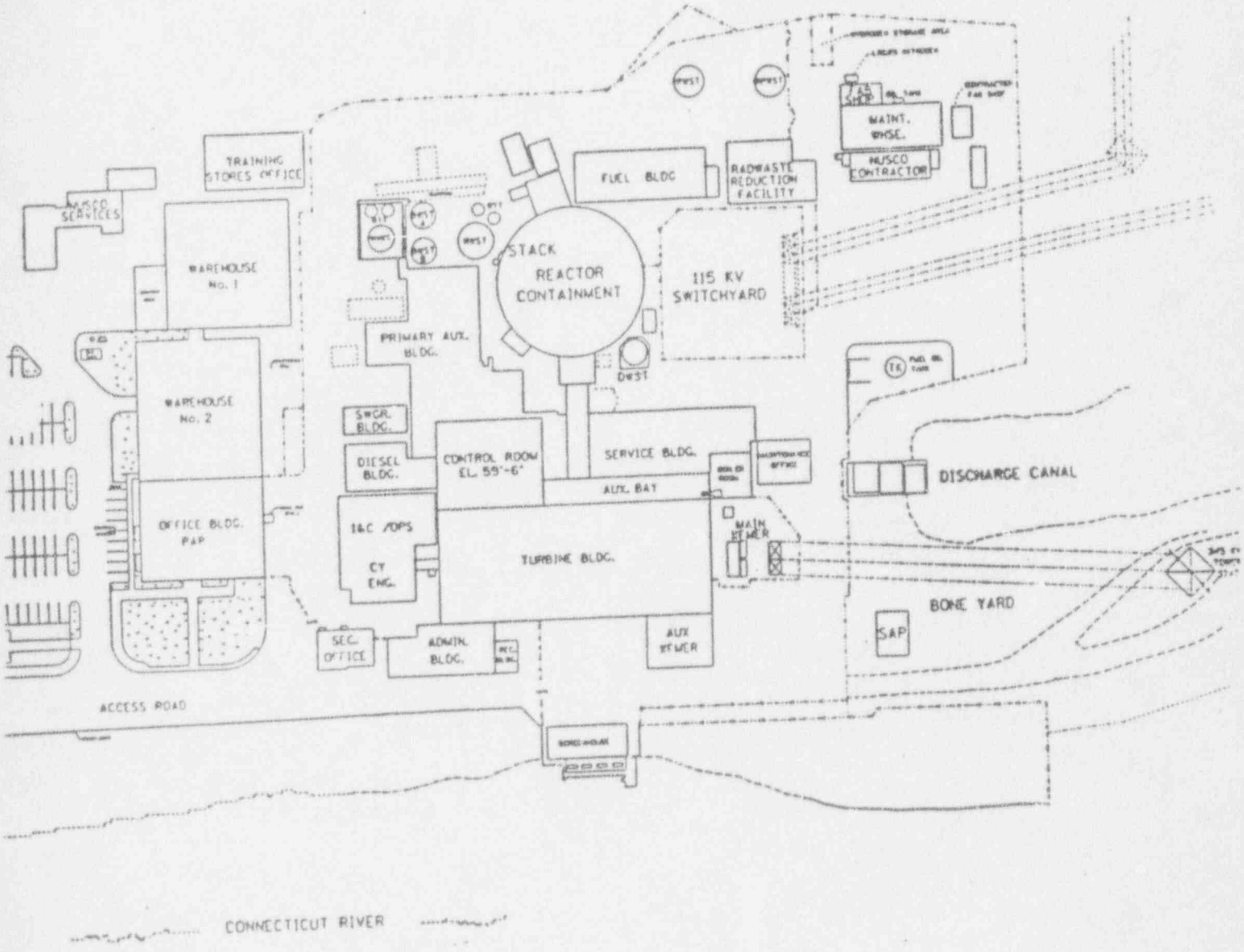

TRAINING
STORES OFFICE
NUSCO
SERVICES
WAREHOUSE
No. 1
WAREHOUSE
No. 2
OFFICE BLDG.
P&P
PRIMARY AUX.
BLDG.
STACK
REACTOR
CONTAINMENT
FUEL BLDG
RADWASTE
REDUCTION
FACILITY
MAINT.
BHSE.
NUSCO
CONTRACTOR
115 KV
SWITCHYARD
DWST
SWGR.
BLDG.
DIESEL
BLDG.
CONTROL ROOM
EL. 59'-6"
SERVICE BLDG.
AUX. BAY
I&C /OPS
CT
ENG.
TURBINE BLDG.
MAIN
XFMER
DISCHARGE CANAL
BONE YARD
SAP
SEC.
OFFICE
ADMIN.
BLDG.
AUX
XFMER
ACCESS ROAD
CONNECTICUT RIVER

FIGURE 2

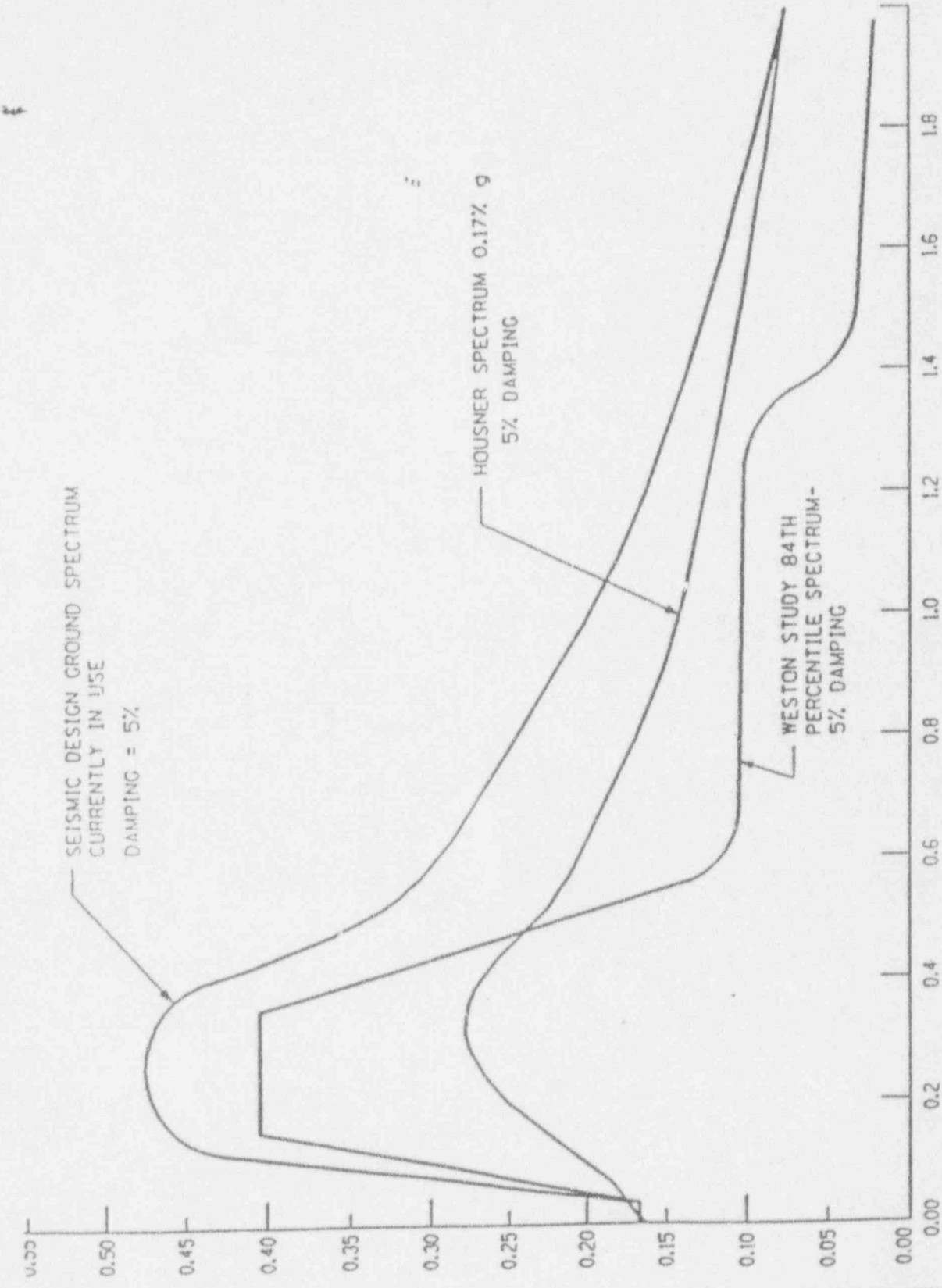


FIGURE 3.7-3 SEISMIC DESIGN GROUND SPECTRUM CURRENTLY IN USE DAMPING = 5%

ATTACHMENT C

RESUMES AND TRAINING RECORDS OF KEY ABB IMPELL PERSONNEL

(44 Pages)

Charbel Abou-Jaoude (6 Pages)
Peter Guglielmino (5 Pages)
Aziz Saber (5 Pages)
Robert Courcy (7 Pages)
Sing Chu (6 Pages)
Steve Reichle (7 Pages)
James Buckley (5 Pages)
John Reilly (3 Pages)

ABB Impell Corporation

CHARBEL M. ABOU-JAOUDE

EXPERTISE

Mr. Abou-Jaoude is a Manager in the Eastern Region's Boston Office Civil/Structural group, with a broad technical and managerial experience in the power industry. His areas of technical expertise are Structural Mechanics and Seismic Design; he has an in-depth knowledge of various industry codes/standards such as Sections III & XI of the ASME Code, ANSI B31.1, IEEE-344 and 382, various USNRC Reg. Guides and NUREG Reports, WRC Bulletins, AISC, and ACI-349. He is well versed in the Generic Implementation Procedure developed by the Seismic Qualification Utility Group for the resolution of USI-A-46, and the methodologies developed by the industry for the response to Generic Letter 88-20 as outlined in NUREG-1407; he has completed the SQUG/EPRI sponsored A-46 and Seismic IPEEE training courses and has participated in several A-46/IPEEE walkdowns as an SRT member. While at ABB Impell, he has lead the engineering efforts of various work scopes; his responsibilities have included: Criteria development, training and personnel development, project execution, interface with regulators and outside organizations, and overall project management.

Currently, Mr. Abou-Jaoude is the Project Engineer for the NUSCo (Connecticut Yankee, Milstone Units 1&2), and PSE&G (Salem 1&2) A-46 projects. He is also the Technical Constultant and an SRT member for the PECo (Limmerik 1&2, Peach Bottom 2&3) IPEEE/A-46 project and the Wolf Creek IPEEE SPRA effort.

Mr. Abou-Jaoude was the Assistant Project Manager for the Civil/Structural effort at TU Electric CPSES Unit 2 Project. He had primary management responsibility for the work of 80 engineers in the Electrical Raceways, Seismic Equipment Qualification, and Seismic II/I disciplines. This effort involved the design validation of existing Raceway designs, issuance of new designs, establishing the qualification basis of all BOP Seismic Cat 1 and NSSS C1E equipment, procurement of new and replacement equipment, structural evaluation of non seismic commodities using an A-46 walkdown based approach, and field engineering to support the completion and start-up of Unit 2.

Prior to his Unit 2 assignment at CPSES Mr. Abou-Jaoude was the Assistant Project Manager for the Secondary Water Chemistry Improvement Project at Consumers Power (Palisades). This project involved modifications to the existing blowdown system, the addition of various equipment items, and the installation of 2000 ft. of piping. The design effort was completed in a period of six months with a peak staff of 40 engineers; the design has been successfully implemented and its operation has provided improvements beyond the plant's initial expectations. In addition to this project he was involved in a number of projects for Consumers Power: He was the Project Engineer for consulting

EXPERTISE (Cont'd)

work related to the resolution of 79-14 piping and pipe support issues; he also was the Project Engineer for a modification to install a reactor head shielding which involved generating the amplified response spectra and performing the seismic analysis and qualification of the lifting ring/shielding structure.

Mr. Abou-Jaoude has also worked on a number of piping and equipment qualification projects for Commonwealth Edison and Northern States Power. He was the Project Engineer for the development of criteria to evaluate integral welded attachments for Prairie Island; the completion of this effort provided successful closure of an NRC 79-14 issue.

Previously Mr. Abou-Jaoude lead a group of 18 engineers, working on the seismic qualification of BOP components, in support of a successful SQRT audit for TU Electric's Comanche Peak Station Unit 1. He was responsible for the technical adequacy, budget and schedule of the following scope:

- Preparation of summary packages and supporting calculations to demonstrate the seismic qualification of storage tanks, heat exchangers, pumps, valves, the diesel generator set, piping, and other electrical components (motors, battery racks, control panels, and instrumentation devices).

- Evaluation of mechanical equipment rerating, under Section XI of the ASME Code, for revised design conditions such as pressures, temperatures, nozzle loads, and or acceleration values (approx. 200 stress reports).

Mr. Abou-Jaoude was also involved in the Comanche Peak cable tray hanger design validation effort. He was a group lead responsible for qualifying cable tray systems. This required detailed dynamic analysis and evaluation of structural members and anchorages. He was involved in the development of criteria for modification reduction techniques. He also worked on the dynamic testing of full scale cable tray systems and provided analytical results for correlation with measured test data.

Prior to joining ABB Impell, Mr. Abou-Jaoude has worked in the Middle-East on the construction of several commercial and industrial reinforced concrete buildings. He has also worked as a field engineer responsible for the installation and maintenance of equipment at an automotive refurbishing plant in the United Arab Emirates.

CHARBEL M. ABOU-JAOUDE

EDUCATION

M.S., Civil Engineering, December 1985
University of Michigan, Ann Arbor, Michigan

B.E., Mechanical Engineering, July 1984
American University of Beirut. Box 11 0236, Beirut, Lebanon

PROFESSIONAL AFFILIATIONS

American Society of Civil Engineers
American Society of Mechanical Engineers
Tau Beta Pi Honor Society
Chi Epsilon Honor Society

PUBLICATIONS

Lee, B. J., Abou-Jaoude, C. M., and De Estrada, M., "Issues of Control Panel Rigidity in Seismic Qualification," Proc. of 1991 Pressure Vessels and Piping (PVP) Conference, Vol. 220.

Lee, B. J., and Abou-Jaoude, C. M., "Effect of Base Uplift on Dynamic Response of Electrical and Mechanical Equipment," Proc. of 1992 Pressure Vessels and Piping (PVP) Conference, Vol. 237-2.

Roche, T.R., Abou-Jaoude, C.M., et al, " Comparison Between Analytical and Test Results for Transformer Base Details," Proc. of 1993 Pressure Vessels and Piping (PVP) Conference, Vol. 256-2.

EPRI
Electric Power
Research Institute

Certificate of Achievement

This is to Certify that

Charbel M. Abou-Jaoude

has Completed the

Seismic IPE Add-On Training Course

Held December 1-3, 1992

David A. Freed

David A. Freed, MPR Associates
SQUG Training Coordinator

R. P. Kassawara

Robert P. Kassawara, EPRI
SQUG Program Manager

SQUG

Certificate of Achievement

This is to Certify that

Charbel M. Abou-Jaoude

has Completed the SQUG Walkdown Screening
and Seismic Evaluation Training Course
Held November 9-13, 1992

David A. Freed, MPR Associates
SQUG Training Coordinator

Neil P. Smith, Commonwealth Edison
SQUG Chairman

Robert P. Kassawara, EPRI
SQUG Program Manager

SQUG

March 31, 1993

MEMORANDUM

To: Charbel M. Abou-Jaoude

From: Neil P. Smith, SQUG Chairman Neil P. Smith

Subject: Certificate of Achievement

Enclosed is your certificate for having completed the SQUG Walkdown Screening and Seismic Evaluation Training Course held November 9-13, 1992.

Based on feedback from the evaluation forms received from the course participants, this session of the training course was successful. The instructors reported that this success was due in no small part to the pre-course preparation and enthusiastic participation of the attendees.

We appreciate your participation and welcome any future comments or suggestions for improving the course.

PETER GUGLIELMINO

PROFESSIONAL EXPERIENCE

Mr. Guglielmino has over 18 years experience in the nuclear industry with expertise in:

- Project Management
- Business Development
- Civil Engineering
- Equipment Qualification
- Mechanical Engineering
- Technical Training

Presently he is a Project Manager with overall responsibility for project management activities at Northeast Utilities, Duquesne Light Co., Cleveland Electric Illuminating Co. and Toledo Edison Co. As a Project Manager, Mr. Guglielmino is responsible for the project's technical quality and commercial issues. He is presently serving as the Project Manager for the Resolution of Unresolved Safety Issue (USI) - A46, Project for Connecticut Yankee Millstone 1 and 2 and for the implementation of unresolved safety issues A-46 and the Individual Plant Examination for External Events (IPEEE) programs for Philadelphia Electric Company's Peach Bottom Units 2 and 3 and Limerick Units 1 and 2. He is a member of the Seismic Review Team (SRT) and has completed the SQUG/EPRI sponsored training for USI A46 and IPEEE programs.

Most recently, Mr. Guglielmino was Client Manager responsible for all aspects of client relations including business development.

Prior to joining ABB Impell, Mr. Guglielmino worked for Cygna Energy Systems as a Client Manager where he was responsible for all aspects of client relationships, including technical management, project management, business development and contracts.

The following projects were secured and managed by Mr. Guglielmino:

- Implementation of Regulatory Guide 1.97 Modifications at J.A. FitzPatrick Nuclear Power Plant

- Engineering and Design of Containment Isolation Provision Upgrade, J.A. FitzPatrick Nuclear Power Plant

PROFESSIONAL EXPERIENCE (Cont'd)

- Seismic Qualification of the Reg. Guide 1.97 Instruments and Control Room Panels at TMI-1, utilizing In-Situ Testing and Dynamic Analysis
- Appendix R Upgrade Associated Armor Cable Support, J.A. FitzPatrick Nuclear Power Plant
- Valve Limitorque Motor Operator Sizing and Setpoint Calculations, J.A. FitzPatrick Nuclear Power Plant
- Failure Analysis of the Control Rod Drive Mechanism (CRDM) Cooling Fans, Indian Point Unit 2
- Feasibility Study of the CRDM Cooling System, Indian Point Unit 2
- Piping Database Phase 2 and 3, Indian Point Unit 2
- Seismic Evaluation of the Service Water Pumps at Indian Point Unit 2

As Manager int he Structural Mechanics Department, Mr. Guglielmino had administrative and technical responsibility for the department including staffing, planning budgeting, salary, administrative and marking.

As Section Manager he provided full support to the Engineering Mechanics Department in the areas noted above. Some examples of direct involvement included:

- Equipment structural evaluation and failure analysis of the Traveling Water Screens for Salem Nuclear Generating Station
- Evaluation of hot shutdown piping systems using PVRC damping criteria (Code Case N-411) and peak shifting criteria (Code Case N-397), Yankee Rowe
- Development of analytical techniques, test methods and acceptance criteria for the seismic evaluation and qualification of safety-related cable tray support systems

PROFESSIONAL EXPERIENCE (Cont'd)

- Development of Cygna's generic approach to snubber reduction
- Development of Cygna's generic approach to nuclear plant life extension
- Pipe support upgrade analysis to meet the requirements of NRC IE Bulletin 79-02, Three Mile Island, Unit 1
- Seismic qualification of safety-related small bore piping using combined in-situ testing and analysis methods, Yankee Rowe
- Application of Code Case N-411 on selected piping systems to determine benefits and effectiveness in reducing snubbers at Three Mile Island Nuclear Station, Unit 1
- ASME Code Section III, Class I analysis of in-line components, Limerick Generating Station, Units I and II

Prior to that, Mr. Guglielmino was an Engineering Supervisor who functioned as project engineer for the Analysis and Qualification of the Instrument Racks at Commonwealth Edison's Dresden Units 2 and 3, and Quad Cities Units 1 and 2; as project engineer for the Equipment Seismic and Hydrodynamic Requalification Project for WNP-2; and as project engineer for a series of equipment qualification tasks for Copes-Vulcan and the Zion Nuclear Power Station.

Mr. Guglielmino provided key leadership in the development of Cygna's generic Equipment Qualification Program as well as contributed to the development and implementation of a piping system analysis and design training program for VEPCo.

He was also responsible for developing the design criteria and analytical methodology for the re-evaluation of safety-related masonry walls at Unit 1 of the Millstone Nuclear Power Station and providing technical supervision to a staff of 25 engineers assigned to the project.

PROFESSIONAL EXPERIENCE (Cont'd)

Mr. Guglielmino also participated in a cable tray scoping study for the Surry Nuclear Power Station, Units 1 & 2, which determined the potential applicability of NRC Information Notice 80-21 and response strategy.

Prior to joining Cygna, he worked for Stone & Webster where he supported the Engineering Mechanics Division working on a full range of engineering and field problems for nuclear power plants, including the seismic qualification of cable tray and cable tray support, analysis and design of supports for safety-related equipment, and stress evaluation of piping nozzles for category I vessels. Other duties included the review and approval of vendor seismic qualification reports, preparation of technical input for purchase specifications and SAR submittals and the resolution of various problems associated with installation and constructability of equipment supports.

EDUCATION

M.S., Civil Engineering
Northeastern University, Boston, Massachusetts

B.S., Civil Engineering
Northeastern University, Boston, Massachusetts

SQUG

Certificate of Achievement

This is to Certify that

Peter Guglielmino

has Completed the SQUG Walkdown Screening
and Seismic Evaluation Training Course
Held June 22-26, 1992

Neil P. Smith, Commonwealth Edison
SQUG Chairman

David A. Freed, MPR Associates
SQUG Training Coordinator

Robert P. Kassawara, EPRI
SQUG Program Manager

AZIZ SABER

PROFESSIONAL EXPERIENCE

Mr. Saber is a Senior Engineer in the Boston Office Engineering Mechanics Group. He has over eight years of experience in the power industry, and extensive experience in the design and installation of suspended distributed systems. He has an in depth knowledge of dynamic analysis and structural design; he is well versed in the use of various finite element codes (STRUDL, ANSYS, ADINA, NASTRAN, SAP) and the design criteria for nuclear power structures (Reinforced Concrete and Steel). Mr. Saber is an active member of ACI Committee 533 on precast panels.

Mr. Saber is currently involved in the IPEEE and A46 projects for PECo and NUSCO. He is certified as SRT by the SQUG. Mr. Saber is responsible for review of the plant safe shutdown equipment list and the evaluation of equipment anchorage, concrete pedestals, and support details.

Prior to his transfer to the Boston Office, Mr. Saber was assigned to the Comanche Peak Unit Civil/Structural Project as a site lead. He provided the coordination of the field engineering activities of the electrical raceways group in support of the construction and completion of the CPSES U2 designs.

Mr. Saber has worked on various other CPSES Unit 1 projects. He has worked on the Mechanical Equipment List project and with the Cable Tray and Cable Tray Hangers Group. He was the lead engineer for the Field Engineering Group responsible for supporting activities and resolving any field problems with authorization to approve any design changes and assure their adherence with the design specifications and code requirements.

Mr. Saber was also responsible for revising and updating the technical project design methodology and the installation and inspection specification for electrical raceways. He also designed and analyzed cable trays and components using computer aid programs and graphics and detailed calculations.

While assigned to the Train C Conduit project, Mr. Saber designed and analyzed conduit systems and supports for seismic loads using systems frequency, projected and/or tributary span methods. He was a lead engineer in the

EXPERIENCE (Cont'd)

System Interaction Group for engineering evaluations of postulated interactions resulting from seismically induced failures of non-safety-related conduits incident upon safety-related systems, structures and components. His responsibilities included writing engineering design change notices to update and revise the project criteria, training personnel for using the field walkdown criteria and the plant documents; namely FSAR, structural drawings, composite piping drawings, HVAC layout drawings, flow diagrams, Q-list and electrical wiring diagrams to resolve the postulated interactions based on field conditions along with engineering techniques.

Prior to joining ABB Impell, Mr. Saber was a structural engineer responsible for designing and analyzing seismic loading structural supports in power plants utilizing computer programming and graphics. He supervised the installation of those supports with the authorization to issue any field changes and assure their adherence with the design specifications and code requirements.

EDUCATION

M.S., Civil Engineering, University of Michigan, Ann Arbor
B.S., Civil Engineering, The American University of Beirut, Lebanon

PROFESSIONAL AFFILIATIONS

Professional Engineer, State of Texas
American Concrete Institute
American Society of Civil Engineers
The Masonry Society

EPRI
Electric Power
Research Institute

Certificate of Achievement

This is to Certify that

Aziz Saber

has Completed the
Seismic IPE Add-On Training Course
Held August 31 - September 2, 1993

David A. Freed, MPR Associates
SQUG Training Coordinator

R. P. Kassawara, EPRI
SQUG Program Manager

SQUG

Certificate of Achievement

This is to Certify that

Aziz Saber

has Completed the SQUG Walkdown Screening
and Seismic Evaluation Training Course
Held August 2-6, 1993

Neil P. Smith, Commonwealth Edison
SQUG Chairman

David A. Freed, MPR Associates
SQUG Training Coordinator

Robert P. Kassawara, EPRI
SQUG Program Manager

State Board of Registration for
Professional Engineers

P. O. DRAWER 18329
AUSTIN, TEXAS 78760

THIS CERTIFIES THAT

AZIZ SABER

WHOSE SIGNATURE APPEARS BELOW, BEING THE HOLDER OF CERTIFICATE NUMBER 68182 CURRENTLY RENEWED IS ENTITLED TO PRACTICE AS A PROFESSIONAL ENGINEER IN TEXAS FOR PERIOD OF 07/01/93 - 06/30/94

Aziz Saber
SIGNATURE OF REGISTRANT

EXECUTIVE DIRECTOR

ROBERT J. COURCY

PROFESSIONAL EXPERIENCE

Mr. Courcy has over 22 years experience in structural engineering analysis/design and supervision of projects for nuclear and fossil power generation and industrial facilities. He is presently a Lead Senior Engineer with ABB Impell's Eastern Region Engineering Mechanics Section in Boston. In this position he fills the role of a Project Engineer, Analyst and Procedures Writer, responsible for the supervision and technical aspects of projects involving building structures, equipment supports, piping, tubing and conduit systems, as well as seismic equipment qualification. Mr. Courcy is also assigned as a member of the Seismic Review Team on the USI A-46 SQUG project for Northeast Utilities. He has been trained by EPRI/SQUG/IPEEE and is certified as a Seismic Capability Engineer.

Specific projects include the following:

- Seismic Equipment Qualification for Northeast Utilities' Connecticut Yankee Atomic Power Station (CYAPS). Responsible for seismic qualification activities associated with the purchasing and installation of new safety-related cabinets, electrical and mechanical components, raceways, valves, etc. for refueling outage Cycle 17 at CYAPS.

- Design Basis Reconstitution (DBR) project for Niagara Mohawk's Nine Mile Station 1. Responsible for the design verification of the DBR document and calculations for the analysis of reinforced concrete.

- Reactor Water Pipe Replacement project for Boston Edison's Pilgrim Station. Responsible for the writing/preparation of the Plant Design Change (PDC) document and interface with the pipe supplier and BECo's Construction Management group.

- Service Water Pipe Replacement project for Commonwealth Edison's Zion Plant. Responsible for the preparation of the pipe support design/evaluation procedures.

- Fuel Pool Cooling System pipe replacement at Vermont Yankee for Yankee Atomic Electric co. Responsible for the design/evaluation of equipment and pipe supports.

- Conduit evaluation project for Texas Utilities' Comanche Peak Station. Responsible for the design/evaluation of conduit supports.

PROFESSIONAL EXPERIENCE (Cont'd)

- Control Room Lighting project for Public Service Electric & Gas (PSE&G) Salem 1 and 2 plants. Responsible for the development of the conceptual design for the Control Room lighting supports and connection details.

- DOE SNOx project for Ohio Edison's Niles Plant. Subcontracted from ABB Environmental Systems. Responsible for the conceptual design, analysis and details for the following:

  - Sixteen 50'-0" structural steel towers with interconnecting bridges for the support of a 7'-0" diameter flue gas duct system.

  - A rigid frame steel structure to support a gas/gas heat exchanger unit.

  - Development of a procurement, fabrication and delivery specification for structural steel.

- Instrument Tubing Evaluation project for Rochester Gas & Electric's Ginna Plant. Responsible for the layout, analysis and support of various instrument tubing systems and the interface with RG&E's Construction Management group.

- Major Pipe Support Evaluation/Modification project for NMPC's Nine Mile Station. Responsible for the analysis to determine stiffnesses and load capacities of all pipe supports.

Prior to joining Impell, Mr. Courcy served eight and a half years as a Supervising Engineer for Cygna Energy Services. For approximately six years, he was Group Leader for the Site Engineering Office at Pilgrim Nuclear Power Station (PNPS), responsible for the supervision and technical direction of the group. While in charge of this group, he was responsible for the resolution of all problems associated with new construction, and modification projects.
Major projects that he was involved with included:

- Appendix "R" - Responsible for conduit layout, support design and resolution of on-going problems with the excavation and placement of major concrete duct bank.

PROFESSIONAL EXPERIENCE (Cont'd)

- Blockwalls - Responsible for the development of modifications details for all new structural steel reinforcing members.

- Scram Discharge Volume - Redesigned pipe supports and resolved pipe and pipe support problems.• TMI - Developed modifications of piping, tubing and supports.

- MCC Environmental Enclosures - Responsible for the design of structural steel enclosures and conduit tubing and pipe supports.Earlier, Mr. Courcy was in charge of a ten man design team at Millstone 1 where he was involved in the design and installation of numerous duct, pipe and conduit supports, along with the design and installation of six MCC enclosures and a structural steel extension to the building steam tunnel.

Originally Mr. Courcy represented Boston Edison Company as part of the craft supervision team during the NRC IE 79-02 and 79-14 Bulletin effort at PNPS.

Prior to joining Cygna, Mr. Courcy served over ten years as a structural designer/engineer at Charles T. Main, Inc. in Boston in their Pulp and Paper Division. In this capacity he was responsible for the structural analysis of several major structures such as recovery and power boiler buildings, paper machine and evaporator buildings, and warehouse structures. The analysis included steel framing, concrete floors and foundations, and equipment supports.

Projects he worked on during his tenure at Charles T.Main included:

- Scott Paper Co. - Design of a bleach plant building and digester enclosure tower

- Boise Cascade - Design of a paper machine building and renovation of an existing building into a storage facility.

- Fraser Paper Co. - Design an extension to an existing paper machine building to house a new in-line coater machine, a boiler building and several tank foundations.

- Union Camp Co. - Design of a recovery boiler building, an evaporator building and a black liquor pump house.

EDUCATION

A.S. Structural Engineering, Northeastern University, Boston Massachusetts

PROFESSIONAL REGISTRATION

Registered Professional Engineer (Structural) - Massachusetts

SQUG

Certificate of Achievement

This is to Certify that

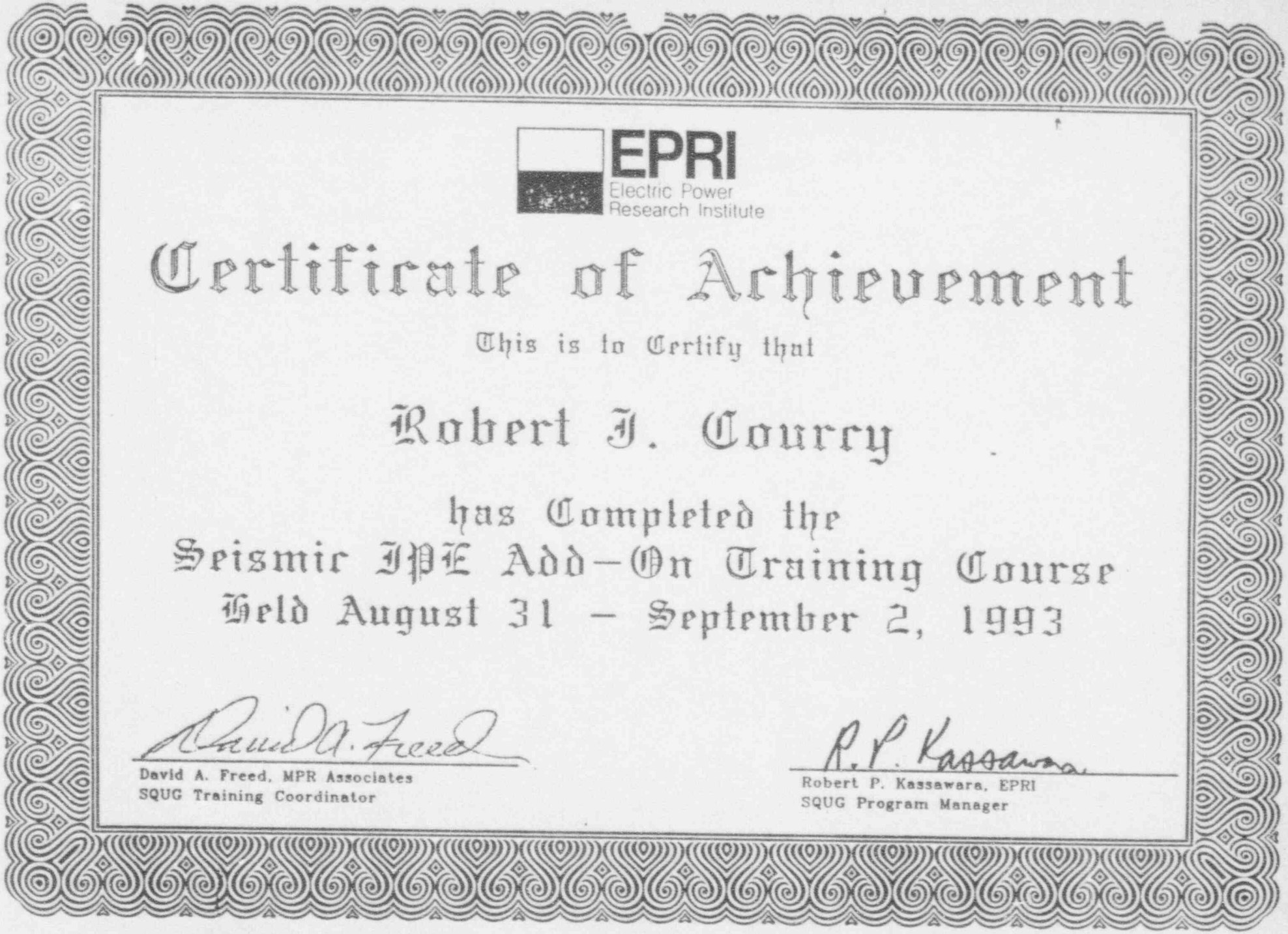
Robert J. Courcy

has Completed the SQUG Walkdown Screening
and Seismic Evaluation Training Course
Held August 2–6, 1993

Neil P. Smith, Commonwealth Edison
SQUG Chairman

David A. Freed, MPR Associates
SQUG Training Coordinator

Robert P. Kassaware, EPRI
SQUG Program Manager


EPRI
Electric Power
Research Institute
Certificate of Achievement
This is to Certify that
Robert J. Courcy
has Completed the
Seismic IPE Add-On Training Course
Held August 31 - September 2, 1993
David A. Freed, MPR Associates
SQUG Training Coordinator
R. P. Kassawara
Robert P. Kassawara, EPRI
SQUG Program Manager

COMMONWEALTH OF MASSACHUSETTS

DIVISION OF REGISTRATION

IN ENGINEERING

AS A REG/PROF. ENGINEER

ISSUES THIS LICENSE TO

ROBERT J COURCY

3 HOBBLER RD

BOURNE MA 02532-2223

32320 06/30/94 207622

LICENSE NO. | EXPIRATION DATE | SERIAL NO.

Signature

SING CHU
Senior Engineer

PROFESSIONAL EXPERIENCE

Mr. Chu is a Senior Engineer in the Engineering Mechanics Division of our Boston Office. He has 7 years of experience in areas of systems engineering, design baseline documentation, cost and scheduling, computers, and emergency preparedness.

Systems Engineering

NUSCO - Presently Mr. Chu is involved in the NRC's Unresolved Safety Issue (USI) A-46 "Seismic Qualification of Equipment in Operating Plants" for Connecticut Yankee and Millstone Units 1 & 2. His responsibilities include screening verification and walkdown, and outlier identification and resolution. All tasks are performed in accordance with the SQUG, "Generic Implementation Procedure for Seismic Verification of Nuclear Plant Equipment" with Stevenson & Associates GIPPER software v1.0.

PECo / PSE&G - Mr. Chu is also involved in USI A-46 and IPEEE projects at Peach Bottom Atomic Power Stations and Salem Stations.

NUSCO - Staff augmentation for Seismic Equipment Qualification at Connecticut Yankee. Responsible for seismic qualification activities associated with new replacement equipment such as electrical instrument and cabinets, mechanical components, and valves, etc. for RFO Cycle 17.

FPL - Mr. Chu functioned as an engineer in support of the As-Built In-Service Inspection Project. In this capacity, Mr. Chu performed field walkdowns and generated engineering calculations to qualify noncompliance to the existing field conditions. Structural and stress analysis were performed by using STAAD III and MATHCAD.

Design Baseline Documentation

PECo - Mr. Chu developed the 480 Volt Load center and the 480 Volt Motor Control Center Design Baseline Documents (DBDs) for both PBAPS and LGS. His duties included researching the system design, modifications, plant specifications, and licensing documents. Mr. Chu was also responsible for writing draft and final sections of the DBDs ensuring technical accuracy and completeness in accordance with PECo requirements.

PROFESSIONAL EXPERIENCE (Cont'd)

Cost and Scheduling

NMPC - Mr. Chu served as the Financial Administrator to the Nine Mile Point Units 1 & 2 engineering mechanics project. In addition, he was our Syracuse Branch Office Administrator. Mr. Chu was mainly responsible for forecasting and scheduling of NMPC's Work Task Assignments. He also monitored and tracked all purchase orders and job expenditures to ensure that they are within their specific contracted limits. Mr. Chu's other responsibilities are as follows:

Assisting in setting up Structural Evaluation System (SES) database for the Seismic Upgrade Program

Translate NUPIPE-SW piping models to SUPERPIPE using the same geometry, material properties, support configuration, and boundary conditions.

Provide forecasts and schedules for NMPC's Work Task Assignments, monitors and tracks all purchase orders and job expenditures to ensure that they are within their specified contracted limits.

Track actual vs. projected resource allocation, production, and expenditure.

Use of ABB Impell's Project Engineering System to support project engineers with job tasks progress and activities information.

Established and maintained databases for the NMPC Maintenance Walkdown/ISI and 50.59 program.

Responsible for maintenance, setup, networking, supplies, and procurement of ABB Impell Syracuse office computer system.

IE - Mr. Chu assisted the project engineer in cost and scheduling for the Duane Arnold Offsite Emergency Plan Project. His main responsibilities were to monitor overall budget and schedule for the project in accordance with contract requirements and to provide project progress (% completed) and financial status to the client.

PROFESSIONAL EXPERIENCE (Cont'd)

Emergency Preparedness

NMPC/LILCO - Mr. Chu was involved in the development of the NRC exercise and emergency preparedness drill scenarios for NMPC's Nine Mile Point Unit 2. He also reviewed and developed LILCO Shoreham Station's 1988 FEMA/NRC graded exercise. In both capacities, Mr. Chu's main task was to generate drill information based upon raw data input. His primary involvement was to generate both in-plant and offsite radiological data using HP-85 Dose Assessment Program and various spreadsheet and database programs he developed. This included ingestion pathway, core damage, in-plant chemistry, effluent monitoring, and plant status calculations. He has also generated all the necessary maps such as EPZ survey, ingestion pathway, in-plant dose and D.O.E. Environmental Survey for these exercises. Mr. Chu provided support as a controller at the Technical Support Center (TSC) for SNPS.

NHY - Mr. Chu was assigned to New Hampshire Yankee's Seabrook Station as a document/production controller. Here, he helped to establish and track the completion of several hundred open items between several consulting firms required to revise the New Hampshire
Radiological Emergency Response Plan. He has also provided input to assist in completing Seabrook's Offsite Emergency Plan.

Prior to this assignment, Mr. Chu was assigned to ABB Impell's Plant Engineering Division to assist in completing Niagara Mohawk's Nine Mile Point Unit 1 pipe hangers and supports analysis using CAD and CAEMIS (Computer Aided Engineering Management Information System). Duties included generating support and hanger drawings using CAD, creating mathematical model, and running analysis per set requirements.

Prior to joining ABB Impell Corporation, Mr. Chu worked as an electrician aide for a large electrical contractor.

EDUCATION

B.S. Aerospace Engineering
Polytechnic University, Farmingdale/Brooklyn, New York

TRAINING COURSES

- SQUG USI A-46 Walkdown Screening and Seismic Evaluation Training Course. Nov. 1992
- SQUG IPE Individual Plant Examination of External Events Seismic Margin Assessment Training Course, Dec. 1992
- Stevenson & Associates SQUG Generic Implementation Procedure GIPPER computer program training course Nov. 1992.

HONORS AND AFFILIATIONS

Who's Who Among Students in American Universities and Colleges

REGISTRATION

Engineer in Training, New York

EPRI
Electric Power
Research Institute

Certificate of Achievement

This is to Certify that

Sing L. Chu

has Completed the

Seismic IPE Add-On Training Course

Held December 1-3, 1992

David A. Freed

David A. Freed, MPR Associates
SQUG Training Coordinator

R.P. Kassawara

Robert P. Kassawara, EPRI
SQUG Program Manager

SQUG

Certificate of Achievement

This is to Certify that

Sing L. Chu

has Completed the SQUG Walkdown Screening
and Seismic Evaluation Training Course
Held November 9-13, 1992

Neil P. Smith, Commonwealth Edison
SQUG Chairman

David A. Freed, MPR Associates
SQUG Training Coordinator

Robert P. Kassawara, EPRI
SQUG Program Manager

STEPHEN P. REICHLE

PROFESSIONAL EXPERIENCE

Mr. Reichle has over 19 years of power plant engineering, design, maintenance, and operations experience. As Technical Manager in the Engineering Division of ABB Impell's Boston office he is currently assigned as the Project Engineer on the NRC's Unresolved Safety Issue (USI) A-46 project for Northeast Utilities. In addition to the Northeast Utilities A-46 project, Mr. Reichle is also the Systems Project Engineer on the PECo IPEEE/A-46 project for the Limerick and Peach Bottom plants. He is responsible for the identification of safe shutdown paths and the development of a Success Path Component List for each unit. These NRC programs deal with the seismic adequacy, or margin of equipment in operating plants.

Mr. Reichle has prepared Design Baseline Documents (DBDs) for the feedwater systems at the PECO Peach Bottom and Limerick nuclear plants. This project consisted of conducting the necessary research to identify the boundaries, interfaces and requirements of the individual systems. The documents also describe how each of the systems satisfies their design input and output requirements, and what modifications have impacted the system's original design basis. During this project assignment, Mr. Reichle also participated in the Appendix R update project for the Limerick Nuclear Station by reviewing the new and updated shutdown methods identified for each fire area, and assisting in the resolution of shutdown concerns identified during the review process.

Previously, Mr. Reichle served as the Project Manager for the Appendix R Compliance Program and Fire Barrier Upgrade Projects at the Pilgrim Station. Mr. Reichle managed these programs for over two years, with tasks including the development of Appendix R shutdown analyses, the development of associated operating procedures, the review and upgrade of all Appendix R fire barriers, and the design of various electrical and mechanical system modifications. This project was staffed with approximately 25 engineers and technicians.

Mr. Reichle served as the Project Engineer, and managed the engineering resources, during the update of the J. A. FitzPatrick Fire Protection Reference Manual, and supported the update of the Fire Protection Program Manual for

EXPERIENCE (Cont'd)

Indian Point Unit 3. Both of these projects involved the update of fire protection and Appendix R programs to include the changes made by modifications, and the preparation of a new manual that included both programs.
Mr. Reichle also served as the Project Engineer for an Appendix R project for Northeast Utilities Millstone 3 Nuclear Power Plant. This project consisted of four major tasks: 1) review the plant's safe shutdown methodology and equipment list to ensure completeness 2) identify which components might be affected for each fire area, 3) identify the worst case fire scenario (in terms of equipment loss) for each fire area, and 4) identify and prioritize the operator actions that need to be taken in each fire area.

Prior to this assignment, Mr. Reichle performed a design baseline verification of the Emergency Operating Procedures (EOP) for Nine Mile Point 1, and determined the impact of operating safety related systems with normally open manual valves at the system's interface with non-safety related portions of the system. His responsibilities on these projects included the preparation of verification packages to document design basis of input parameters to EOP flowcharts, preparation of various design calculations, and preparation of a report on the boundary valves. Also included within this project was a review of the plant's Service Water System and the effect of increased lake water temperature.

Mr. Reichle has also served as a technical specialist in support of triennial fire protection audits at the H.B. Robinson, Brunswick and Shearon Harris nuclear power plants. During these audits, he served as the Systems Engineer reviewing station operating practices, programs and procedures used to ensure safe shutdown of the plants in the event of a fire.
Mr. Reichle has also served as the Project Manager for the single failure analysis of the ECCS sub-systems, and their support systems, for the Connecticut Yankee plant. This project included the identification and review of potential equipment failures for each of the systems, including mechanical, electrical and instrumentation, during injection and recirculation modes in response to a LOCA.

EXPERIENCE (Cont'd

In conjunction with the above single-failure analyses, a review of the CY surveillance procedures was performed. This review was conducted to ensure that all ECCS redundant or required components were included in the appropriate procedure, and that proper surveillances were being performed to assure operability of the systems.

Prior to joining ABB Impell, Mr. Reichle was a Senior Engineer at Cygna Energy Services and assisted in the preparation of the Appendix "R" review for various NUSCo generating stations. As a member of this project, he was assigned tasks such as developing safe shutdown scenarios and identifying equipment which needed to be protected, establishing safe shutdown fire areas, performing walkdowns of fire areas to verify the adequacy of

existing barriers (including doors, dampers, and penetration seals), identifying barrier deficiencies, preparing justifications for exemption requests, and making recommendations for upgrading fire barriers or their penetrations to the required fire resistance rating.

Mr. Reichle also participated in preparing a conceptual design of a seismic hot shutdown system for the Yankee Rowe Nuclear Plant. This project reviewed the feasibility of providing a standby, portable pumping system made up of standard commercial grade components, that would deliver water to the steam generators and/or main coolant system in the event no other method was available. Included in this project was the identification system demands, sizing of components, identification of water sources, and providing an estimated cost to install the system.

In a previous assignment, Mr. Reichle served as Lead Engineer for the development of surveillance and maintenance procedures for the Shoreham Power Station. His responsibilities included the identification of maintenance and inspection requirements for all mechanical balance of plant equipment.

EXPERIENCE (Cont'd)

He established the parts requirements, special tools, rigging and handling instructions for those procedures. Mr. Reichle also supervised additional tasks for the Shoreham Station including:

- Development of Fire Protection Program Description and Associated procedures
- Development of Maintenance Program Description
- NUREG-0612 Heavy Loads Analysis
- Rigging and Handling Procedures for NUREG-0612 Heavy Loads
- Preparation of Refueling Procedures
- Design, Analysis, and Fabrication of Fuel Handling and Reactor Head Strongback

Before joining Cygna, Mr. Reichle held the position of Lead Applications Engineer for the Jamesbury Corp., a manufacturer of fluid control equipment. His responsibilities included supervising technical analysis, sizing equipment, selecting material and accessories, and resolving field installation and operational problems of motor-operated valves.

Mr. Reichle was responsible for sizing valve actuators (both pneumatic and electric) given the system operating conditions. For motor operated valves this task included determining the necessary torque output, then selecting the appropriate gear train configuration and motor size. For nuclear projects, motor sizing included considerations of both normal and degraded voltage conditions.

Earlier in his career, Mr. Reichle worked with Stone & Webster Engineering Corporation where he was the responsible engineer for liquid and solid radioactive waste systems. Responsibilities associated with this position included: development of system design and flow diagrams, engineering, selection of equipment and layout, preparation of equipment specifications and purchase requisitions. Other duties included review of system piping diagrams, and resolution of field installation problems. Mr. Reichle also assisted in the development of a spare parts program and database for Millstone Unit 3.

EXPERIENCE (Cont'd)

In his initial assignment at Stone and Webster, Mr. Reichle assisted in the preparation of a system operations manual for Connecticut Yankee. This work included the writing of system descriptions and operating procedures for the waste evaporator degasifier, aerated drains, and steam generator blowoff.

Before Mr. Reichle's employment with Stone & Webster, he spent six years in the U. S. Navy Nuclear Submarine Program where he qualified as an Engineering Watch Supervisor.

EDUCATION

B.S., Mechanical Engineering, Central New England College
A.S., Mechanical Engineering, Worcester Junior College
U.S. Navy Nuclear Power School and Prototype Training

Graduate Work, Fire Protection Engineering,
Worcester Polytechnic Institute

PROFESSIONAL ACTIVITIES

Member, American Society of Mechanical Engineers

SQUG

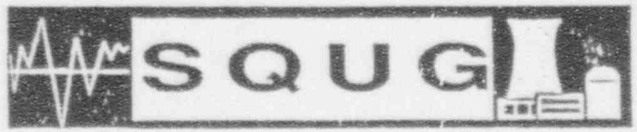
Certificate of Achievement

This is to Certify that

Stephen Reichle

has Completed the
SQUG Relay Evaluation Training Course
Held February 25-27, 1992

Jess O. Betlack, MPR Associates



Certificate of Achievement

This is to Certify that

Stephen Reichle

has Completed the
SQUG Equipment Selection Training Course
Held February 25-27, 1992

Paul W. Hayes, MPR Associates

Richard G. Starck II, MPR Associates

JAMES J. BUCKLEY

SPECIALTIES

ELECTRICAL ENGINEERING AND DESIGN

PROFESSIONAL EXPERIENCE

Mr. Buckley is the Supervisor of Design and Drafting for ABB Impell's Boston office Design/Engineering Section of the Electrical Systems Division. He has over 23 years of experience in the engineering, design and installation of electrical systems for power generation and various industrial facilities including pulp and paper projects and water/ sewerage treatment plants.

Mr. Buckley has attended the SQUG training course for Safe Shutdown Equipment Selection and Relay Screening and Evaluation which qualifies him as a Lead Relay Reviewer. Presently, Mr. Buckley is the Lead Relay Reviewer for the identification of USI A-46 Safe Shutdown Equipment and Relays for Northeast Utilities Service Company (NUSCO) projects for Connecticut Yankee and Millstone Units 1 and 2 Stations. The overall project scope is to retrieve each electrical component from the Safe Shutdown List for Relay Evaluation and review schematics, wiring diagrams, cable schedules, and raceway schedules associated with each component to identify relays and raceways required to be verified as seismically adequate per the requirements of the SQUG Generic Implementation Procedure (GIP). He has also been the Lead Relay Reviewer for the Philadelphia Electric Company (PECo) Peach Bottom Atomic Power Station Units 2 and 3 and the Public Service Electric & Gas Company (PSE&G) Salem Generating Station Units 1 and 2.

Recently, Mr. Buckley served as Lead Engineer for the Electric Load Management System project, a data collection effort for NUSCO's Millstone Unit 1 Station. He also held the same position for an identical project at NUSCO's Connecticut Yankee Station.

Prior to this assignment, Mr. Buckley was assigned to the Carolina Power and Light, Brunswick Plant, Appendix R separation analysis documentation review. He also supported the Niagara Mohawk, Nine Mile Unit 1, project which consisted of 125VDC system modifications, fuse and molded-case switch additions to the 125VDC distribution boards and addition of battery monitoring systems for 125VDC batteries.

EXPERIENCE (Cont.)

In a previous assignment, he was a Project Engineer on the Commonwealth Edison, Dresden Unit 2 Annunciator Modifications Project. This modification addressed the human engineering deficiencies associated with the plant annunciator system. Changes to the system included auditory coding, ringback and flashrate adjustment and reflash. These changes resulted in extensive revisions to the plant's wiring and schematic drawings.

Previously, he was the Lead Electrical Design/Engineer for the No. 4 Chemical Recovery Boiler Project for Miramichi Pulp and Paper. His responsibilities included checking electrical specifications and calculations, development of the wiring design for connection of field cables as well as the design of raceways, grounding, lighting, etc.

His earlier assignments at ABB Impell included experience in an as-built verification of wiring diagrams for control panels and the development of design change packages required to resolve any deficiencies and updating all affected drawings for Boston Edison's Pilgrim Station. Other activities at Pilgrim Station included lighting design of the Computer Room, answering Engineering Service Requests (ESR), issuing and resolving Potential Conditions Adverse to Quality (PCAQ), writing and implementing Maintenance Work Request (MWR), evaluating plant conditions for circuit isolations and the preparing Appendix R Plant Design Change Packages. These packages included cable rerouting, and the installation of fire detection and suppression systems.

His previous assignments include a staff position on the Equipment Qualification Program team for Northeast Utilities and at the Seabrook Station which also included walkdown assignments. Earlier assignments with ABB Impell include the electrical design of the Appendix R Emergency Lighting System for Connecticut Yankee.

In an assignment at the NYPA Fitzpatrick plant, Mr. Buckley was responsible for coordinating the installation of electrical modifications in accordance with 10 CFR 50, Appendix R. His responsibilities included the layout of equipment, conduit routing and design of conduit supports.

Mr. Buckley previously worked with the C.T. Main Corporation Pulp and Paper Division where he was responsible for the electrical design of recovery boiler systems including precipitators, evaporators, and air compressors for the Ngodwana Mill Expansion Program in South Africa. In connection with this work, he was also responsible for raceway layout and design, and field engineering support. He prepared the secondary electrical power drawings, motor control center arrangements, computerized cable schedules, and related PLC drawings. He was assigned to the site for four months for

EXPERIENCE (Cont)

the checkout and start-up of the recovery boiler, and the review of the electrical subcontractor's work. Other projects included the design of paper machines, power boilers, coal and wood yards and turbine generators.

With Metcalf & Eddy, Mr. Buckley was involved in the electrical design of various water and sewerage treatment plants. His work included a three month field assignment to determine the sources of computer analog and digital inputs associated with the computerization of an existing sewage treatment plant in St. Paul, Minnesota. In an earlier assignment, he spent three months overseas providing engineering support for the construction of military air base facilities in the Kingdom of Saudi Arabia.

EDUCATION

Attended Northeastern University's Lincoln College

SQUG

Certificate of Achievement

This is to Certify that

James Buckley

has Completed the
SQUG Relay Evaluation Training Course
Held February 25-27, 1992

Jess O. Betlack, MPR Associates

SQUG

Certificate of Achievement

This is to Certify that

James Buckley

has Completed the
SQUG Equipment Selection Training Course
Held February 25-27, 1992

Paul W. Hayes, MPR Associates

Richard G. Starck II, MPR Associates

JOHN W. REILLY

PROFESSIONAL EXPERIENCE

Mr. Reilly is a Principal Engineer with the Boston office of ABB Impell Corporation's Eastern Region. He is presently assigned to the Boston Edison Company Setpoint Control Program. The primary objective of this program is to increase the Pilgrim Nuclear Power Station operating cycle from 18 months to 24 months by identifying the governing criteria for such a change. The overall approach in developing the setpoint calculations is to determine a total loop uncertainty based on instrument error, including statistically analyzing actual plant calibration and surveillance data to reflect a high confidence level drift value to bound the actual instrument's drift over a 24 month interval.

Prior to this project, Mr. Reilly was assigned to the Public Service Electric & Gas Company Erosion-Corrosion modelling effort. This task consisted of the engineering support necessary to model all susceptible systems and lines for Salem Units 1 & 2 and the Hopecreek Generating Stations, including but not limited to, developing the plant configuration (heat balance) file for each unit, developing the water chemistry file for each unit, running flow analyses where required and generating specific component susceptibility reports for each system.

Mr. Reilly was previously assigned to the NRC's USI A-46/SQUG project for Northeast Utilities Service Company, Millstone Unit 2 and Connecticut Yankee plants. He was responsible for the identification of those systems and safe shutdown paths used to accomplish the plant safe shutdown functions as well as the components necessary to align these paths. All paths and components were chosen based on a safety classification approach with the application of the SQUG GIP criteria such that the integrity of the Reactor Coolant System pressure boundary was maintained and the reactor was shut down and maintained in a safe shutdown condition. In addition to the above, Mr. Reilly was responsible for the preparation of the Safe Shutdown Paths report for Millstone Unit 2.

Prior to this project, Mr. Reilly was assigned to the Erosion/Corrosion Project at NUSCo's Connecticut Yankee and Millstone 1, 2 and 3 nuclear power stations where he served as a lead reviewer of historical E/C-related piping modifications and deficiencies. This information was used to determine the plants' operability status after the Millstone 2 failure.

PROFESSIONAL EXPERIENCE

Mr. Reilly was also previously assigned to a project at Boston Edison's Pilgrim Station during which time he worked on a multi-disciplined project team to establish the design performance, installation and test requirements for a hydrogen injection system. The system's primary function was to suppress the radiolysis of water in the reactor vessel by providing, controlling and delivering hydrogen gas into the feedwater.

In addition, he assisted in the development of the SQUG Safe Shutdown Equipment List for the Connecticut Yankee Station. His responsibilities included the review of P&ID's and electrical drawings to identify safe shutdown equipment, as well as sharing lead responsibility in the preparation of component specific data packages for the safe shutdown equipment identified as requiring a detailed seismic review.

In an earlier assignment for New York Power Authority, Mr. Reilly prepared a detailed Fire Hazard Analysis for the James A. FitzPatrick Nuclear Power Plant as part of a Fire Protection Program upgrade. The project also included a review of modification packages to determine impact on licensing commitments, safe shutdown capabilities, and fire protection/detection.

Mr. Reilly also prepared Section 6.0 of the Fire Protection Program Manual titled "Fire Area/Zone Analyses" as a part of this project. This included a combustible loading analysis for all plant fire zones and a station walkdown to gather new, and verify current, fire protection information.

Prior to this project, Mr. Reilly was assigned to a project involving the substantiation of heat exchanger performance parameters and tubing minimum wall criteria for Rochester Gas and Electric Corporation's Ginna Nuclear Power Station. This effort included developing heat exchanger performance calculations, ductile analyses, vibration analyses and fatigue analyses based on existing, probable and possible equipment loadings to determine required heat transfer surface and minimum tube wall requirements.

PROFESSIONAL EXPERIENCE

Other responsibilities and experience include in-house responsibility for computer troubleshooting and upgrading, including both hardware and software maintenance; on-site walkdown planning preparation; electronic communications between regional offices via configuration files and modems; and database and report development as necessary for project commitments.

EDUCATION

B.S., Mechanical Engineering, University of Notre Dame, 1988
B.A., Liberal Arts, Stonehill College, 1987

LICENSES AND REGISTRATION

Engineer-in-Training License

ATTACHMENT D

PEER REVIEW REPORT

(6 Pages)

Stevenson & Associates
A structural-mechanical consulting engineering firm

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Tel 617 932 9580 Fax 617 933 4428
BOSTON•CLEVELAND

91C2648-LSC-017

July 22, 1993

Steve W. Wainio
Northeast Utilities Service Company
P. O. Box 270
Hartford, CT 06141

Subject: A-46 (SQUG) and IPEEE Peer Review Walkdown for Connecticut Yankee Power Plant

Reference: NU Letter No. NE-93-SAB-251 from S. Weerakkody dated June 2, 1993

Dear Steve:

Please let this letter serve as a report on the peer review walkdown of the A-46 (SQUG) and IPEEE evaluation for the Connecticut Yankee (CY) plant. The peer review was conducted by Drs. R. P. Kennedy and J. D. Stevenson on May 25 and 26, 1993.

All accessible areas of the plant were reviewed including the Containment, Primary Auxiliary Building (PAB), Turbine Building, Diesel Generator Building, Terry Turbine Building, Intake Structure and the Yard in which the major tankage for CY is located. Areas which were inaccessible due to radiological concerns were the RHR pits, piping trench, seal water cubicle, and boron recovery areas in the PAB, and the lower elevation of the Containment containing the reactor coolant loops.

The walkdown has been conducted in a very competent manner and results are in accordance with the guidance of the Generic Implementation Plan (GIP) and NP-6041 documentation. The CY plant has been found to be in good condition with respect to seismic ruggedness owing to good original design and modifications made to meet findings and suggested improvements resulting from the Systematic Evaluation Program (SEP) reviews.

During the peer review walkdowns a number of observations were made for the consideration of the A-46 and IPEEE seismic capability engineers. The following general conditions were noted:

- At various locations in the plant grating, which may pose an interaction hazard is not always positively restrained (clipped or anchored) to the structures.

- Ductwork throughout the plant that is anchored into concrete should be investigated to determine the type and capacity of the anchors used.

- Finally, interactions between ductwork, and electrical raceways exiting busses are generally judged as not significant for cabinets containing essential relays so long as the "bad actor" relays have been dispositioned.

The component-specific comments are organized by location (room and building) and as A-46/IPEEE and IPEEE only concerns:

A-46 and IPEEE Related Comments

Primary Auxiliary Building

BA-MOV-349 & -386 A channel type support was found engaged (coped) around nuts of the motor operators. As there are no longitudinal supports on the piping, this arrangement will act as a restraint, thus making the valves an independent support. This should be evaluated with regard to differential motion to ensure the valve and operator can withstand the resulting loads or the support should be removed.

MCC8-6 A fire piping nozzle is in close proximity to the conduit above the MCC. Although the MCC is rigidly braced precluding any significant fore-aft displacement, the fire piping branch is more flexible. If the nozzle is forced into the conduits by a seismic event, the concern is that the diffuser washer could shear off the nozzle if it is attached to the nozzle itself. If the diffuser is actually attached to the pipe and not the nozzle itself, this is no longer a concern. Per the referenced letter, this MCC is not powered from emergency buses and is therefore not needed for accident mitigation.

E-4-1A & -1B The component cooling heat exchanger will act as an anchor for the service water piping attached to it as this piping is only gravity supported. As such, a determination must be made as to how much piping to consider as acting inertially with the heat exchanger when calculating the anchorage loads of the heat exchanger. In addition, the anchors are close to a free edge of the supporting concrete beam which might also result in capacity reduction.

Charging and Metering Pumps Small bore, threaded piping appears to be marginally anchored to resist seismic effects. This should be investigated for seismic capacity considerations.

FL-53-1A & -1B Adam's Filters These filters have a motor driven shaft which forms part of the filter pressure boundary by allowing back-wash flow through the center of the shaft to an approximately 3 inch pipe. The primary anchorage for the filter is located at mid-length of the filter and is directly below the approximately 14 inch inlet nozzle. The motor driver is mounted separately from the filter. There exists the potential for a significant torsional/lateral load (developed by the attached piping under earthquake loading) to be reacted by the filter inlet nozzle and potentially cause rotation or side-slippage of the filter housing. This motion might cause shaft/driver misalignment and should be investigated to address the effects on operability and potential for loss of pressure boundary at the 3" backwash pipe and filter shaft assembly. It is our understanding based on an explanation provided to the walkdown team that the filters are a long-term protective measure and there are no consequences for loss of filtering for a short period such as days or weeks such that the filter can be bypassed and this is no longer a safe shutdown issue. In effect, the filters may be removed from the SSEL.

Containment

F-17-1 thru -4 Anchorage of the CAR fans cannot be seen since it is under coverplates and not visible. Slab drawings investigated as to what anchorage was installed to ensure the anchorage is adequate.

Intake Structure

P-37-1A and Diesel Fire Pump Control Panel The grating above the pump should be checked to ensure it is positively secured.

P-5-1A The fuel oil line from the diesel oil tank to the pump passes through a masonry block wall which should be checked for seismic integrity and may as a result govern the seismic fragility for the diesel driven fire pump.

Switchgear Room A

T-484, -485, -496, -497 At least one of the transformers should be opened to verify the coils are properly anchored to the frame. The "flex" conduit connection to the transformer is tight with no slack. Check whether there is slack internally in the transformer or verify that the transformer will not displace significantly during the seismic event.

BT-1A There is a gap between the battens and the battery cells. This gap should be closed by inserting spacer washers between the tubes and the battens, or insert Styrofoam spacers between the battens and the battery cells.

Bus 1-2 There is a resistor cage secured to the top of the bus. The resistors are composed of ceramic and may be fragile. This type of anchorage is not represented in the earthquake experience data. It is necessary to ensure this component has been tested or analyzed, or determine that it is functionally unnecessary to meet A-46 or IPEEE requirements; otherwise, this component and the bus are outliers. Per the referenced letter, this bus is supplied by offsite power only and will therefore not be available for A-46 shutdown purposes.

Diesel Generator Buildings A & B

Diesel Generators The lower bound seismic weaknesses of the AC emergency generation system appear to be controlled by the fuel oil and air start piping. However, this is judged to have sufficient capacity in excess of the design basis seismic level. The sight glass level indicator on the lubrication expansion tank on the diesel skid, which in general tend to have low seismic capacities does not in this instance appear to be a problem because of the relatively short length of the sight glass itself and the rigidity of the tank wall.

Essential Relays Low ruggedness (or bad actor) relays can only be dispositioned by comparing demand to capacity if it is known they are not low ruggedness relays due to impact sensitivity, but rather for the specific reason of low seismic capacity. If the bad actor relay is so classified because of high frequency impact sensitivities it will be necessary to test the relays to the response levels anticipated in the higher frequency ranges or demonstrate that potential impacts due to seismic interaction concerns are not present. Specifically, low ruggedness relays exist in Buses 8 and 9 switchgear. Walkdowns in these areas have not identified any potential seismic interactions which would result in impacts to these switchgear.

Switchgear Room B

T-IV-1D & -1C The spray screen above the unit is coped to accommodate a spatial interaction with supports on the wall. There is a 1/4" gap between the support and the inverter shields and this is judged sufficient given that the inverter is relatively stiff. This has previously been dispositioned as acceptable during the construction of Switchgear Room B, circa 1989.

Yard Equipment

TK-4-1A The computed maximum uplift should be limited to approximately 1/4" to ensure the integrity of the wall to base weld of the tank. A concern was raised regarding the depth of the fill line piping inside the RWST to preclude a line break outside of the RWST siphoning the water from the tank. If this were the case, it might be necessary to terminate the fill line at the top of the tank. Per the referenced letter, this line is an overflow line and is thus empty.

TK-20-1A Storage boxes are located adjacent to the tank. Some boxes are stacked 2-3 high on one another. Assuming this tank is on the SSEL, the boxes should be strapped, or moved, or stacked such that the highest stacked box cannot hit the tank assuming a 45 degree fall zone from the highest box.

TK-62-1A Check the bolt chairs which are inverted with respect to the normal preferred bolt chair design. The bolt chairs may govern the seismic capacity. The bolt itself is flush with the bottom plate of the chair so this reduces the length over which the bolt can stretch.

TK-25-1A The DWST tank walls should be checked for the local stresses imposed on it by the lateral braces at the top of the shield. Per discussions with S. Wainio, this upgrade should have considered local stresses imposed on the tank wall; therefore, S&A will attempt to verify this by reviewing the upgrade calculations. Also check the capability of the wall to transfer the lateral seismic loads including its base anchorage.

SI-MOV-24 Check to see if the apparent vertical support outboard of the valve with respect to the RWST is taking the vertical load. The concern is that the valve weight may result in excess tank wall or nozzle stresses.

Control Room (Turbine Building)

Control Room The ceiling appears to be adequately secured such that there will be no general failure of the ceiling; however, individual acoustic panels may fall. These panels are judged small and lightweight such that they will not injure occupants of the control room or impede access to the control boards themselves. The lights are safety wired, and sometimes secured by threaded rods, as well. Instrumentation drawers in the main control boards are sometimes not screwed in (fasteners missing). This should be rectified.

Waste Disposal Building

MCC-9 and -10 The MCCs in general are supported on concrete (grout pads). Care should exercised to ensure the anchorage free edge distance reduction factors are considered, and the grout pad is doweled properly to the concrete floor or the anchorage embedments extend into the structural slab.

S&A

IPEEE Only Related Comments

PAB

P-118-1A & -1B Shear anchorage is currently accomplished through friction only. Alignment bolts are present, but not snug. A more positive means of anchorage is recommended for and can readily be accommodated by tightening the alignment bolts. Per the referenced letter, these pumps are not risk significant since they are but one of many available methods to refill the DWST.

Service Water Piping The service water piping in the PAB and diesel areas is not seismically supported. This was an issue addressed by the SEP review. As such, it is a critical piping system since it provides primary cooling to the diesel generators. Dr. Stevenson has provided an estimated preliminary HCLPF of 0.2g pga (which is equivalent to 0.42g median fragility-pga with a β_c of 0.4) for screening purposes only.

Main Steam and Feedwater Piping If values of fragilities for the main steam and feedwater pipelines are needed outside of the containment, they would be the same as for the service water piping.

Containment

Flux Mapping Cart The cart is welded to a frame (platform) and this appears quite adequate. It was noted that the platform may be anchored by Starr "Slug-In" (leaded) type anchors. This needs to be checked.

Yard

Yard Crane Check the capacity of the support frame to withstand the seismic forces imposed by the crane. For seismic fragility, use the plastic section properties (Z). The yard crane is currently being analyzed by NU engineering and they indicate it will pass for the design basis loads and acceptance criteria. The first failure will occur in the frame bays where the crane is parked. As a matter of logistics, it may be prudent to park the crane on the side opposite of the RWST, (i.e. near the RPWST) where it would interact with less important components and structures if it were to fail. As a practical matter, the crane should only be able to take out one tank if it were to fail.

Vent Stack Calculate the seismic fragility of the vent stack. It has been qualified for the design basis load. Check the bending moment on the stack at the base and at the brace point. Also check base anchorage, brace anchorage and the brace stresses including buckling considerations.

Hydrogen Tank Skid The skid is unanchored. The concern is that studies have shown that Hydrogen can detonate in open atmosphere if the gaseous mixing ratio is in the detonation range, and the tank could also become a missile due to jetting forces. As such, its proximity to the PWST and RPWST is a matter for concern. Dr. Kennedy has recommended the skid be anchored as a matter of general good engineering practice.

New CST As this is an IPEEE item for consideration, the ring wall (tank foundation) appears quite adequate and in no apparent danger of cracking the ring wall on the tensile side. The reinforcing of the ring wall should be checked to ensure that reinforcing is located outside of the tank anchors. If the ring wall is analyzed, it should be treated as a curved beam.

P-162-1A The auxiliary S/G feed lube oil pump is located in a "Butler" type building. The building anchorage should be verified and the anchorage of the electrical panels, which appear to be anchored to wallboard of the enclosure, should be checked for adequate anchorage. A tug test should be sufficient to verify the wall mounted panel anchorages.

Turbine Building

Waste Oil Room in Turbine Building This room has numerous flammables on an unanchored elevated rack. In addition, the waste oil vertical tank is unanchored. This room is enclosed with unreinforced masonry block walls without top restraint (walls built up to structural steel). This may be a GI-57 fire-seismic interaction issue that should be investigated.

Safety Related Structures

Dr. R. P. Kennedy conducted a peer review of the structural assessments made by Dr. J. W. Reed for the safety related structures at CY. Dr. Reed is using the screening methodology provided in EPRI Report NP-6041, Revision 1 as the basis for assigning the structural fragilities using the 0.8g spectral acceleration "screening lane". Dr. Kennedy concurs that this is a sound and feasible approach for the safety related structures at CY.

If you have questions or comments, please contact the undersigned.

Very truly yours,

John D. Stevenson
Seismic Walkdown Engineer

Very truly yours,

Robert P. Kennedy
Seismic Walkdown Engineer

SCREENING EVALUATION WORK SHEET (SEWS)		GIP Rev 2, Corrected, 2/14/92 Status: Yes Sheet 1 of 2
ID : E-4-1A (Rev. 0)	Class : 21 - Tanks and Heat Exchangers	
Description : COMPONENT COOLING Hx		
Building : AB	Floor El. : 35.50	Room, Row/Col : 1&2 FLOOR
Manufacturer, Model, Etc. :		

BASIS : External analysis

1. The buckling capacity of the shell of a large, flat-bottom, vertical tank is equal to or greater than the demand.	N/A
2. The capacity of the anchor bolts and their embedments is equal to or greater than the demand.	Yes
3. The capacity of connections between the anchor bolts and the tank shell is equal to or greater than the demand.	Yes
4. Attached piping has adequate flexibility to accommodate the motion of a large, flat-bottom, vertical tank.	Yes
5. A ring-type foundation is not used to support a large, flat-bottom, vertical tank.	N/A

IS EQUIPMENT SEISMICALLY ADEQUATE? Yes

COMMENTS

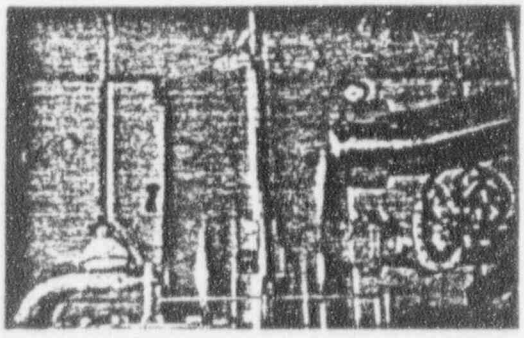
Reference Stevenson Report - Seismic Reevaluation Program Section 5.36.
Refer to ABB Impell Calc No. 0240-099-CCWHX for heat exchanger evaluation.
Reference NUSCO Dwg No. 16103-29186 sheet 11 for Hx details.

Evaluated by: C. M. [illegible] 12.17.93 Date: 3.31.93
[illegible] 12/17/93
[illegible] 12/17/93

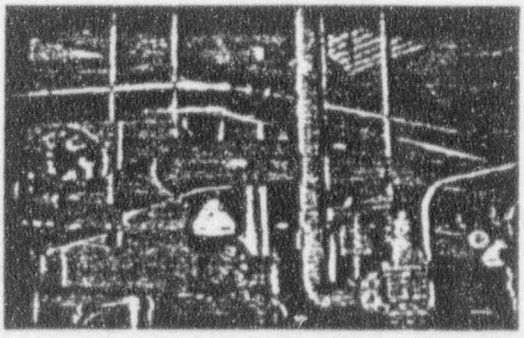
Attachment: Pictures

SCREENING EVALUATION WORK SHEET (SEWS)		GIP Rev 2, Corrected, 2/14/92 Status: Yes Sheet 2 of 2
ID : E-4-1A (Rev. 0)	Class : 21 - Tanks and Heat Exchangers	
Description : COMPONENT COOLING Hx		
Building : AB	Floor El. : 35.50	Room, Row/Col : 1&2 FLOOR
Manufacturer, Model, Etc. :		

PICTURES



E-4-1A IMAGE #1



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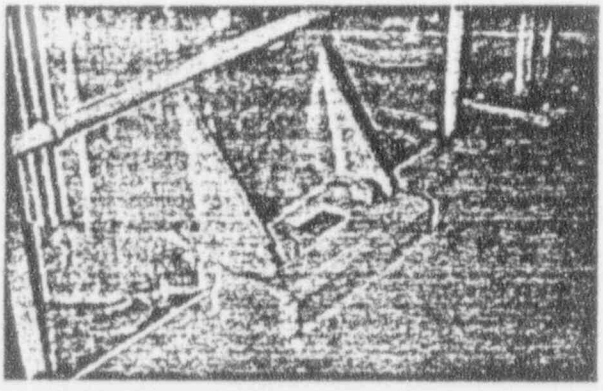

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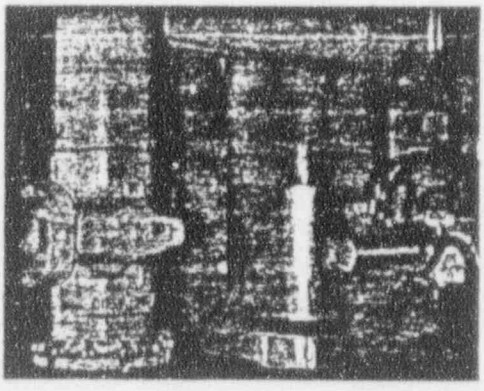


E-4-1A IMAGE 4

SCREENING EVALUATION WORK SHEET (SEWS)		GIP Rev 2, Corrected, 2/14/92 Status: Yes Sheet 1 of 2
ID : E-4-1B (Rev. 0)	Class : 21 - Tanks and Heat Exchangers	
Description : COMPONENT COOLING Hx		
Building : AB	Floor El. : 35.50	Room, Row/Col : 1&2 FLOOR
Manufacturer, Model, Etc. :		

BASIS : External analysis

1. The buckling capacity of the shell of a large, flat-bottom, vertical tank is equal to or greater than the demand.	N/A
2. The capacity of the anchor bolts and their embedments is equal to or greater than the demand.	Yes
3. The capacity of connections between the anchor bolts and the tank shell is equal to or greater than the demand.	Yes
4. Attached piping has adequate flexibility to accommodate the motion of a large, flat-bottom, vertical tank.	Yes
5. A ring-type foundation is not used to support a large, flat-bottom, vertical tank.	N/A

IS EQUIPMENT SEISMICALLY ADEQUATE? Yes

COMMENTS

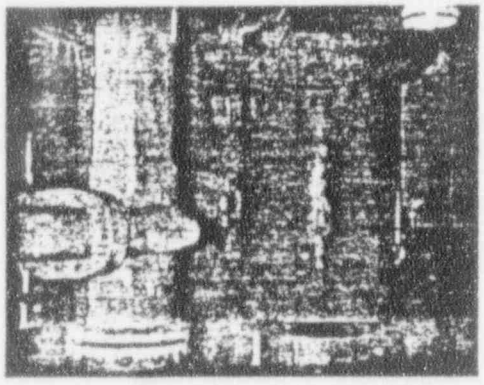
Reference Stevenson Report - Seismic Reevaluation Program Section 5.36.
Refer to ABB Impell Calc No. 0240-099-CCWHX for heat exchanger evaluation.
Reference NUSCO Dwg No. 16103-29186 sheet 11 for Hx details.

Evaluated by: C. M. Du Pont 12.17.93 Date: (WR. Dec 3.31.93)
12/17/93
12/17/93

Attachment: Pictures

SCREENING EVALUATION WORK SHEET (SEWS)		GIP Rev 2, Corrected, 2/14/92 Status: Yes Sheet 2 of 2
ID : E-4-1B (Rev. 0)	Class : 21 - Tanks and Heat Exchangers	
Description : COMPONENT COOLING Hx		
Building : AB	Floor El. : 35.50	Room, Row/Col : 1&2 FLOOR
Manufacturer, Model, Etc. :		

PICTURES



E-4-1B IMAGE 1

SCREENING EVALUATION WORK SHEET (SEWS)		GIP Rev 2, Corrected, 2/14/92 Status: Yes Sheet 1 of 1
ID : E-7-1A (Rev. 0)	Class : 21 - Tanks and Heat Exchangers	
Description : REGENERATIVE Hx		
Building : CE	Floor El. : 26.33	Room, Row/Col : RHx CUB
Manufacturer, Model, Etc. :		

BASIS : External analysis

1. The buckling capacity of the shell of a large, flat-bottom, vertical tank is equal to or greater than the demand.	N/A
2. The capacity of the anchor bolts and their embedments is equal to or greater than the demand.	Yes
3. The capacity of connections between the anchor bolts and the tank shell is equal to or greater than the demand.	Yes
4. Attached piping has adequate flexibility to accommodate the motion of a large, flat-bottom, vertical tank.	Yes
5. A ring-type foundation is not used to support a large, flat-bottom, vertical tank.	N/A

IS EQUIPMENT SEISMICALLY ADEQUATE? **Yes**

COMMENTS

Reference Stevenson Report - Seismic Reevaluation Program section 5.4.
Hx was inaccessible during final walkdown (50R on contact).
Based on the nature of the component, it is sufficient to evaluate based on review of drawings and performing analysis. (No credible interaction possibility for this type of component)
Refer to ABB Impell Calc No. 0024-00099-CE-01 for anchorage Ck.
Reference NUSCO Dwg No. 16103-29042 sheet 1-3 for Hx details.

Evaluated by: C. M. Abramowicz Date: 12.17.93
12/17/93
12/17/93

SCREENING EVALUATION WORK SHEET (SEWS)		GIP Rev 2, Corrected, 2/14/92 Status: Yes Sheet 1 of 1
ID : E-7-1B (Rev. 0)	Class : 21 - Tanks and Heat Exchangers	
Description : REGENERATIVE Hx		
Building : CE	Floor El. : 26.33	Room, Row/Col : RHx CUB
Manufacturer, Model, Etc. :		

BASIS : External analysis

1. The buckling capacity of the shell of a large, flat-bottom, vertical tank is equal to or greater than the demand.	N/A
2. The capacity of the anchor bolts and their embedments is equal to or greater than the demand.	Yes
3. The capacity of connections between the anchor bolts and the tank shell is equal to or greater than the demand.	Yes
4. Attached piping has adequate flexibility to accommodate the motion of a large, flat-bottom, vertical tank.	Yes
5. A ring-type foundation is not used to support a large, flat-bottom, vertical tank.	N/A

IS EQUIPMENT SEISMICALLY ADEQUATE? **Yes**

COMMENTS

Reference Stevenson Report - Seismic Reevaluation Program section 5.4.
Hx was inaccessible during final walkdown (50R on contact).
Based on the nature of the component, it is sufficient to evaluate based on review of drawings and performing analysis. (No credible interaction possibility for this type of component)
Refer to ABB Impell Calc No. 0024-00099-CE-01 for anchorage Ck.

Evaluated by: C. M. Abu Bevara Date: 12.17.93
A Salvi 12/17/93
12/17/93

SCREENING EVALUATION WORK SHEET (SEWS)		GIP Rev 2, Corrected, 2/14/92 Status: Yes Sheet 1 of 1
ID : E-7-1C (Rev. 0)	Class : 21 - Tanks and Heat Exchangers	
Description : REGENERATIVE Hx		
Building : CE	Floor El. : 26.33	Room, Row/Col : RHx CUB
Manufacturer, Model, Etc. :		

BASIS : External analysis

1. The buckling capacity of the shell of a large, flat-bottom, vertical tank is equal to or greater than the demand.	N/A
2. The capacity of the anchor bolts and their embedments is equal to or greater than the demand.	Yes
3. The capacity of connections between the anchor bolts and the tank shell is equal to or greater than the demand.	Yes
4. Attached piping has adequate flexibility to accommodate the motion of a large, flat-bottom, vertical tank.	Yes
5. A ring-type foundation is not used to support a large, flat-bottom, vertical tank.	N/A

IS EQUIPMENT SEISMICALLY ADEQUATE? Yes

COMMENTS

Reference Stevenson Report - Seismic Reevaluation Program section 5.4.
Hx was inaccessible during final walkdown (50R on contact).
Based on the nature of the component, it is sufficient to evaluate based on review of drawings and performing analysis. (No credible interaction possibility for this type of component)
Refer to ABB Impell Calc No. 0024-00099-CE-01 for anchorage Ck.

Evaluated by: C. M. Abu Zarour Date: 12.17.93
A. Zaitsev 12/17/93

SCREENING EVALUATION WORK SHEET (SEWS)		GIP Rev 2, Corrected, 2/14/92 Status: Yes Sheet 1 of 1
ID : E-45-1A (Rev. 0)	Class : 21 - Tanks and Heat Exchangers	
Description : RCP SEAL WATER Hx		
Building : AB	Floor El. : -19.00	Room, Row/Col : RHR PIT
Manufacturer, Model, Etc. :		

BASIS : External analysis

1. The buckling capacity of the shell of a large, flat-bottom, vertical tank is equal to or greater than the demand.	N/A
2. The capacity of the anchor bolts and their embedments is equal to or greater than the demand.	Yes
3. The capacity of connections between the anch[illegible]nd the tank shell is equal to or greater than the demand.	Yes
4. Attached piping has adequate flexibility to accommodate the motion of a large, flat-bottom, vertical tank.	Yes
5. A ring-type foundation is not used to support a large, flat-bottom, vertical tank.	N/A

IS EQUIPMENT SEISMICALLY ADEQUATE? Yes

COMMENTS

Hx is manufactured by Atlas Co.
Hx was inaccessible during final walkdown.
Heat exchanger overall size and anchorage arrangement is similar to E-76-1A Non-Regenative Heat exchanger
Based on the nature of the component., no credible interaction p[illegible]ibility for this type of component.
The component was not walked-down for ALARA consideration, [illegible]ew of its size and type, this component is not consider to have seismic vulnerabilities.
The evaluation for CCW Hx E-4-1A and Non-Regenative Hx E-76-1A are considered to envelope this component.
Reference ABB Impell Calc No. 0024-00099-PAB-01 component E-76-1A for anchorage Ck.
Reference NUSCO Dwg No. 16103-29032 sheet 1 for Hx details.

Evaluated by: C. M. Abu Bakar — Date: 12.17.93
A Salvi — 12/17/93
[signature] — 12/17/93

SCREENING EVALUATION WORK SHEET (SEWS)		GIP Rev 2, Corrected, 2/14/92 Status: Yes Sheet 1 of 2
ID : E-76-1A (Rev. 0)	Class : 21 - Tanks and Heat Exchangers	
Description : NON-REGENERATIVE Hx		
Building : AB	Floor El. : 21.50	Room, Row/Col : MT PP CUB
Manufacturer, Model, Etc. :		

BASIS : External analysis

1. The buckling capacity of the shell of a large, flat-bottom, vertical tank is equal to or greater than the demand.	N/A
2. The capacity of the anchor bolts and their embedments is equal to or greater than the demand.	Yes
3. The capacity of connections between the anchor bolts and the tank shell is equal to or greater than the demand.	Yes
4. Attached piping has adequate flexibility to accommodate the motion of a large, flat-bottom, vertical tank.	Yes
5. A ring-type foundation is not used to support a large, flat-bottom, vertical tank.	N/A

IS EQUIPMENT SEISMICALLY ADEQUATE? **Yes**

COMMENTS

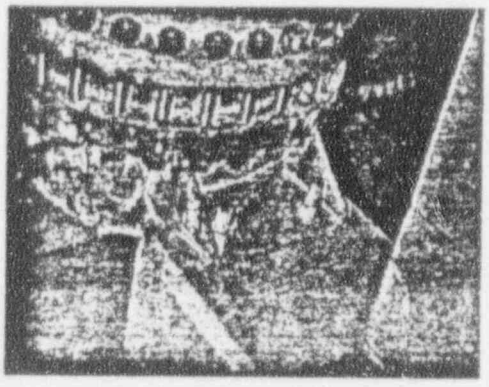
Refer to ABB Impell Calc No. 0024-00099-TK-01 for anchorage ck.
Reference NUSCO Dwg No. 16103-20206 for Hx details.

Evaluated by: C. M. Abeyrathna 12.17.93 Date: (WR. Dec 5. 26.93)
A Zaheer 12/17/93
12/17/93

Attachment: Pictures

SCREENING EVALUATION WORK SHEET (SEWS)		GIP Rev 2, Corrected, 2/14/92 Status: Yes Sheet 2 of 2
ID : E-76-1A (Rev. 0)	Class : 21 - Tanks and Heat Exchangers	
Description : NON-REGENERATIVE Hx		
Building : AB	Floor El. : 21.50	Room, Row/Col : MT PP CUB
Manufacturer, Model, Etc. :		

PICTURES



E-76-1A anchorage

SCREENING EVALUATION WORK SHEET (SEWS)		GIP Rev 2, Corrected, 2/14/92 Status: Yes Sheet 1 of 1
ID : TK-2-1A (Rev. 0)	Class : 21 - Tanks and Heat Exchangers	
Description : BORIC ACID TANK		
Building : AB	Floor El. : 21.50	Room, Row/Col : 1ST FL
Manufacturer, Model, Etc. :		

BASIS : External analysis

1. The buckling capacity of the shell of a large, flat-bottom, vertical tank is equal to or greater than the demand.	N/A
2. The capacity of the anchor bolts and their embedments is equal to or greater than the demand.	Yes
3. The capacity of connections between the anchor bolts and the tank shell is equal to or greater than the demand.	Yes
4. Attached piping has adequate flexibility to accommodate the motion of a large, flat-bottom, vertical tank.	Yes
5. A ring-type foundation is not used to support a large, flat-bottom, vertical tank.	N/A

IS EQUIPMENT SEISMICALLY ADEQUATE? **Yes**

COMMENTS

Manufactured by CB&I 17' dia tank.
Reference NUSCO Dwg 16103-59018 Sheets 164 to 172 for tank outline and support.
Refer to Stevenson Report - Seismic Reevaluation Program Section 5.10, results of the analysis indicates that the Boric Acid Tank will maintain its structural and leak tight integrity during the specified seismic disturbance. Fire. lateral shell mode is 13.02 Hz.
Reference NUSCO Dwg No. 16103-59018 sheets 165-174 for tank outline.

Evaluated by: C. M. Abu Touma — Date: 6.14.93
AS also — 12/17/93
P Gaylord — 12/17/93

SCREENING EVALUATION WORK SHEET (SEWS)		GIP Rev 2, Corrected, 2/14/92 Status: Yes Sheet 1 of 1
ID : TK-4-1A (Rev. 0)	Class : 21 - Tanks and Heat Exchangers	
Description : RWST		
Building : YD	Floor El. : 21.50	Room, Row/Col : INSD RCA
Manufacturer, Model, Etc. :		

BASIS : External analysis

1. The buckling capacity of the shell of a large, flat-bottom, vertical tank is equal to or greater than the demand.	Yes
2. The capacity of the anchor bolts and their embedments is equal to or greater than the demand.	Yes
3. The capacity of connections between the anchor bolts and the tank shell is equal to or greater than the demand.	Yes
4. Attached piping has adequate flexibility to accommodate the motion of a large, flat-bottom, vertical tank.	Yes
5. A ring-type foundation is not used to support a large, flat-bottom, vertical tank.	Yes

IS EQUIPMENT SEISMICALLY ADEQUATE? **Yes**

COMMENTS

Reference Stevenson Report - Seismic reevaluation Program Section 5.12.
Refer also calculation No. 91C2648-C004 from memo from WDjordjevic to SWainio Transmittal of Tank Analysis for PWST, DWST, and RWST dated 6/17/92, results of the analysis indicate that the RWST has a HCLPF of .243g which represent 40% greater capacity than demand. Note that detail analysis was performed in accordance with NP-6041 Appendix H (0.17g Peak Ground Acceleration for SSE).
Reference NUSCO Dwg No. 16103-27044 for tank location.
Reference NUSCO Dwg No. 16103-59018 sheet 143 for tank outline.
Reference NUSCO Dwg No. 16103-59018 sheet 147 for tank anchorage.

Evaluated by: C. M. Abu Bakar — Date: 12.8.93
A Saiyed — 12/17/93
P Guy — 12/17/93

SCREENING EVALUATION WORK SHEET (SEWS)		GIP Rev 2, Corrected, 2/14/92 Status: Yes Sheet 1 of 2
ID : TK-5-1A (Rev. 0)	Class : 21 - Tanks and Heat Exchangers	
Description : COMP COOL WTR SURGE TANK		
Building : AB	Floor El. : 35 50	Room, Row/Col : 2ND FLOOR
Manufacturer, Model, Etc. :		

BASIS : Horizontal TANK analysis

1. The buckling capacity of the shell of a large, flat-bottom, vertical tank is equal to or greater than the demand.	N/A
2. The capacity of the anchor bolts and their embedments is equal to or greater than the demand.	Yes
3. The capacity of connections between the anchor bolts and the tank shell is equal to or greater than the demand.	Yes
4. Attached piping has adequate flexibility to accommodate the motion of a large, flat-bottom, vertical tank.	Yes
5. A ring-type foundation is not used to support a large, flat-bottom, vertical tank.	N/A

IS EQUIPMENT SEISMICALLY ADEQUATE? **Yes**

COMMENTS

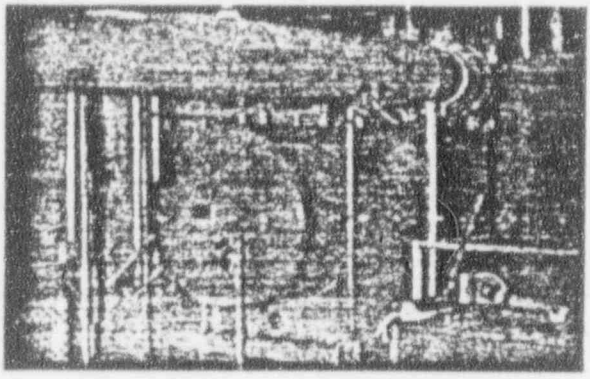
Manufactured by Minnotte Corp.
Refer to ABB Impell Calc No. 0024-00099-PAB-01 for anchorage Ck.
Reference NUSCO Dwg No. 16103-29151 for tank outline.

Evaluated by: C. M. Abu Bandar 12.17.93 Date: (ck. by G 3.31.93)
A. Zaky 12.17.93
12.17.97

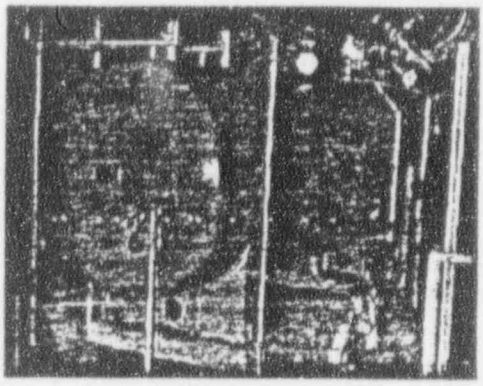
Attachment: Pictures

SCREENING EVALUATION WORK SHEET (SEWS)		GIP Rev 2, Corrected, 2/14/92 Status: Yes Sheet 2 of 2
ID : TK-5-1A (Rev. 0)	Class : 21 - Tanks and Heat Exchangers	
Description : COMP COOL WTR SURGE TANK		
Building : AB	Floor El. : 35.50	Room, Row/Col : 2ND FLOOR
Manufacturer, Model, Etc. :		

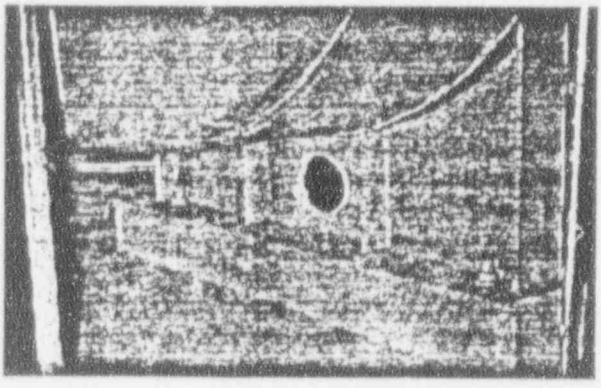
PICTURES



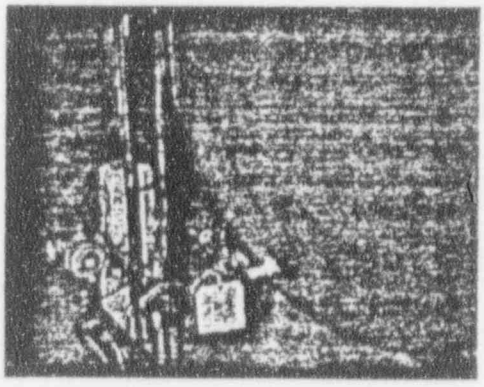
TK-5-1A IMAGE #1



TK-5-1A IMAGE 2



TK-5-1A IMAGE 3



TK-5-1A IMAGE 4

SCREENING EVALUATION WORK SHEET (SEWS)		GIP Rev 2, Corrected, 2/14/92 Status: Yes Sheet 1 of 2
ID : TK-20-1A (Rev. 0)	Class : 21 - Tanks and Heat Exchangers	
Description : PWST		
Building : YD	Floor El. : 21.50	Room, Row/Col : INSD RCA
Manufacturer, Model, Etc. :		

BASIS : External analysis

1. The buckling capacity of the shell of a large, flat-bottom, vertical tank is equal to or greater than the demand.	Yes
2. The capacity of the anchor bolts and their embedments is equal to or greater than the demand.	Yes
3. The capacity of connections between the anchor bolts and the tank shell is equal to or greater than the demand.	Yes
4. Attached piping has adequate flexibility to accommodate the motion of a large, flat-bottom, vertical tank.	Yes
5. A ring-type foundation is not used to support a large, flat-bottom, vertical tank.	Yes

IS EQUIPMENT SEISMICALLY ADEQUATE? **Yes**

COMMENTS

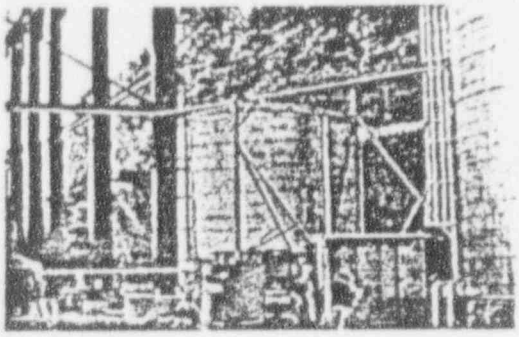
Reference Stevenson Report - Seismic Reevaluation Program Section 5.18.
Refer to PWST Manual Calculation No. 91C2648-C002 memo from WDjordjevic to SWainio Tranmittal of Tank Analysis for PWST, DWST, and RWST dated 6/17/92. Results of the calc shows the tank has a seismic capacity HCLPF in excess of the seismic demand. Note that detail evaluation was performed in accordance with NP-6041 Appendix H (0.17g Peak Ground Acceleration for the SSE).
Walkdown Note: in the vicinity of the PWST there are some stacked metal containers, this is not a credible interaction concern since the containers are more than 4 ft. away and are unlikely to overturn. However, recommend not stacking containers on top of each other.
Reference NUSCO Dwg No. 16103-27044 for tank location.
Reference NUSCO Dwg No. 16103-59018 sheets 117-124 for tank details.

Evaluated by: C. M. Abu Dawabe — Date: 12.8.93
A Sabir — 12/17/93
P Guy — 12/17/93

Attachment: Pictures

SCREENING EVALUATION WORK SHEET (SEWS)		GIP Rev 2, Corrected, 2/14/92 Status: Yes Sheet 2 of 2
ID : TK-20-1A (Rev. 0)	Class : 21 - Tanks and Heat Exchangers	
Description : PWST		
Building : YD	Floor El. : 21.50	Room, Row/Col : INSD RCA
Manufacturer, Model, Etc. :		

PICTURES



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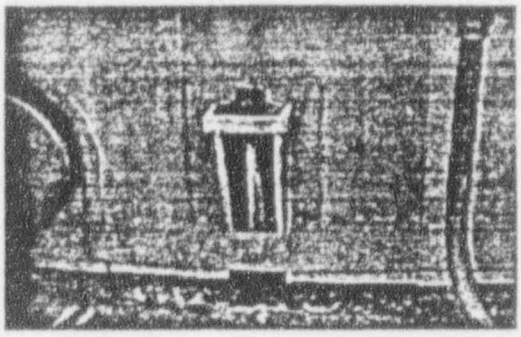
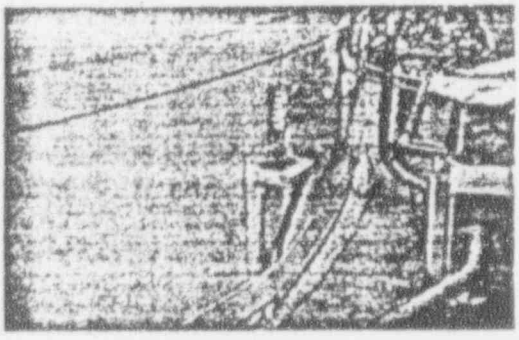


Tk-20-1A image #2



TK-20-1A image #3

SCREENING EVALUATION WORK SHEET (SEWS)		GIP Rev 2, Corrected, 2/14/92 Status: Yes Sheet 1 of 1
ID : TK-25-1A (Rev. 0)	Class : 21 - Tanks and Heat Exchangers	
Description : DWST		
Building : YD	Floor El. : 21.50	Room, Row/Col : OTSD RCA
Manufacture , Model, Etc. :		

BASIS : External analysis

1. The buckling capacity of the shell of a large, flat-bottom, vertical tank is equal to or greater than the demand.	Yes
2. The capacity of the anchor bolts and their embedments is equal to or greater than the demand.	Yes
3. The capacity of connections between the anchor bolts and the tank shell is equal to or greater than the demand.	Yes
4. Attached piping has adequate flexibility to accommodate the motion of a large, flat-bottom, vertical tank.	Yes
5. A ring-type foundation is not used to support a large, flat-bottom, vertical tank.	Yes

IS EQUIPMENT SEISMICALLY ADEQUATE? **Yes**

COMMENTS

Reference Stevenson Report - Seismic Reevaluation Program Section 5.11.
Refer to calculation No. 91C2648-C003 from memo from WDjordjevic to SWainio Transmittal of Tank Analysis for PWST, DWST, and RWST dated 6/17/92, results of the analysis indicate that the DWST has a HCLPF of .23g based on the 1/8" maximum restraint gap which represent 35% greater capacity than demand. Note the detail analysis was performed in accordance with NP-6041 Appendix H (0.17g Peak Ground Acceleration for the SSE).
Reference NUSCO Dwg No. 16103-27044 for tank location.
Reference NUSCO Dwg No. 16103-59081 sheets 1-9 for tank details.

Evaluated by C. M. Ravindra Date: 12.8.93
A Scalise 12.17.93
P Griffith 12.17.93

SCREENING EVALUATION WORK SHEET (SEWS)		GIP Rev 2, Corrected, 2/14/92 Status: No Sheet 1 of 2
ID : TK-25-1B (Rev. 0)	Class : 21 - Tanks and Heat Exchangers	
Description : CST		
Building : YD	Floor El. : 21.50	Room, Row/Col : OTSD RCA
Manufacturer, Model, Etc. :		

BASIS : External analysis

1. The buckling capacity of the shell of a large, flat-bottom, vertical tank is equal to or greater than the demand.	Yes
2. The capacity of the anchor bolts and their embedments is equal to or greater than the demand.	Yes
3. The capacity of connections between the anchor bolts and the tank shell is equal to or greater than the demand.	Yes
4. Attached piping has adequate flexibility to accommodate the motion of a large, flat-bottom, vertical tank.	Yes
5. A ring-type foundation is not used to support a large, flat-bottom, vertical tank.	No

IS EQUIPMENT SEISMICALLY ADEQUATE? No

COMMENTS

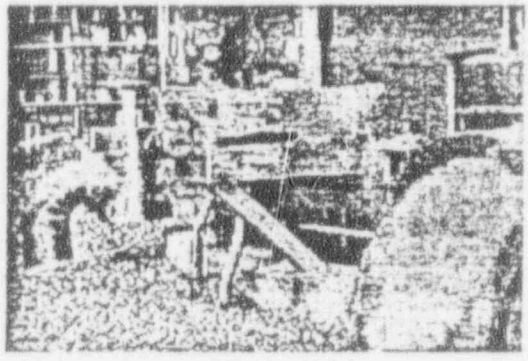
Manufactured by CBI 25' I.D. X 28'-0" Vertical Tank
CST has been replaced as part of PA 89-056.
Reference CBI Design Calculation for CST, CBI Contract No. 922019, 5/28/92
Reference CBI Foundation Design Calculation for CST, CBI Contract No. 922019, 5/14/92
Reference NUSCO Dwg 16103-29512 sheets 1 to 4 for tank outline and fondation details.

Evaluated by: C. M. Abu Rudel Date: 12.17.93
A Bates 12.17.93
P Graybeal 12.17.93

Attachment: Pictures

SCREENING EVALUATION WORK SHEET (SEWS)		GIP Rev 2, Corrected, 2/14/92 Status: No Sheet 2 of 2
ID : TK-25-1B (Rev. 0)	Class : 21 - Tanks and Heat Exchangers	
Description : CST		
Building : YD	Floor El. : 21.50	Room, Row/Col : OTSD RCA
Manufacturer, Model, Etc. :		

PICTURES



New CST image 1

OUTLIER SEISMIC VERIFICATION SHEET (OSVS)		GIP Rev 2, Corrected 2/14/92 Sheet 1 of 1
ID : TK-33-1A (Rev. 0)	Class : 21. Tanks and Heat Exchangers	
Description : FUEL OIL STORAGE TANK		
Building : YD	Floor El. : 21.50	Room, Row/Col : OTSD RCA

1. OUTLIER ISSUE DEFINITION - Tanks and Heat Exchangers

a. Identify all the screening guidelines which are not met. (Check more than one if several guidelines could not be satisfied.)

Shell Buckling	
Anchor Bolts and Embedment	X
Anchorage Connections	
Flexibility of Attached Piping	
Other	

b. Describe all the reasons for the outlier (i.e., if all the listed outlier issues were resolved, then the signatories would consider this item of equipment to be verified for seismic adequacy).

Diesel Fuel Oil Storage Tank is unanchored.

2. PROPOSED METHOD OF OUTLIER RESOLUTION (Optional)

a. Defined proposed method(s) for resolving outlier.

Provide alternate fuel supply similar to Millstone site by arranging fuel truck on site or deliver extra fuel.

b. Provide information needed to implement proposed method(s) for resolving outlier (e.g., estimate of fundamental frequency).

Initiate appropriate plant documentation to implement above describe change.

3. COMMENTS

4. CERTIFICATION:

The information on this OSVS is, to the best of our knowledge and belief, correct and accurate, and resolution of the outlier issues listed on the previous page will satisfy the requirments for this item of equipment to be verified for seismic adequacy.

Approved by: C. M. Abramovici Date: 12.17.93

A Safer 12/17/93

D Seyfert 12.17.93

SCREENING EVALUATION WORK SHEET (SEWS)		GIP Rev 2, Corrected, 2/14/92 Status: Yes Sheet 1 of 1
ID : TK-33-2A (Rev. 0)	Class : 21 - Tanks and Heat Exchangers	
Description : EDG FUEL OIL STORAGE TANK		
Building : YD	Floor El. : 18.50	Room, Row/Col : NO. YARD
Manufacturer, Model, Etc. :		

BASIS : External analysis

1. The buckling capacity of the shell of a large, flat-bottom, vertical tank is equal to or greater than the demand.	N/A
2. The capacity of the anchor bolts and their embedments is equal to or greater than the demand.	Yes
3. The capacity of connections between the anchor bolts and the tank shell is equal to or greater than the demand.	Yes
4. Attached piping has adequate flexibility to accommodate the motion of a large, flat-bottom, vertical tank.	N/A
5. A ring-type foundation is not used to support a large, flat-bottom, vertical tank.	N/A

IS EQUIPMENT SEISMICALLY ADEQUATE? Yes

COMMENTS

Reference Stevenson Report - Seismic Reevaluation Porgram Section 5.14. Results of the anaysis indicate that the 5,000 underground Fuel Oil Tank will maintain its structural and leak tight integrity during and after the specified seismic events.
Refer to ABB Impell Calc No. 0024-00099-YD-01 for anchorage Ck.
Reference NUSCO Dwg No. 16103-22053 for tank outline.

Evaluated by: C. M. Abu Bandar — Date: 12.17.93
A Sabol — 12.17.93
P Gayton — 12.17.93

SCREENING EVALUATION WORK SHEET (SEWS)		GIP Rev 2, Corrected, 2/14/92 Status: Yes Sheet 1 of 1
ID : TK-33-2B (Rev. 0)	Class : 21 - Tanks and Heat Exchangers	
Description : EDG FUEL OIL STORAGE TANK		
Building : YD	Floor El. : 18.50	Room, Row/Col : NO. YARD
Manufacturer, Model, Etc. :		

BASIS : External analysis

1. The buckling capacity of the shell of a large, flat-bottom, vertical tank is equal to or greater than the demand.	N/A
2. The capacity of the anchor bolts and their embedments is equal to or greater than the demand.	Yes
3. The capacity of connections between the anchor bolts and the tank shell is equal to or greater than the demand.	Yes
4. Attached piping has adequate flexibility to accommodate the motion of a large, flat-bottom, vertical tank.	N/A
5. A ring-type foundation is not used to support a large, flat-bottom, vertical tank.	N/A

IS EQUIPMENT SEISMICALLY ADEQUATE? Yes

COMMENTS

Reference Stevenson Report - Seismic Reevaluation Porgram Section 5.14. Results of the anaysis indicate that the 5,000 underground Fuel Oil Tank will maintain its structural and leak tight integrity during and after the specified seismic events.
Refer to ABB Impell Calc No. 0024-00099-YD-01 for anchorage Ck.
Reference NUSCO Dwg No. 16103-22053 for tank outline.

Evaluated by: C. M. Abou-Jaoude — Date: 12.17.93
A Gabriel — 12-17-93
P Guglielmo — 12/17/93

SCREENING EVALUATION WORK SHEET (SEWS)		GIP Rev 2, Corrected, 2/14/92 Status: Yes Sheet 1 of 2
ID : TK-53-1A (Rev. 0)	Class : 21 - Tanks and Heat Exchangers	
Description : DIESEL FIRE PUMP FUEL OIL STORAGE TANK		
Building : CW	Floor El. : 21.50	Room, Row/Col : UL NW
Manufacturer, Model, Etc. :		

BASIS : External analysis

1. The buckling capacity of the shell of a large, flat-bottom, vertical tank is equal to or greater than the demand.	N/A
2. The capacity of the anchor bolts and their embedments is equal to or greater than the demand.	Yes
3. The capacity of connections between the anchor bolts and the tank shell is equal to or greater than the demand.	Yes
4. Attached piping has adequate flexibility to accommodate the motion of a large, flat-bottom, vertical tank.	Yes
5. A ring-type foundation is not used to support a large, flat-bottom, vertical tank.	N/A

IS EQUIPMENT SEISMICALLY ADEQUATE? Yes

COMMENTS

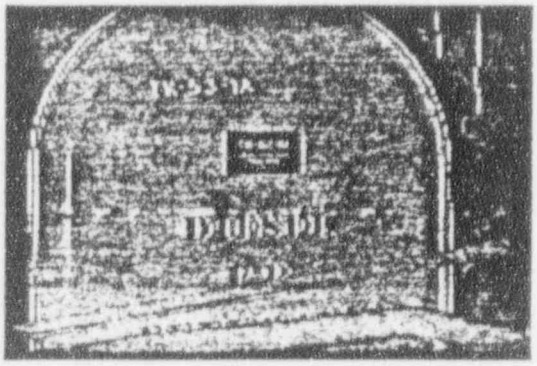
Block wall and potential effect on the fuel line will be evaluated by the IPEEE program since wall was not in IEB-80-11.
Refer to ABB Impell Calc No. 0024-00099-CW-01 for anchorage Ck.

Evaluated by: C. M. Abu Khadra Date: 12.17.93
12/17/93
12/17/93

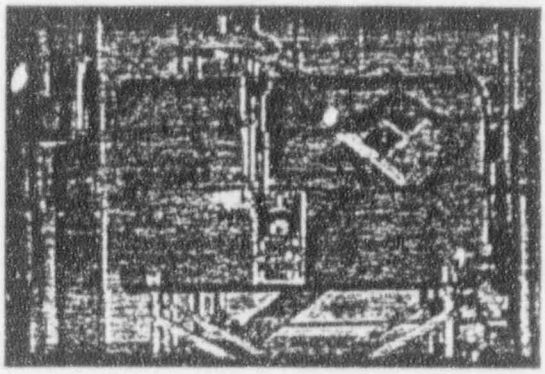
Attachment: Pictures

SCREENING EVALUATION WORK SHEET (SEWS)		GIP Rev 2, Corrected, 2/14/92 Status: Yes Sheet 2 of 2
ID : TK-53-1A (Rev. 0)	Class : 21 - Tanks and Heat Exchangers	
Description : DIESEL FIRE PUMP FUEL OIL STORAGE TANK		
Building : CW	Floor El. : 21.' 0	Room, Row/Col : UL NW
Manufacturer, Model, Etc. :		

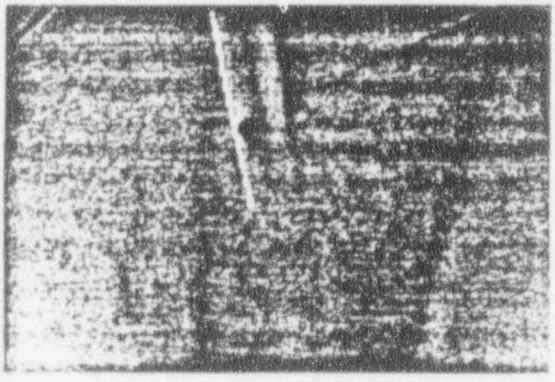
PICTURES



TK-53-1A image 1



TK-53-1A image 2



Tk-53-1A image 3, baseplate and anchorage

SCREENING EVALUATION WORK SHEET (SEWS)		GIP Rev 2, Corrected, 2/14/92 Status: Yes Sheet 1 of 2
ID : TK-80-1A (Rev. 0)	Class : 21 - Tanks and Heat Exchangers	
Description : PORV AIR RECEIVER		
Building : CE	Floor El. : 48.50	Room, Row/Col : CTMT
Manufacturer, Model, Etc. :		

BASIS : External analysis

1. The buckling capacity of the shell of a large, flat-bottom, vertical tank is equal to or greater than the demand.	N/A
2. The capacity of the anchor bolts and their embedments is equal to or greater than the demand	Yes
3. The capacity of connections between the anchor bolts and the tank shell is equal to or greater than the demand.	Yes
4. Attached piping has adequate flexibility to accommodate the motion of a large, flat-bottom, vertical tank.	N/A
5. A ring-type foundation is not used to support a large, flat-bottom, vertical tank.	N/A

IS EQUIPMENT SEISMICALLY ADEQUATE? Yes

COMMENTS

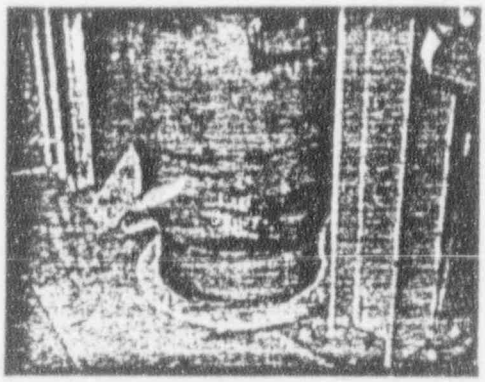
Manufactured by Southwest Fabricating Co.
Tank is well anchored and restrainted. Tubing from accumulator has 3/8" clearance with nearby column, Judged to be OK since the accumuulator will have small lateral movement.
Refer to ABB Impell Calc No. 0024-00099-CE-01 for anchorage Ck.
Reference NUSCO Dwg No. 16103-29613 for tank details.

Evaluated by: C. M. Abu Zeid 12.17.93 Date: (wk. Date 7.3.93)
12/17/93
12/17/93

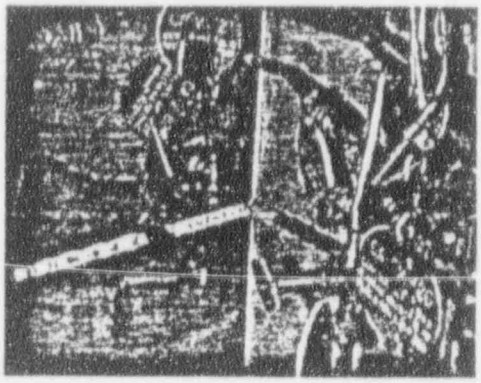
Attachment: Pictures

SCREENING EVALUATION WORK SHEET (SEWS)		GIP Rev 2, Corrected, 2/14/92 Status: Yes Sheet 2 of 2
ID : TK-80-1A (Rev. 0)	Class : 21 - Tanks and Heat Exchangers	
Description : PORV AIR RECEIVER		
Building : CE	Floor El. : 48.50	Room, Row/Col : CTMT
Manufacturer, Model, Etc. :		

PICTURES



TK-80-1A ANCHORAGE



TUBING INT W/ BEAM

SCREENING EVALUATION WORK SHEET (SEWS)		GIP Rev 2, Corrected, 2/14/92 Status: Yes Sheet 1 of 3
ID : TK-101-2AA (Rev. 0)	Class : 21 - Tanks and Heat Exchangers	
Description : D/G AIR FLASK		
Building : DG	Floor El. : 21.50	Room, Row/Col : A DIESEL
Manufacturer, Model, Etc. :		

BASIS : External analysis

1. The buckling capacity of the shell of a large, flat-bottom, vertical tank is equal to or greater than the demand.	N/A
2. The capacity of the anchor bolts and their embedments is equal to or greater than the demand.	Yes
3. The capacity of connections between the anchor bolts and the tank shell is equal to or greater than the demand.	N/A
4. Attached piping has adequate flexibility to accommodate the motion of a large, flat-bottom, vertical tank.	N/A
5. A ring-type foundation is not used to support a large, flat-bottom, vertical tank.	N/A

IS EQUIPMENT SEISMICALLY ADEQUATE? **Yes**

COMMENTS

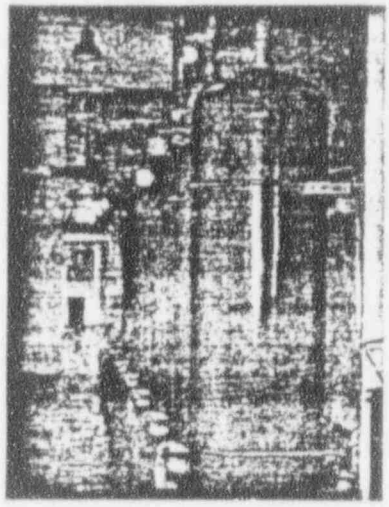
Reference Stevenson Report- Seismic Reevaluation Program volume 1, section 5.3. Results indicated the pre SEP supporting arrangement for the Diesel Air Tanks was dynamically unstable since no positive restraint existed between the tanks and their base support frame.
Modifications were recommended and implemented.
Note from final walkdown: Restraint strap has been installed on these Air Tanks.
Refer to ABB Impell Calc 0024-00099-DG-01 for anchorage Ck.

Evaluated by: C. M. Ohm Jr. 12.17.93 Date: (orig. Date 2.4.93)
A Bates 12/17/93
12/17/93

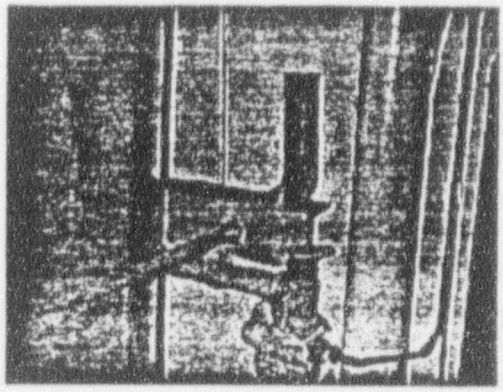
Attachment: Pictures

SCREENING EVALUATION WORK SHEET (SEWS)		GIP Rev 2, Corrected, 2/14/92 Status: Yes Sheet 2 of 3
ID : TK-101-2AA (Rev. 0)	Class : 21 - Tanks and Heat Exchangers	
Description : D/G AIR FLASK		
Building : DG	Floor El. : 21.50	Room, Row/Col : A DIESEL
Manufacturer, Model, Etc. :		

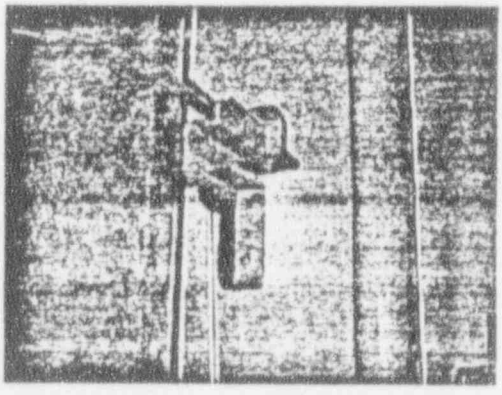
PICTURES



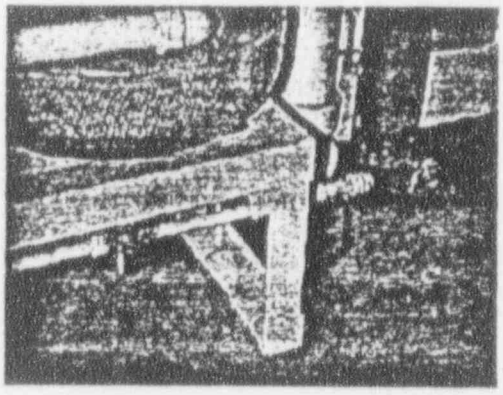
TK-101-2AA IMAGE 3



TK-101-2AA IMAGE 4

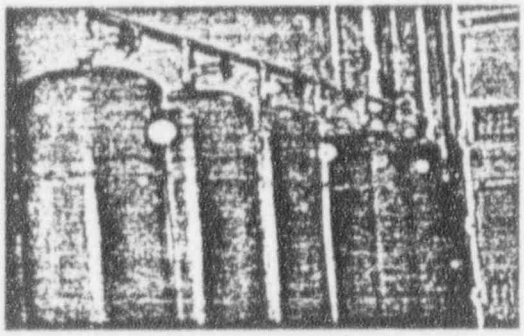


TK-101-2AA IMAGE 5

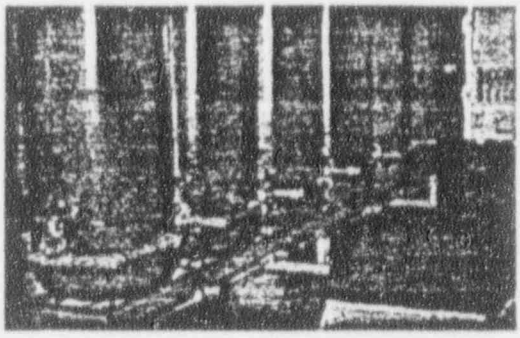


TK-101-2AA IMAGE 6

SCREENING EVALUATION WORK SHEET (SEWS)		GIP Rev 2, Corrected, 2/14/92 Status: Yes Sheet 3 of 3
ID : TK-101-2AA (Rev. 0)	Class : 21 - Tanks and Heat Exchangers	
Description : D/G AIR FLASK		
Building : DG	Floor El. : 21 50	Room, Row/Col : A DIESEL
Manufacturer, Model, Etc. :		



TK-101-2BA IMAGE #1, TYPICAL FOR TK-101-2AA TO 2BF



TK-101-2BA IMAGE #2, TYPICAL FOR TK-101-2AA TO 2BF

SCREENING EVALUATION WORK SHEET (SEWS)		GIP Rev 2, Corrected, 2/14/92 Status: Yes Sheet 1 of 1
ID : TK-101-2AB (Rev. 0)	Class : 21 - Tanks and Heat Exchangers	
Description : D/G AIR FLASK		
Building : DG	Floor El. : 21.50	Room, Row/Col : A DIESEL
Manufacturer, Model, Etc. :		

BASIS : External analysis

1. The buckling capacity of the shell of a large, flat-bottom, vertical tank is equal to or greater than the demand.	N/A
2. The capacity of the anchor bolts and their embedments is equal to or greater than the demand.	Yes
3. The capacity of connections between the anchor bolts and the tank shell is equal to or greater than the demand.	N/A
4. Attached piping has adequate flexibility to accommodate the motion of a large, flat-bottom, vertical tank.	N/A
5. A ring-type foundation is not used to support a large, flat-bottom, vertical tank.	N/A

IS EQUIPMENT SEISMICALLY ADEQUATE? **Yes**

COMMENTS

Reference Stevenson Report- Seismic Reevaluation Program volume 1, section 5.3. Results indicated the pre SEP supporting arrangement for the Diesel Air Tanks was dynamically unstable since no positive restraint existed between the tanks and their base support frame.
Modifications were recommended and implemented.
Note from final walkdown: Restraint strap has been installed on these Air Tanks.
Refer to ABB Impell Calc 0024-00099-DG-01 for anchorage Ck.

Evaluated by: C. M. Dan Devine 12.17.93 Date: (orig. Dat 2.4.93)
A Baker 12/17/93
P Gyftopoulos 12/17/93

SCREENING EVALUATION WORK SHEET (SEWS)		GIP Rev 2, Corrected, 2/14/92 Status: Yes Sheet 1 of 1
ID : TK-101-2AC (Rev. 0)	Class : 21 - Tanks and Heat Exchangers	
Description : D/G AIR FLASK		
Building : DG	Floor El. : 21.50	Room, Row/Col : A DIESEL
Manufacturer, Model, Etc. :		

BASIS : External analysis

1. The buckling capacity of the shell of a large, flat-bottom, vertical tank is equal to or greater than the demand.	N/A
2. The capacity of the anchor bolts and their embedments is equal to or greater than the demand.	Yes
3. The capacity of connections between the anchor bolts and the tank shell is equal to or greater than the demand.	N/A
4. Attached piping has adequate flexibility to accommodate the motion of a large, flat-bottom, vertical tank.	N/A
5. A ring-type foundation is not used to support a large, flat-bottom, vertical tank.	N/A

IS EQUIPMENT SEISMICALLY ADEQUATE? **Yes**

COMMENTS

Reference Stevenson Report- Seismic Reevaluation Program volume 1, section 5.3. Results indicated the pre SEP supporting arrangement for the Diesel Air Tanks was dynamically unstable since no positive restraint existed between the tanks and their base support frame.
Modifications were recommended and implemented.
Note from final walkdown: Restraint strap has been installed on these Air Tanks.
Refer to ABB Impell Calc 0024-00099-DG-01 for anchorage Ck.

Evaluated by: C. M. Adamson 12.17.93 Date: (ck. Date 8.4.93)
A Gabriel 12/17/93
12/17/93

SCREENING EVALUATION WORK SHEET (SEWS)		GIP Rev 2, Corrected, 2/14/92 Status: Yes Sheet 1 of 1
ID : TK-101-2AD (Rev. 0)	Class : 21 - Tanks and Heat Exchangers	
Description : D/G AIR FLASK		
Building : DG	Floor El. : 21.50	Room, Row/Col : A DIESEL
Manufacturer, Model, Etc. :		

BASIS : External analysis

1. The buckling capacity of the shell of a large, flat-bottom, vertical tank is equal to or greater than the demand.	N/A
2. The capacity of the anchor bolts and their embedments is equal to or greater than the demand.	Yes
3. The capacity of connections between the anchor bolts and the tank shell is equal to or greater than the demand.	N/A
4. Attached piping has adequate flexibility to accommodate the motion of a large, flat-bottom, vertical tank.	N/A
5. A ring-type foundation is not used to support a large, flat-bottom, vertical tank.	N/A

IS EQUIPMENT SEISMICALLY ADEQUATE? **Yes**

COMMENTS

Reference Stevenson Report- Seismic Reevaluation Program volume 1, section 5.3. Results indicated the pre SEP supporting arrangement for the Diesel Air Tanks was dynamically unstable since no positive restraint existed between the tanks and their base support frame.
Modifications were recommended and implemented.
Note from final walkdown: Restraint strap has been installed on these Air Tanks.
Refer to ABB Impell Calc 0024-00099-DG-01 for anchorage Ck.

Evaluated by: C. M. Dhundale 12.17.93 Date: (wk. dat 2.4.93)
A Baker 12/17/93
P Gupta 12/17/93

SCREENING EVALUATION WORK SHEET (SEWS)		GIP Rev 2, Corrected, 2/14/92 Status: Yes Sheet 1 of 1
ID : TK-101-2AE (Rev 0)	Class : 21 - Tanks and Heat Exchangers	
Description : D/G AIR FLASK		
Building : DG	Floor El. : 21.50	Room, Row/Col : A DIESEL
Manufacturer, Model, Etc. :		

BASIS : External analysis

1. The buckling capacity of the shell of a large, flat-bottom, vertical tank is equal to or greater than the demand.	N/A
2. The capacity of the anchor bolts and their embedments is equal to or greater than the demand.	Yes
3. The capacity of connections between the anchor bolts and the tank shell is equal to or greater than the demand.	N/A
4. Attached piping has adequate flexibility to accommodate the motion of a large, flat-bottom, vertical tank.	N/A
5. A ring-type foundation is not used to support a large, flat-bottom, vertical tank.	N/A

IS EQUIPMENT SEISMICALLY ADEQUATE? Yes

COMMENTS

Reference Stevenson Report- Seismic Reevaluation Program volume 1, section 5.3. Results indicated the pre SEP supporting arrangement for the Diesel Air Tanks was dynamically unstable since no positive restraint existed between the tanks and their base support frame.
Modifications were recommended and implemented.
Note from final walkdown: Restraint strap has been installed on these Air Tanks.
Refer to ABB Impell Calc 0024-00099-DG-01 for anchorage Ck.

Evaluated by: C. M. Plan Reviewer 12.17.93 Date (w/ Rev 2.4.93)
A Szabo 12/17/93
P Gaylor 12.17.93

SCREENING EVALUATION WORK SHEET (SEWS)		GIP Rev 2, Corrected, 2/14/92 Status: Yes Sheet 1 of 1
ID : TK-101-2AF (Rev. 0)	Class : 21 - Tanks and Heat Exchangers	
Description : D/G AIR FLASK		
Building : DG	Floor El. : 21.50	Room, Row/Col : A DIESEL
Manufacturer, Model, Etc. :		

BASIS : External analysis

1. The buckling capacity of the shell of a large, flat-bottom, vertical tank is equal to or greater than the demand.	N/A
2. The capacity of the anchor bolts and their embedments is equal to or greater than the demand.	Yes
3. The capacity of connections between the anchor bolts and the tank shell is equal to or greater than the demand.	N/A
4. Attached piping has adequate flexibility to accommodate the motion of a large, flat-bottom, vertical tank.	N/A
5. A ring-type foundation is not used to support a large, flat-bottom, vertical tank.	N/A

IS EQUIPMENT SEISMICALLY ADEQUATE? Yes

COMMENTS

Reference Stevenson Report- Seismic Reevaluation Program volume 1, section 5.3. Results indicated the pre SEP supporting arrangement for the Diesel Air Tanks was dynamically unstable since no positive restraint existed between the tanks and their base support frame.
Modifications were recommended and implemented.
Note from final walkdown: Restraint strap has been installed on these Air Tanks.
Refer to ABB Impell Calc 0024-00099-DG-01 for anchorage Ck.

Evaluated by: C. M. DeThomas 12.17.93 Date: (ck. Date 2.4.92)
A Bates 12/17/93
P Graybeal 12/17/93

SCREENING EVALUATION WORK SHEET (SEWS)		GIP Rev 2, Corrected, 2/14/92 Status: Yes Sheet 1 of 2
ID : TK-101-2BA (Rev. 0)	Class : 21 - Tanks and Heat Exchangers	
Description : D/G AIR FLASK		
Building : DG	Floor El. : 21.50	Room, Row/Col : B DIESEL
Manufacturer, Model, Etc. :		

BASIS : External analysis

1. The buckling capacity of the shell of a large, flat-bottom, vertical tank is equal to or greater than the demand.	N/A
2. The capacity of the anchor bolts and their embedments is equal to or greater than the demand.	Yes
3. The capacity of connections between the anchor bolts and the tank shell is equal to or greater than the demand.	N/A
4. Attached piping has adequate flexibility to accommodate the motion of a large, flat-bottom, vertical tank.	N/A
5. A ring-type foundation is not used to support a large, flat-bottom, vertical tank.	N/A

IS EQUIPMENT SEISMICALLY ADEQUATE? Yes

COMMENTS

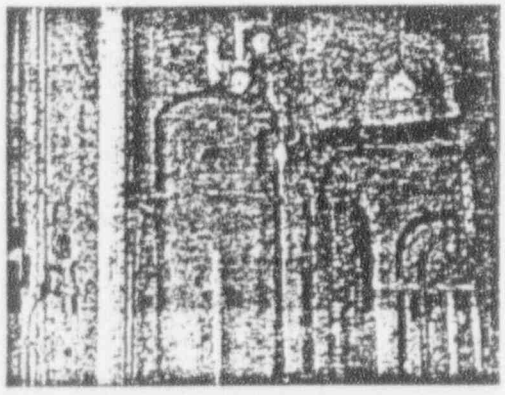
Reference Stevenson Report- Seismic Reevaluation Program volume 1, section 5.3. Results indicated the pre SEP supporting arrangement for the Diesel Air Tanks was dynamically unstable since no positive restraint existed between the tanks and their base support frame.
Modifications were recommended and implemented.
Note from final walkdown: Restraint strap has been installed on these Air Tanks.
Refer to ABB Impell Calc 0024-00099-DG-01 for anchorage Ck.

Evaluated by: C. M. Dan Duncan 12.17.93 Date: (12. Dec 2.4.93)
A Seber 12/17/93
P Grayston 12.17.93

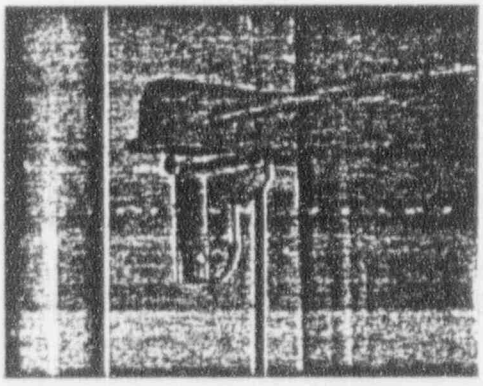
Attachment: Pictures

SCREENING EVALUATION WORK SHEET (SEWS)		GIP Rev 2, Corrected, 2/14/92 Status: Yes Sheet 2 of 2
ID : TK-101-2BA (Rev. 0)	Class : 21 - Tanks and Heat Exchangers	
Description : D/G AIR FLASK		
Building : DG	Floor El. : 21.50	Room, Row/Col : B DIESEL
Manufacturer, Model, Etc. :		

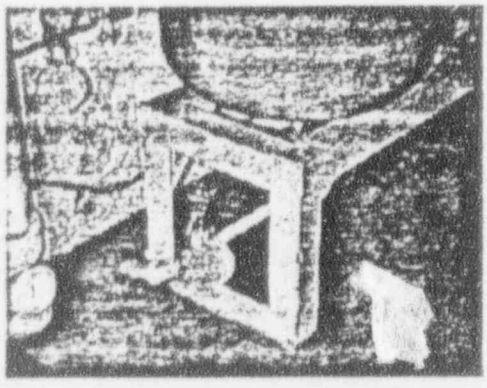
PICTURES



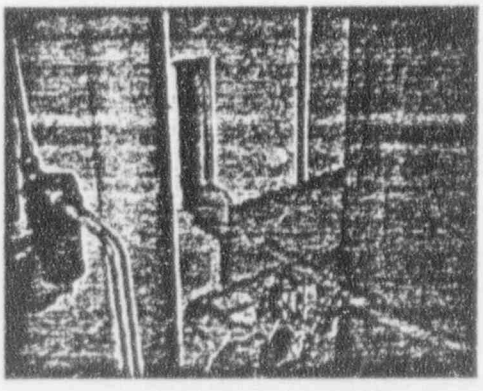
TK-101-2BA IMAGE 1



TK-101-2BA IMAGE 2



TK-101-2BA IMAGE 3



TK-101-2BA IMAGE 4

SCREENING EVALUATION WORK SHEET (SEWS)		GIP Rev 2, Corrected, 2/14/92 Status: Yes Sheet 1 of 1
ID : TK-101-2BB (Rev. 0)	Class : 21 - Tanks and Heat Exchangers	
Description : D/G AIR FLASK		
Building : DG	Floor El. : 21.50	Room, Row/Col : B DIESEL
Manufacturer, Model, Etc :		

BASIS : External analysis

1. The buckling capacity of the shell of a large, flat-bottom, vertical tank is equal to or greater than the demand.	N/A
2. The capacity of the anchor bolts and their embedments is equal to or greater than the demand.	Yes
3. The capacity of connections between the anchor bolts and the tank shell is equal to or greater than the demand.	N/A
4. Attached piping has adequate flexibility to accommodate the motion of a large, flat-bottom, vertical tank.	N/A
5. A ring-type foundation is not used to support a large, flat-bottom, vertical tank.	N/A

IS EQUIPMENT SEISMICALLY ADEQUATE? **Yes**

COMMENTS

Reference Stevenson Report- Seismic Reevaluation Program volume 1, section 5.3. Results indicated the pre SEP supporting arrangement for the Diesel Air Tanks was dynamically unstable since no positive restraint existed between the tanks and their base support frame.
Modifications were recommended and implemented.
Note from final walkdown: Restraint strap has been installed on these Air Tanks.
Refer to ABB Impell Calc 0024-00099-DG-01 for anchorage Ck.

Evaluated by C.M. Allen Ramirez 12.17.93 Date: (walk. Date 2.4.93)
A Baker 12/17/93
PG appt 12/17/93

SCREENING EVALUATION WORK SHEET (SEWS)		GIP Rev 2, Corrected, 2/14/92 Status: Yes Sheet 1 of 1
ID : TK-101-2BC (Rev. 0)	Class : 21 - Tanks and Heat Exchangers	
Description : D/G AIR FLASK		
Building : DG	Floor El. : 21 50	Room, Row/Col : B DIESEL
Manufacturer, Model, Etc. :		

BASIS : External analysis

1. The buckling capacity of the shell of a large, flat-bottom, vertical tank is equal to or greater than the demand.	N/A
2. The capacity of the anchor bolts and their embedments is equal to or greater than the demand.	Yes
3. The capacity of connections between the anchor bolts and the tank shell is equal to or greater than the demand.	N/A
4. Attached piping has adequate flexibility to accommodate the motion of a large, flat-bottom, vertical tank.	N/A
5. A ring-type foundation is not used to support a large, flat-bottom, vertical tank.	N/A

IS EQUIPMENT SEISMICALLY ADEQUATE? **Yes**

COMMENTS

Reference Stevenson Report- Seismic Reevaluation Program volume 1, section 5.3. Results indicated the pre SEP supporting arrangement for the Diesel Air Tanks was dynamically unstable since no positive restraint existed between the tanks and their base support frame.
Modifications were recommended and implemented.
Note from final walkdown: Restraint strap has been installed on these Air Tanks.
Refer to ABB Impell Calc 0024-00099-DG-01 for anchorage Ck.

Evaluated by: C. M. Adams Thomas 12.17.93 Date: 12.17.93
A Baker 12/17/93
P Graybeal 12.17.93

SCREENING EVALUATION WORK SHEET (SEWS)		GIP Rev 2, Corrected, 2/14/92 Status: Yes Sheet 1 of 1
ID : TK-101-2BD (Rev. 0)	Class : 21 - Tanks and Heat Exchangers	
Description : D/G AIR FLASK		
Building : DG	Floor El. : 21.50	Room, Row/Col : B DIESEL
Manufacturer, Model, Etc. :		

BASIS : External analysis

1. The buckling capacity of the shell of a large, flat-bottom, vertical tank is equal to or greater than the demand.	N/A
2. The capacity of the anchor bolts and their embedments is equal to or greater than the demand.	Yes
3. The capacity of connections between the anchor bolts and the tank shell is equal to or greater than the demand.	N/A
4. Attached piping has adequate flexibility to accommodate the motion of a large, flat-bottom, vertical tank.	N/A
5. A ring-type foundation is not used to support a large, flat-bottom, vertical tank.	N/A

IS EQUIPMENT SEISMICALLY ADEQUATE? Yes

COMMENTS

Reference Stevenson Report- Seismic Reevaluation Program volume 1, section 5.3. Results indicated the pre SEP supporting arrangement for the Diesel Air Tanks was dynamically unstable since no positive restraint existed between the tanks and their base support frame.
Modifications were recommended and implemented.
Note from final walkdown: Restraint strap has been installed on these Air Tanks.
Refer to ABB Impell Calc 0024-00099-DG-01 for anchorage Ck.

Evaluated by: C. M. Stevenson 12/17/93 Date: (Walk Down Date 2.4.93)
Reviewer 12/17/93
P. Graybeal 12.17.93

SCREENING EVALUATION WORK SHEET (SEWS)		GIP Rev 2, Corrected, 2/14/92 Status: Yes Sheet 1 of 1
ID : TK-101-2BE (Rev. 0)	Class : 21 - Tanks and Heat Exchangers	
Description : D/G AIR FLASK		
Building : DG	Floor El. : 21.50	Room, Row/Col : B DIESEL
Manufacturer, Model, Etc. :		

BASIS : External analysis

1. The buckling capacity of the shell of a large, flat-bottom, vertical tank is equal to or greater than the demand.	N/A
2. The capacity of the anchor bolts and their embedments is equal to or greater than the demand.	Yes
3. The capacity of connections between the anchor bolts and the tank shell is equal to or greater than the demand.	N/A
4. Attached piping has adequate flexibility to accommodate the motion of a large, flat-bottom, vertical tank.	N/A
5. A ring-type foundation is not used to support a large, flat-bottom, vertical tank.	N/A

IS EQUIPMENT SEISMICALLY ADEQUATE? Yes

COMMENTS

Reference Stevenson Report- Seismic Reevaluation Program volume 1, section 5.3. Results indicated the pre SEP supporting arrangement for the Diesel Air Tanks was dynamically unstable since no positive restraint existed between the tanks and their base support frame.
Modifications were recommended and implemented.
Note from final walkdown: Restraint strap has been installed on these Air Tanks.
Refer to ABB Impell Calc 0024-00099-DG-01 for anchorage Ck.

Evaluated by: C. M. Plum Jensen 12.17.93 Date: (VR Ltr 2.4.93)
12/17/93
P Griffin 12.17.93

SCREENING EVALUATION WORK SHEET (SEWS)		GIP Rev 2, Corrected, 2/14/92 Status: Yes Sheet 1 of 1
ID : TK-101-2BF (Rev. 0)	Class : 21 - Tanks and Heat Exchangers	
Description : D/G AIR FLASK		
Building : DG	Floor El. : 21.50	Room, Row/Col : B DIESEL
Manufacturer, Model, Etc. :		

BASIS : External analysis

1. The buckling capacity of the shell of a large, flat-bottom, vertical tank is equal to or greater than the demand.	N/A
2. The capacity of the anchor bolts and their embedments is equal to or greater than the demand.	Yes
3. The capacity of connections between the anchor bolts and the tank shell is equal to or greater than the demand.	N/A
4. Attached piping has adequate flexibility to accommodate the motion of a large, flat-bottom, vertical tank.	N/A
5. A ring-type foundation is not used to support a large, flat-bottom, vertical tank.	N/A

IS EQUIPMENT SEISMICALLY ADEQUATE? **Yes**

COMMENTS

Reference Stevenson Report- Seismic Reevaluation Program volume 1, section 5.3. Results indicated the pre SEP supporting arrangement for the Diesel Air Tanks was dynamically unstable since no positive restraint existed between the tanks and their base support frame.
Modifications were recommended and implemented.
Note from final walkdown: Restraint strap has been installed on these Air Tanks.
Refer to ABB Impell Calc 0024-00099-DG-01 for anchorage Ck.

Evaluated by: C M. Allen Jr 12.17.93 Date: (wlk. Date 2.4.93)
A Sabol 12/17/93
P Gyftopoulos 12.17.93

ATTACHMENT F

SVDS

(22 Pages)

Eq Cl	Eq ID	Rev No	Sys/Eq Desc	Bldg	Fl El	Rm or Rw/Cl	Base El	<40'?	Cap. Spec.	Demd. Spec	Cap > Demd?	Caveats OK?	Anchor OK?	Interact OK	Equip OK?
0	AIR BOT 278A	0	BU AIR 1 / BACKUP AIR FOR CH-AOV-278	AB	15.50	MT PP CUB	21.50	Unk	Unk	Unk	Unk	Unk	No	Yes	No
0	AIR BOT 278B	0	BU AIR 1 / BACKUP AIR FOR CH-AOV-278	AB	15.50	MT PP CUB	21.50	Unk	Unk	Unk	Unk	Unk	Yes	Yes	Yes
0	E-24-1A	0	CC / S/G SAMPLE COOLER	AB	21.50	BLOWDOWN	21.50	Unk	Unk	Unk	Unk	Unk	Yes	Yes	Yes
0	E-24-2A	0	CC / S/G SAMPLE COOLER	AB	21.50	BLOWDOWN	21.50	Unk	Unk	Unk	Unk	Unk	Yes	Yes	Yes
0	E-24-3A	0	CC / S/G SAMPLE COOLER	AB	21.50	BLOWDOWN	21.50	Unk	Unk	Unk	Unk	Unk	Yes	Yes	Yes
0	E-24-4A	0	CC / S/G SAMPLE COOLER	AB	21.50	BLOWDOWN	21.50	Unk	Unk	Unk	Unk	Unk	Yes	Yes	Yes
0	E-9-1A	0	CC / DRAIN SAMPLE Hx	AB	21.50	BLOWDOWN	21.50	Unk	Unk	Unk	Unk	Unk	Yes	Yes	Yes
0	E-9-1B	0	CC / PRESSURIZER LIQUID SAMPLE Hx	AB	21.50	BLOWDOWN	21.50	Unk	Unk	Unk	Unk	Unk	Yes	Yes	Yes
0	E-9-1C	0	CC / HOT LEG SAMPLE Hx	AB	21.50	BLOWDOWN	21.50	Unk	Unk	Unk	Unk	Unk	Yes	Yes	Yes
0	FL-35-1A	0	CVCS / RCP SEAL WTR RETURN FILTER	AB	15.00	SW FL CUB	21.50	Unk	Unk	Unk	Unk	Unk	Yes	Yes	Yes
0	FL-59-1A	0	CVCS / NORTH FILTER	AB	15.50	SW FL CUB	21.50	Unk	Unk	Unk	Unk	Unk	Yes	Yes	Yes
0	FL-59-1B	0	CVCS / SOUTH FILTER	AB	15.50	SW FL CUB	21.50	Unk	Unk	Unk	Unk	Unk	Yes	Yes	Yes
0	FL-99-1A	0	CC / CCW SLIP STREAM FILTER	AB	35.50	2ND FLOOR	21.50	Unk	Unk	Unk	Unk	Unk	Yes	Yes	Yes

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Aziz Saber	A Saber	12/17/93
Peter Guglielmino	P Guglielmino	12/17/93

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N/A		
N/A		

Eq. Cl	Eq. ID	Rev No	Sys/Eq. Desc	Bldg.	Fl El.	Rm or Rw/Cl	Base El.	<40'?	Cap. Spec.	Demd. Spec.	Cap > Demd?	Caveats OK?	Anchor OK?	Interact. OK	Equip OK?
1	MCC10-5	0	ELEC AC / 480V MCC10-5, BUS 10-5	WD	21.50	HALL	21.50	N/A	ABS	CRS	Yes	Yes	Yes	Yes	Yes
1	MCC12-11	0	ELEC AC / 480V MCC12-11, BUS 12-11	SB	41.50	B SWGR	21.50	N/A	DOC	CRS	Yes	Yes	Yes	Yes	Yes
1	MCC13-4	0	ELEC AC / 480V MCC13-4, BUS 13-4	SB	41.50	A SWGR	21.50	N/A	ABS	CRS	Yes	Yes	Yes	Yes	Yes
1	MCC5-5	0	ELEC DC / 480V MCC5-1, BUS 5-5	SB	41.50	A SWGR	21.50	N/A	ABS	CRS	Yes	Yes	Yes	Yes	Yes
1	MCC5-6	0	ELEC DC / 480V MCC5-1, BUS 5-6	SB	41.50	A SWGR	21.50	N/A	ABS	CRS	Yes	Yes	Yes	Yes	Yes
1	MCC7-7	0	ELEC AC / 480V MCC7, BUS 7-7	CV	21.50	CABL VAUT	21.50	N/A	ABS	CRS	Yes	Yes	Yes	Yes	Yes
1	MCC8-5	0	ELEC AC / 480V MCC8, BUS 8-5	AB	21.50	PAB 1FLMD	21.50	Yes	BS	GRS	Yes	Yes	Yes	Yes	Yes
1	MCC8-6	0	ELEC AC / 480V MCC8, BUS 8-6	AB	21.50	PAB 1FLMD	21.50	Yes	BS	GRS	Yes	Yes	Yes	Yes	Yes
1	MCC9-4	0	ELEC AC / 480V MCC9-4, BUS 9-4	WD	21.50	HALL	21.50	N/A	ABS	CRS	Yes	Yes	Yes	Yes	Yes

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2	BUS 1-4	0	ELEC AC / 480V BUS 1-4	SB	41.50	A SWGR	21.50	N/A	ABS	CRS	Yes	No	Yes	No	No
2	BUS 1-5	0	ELEC AC / 480V BUS 1-5	SB	41.50	A SWGR	21.50	N/A	ABS	CRS	Yes	Yes	Yes	Yes	Yes
2	BUS 1-6	0	ELEC AC / 480V BUS 1-6	SB	41.50	A SWGR	21.50	N/A	ABS	CRS	Yes	Yes	Yes	Yes	Yes
2	BUS 1-7	0	ELEC AC / 480V BUS 1-7	SB	41.50	A SWGR	21.50	N/A	ABS	CRS	Yes	Yes	Yes	Yes	Yes
2	BUS 11	0	ELEC AC / 480V BUS 11	SB	41.50	B SWGR	21.50	N/A	DOC	CRS	Yes	Yes	Yes	Yes	Yes

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3	BUS 1-2	0	ELEC AC / 4160V BUS 1-2	SB	41.50	A SWGR	21.50	N/A	ABS	CRS	Yes	Yes	Yes	Yes	Yes
3	BUS 1-3	0	ELEC AC / 4160V BUS 1-3	SB	41.50	A SWGR	21.50	N/A	ABS	CRS	Yes	Yes	Yes	Yes	Yes
3	BUS 8	0	ELEC AC / 4160V EMERGENCY BUS 8	DG	21.50	A DIESEL	21.50	Yes	BS	GRS	Yes	Yes	Yes	Yes	Yes
3	BUS 9	0	ELEC AC / 4160V EMERGENCY BUS 9	DG	21.50	B DIESEL	21.50	Yes	BS	GRS	Yes	Yes	Yes	Yes	Yes

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4	T-484	0	ELEC AC / 4160/480V TRANSFORMER	SB	41.50	A SWGR	21.50	N/A	ABS	CRS	Yes	Yes	Yes	Yes	Yes
4	T-485	0	ELEC AC / 4160/480V TRANSFORMER	SB	41.50	A SWGR	21.50	N/A	ABS	CRS	Yes	Yes	Yes	Yes	Yes
4	T-4911	0	ELEC AC / 4160/480V TRANSFORMER	SB	41.50	A SWGR	21.50	N/A	DOC	CRS	Yes	Yes	Yes	Yes	Yes
4	T-496	0	ELEC AC / 4160/480V TRANSFORMER	SB	41.50	A SWGR	21.50	N/A	ABS	CRS	Yes	Yes	Yes	Yes	Yes
4	T-497	0	ELEC AC / 4160/480V TRANSFORMER	SB	41.50	A SWGR	21.50	N/A	ABS	CRS	Yes	Yes	Yes	Yes	Yes
4	T-IV-1C	0	ELEC AC / 120V AC VITAL BUS INVERTER C TRAN	SB	41.50	B SWGR	21.50	N/A	DOC	CRS	Yes	Yes	Yes	Yes	Yes
4	T-IV-1D	0	ELEC AC / 120V AC VITAL BUS INVERTER D TRAN	SB	41.50	B SWGR	21.50	N/A	DOC	CRS	Yes	Yes	Yes	Yes	Yes

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5	P-109-1A	0	DG / EDG FUEL OIL TRANSFER PUMP	DG	21.50	A DIESEL	21.50	Yes	BS	GRS	Yes	Yes	Yes	Yes	Yes
5	P-109-1B	0	DG / EDG FUEL OIL TRANSFER PUMP	DG	21.50	B DIESEL	21.50	Yes	BS	GRS	Yes	Yes	Yes	Yes	Yes
5	P-11-1A	0	CVCS / CHARGING METERING PUMP	AB	15.50	MT PP CUB	21.50	Yes	BS	GRS	Yes	Yes	Yes	Yes	Yes
5	P-118-1A	0	PWS / RECYCLED PRIMARY WTR TRANS PUMP	AB	21.50	LWLVL SEC	21.50	Yes	BS	GRS	Yes	Yes	Yes	Yes	Yes
5	P-118-1B	0	PWS / RECYCLED PRIMARY WTR TRANS PUMP	AB	21.50	LWLVL SEC	21.50	Yes	BS	GRS	Yes	Yes	Yes	No	No
5	P-13-1A	0	CC / COMPONENT COOLING PUMP	AB	21.50	WEST HALL	21.50	Yes	BS	GRS	Yes	Yes	Yes	No	No
5	P-13-1B	0	CC / COMPONENT COOLING PUMP	AB	21.50	WEST HALL	21.50	Yes	BS	GRS	Yes	Yes	Yes	Yes	Yes
5	P-13-1C	0	CC / COMPONENT COOLING PUMP	AB	21.50	WEST HALL	21.50	Yes	BS	GRS	Yes	Yes	Yes	Yes	Yes
5	P-18-1A	0	CVCS / CHARGING PUMP	AB	15.50	CH PP CUB	21.50	Yes	BS	GRS	Yes	Yes	Yes	Yes	Yes
5	P-18-1B	0	CVCS / CHARGING PUMP	AB	15.50	CH PP CUB	21.50	Yes	BS	GRS	Yes	Yes	Yes	Yes	Yes
5	P-29-1A	0	PWS / PW TRANSFER PUMP	AB	21.50	LL SE COR	21.50	Yes	BS	GRS	Yes	Yes	Yes	Yes	Yes
5	P-29-1B	0	PWS / PW TRANSFER PUMP	AB	21.50	LL SE COR	21.50	Yes	BS	GRS	Yes	Yes	Yes	Yes	Yes
5	P-32-1A	0	MS / AUX S/G FEED PUMP	TT	21.50	TERRY TRB	21.50	Yes	BS	GRS	Yes	Yes	Yes	Yes	Yes
5	P-32-1B	0	MS / AUX S/G FEED PUMP	TT	21.50	TERRY TRB	21.50	Yes	BS	GRS	Yes	Yes	Yes	Yes	Yes

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6	P-37-1A	0	SW / SERVICE WATER PUMP	CW	21.50	UL NW	-18.00	Yes	BS	GRS	Yes	Yes	Yes	Yes	Yes
6	P-37-1B	0	SW / SERVICE WATER PUMP	CW	21.50	UL NW	-18.00	Yes	BS	GRS	Yes	Yes	Yes	Yes	Yes
6	P-37-1C	0	SW / SERVICE WATER PUMP	CW	21.50	UL NW	-18.00	Yes	BS	GRS	Yes	Yes	Yes	Yes	Yes
6	P-37-1D	0	SW / SERVICE WATER PUMP	CW	21.50	UL NW	-18.00	Yes	BS	GRS	Yes	Yes	Yes	Yes	Yes
6	P-4-1A	0	FP / ELEC DRIVEN FIRE PMP	CW	21.50	UL NW	-18.00	Yes	BS	GRS	Yes	Yes	Yes	Yes	Yes
6	P-5-1A	0	FP / DIESEL DRIVEN FIRE PUMP	CW	21.50	UL SOUTH	-18.00	Yes	BS	GRS	Yes	Yes	Yes	Yes	Yes

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7	BA-RV-279	0	CVCS / METERING PUMP SUCTION	AB	15.50	MT PP CUB	21.50	Yes	BS	GRS	Yes	Yes	N/A	Yes	Yes
7	CA-RV-1247	0	BU AIR 1 / BACKUP AIR HEADER RELIEF	AB	15.50	MT PP CUB	21.50	Yes	BS	GRS	Yes	Yes	N/A	Yes	Yes
7	CC-FCV-608	0	CVCS / RCP CCW RETURN FLOW VALVE	AB	21.50	BLOWDOWN	21.50	Yes	BS	GRS	Yes	Yes	N/A	Yes	Yes
7	CC-RV-749	0	CC / SEAL WATER Hx ISO RELIEF	AB	-19.00	RHR PIT	21.50	Yes	BS	GRS	Yes	Yes	N/A	Yes	Yes
7	CC-RV-763A	0	CC / CCS PIPING OVERPRESSURE PROTECTOR	AB	-19.00	RHR PIT	21.50	Yes	BS	GRS	Yes	Yes	N/A	Yes	Yes
7	CC-RV-763B	0	CC / CCS PIPING OVERPRESSURE PROTECTOR	AB	-19.00	RHR PIT	21.50	Yes	BS	GRS	Yes	Yes	N/A	Yes	Yes
7	CC-TV-912	0	CVCS / RCP THERMAL BARRIER SUPPLY TRIP	AB	13.50	PP TRENCH	21.50	Yes	BS	GRS	Yes	Yes	N/A	Yes	Yes
7	CC-TV-913	0	CVCS / RCP THERMAL BARRIER SUPPLY TRIP	AB	13.50	PP TRENCH	21.50	Yes	BS	GRS	Yes	Yes	N/A	Yes	Yes
7	CD-LCVP1317A	0	CS / CONDENSER MAKEUP VALVE	TB	21.50	NO EAST	21.50	Yes	BS	GRS	Yes	Yes	N/A	Yes	Yes
7	CH-AOV-278	0	CVCS / CHARGING METERING PUMP SUCTION	AB	15.50	PP 1B CUB	21.50	Yes	BS	GRS	Yes	Yes	N/A	Yes	Yes
7	CH-FCV-110	0	CVCS / CHARGING FLOW CONTROL	AB	13.33	PP TRENCH	21.50	Yes	BS	GRS	Yes	Yes	N/A	Yes	Yes
7	CH-FCV-110A	0	CVCS / CHARGING FLOW CONTROL	AB	13.50	PP TRENCH	21.50	Yes	BS	GRS	Yes	Yes	N/A	Yes	Yes
7	CH-HCV-308	0	CVCS / RCP SEAL WATER FLOW CONTROL	AB	13.50	PP TRENCH	21.50	Yes	BS	GRS	Yes	Yes	N/A	Yes	Yes
7	CH-RV-280	0	CVCS / CHARGING METERING PUMP DISCHARGE	AB	15.50	MT PP CUB	21.50	Yes	BS	GRS	Yes	Yes	N/A	Yes	Yes
7	FO-LCV-1700A	0	DG / EG-2A FO TANK LVL CONTROL	DG	21.50	A DIESEL	21.50	Yes	BS	GRS	Yes	Yes	N/A	Yes	Yes
7	FO-LCV-1700B	0	DG / EG-2B FO TANK LVL CONTROL	DG	21.50	B DIESEL	21.50	Yes	BS	GRS	Yes	Yes	N/A	Yes	Yes
7	FWFCV-1301-1	0	FW / FEEDWATER REGULATING VALUE	TB	37.50	S EAST	21.50	Yes	BS	GRS	Yes	Yes	N/A	Yes	Yes

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7	FWFCV-1301-2	0	FW / FEEDWATER REGULATING VALVE	TB	37.50	S EAST	21.50	Yes	BS	GRS	Yes	Yes	N/A	Yes	Yes
7	FWFCV-1301-3	0	FW / FEEDWATER REGULATING VALVE	TB	37.50	S EAST	21.50	Yes	BS	GRS	Yes	Yes	N/A	Yes	Yes
7	FWFCV-1301-4	0	FW / FEEDWATER REGULATING VALVE	TB	37.50	S EAST	21.50	Yes	BS	GRS	Yes	Yes	N/A	Yes	Yes
7	FWHICV1301-1	0	AFW / AFW REGULATING VALVE	TB	37.50	S EAST	21.50	Yes	BS	GRS	Yes	Yes	N/A	Yes	Yes
7	FWHICV1301-2	0	AFW / AFW REGULATING VALVE	TB	37.50	S EAST	21.50	Yes	BS	GRS	Yes	Yes	N/A	Yes	Yes
7	FWHICV1301-3	0	AFW / AFW REGULATING VALVE	TB	37.50	S EAST	21.50	Yes	BS	GRS	Yes	Yes	N/A	Yes	Yes
7	FWHICV1301-4	0	AFW / AFW REGULATING VALVE	TB	37.50	S EAST	21.50	Yes	BS	GRS	Yes	Yes	N/A	Yes	Yes
7	LD-TV-230	0	RC / LETDOWN ISOLATION	CE	16.00	LLOA	0.50	N/A	ABS	CRS	Yes	Yes	N/A	Yes	Yes
7	MS-HICV-1201	0	MS / ATMOSPHERIC DUMP	TT	59.50	TERRY TRB	21.50	Yes	BS	GRS	Yes	Yes	N/A	Yes	Yes
7	MS-SV-11	0	MS / STEAM GENERATOR SAFETY VALVE	TT	37.50	TERRY TRB	21.50	Yes	BS	GRS	Yes	Yes	N/A	Yes	Yes
7	MS-SV-12	0	MS / STEAM GENERATOR SAFETY VALVE	TT	37.50	TERRY TRB	21.50	Yes	BS	GRS	Yes	Yes	N/A	Yes	Yes
7	MS-SV-1216A	0	MS / A AUX FEED PUMP SV	TT	21.50	TERRY TRB	21.50	Yes	BS	GRS	Yes	Yes	N/A	Yes	Yes
7	MS-SV-1216B	0	MS / B AUX FEED PUMP SV	TT	21.50	TERRY TRB	21.50	Yes	BS	GRS	Yes	Yes	N/A	Yes	Yes
7	MS-SV-13	0	MS / STEAM GENERATOR SAFETY VALVE	TT	37.50	TERRY TRB	21.50	Yes	BS	GRS	Yes	Yes	N/A	Yes	Yes
7	MS-SV-14	0	MS / STEAM GENERATOR SAFETY VALVE	TT	37.50	TERRY TRB	21.50	Yes	BS	GRS	Yes	Yes	N/A	Yes	Yes
7	MS-SV-21	0	MS / STEAM GENERATOR SAFETY VALVE	TT	37.50	TERRY TRB	21.50	Yes	BS	GRS	Yes	Yes	N/A	Yes	Yes
7	MS-SV-22	0	MS / STEAM GENERATOR SAFETY VALVE	TT	37.50	TERRY TRB	21.50	Yes	BS	GRS	Yes	Yes	N/A	Yes	Yes
7	MS-SV-23	0	MS / STEAM GENERATOR SAFETY VALVE	TT	37.50	TERRY TRB	21.50	Yes	BS	GRS	Yes	Yes	N/A	Yes	Yes
7	MS-SV-24	0	MS / STEAM GENERATOR SAFETY VALVE	TT	37.50	TERRY TRB	21.50	Yes	BS	GRS	Yes	Yes	N/A	Yes	Yes
7	MS-SV-31	0	MS / STEAM GENERATOR SAFETY VALVE	TT	37.50	TERRY TRB	21.50	Yes	BS	GRS	Yes	Yes	N/A	Yes	Yes
7	MS-SV-32	0	MS / STEAM GENERATOR SAFETY VALVE	TT	37.50	TERRY TRB	21.50	Yes	BS	GRS	Yes	Yes	N/A	Yes	Yes

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7	MS-SV-33	0	MS / STEAM GENERATOR SAFETY VALVE	TT	37.50	TERRY TRB	21.50	Yes	BS	GRS	Yes	Yes	N/A	Yes	Yes
7	MS-SV-34	0	MS / STEAM GENERATOR SAFETY VALVE	TT	37.50	TERRY TRB	21.50	Yes	BS	GRS	Yes	Yes	N/A	Yes	Yes
7	MS-SV-41	0	MS / STEAM GENERATOR SAFETY VALVE	TT	37.50	TERRY TRB	21.50	Yes	BS	GRS	Yes	Yes	N/A	Yes	Yes
7	MS-SV-42	0	MS / STEAM GENERATOR SAFETY VALVE	TT	37.50	TERRY TRB	21.50	Yes	BS	GRS	Yes	Yes	N/A	Yes	Yes
7	MS-SV-43	0	MS / STEAM GENERATOR SAFETY VALVE	TT	37.50	TERRY TRB	21.50	Yes	BS	GRS	Yes	Yes	N/A	Yes	Yes
7	MS-SV-44	0	MS / STEAM GENERATOR SAFETY VALVE	TT	37.50	TERRY TRB	21.50	Yes	BS	GRS	Yes	Yes	N/A	Yes	Yes
7	MS-TV-1211-1	0	MS / MAIN STEAM TRIP VALVE	TT	59.50	UL NORTH	21.50	Yes	BS	GRS	Yes	Yes	N/A	Yes	Yes
7	MS-TV-1211-2	0	MS / MAIN STEAM TRIP VALVE	TT	59.50	UL NORTH	21.50	Yes	BS	GRS	Yes	Yes	N/A	Yes	Yes
7	MS-TV-1211-3	0	MS / MAIN STEAM TRIP VALVE	TT	59.50	UL SOUTH	21.50	Yes	BS	GRS	Yes	Yes	N/A	Yes	Yes
7	MS-TV-1211-4	0	MS / MAIN STEAM TRIP VALVE	TT	59.50	UL SOUTH	21.50	Yes	BS	GRS	Yes	Yes	N/A	Yes	Yes
7	MSPICV-1206A	0	MS / AFW TURBINE CONTROL	TT	21.50	TERRY TRB	21.50	Yes	BS	GRS	Yes	Yes	N/A	Yes	Yes
7	MSPICV-1206B	0	MS / AFW TURBINE CONTROL	TT	21.50	TERRY TRB	21.50	Yes	BS	GRS	Yes	Yes	N/A	Yes	Yes
7	PR-AOV-568	0	RC / PRESSURIZER PORV	CE	48.50	PRESS TOP	0.50	N/A	ABS	CRS	Yes	Yes	N/A	Yes	Yes
7	PR-AOV-570	0	RC / PRESSURIZER PORV	CE	48.50	PRESS TOP	0.50	N/A	ABS	CRS	Yes	Yes	N/A	Yes	Yes
7	PR-RV-587	0	RC / LTOP RELIEF	CE	48.50	PRESS TOP	0.50	N/A	ABS	CRS	Yes	Yes	N/A	Yes	Yes
7	PR-RV-588	0	RC / LTOP RELIEF	CE	48.50	PRESS TOP	0.50	N/A	ABS	CRS	Yes	Yes	N/A	Yes	Yes
7	PR-SV-584	0	RCS / PRESSURIZER CODE SAFETY VALVE	CE	48.50	PRESS TOP	0.50	N/A	ABS	CRS	Yes	Yes	N/A	Yes	Yes
7	PR-SV-585	0	RCS / PRESSURIZER CODE SAFETY VALVE	CE	48.50	PRESS TOP	0.50	N/A	ABS	CRS	Yes	Yes	N/A	Yes	Yes
7	PR-SV-586	0	RCS / PRESSURIZER CODE SAFETY VALVE	CE	48.50	PRESS TOP	0.50	N/A	ABS	CRS	Yes	Yes	N/A	Yes	Yes

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7	SW-FCV-129	0	SW / SW FLOW CONTROL VLV FOR D/G EG-2A	DG	21.50	A DIESEL	21.50	Yes	BS	GRS	Yes	Yes	N/A	Yes	Yes
7	SW-FCV-130	0	SW / SW FLOW CONTROL VLV FOR D/G EG-2B	DG	21.50	B DIESEL	21.50	Yes	BS	GRS	Yes	Yes	N/A	Yes	Yes
7	SW-TV-2210	0	SW / S/G BLOWDOWN CONDENSERS	AB	35.50	2ND FLOOR	21.50	Yes	BS	GRS	Yes	Yes	N/A	Yes	Yes
7	SW-TV-2365A	0	SW / NORTH SW HDR SUPPLY TRIP VALVE TO S/G BLOWDOWN CONDENSERS	AB	35.50	2ND FLOOR	21.50	Yes	BS	GRS	Yes	Yes	N/A	Yes	Yes
7	SW-TV-2365B	0	SW / SOUTH SW HDR SUPPLY TRIP VALVE TO S/G BLOWDOWN CONDENSERS	AB	35.50	2ND FLOOR	21.50	Yes	BS	GRS	Yes	Yes	N/A	Yes	Yes

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8	BA-MOV-3[illegible]		[illegible]RWST TO CHARGING PUMPS	AB	15.50	PP 1A CUB	21.50	Yes	BS	GRS	Yes	Yes	N/A	Yes	Yes
8	BA-MOV-34[illegible]		[illegible]MT TO METERING PUMP	AB	21.50	BOR AC TK	21.50	Yes	BS	GRS	Yes	No	N/A	Yes	No
8	BA-MOV-37[illegible]	U	CVCS / RWST TO CHARGING PUMPS	AB	15.50	PP 1A CUB	21.50	Yes	BS	GRS	Yes	Yes	N/A	Yes	Yes
8	BA-MOV-386	0	CVCS / RWST TO CHARGING PUMPS	AB	21.50	BOR AC TK	21.50	Yes	BS	GRS	Yes	No	N/A	No	No
8	CH-MOV-257	0	CVCS / VCT OUTLET	AB	15.50	PP 1B CUB	21.50	Yes	BS	GRS	Yes	Yes	N/A	Yes	Yes
8	CH-MOV-257B	0	CVCS / VCT OUTLET	AB	15.50	PP 1B CUB	21.50	Yes	BS	GRS	Yes	Yes	N/A	Yes	Yes
8	CH-MOV-292B	0	CVCS / CHARGING VALVE LOOP 2	CE	1.50	OA	0.50	N/A	ABS	CRS	Yes	Yes	N/A	Yes	Yes
8	CH-MOV-292C	0	CVCS / CHARGING VALVE LOOP 2	CE	1.50	OA	0.50	N/A	ABS	CRS	Yes	Yes	N/A	Yes	Yes
8	CH-MOV-298	0	CVCS / PZR AUX SPRAY	CE	16.00	LP4 LLOA	0.50	N/A	ABS	CRS	Yes	Yes	N/A	Yes	Yes
8	CH-MOV-311	0	CVCS / SEAL WATER RETURN	CE	16.00	RCP MEZZ	0.50	N/A	ABS	CRS	Yes	Yes	N/A	Yes	Yes
8	CH-MOV-312	0	CVCS / SEAL WATER RETURN	CE	16.00	RCP MEZZ	0.50	N/A	ABS	CRS	Yes	Yes	N/A	Yes	Yes
8	CH-MOV-313	0	CVCS / SEAL WATER RETURN	CE	16.00	RCP MEZZ	0.50	N/A	ABS	CRS	Yes	Yes	N/A	Yes	Yes
8	CH-MOV-314	0	CVCS / SEAL WATER RETURN	CE	16.00	RCP MEZZ	0.50	N/A	ABS	CRS	Yes	Yes	N/A	Yes	Yes
8	CH-SOV-242	0	CVCS / CHARGING PUMP SUCTION TO VCT	AB	15.50	CHG PMP1B	21.50	Yes	BS	GRS	Yes	Yes	N/A	Yes	Yes
8	CH-SOV-242B	0	CVCS / CHARGING PUMP SUCTION TO VCT	AB	15.50	CHG PMP1B	21.50	Yes	BS	GRS	Yes	Yes	N/A	Yes	Yes
8	FW-MOV-11	0	FW / FEEDWATER REG BLOCK VALVE	TB	37.50	4210	21.50	Yes	BS	GRS	Yes	Yes	N/A	Yes	Yes
8	FW-MOV-12	0	FW / FEEDWATER REG BLOCK VALVE	TB	37.50	4210	21.50	Yes	BS	GRS	Yes	Yes	N/A	Yes	Yes
8	FW-MOV-13	0	FW / FEEDWATER REG BLOCK VALVE	TB	37.50	4210	21.50	Yes	BS	GRS	Yes	Yes	N/A	Yes	Yes
8	FW-MOV-14	0	FW / FEEDWATER REG BLOCK VALVE	TB	37.50	4210	21.50	Yes	BS	GRS	Yes	Yes	N/A	Yes	Yes
8	FW-MOV-35	0	FW / AFW PUMP DISCHARGE TO CTMT	TT	21.50	TERRY TRB	21.50	Yes	BS	GRS	Yes	Yes	N/A	Yes	Yes
8	LD-MOV-200	0	RC / LETDOWN ISOLATION	CE	16.00	RCP MEZZ	0.50	N/A	ABS	CRS	Yes	Yes	N/A	Yes	Yes
8	PR-MOV-567	0	RC / PZR PORV BLOCK VALVE	CE	48.50	PRESS TOP	0.50	N/A	ABS	CRS	Yes	Yes	N/A	Yes	Yes
8	PR-MOV-569	0	RC / PZR PORV BLOCK VALVE	CE	48.50	PRESS TOP	0.50	N/A	ABS	CRS	Yes	Yes	N/A	Yes	Yes

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8	PR-MOV-596	0	RC / LTOP RELIEF ISOLATION	CE	48.50	PRESS TOP	0.50	N/A	ABS	CRS	Yes	Yes	N/A	Yes	Yes
8	PR-MOV-597	0	RC / LTOP RELIEF ISOLATION	CE	48.50	PRESS TOP	0.50	N/A	ABS	CRS	Yes	Yes	N/A	Yes	Yes
8	PR-MOV-598	0	RC / LTOP RELIEF ISOLATION	CE	48.50	PRESS TOP	0.50	N/A	ABS	CRS	Yes	Yes	N/A	Yes	Yes
8	PR-MOV-599	0	RC / LTOP RELIEF ISOLATION	CE	48.50	PRESS TOP	0.50	N/A	ABS	CRS	Yes	Yes	N/A	Yes	Yes
8	RH-MOV-780	0	RHR / LOOP 1 INBOARD STOP	CE	16.00	RCP MEZZ	0.50	N/A	ABS	CRS	Yes	Yes	N/A	Yes	Yes
8	RH-MOV-781	0	RHR / LOOP 1 OUTBOARD STOP	CE	16.00	LLOA	0.50	N/A	ABS	CRS	Yes	Yes	N/A	Yes	Yes
8	RH-MOV-803	0	RHR / LOOP 2 INBOARD STOP	CE	16.00	LLOA	0.50	N/A	ABS	CRS	Yes	Yes	N/A	Yes	Yes
8	RH-MOV-804	0	RHR / LOOP 2 OUTBOARD STOP	CE	16.00	LLOA	0.50	N/A	ABS	CRS	Yes	Yes	N/A	Yes	Yes
8	SI-MOV-873	0	SI / CORE DELUGE	CE	1.50	L1/2 LLOA	0.50	N/A	ABS	CRS	Yes	Yes	N/A	Yes	Yes
8	SW-MOV-1	0	SW / EAST SW HEADER SUPPLY	TB	21.50	NO EAST	21.50	Yes	BS	GRS	Yes	Yes	N/A	Yes	Yes
8	SW-MOV-2	0	SW / WEST SW HEADER SUPPLY	TB	21.50	NO EAST	21.50	Yes	BS	GRS	Yes	Yes	N/A	Yes	Yes
8	SW-MOV-3	0	SW / COMPONENT COOLING Hx 1A OUTLET	AB	21.50	LL CC Hx	21.50	Yes	BS	GRS	Yes	Yes	N/A	Yes	Yes
8	SW-MOV-4	0	SW / COMPONENT COOLING Hx 1B OUTLET	AB	21.50	LL CC Hx	21.50	Yes	BS	GRS	Yes	Yes	N/A	Yes	Yes
8	SW-MOV-5	0	SW / SW SUPPLY TO 1A RHR Hx	AB	21.50	AB	21.50	Yes	BS	GRS	Yes	Yes	N/A	Yes	Yes
8	SW-MOV-6	0	SW / SW SUPPLY TO 1B RHR Hx	AB	21.50	AB	21.50	Yes	BS	GRS	Yes	Yes	N/A	Yes	Yes
8	SW-MOV-837A	0	SW / ADAMS FILTER 1A BYPASS	AB	35.50	SE PAB	21.50	Yes	BS	GRS	Yes	Yes	N/A	Yes	Yes
8	SW-MOV-837B	0	SW / ADAMS FILTER 1B BYPASS	AB	35.50	SE PAB	21.50	Yes	BS	GRS	Yes	Yes	N/A	Yes	No
8	SW-SOV-2210	0	SW / SOV FOR SW-TV-2210	AB	35.50	2ND FLOOR	21.50	Yes	BS	GRS	Yes	Yes	N/A	Yes	Yes
8	SW-SOV-2365A	0	SW / NORTH SW HDR SUPPLY TRIP VALVE SOV	AB	35.50	2ND FLOOR	21.50	Yes	BS	GRS	Yes	Yes	N/A	Yes	Yes
8	SW-SOV-2365B	0	SW / SOUTH SW HDR SUPPLY TRIP VLV SOV	AB	35.50	2ND FLOOR	21.50	Yes	BS	GRS	Yes	Yes	N/A	Yes	Yes

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10	AC-23-1A	0	HVAC / SWITCHGEAR RM B AIR HANDLING UNIT	SB	41.50	B SWGR	21.50	N/A	DOC	CRS	Yes	Yes	Yes	Yes	Yes

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14	ARC A	0	/ SB1 SWITCHES FOR MS-TV-1211 AND PR-AOV-568	SB	59 50	ELEV WALL	21 50	N/A	ABS	CRS	Yes	Yes	Yes	Yes	Yes
14	ARC B	0	/ SB1 SWITCHES FOR MS-TV-1211 AND PR-AOV-570	SB	59 50	ELEV WALL	21 50	N/A	ABS	CRS	Yes	Yes	Yes	Yes	Yes
14	DC-BUS-A	0	ELEC DC / 125V DC BUS A	SB	41 50	A SWGR	21 50	N/A	ABS	CRS	Yes	Yes	Yes	Yes	Yes
14	DC-BUS-BX	0	ELEC DC / 125V DC BUS BX	SB	41 50	A SWGR	21 50	N/A	ABS	CRS	Yes	Yes	Yes	Yes	Yes
14	DC-EGG-2A	0	ELEC DC / 125V DC DIST PANEL	DG	21 50	A DIESEL	21 50	Yes	BS	GRS	Yes	Yes	Yes	Yes	Yes
14	DC-EGG-2B	0	ELEC DC / 125V DC DIST PANEL	DG	21 50	B DIESEL	21 50	Yes	BS	GRS	Yes	Yes	Yes	Yes	Yes
14	EGG-2A	0	ELEC AC / 480V AC DIST PANEL	DG	21 50	A DIESEL	21 50	Yes	BS	GRS	Yes	Yes	Yes	Yes	Yes
14	EGG-2B	0	ELEC AC / 480V AC DIST PANEL	DG	21 50	B DIESEL	21 50	Yes	BS	GRS	Yes	Yes	Yes	Yes	Yes

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15	BT-1A	0	ELEC DC / BATTERY 1A	SB	41.50	A SWGR	21.50	N/A	ABS	CRS	Yes	No	Yes	Yes	No
15	BT-1B	0	ELEC DC / BATTERY 1B	SB	41.50	B SWGR	21.50	N/A	DOC	CRS	Yes	Yes	Yes	Yes	Yes

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16	BC-1-1A	0	ELEC DC / BATTERY CHARGER 1A	SB	41.50	A SWGR	21.50	N/A	ABS	CRS	Yes	Yes	Yes	Yes	Yes
16	BC-1-1B	0	ELEC DC / BATTERY CHARGER 1B	SB	41.50	B SWGR	21.50	N/A	DOC	CRS	Yes	Yes	Yes	Yes	Yes
16	IV-1A	0	ELEC AC / 120V AC VITAL BUS INVERTER A	SB	41.50	A SWGR	21.50	N/A	ABS	CRS	Yes	Yes	Yes	Yes	Yes
16	IV-1B	0	ELEC AC / 120V AC VITAL BUS INVERTER B	SB	41.50	A SWGR	21.50	Yes	BS	GRS	Yes	Yes	Yes	Yes	Yes
16	IV-1C	0	ELEC AC / 120V AC VITAL BUS INVERTER C	SB	41.50	B SWGR	21.50	N/A	DOC	CRS	Yes	Yes	Yes	Yes	Yes
16	IV-1D	0	ELEC AC / 120V AC VITAL BUS INVERTER D	SB	41.50	B SWGR	21.50	N/A	DOC	CRS	Yes	Yes	Yes	Yes	Yes

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Print or Type Name	Signature	Date
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Print or Type Name	Signature	Date

Eq. Cl	Eq. ID	Rev No	Sys/Eq. Desc	Bldg	Fl El	Rm or Rw/Cl	Base El	<40'?	Cap Spec	Demd Spec	Cap > Demd?	Caveats OK?	Anchor OK?	Interact OK	Equip OK?
17	EG-2A	0	DG / DIESEL ENGINE	DG	21.50	A DIESEL	21.50	Yes	BS	GRS	Yes	Yes	Yes	No	No
17	EG-2B	0	DG / DIESEL ENGINE	DG	21.50	B DIESEL	21.50	Yes	BS	GRS	Yes	Yes	Yes	No	No
17	P-5-1A-ENG	0	FP / DIESEL ENGINE FOR P-5-1A	CW	21.50	UL SOUTH	-18.00	Yes	BS	GRS	Yes	Yes	Yes	Yes	Yes

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Eq. Cl	Eq. ID	Rev No	Sys/Eq. Desc	Bldg.	Fl El.	Rm or Rw/Cl	Base El.	<40'?	Cap. Spec.	Demd. Spec.	Cap > Demd?	Caveats OK?	Anchor OK?	Interact. OK	Equip OK?
18	AR-1700A	0	DG / AIR REG FOR LT-1700A	DG	21.50	A DIESEL	21.50	Yes	BS	GRS	Yes	Yes	Yes	Yes	Yes
18	AR-1700B	0	DG / AIR REG FOR LT-1700B	DG	21.50	B DIESEL	21.50	Yes	BS	GRS	Yes	Yes	Yes	Yes	Yes
18	DA-PRV-27A	0	DG / EDG AIR TO SUPPORT COMPONENTS	DG	21.50	A DIESEL	21.50	Yes	BS	GRS	Yes	Yes	No	Yes	No
18	DA-PRV-27B	0	DG / EDG AIR TO SUPPORT COMPONENTS	DG	21.50	B DIESEL	21.50	Yes	BS	GRS	Yes	Yes	Yes	Yes	Yes
18	LI-1700A	0	DG / EDG FO TANK 2A LVL INDICATOR	DG	21.50	A DIESEL	21.50	Yes	BS	GRS	Yes	Yes	Yes	Yes	Yes
18	LI-1700B	0	DG / EDG FO TANK 2B LVL INDICATOR	DG	21.50	B DIESEL	21.50	Yes	BS	GRS	Yes	Yes	Yes	Yes	Yes
18	LT-1007	0	AFW / PWST COLD SHUTDOWN LEVEL	YD	21.50	PWST	21.50	Yes	BS	GRS	Yes	Yes	Yes	Yes	Yes
18	LT-1301-1A	0	FW / S/G E-G-1 LEVEL (NR)	CE	22.00	#1 CAR FN	0.50	N/A	ABS	CRS	Yes	Yes	Yes	Yes	Yes
18	LT-1301-1C	0	FW / S/G E-G-1 LEVEL (WR)	CE	22.00	#1 CAR FN	0.50	N/A	ABS	CRS	Yes	Yes	Yes	Yes	Yes
18	LT-1301-1D	0	FW / S/G E-G-1 LEVEL (WR)	CE	22.00	#1 CAR FN	0.50	N/A	ABS	CRS	Yes	Yes	Yes	Yes	Yes
18	LT-1301-2A	0	FW / S/G E-G-2 LEVEL (NR)	CE	22.00	#2 CAR FN	0.50	N/A	ABS	CRS	Yes	Yes	Yes	Yes	Yes
18	LT-1301-2C	0	FW / S/G E-G-2 LEVEL (WR)	CE	22.00	#2 CAR FN	0.50	N/A	ABS	CRS	Yes	Yes	Yes	Yes	Yes
18	LT-1301-2D	0	FW / S/G E-G-2 LEVEL (WR)	CE	22.00	#2 CAR FN	0.50	N/A	ABS	CRS	Yes	Yes	Yes	Yes	Yes
18	LT-1301-3A	0	FW / S/G E-G-3 LEVEL (NR)	CE	22.00	#3 CAR FN	0.50	N/A	ABS	CRS	Yes	Yes	Yes	Yes	Yes
18	LT-1301-3C	0	FW / S/G E-G-3 LEVEL (WR)	CE	22.00	#3 CAR FN	0.50	N/A	ABS	CRS	Yes	Yes	Yes	Yes	Yes
18	LT-1301-3D	0	FW / S/G E-G-3 LEVEL (WR)	CE	22.00	#3 CAR FN	0.50	N/A	ABS	CRS	Yes	Yes	Yes	Yes	Yes
18	LT-1301-4A	0	FW / S/G E-G-4 LEVEL (NR)	CE	22.00	#4 CAR FN	0.50	N/A	ABS	CRS	Yes	Yes	Yes	Yes	Yes
18	LT-1301-4C	0	FW / S/G E-G-4 LEVEL (WR)	CE	22.00	#4 CAR FN	0.50	N/A	ABS	CRS	Yes	Yes	Yes	Yes	Yes
18	LT-1301-4D	0	FW / S/G E-G-4 LEVEL (WR)	CE	22.00	#4 CAR FN	0.50	N/A	ABS	CRS	Yes	Yes	Yes	Yes	Yes
18	LT-1307A	0	AFW / DWST HOT SHUTDOWN LEVEL	YD	21.50	OTSD RCA	21.50	Yes	BS	GRS	Yes	Yes	Yes	Yes	Yes
18	LT-1307B	0	AFW / DWST HOT SHUTDOWN LEVEL	YD	21.50	OTSD RCA	21.50	Yes	BS	GRS	Yes	Yes	Yes	Yes	Yes
18	LT-1309	0	CS / CST LEVEL TRANSMITTER	YD	21.50	OTSD RCA	21.50	Yes	BS	GRS	Yes	Yes	Yes	Yes	Yes
18	LT-1700A	0	DG / EDG FO TANK LVL TRANSMITTER	DG	21.50	A DIESEL	21.50	Yes	BS	GRS	Yes	Yes	No	Yes	No
18	LT-1700B	0	DG / EDG FO TANK LVL TRANSMITTER	DG	21.50	B DIESEL	21.50	Yes	BS	GRS	Yes	Yes	No	Yes	No
18	LT-1806A	0	SI / RWST LEVEL	YD	21.50	RWST	21.50	Yes	BS	GRS	Yes	Yes	Yes	Yes	Yes
18	LT-1806B	0	SI / RWST LEVEL	YD	21.50	RWST	21.50	Yes	BS	GRS	Yes	Yes	Yes	Yes	Yes

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Print or Type Name	Signature	Date
N/A		
Print or Type Name	Signature	Date

Eq Cl	Eq ID	Rev No	Sys/Eq Desc	Bldg	Fl El	Rm or Rw/Cl	Base El	<40'?	Cap Spec	Demd Spec	Cap > Demd?	Caveats OK?	Anchor OK?	Interact OK	Equip OK?
18	LT-401-1	0	RC / PRESSURIZER LEVEL	CE	1.50	PZR CABIT	0.50	N/A	ABS	CRS	Yes	Yes	Yes	Yes	Yes
18	LT-401-2	0	RC / PRESSURIZER LEVEL	CE	1.50	PZR CABIT	0.50	N/A	ABS	CRS	Yes	Yes	Yes	Yes	Yes
18	LT-401-3	0	RC / PRESSURIZER LEVEL	CE	1.50	PZR CABIT	0.50	N/A	ABS	CRS	Yes	Yes	Yes	Yes	Yes
18	LT-401-4	0	RC / PRESSURIZER LEVEL	CE	1.50	PZR CABIT	0.50	N/A	ABS	CRS	Yes	Yes	Yes	Yes	Yes
18	LT-402	0	RC / PRESSURIZER LEVEL	CE	1.50	PZR CABIT	0.50	N/A	ABS	CRS	Yes	Yes	Yes	Yes	Yes
18	PT-1201-1B	0	FW / S/G E-G-1 PRESSURE	CE	22.00	#1 CAR FN	0.50	N/A	ABS	CRS	Yes	Yes	Yes	Yes	Yes
18	PT-1201-2B	0	FW / S/G E-G-2 PRESSURE	CE	22.00	#2 CAR FN	0.50	N/A	ABS	CRS	Yes	Yes	Yes	Yes	Yes
18	PT-1201-3B	0	FW / S/G E-G-3 PRESSURE	CE	22.00	#3 CAR FN	0.50	N/A	ABS	CRS	Yes	Yes	Yes	Yes	Yes
18	PT-1201-4B	0	FW / S/G E-G-4 PRESSURE	CE	22.00	#4 CAR FN	0.50	N/A	ABS	CRS	Yes	Yes	Yes	Yes	Yes
18	PT-401-1	0	RC / PRESSURIZER PRESSURE	CE	1.50	PZR CAB	0.50	N/A	ABS	CRS	Yes	Yes	Yes	Yes	Yes
18	PT-401-2	0	RC / PRESSURIZER PRESSURE	CE	1.50	PZR CAB	0.50	N/A	ABS	CRS	Yes	Yes	Yes	Yes	Yes
18	PT-401-3	0	RC / PRESSURIZER PRESSURE	CE	1.50	PZR CAB	0.50	N/A	ABS	CRS	Yes	Yes	Yes	Yes	Yes
18	PT-401-4	0	RC / PRESSURIZER PRESSURE	CE	1.50	PZR CAB	0.50	N/A	ABS	CRS	Yes	Yes	Yes	Yes	Yes
18	RACK28803-1A	0	RCS / RCS TRAN RACK FOR PT-403,403N	CE	1.50	LLOA	0.50	N/A	ABS	CRS	Yes	Yes	Yes	Yes	Yes
18	RACK28803-1B	0	RCS / RCS TRAN RACK FOR PT-404,404N	CE	1.50	LLOA	0.50	N/A	ABS	CRS	Yes	Yes	Yes	Yes	Yes

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Eq. Cl	Eq. ID	Rev No	Sys/Eq. Desc	Bldg.	Fl El	Rm or Rw/Cl	Base El	<40'?	Cap. Spec.	Demd. Spec	Cap > Demd?	Caveats OK?	Anchor OK?	Interact OK	Equip OK?
19	TE-411A	0	RC / HOT LEG LOOP 1 TEMP	CE	1.50	1TC VLV	0.50	N/A	ABS	CRS	Yes	Yes	N/A	Yes	Yes
19	TE-411B	0	RC / COLD LEG LOOP 1 TEMP	CE	1.50	1TC VLV	0.50	N/A	ABS	CRS	Yes	Yes	N/A	Yes	Yes
19	TE-412A	0	RC / HOT LEG LOOP 1 TEMP	CE	1.50	1TC VLV	0.50	N/A	ABS	CRS	Yes	Yes	N/A	Yes	Yes
19	TE-412B	0	RC / COLD LEG LOOP 1 TEMP	CE	1.50	1TC VLV	0.50	N/A	ABS	CRS	Yes	Yes	N/A	Yes	Yes
19	TE-413A	0	RC / HOT LEG LOOP 1 TEMP	CE	1.50	1TC VLV	0.50	N/A	ABS	CRS	Yes	Yes	N/A	Yes	Yes
19	TE-413B	0	RC / COLD LEG LOOP 1 TEMP	CE	1.50	1TC VLV	0.50	N/A	ABS	CRS	Yes	Yes	N/A	Yes	Yes
19	TE-421A	0	RC / HOT LEG LOOP 2 TEMP	CE	1.50	2TC VLV	0.50	N/A	ABS	CRS	Yes	Yes	N/A	Yes	Yes
19	TE-421B	0	RC / COLD LEG LOOP 2 TEMP	CE	1.50	2TC VLV	0.50	N/A	ABS	CRS	Yes	Yes	N/A	Yes	Yes
19	TE-422A	0	RC / HOT LEG LOOP 2 TEMP	CE	1.50	2TC VLV	0.50	N/A	ABS	CRS	Yes	Yes	N/A	Yes	Yes
19	TE-422B	0	RC / COLD LEG LOOP 2 TEMP	CE	1.50	2TC VLV	0.50	N/A	ABS	CRS	Yes	Yes	N/A	Yes	Yes
19	TE-423A	0	RC / HOT LEG LOOP 2 TEMP	CE	1.50	2TC VLV	0.50	N/A	ABS	CRS	Yes	Yes	N/A	Yes	Yes
19	TE-423B	0	RC / COLD LEG LOOP 2 TEMP	CE	1.50	2TC VLV	0.50	N/A	ABS	CRS	Yes	Yes	N/A	Yes	Yes
19	TE-431A	0	RC / HOT LEG LOOP 3 TEMP	CE	1.50	3TC VLV	0.50	N/A	ABS	CRS	Yes	Yes	N/A	Yes	Yes
19	TE-431B	0	RC / COLD LEG LOOP 3 TEMP	CE	1.50	3TC VLV	0.50	N/A	ABS	CRS	Yes	Yes	N/A	Yes	Yes
19	TE-432A	0	RC / HOT LEG LOOP 3 TEMP	CE	1.50	3TC VLV	0.50	N/A	ABS	CRS	Yes	Yes	N/A	Yes	Yes
19	TE-432B	0	RC / COLD LEG LOOP 3 TEMP	CE	1.50	3TC VLV	0.50	N/A	ABS	CRS	Yes	Yes	N/A	Yes	Yes
19	TE-433A	0	RC / HOT LEG LOOP 3 TEMP	CE	1.50	3TC VLV	0.50	N/A	ABS	CRS	Yes	Yes	N/A	Yes	Yes
19	TE-433B	0	RC / COLD LEG LOOP 3 TEMP	CE	1.50	3TC VLV	0.50	N/A	ABS	CRS	Yes	Yes	N/A	Yes	Yes
19	TE-441A	0	RC / HOT LEG LOOP 4 TEMP	CE	1.50	4TC VLV	0.50	N/A	ABS	CRS	Yes	Yes	N/A	Yes	Yes
19	TE-441B	0	RC / COLD LEG LOOP 4 TEMP	CE	1.50	4TC VLV	0.50	N/A	ABS	CRS	Yes	Yes	N/A	Yes	Yes
19	TE-442A	0	RC / HOT LEG LOOP 4 TEMP	CE	1.50	4TC VLV	0.50	N/A	ABS	CRS	Yes	Yes	N/A	Yes	Yes
19	TE-442B	0	RC / COLD LEG LOOP 4 TEMP	CE	1.50	4TC VLV	0.50	N/A	ABS	CRS	Yes	Yes	N/A	Yes	Yes
19	TE-443A	0	RC / HOT LEG LOOP 4 TEMP	CE	1.50	4TC VLV	0.50	N/A	ABS	CRS	Yes	Yes	N/A	Yes	Yes
19	TE-443B	0	RC / COLD LEG LOOP 4 TEMP	CE	1.50	4TC VLV	0.50	N/A	ABS	CRS	Yes	Yes	N/A	Yes	Yes

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Eq. Cl	Eq. ID	Rev No	Sys/Eq. Desc	Bldg.	Fl El.	Rm or Rw/Cl	Base El.	<40'?	Cap. Spec.	Demd. Spec.	Cap > Demd?	Caveats OK?	Anchor OK?	Interact OK	Equip OK?
20	A1A	0	/ POWER SUPPLY - RPS RACK A1A CABINET	SB	59.50	A1A	21.50	N/A	ABS	CRS	Yes	Yes	Yes	Yes	Yes
20	AB/4	0	/ 480V BUS PANEL	SB	59.50	CONTROL AUX	21.50	N/A	ABS	CRS	Yes	Yes	Yes	Yes	Yes
20	AB/5	0	/ EMERGENCY POWER PANEL	SB	59.50	CONTROL AUX	21.50	N/A	ABS	CRS	Yes	Yes	Yes	Yes	Yes
20	AB/6	0	/ UNDERVOLTAGE TABLE	SB	59.50	CONTROL AUX	21.50	N/A	ABS	CRS	Yes	Yes	Yes	Yes	Yes
20	ABT	0	ELEC AC / AUTOMATIC BUS TRANSFER DEVICE (SWITCH) FOR SEMI-VITAL AC PANELS	SB	41.50	A SWGR	21.50	N/A	ABS	CRS	Yes	Yes	Yes	Yes	Yes
20	AUX-EG2A	0	ELEC AC / EMERGENCY STOP/TRIP/BYPASS AUX PANEL	DG	21.50	A DIESEL	21.50	Yes	BS	GRS	Yes	Yes	Yes	Yes	Yes
20	AUX-EG2B	0	ELEC AC / EMERGENCY STOP/TRIP/BYPASS AUX PANEL	DG	21.50	B DIESEL	21.50	Yes	BS	GRS	Yes	Yes	Yes	Yes	Yes
20	B1A	0	/ POWER SUPPLY - RPS RACK B1A CABINET	SB	59.50	B1A	21.50	N/A	ABS	CRS	Yes	Yes	Yes	No	No
20	CB/8DB1	0	/ AUX CONTROL PANEL (EG-2A)	SB	59.50	CONTROL AUX	21.50	N/A	ABS	CRS	Yes	Yes	Yes	Yes	Yes
20	CB/8DB1A	0	/ AUX CONTROL PANEL (EG-2A)	SB	59.50	CONTROL AUX	21.50	N/A	ABS	CRS	Yes	No	Yes	Yes	No
20	CB/9DB1	0	/ AUX CONTROL PANEL (EG-2B)	SB	59.50	CONTROL AUX	21.50	N/A	ABS	CRS	Yes	No	Yes	Yes	No
20	CB/9DB1A	0	/ AUX CONTROL PANEL (EG-2B)	SB	59.50	CONTROL AUX	21.50	N/A	ABS	CRS	Yes	No	Yes	Yes	No
20	CB/B	0	/ MAIN CONTROL BOARD SECTION B	SB	59.50	MCB	21.50	N/A	ABS	CRS	Yes	Yes	Yes	Yes	Yes
20	CB/C	0	/ MAIN CONTROL BOARD SECTION C	SB	59.50	MCB	21.50	N/A	ABS	CRS	Yes	Yes	Yes	Yes	Yes
20	CB/D	0	/ MAIN CONTROL BOARD SECTION D	SB	59.50	MCB	21.50	N/A	ABS	CRS	Yes	Yes	Yes	Yes	Yes
20	CB/E	0	/ MAIN CONTROL BOARD SECTION E	SB	59.50	MCB	21.50	N/A	ABS	CRS	Yes	Yes	Yes	Yes	Yes
20	CB/F	0	/ MAIN CONTROL BOARD SECTION F	SB	59.50	MCB	21.50	N/A	ABS	CRS	Yes	Yes	Yes	Yes	Yes
20	CB/G	0	/ MAIN CONTROL BOARD SECTION G	SB	59.50	MCB	21.50	N/A	ABS	CRS	Yes	Yes	Yes	Yes	Yes
20	DC-BUS-B	0	ELEC DC / 125V DC BUS B	SB	41.50	B SWGR	21.50	N/A	DOC	CRS	Yes	Yes	Yes	Yes	Yes
20	EGP-2A	0	ELEC AC / EXCITATION CONTROL PANEL	DG	21.50	A DIESEL	21.50	Yes	BS	GRS	Yes	Yes	Yes	Yes	Yes
20	EGP-2B	0	ELEC AC / EXCITATION CONTROL PANEL	DG	21.50	B DIESEL	21.50	Yes	BS	GRS	Yes	Yes	Yes	Yes	Yes
20	RACK AF	0	/ POWER SUPPLY - RPS RACK AF	SB	59.50	RACK AF	21.50	N/A	ABS	CRS	Yes	Yes	Yes	Yes	Yes
20	RACK CF	0	/ POWER SUPPLY - RPS RACK CF	SB	59.50	RACK CF	21.50	N/A	ABS	CRS	Yes	Yes	Yes	Yes	Yes

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N/A		
N/A		

ATTACHMENT G

OSVS

(32 Pages)

Seismic Evaluation Report for Connecticut Yankee
Attachment G - Outlier Seismic Verification Sheet (OSVS)

Table of Contents:

OUTLIER SEISMIC VERIFICATION SHEET (OSVS)		GIP Rev 2, Corrected 2/14/92 Sheet 1 of 2
ID : AIR BOT 278A (Rev. 0)	Class : 0. Other	
Description : BACKUP AIR FOR CH-AOV-278		
Building : AB	Floor El. : 15.50	Room, Row/Col : MT PP CUB

1. OUTLIER ISSUE DEFINITION - Mechanical and Electrical Equipment

a. Identify all the screening guidelines which are not met. (Check more than one if several guidelines could not be satisfied.)

Capacity vs. Demand	
Caveats	
Anchorage	
Seismic Interaction	X
Other	

b. Describe all the reasons for the outlier (i.e., if all the listed outlier issues were resolved, then the signatories would consider this item of equipment to be verified for seismic adequacy).

The strap securing air bottle 278A to the building column is loose.
PRV 278 and 279 are mounted on the air bottle and connected to pres indicator which may be impacted by tools (wrenches, caps) fallen off from above.

2. PROPOSED METHOD OF OUTLIER RESOLUTION (Optional)

a. Defined proposed method(s) for resolving outlier.

Tighten strap.
Remove unsecured hardware from the area.

b. Provide information needed to implement proposed method(s) for resolving outlier (e.g., estimate of fundamental frequency).

NA

3. COMMENTS

4. CERTIFICATION:

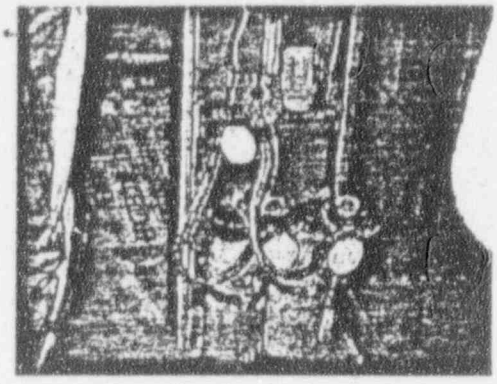
The information on this OSVS is, to the best of our knowledge and belief, correct and accurate, and resolution of the outlier issues listed on the previous page will satisfy the requirments for this item of equipment to be verified for seismic adequacy.

Approved by: C. M. Abu Zuraiq — Date: 12.17.93
A Salim — 12-17-93
Peter Dymbort — 12-17-93

Attachment: Pictures

OUTLIER SEISMIC VERIFICATION SHEET (OSVS)		GIP Rev 2, Corrected 2/14/92 Sheet 2 of 2
ID : AIR BOT 278A (Rev. 0)	Class : 0. Other	
Description : BACKUP AIR FOR CH-AOV-278		
Building : AB	Floor El. : 15.50	Room, Row/Col : MT PP CUB

PICTURES



Air Bot 278A and B

OUTLIER SEISMIC VERIFICATION SHEET (OSVS)		GIP Rev 2, Corrected 2/14/92 Sheet 1 of 2
ID : B1A (Rev. 0)	Class : 20. Instrumentation and Control Panels and Cabinets	
Description : POWER SUPPLY - RPS RACK B1A CABINET		
Building : SB	Floor El. : 59.50	Room, Row/Col : B1A

1. OUTLIER ISSUE DEFINITION - Mechanical and Electrical Equipment

a. Identify all the screening guidelines which are not met. (Check more than one if several guidelines could not be satisfied.)

Capacity vs. Demand	
Caveats	
Anchorage	
Seismic Interaction	X
Other	

b. Describe all the reasons for the outlier (i.e., if all the listed outlier issues were resolved, then the signatories would consider this item of equipment to be verified for seismic adequacy).

Seismic Interaction Caveat 1 - Spec 200 RPS rack sections B1A, B1B, and B2A are part of the SSEL, there are file cabinets nearby B1C and B2C (south end of SPEC 200 cabinet), potential interaction concern, should be restrained. (see images)

2. PROPOSED METHOD OF OUTLIER RESOLUTION (Optional)

a. Defined proposed method(s) for resolving outlier.

Tie down or relocate file cabinets south of SPEC 200 cabinet.

b. Provide information needed to implement proposed method(s) for resolving outlier (e.g., estimate of fundamental frequency).

Initiate appropriate plant work order/document to restrain or relocate the filing cabinets.

3. COMMENTS

4. CERTIFICATION:

The information on this OSVS is, to the best of our knowledge and belief, correct and accurate, and resolution of the outlier issues listed on the previous page will satisfy the requirments for this item of equipment to be verified for seismic adequacy.

Approved by: C. M. Abramson — Date: 12.17.93

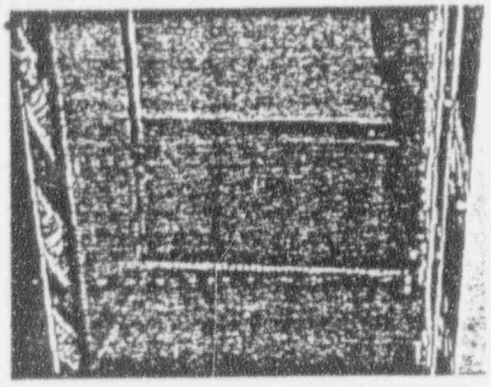
Engineer — 12-17-93

12.17-93

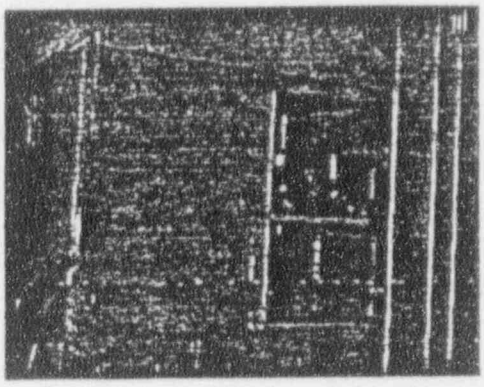
Attachment: Pictures

OUTLIER SEISMIC VERIFICATION SHEET (OSVS)		GIP Rev 2, Corrected 2/14/92 Sheet 2 of 2
ID : B1A (Rev 0)	Class : 20. Instrumentation and Control Panels and Cabinets	
Description : POWER SUPPLY - RPS RACK B1A CABINET		
Building : SB	Floor El. : 59.50	Room, Row/Col : B1A

PICTURES



APPROX DIST OF FILE CAB TO SPEC 200 CAB



FILE CAB NEAR B1C and B2C

OUTLIER SEISMIC VERIFICATION SHEET (OSVS)		GIP Rev 2, Corrected 2/14/92 Sheet 1 of 2
ID : BA-MOV-349 (Rev. 0)	Class : 8. Motor-Operated and Solenoid-Operated Valves	
Description : BAMT TO METERING PUMP		
Building : AB	Floor El. : 21.50	Room, Row/Col : BOR AC TK

1. OUTLIER ISSUE DEFINITION - Mechanical and Electrical Equipment

a. Identify all the screening guidelines which are not met. (Check more than one if several guidelines could not be satisfied.)

Capacity vs. Demand	
Caveats	
Anchorage	
Seismic Interaction	X
Other	

b. Describe all the reasons for the outlier (i.e., if all the listed outlier issues were resolved, then the signatories would consider this item of equipment to be verified for seismic adequacy).

ISSUES WITH C FRAME SUPPORT. For the horizontal direction, C channel frame restrains movement of the valve thru a bolt on top of the actuator. Based on discussion with piping engineer the frame serves no function for the pipe.

2. PROPOSED METHOD OF OUTLIER RESOLUTION (Optional)

a. Defined proposed method(s) for resolving outlier.

Remove/Modify frame to eliminate interference.

b. Provide information needed to implement proposed method(s) for resolving outlier (e.g., estimate of fundamental frequency).

Initiate appropriate plant documentation to implement above describe change.

3. COMMENTS

4. CERTIFICATION:

The information on this OSVS is, to the best of our knowledge and belief, correct and accurate, and resolution of the outlier issues listed on the previous page will satisfy the requirments for this item of equipment to be verified for seismic adequacy.

Approved by: C. M. Allen Date: 12-17-93

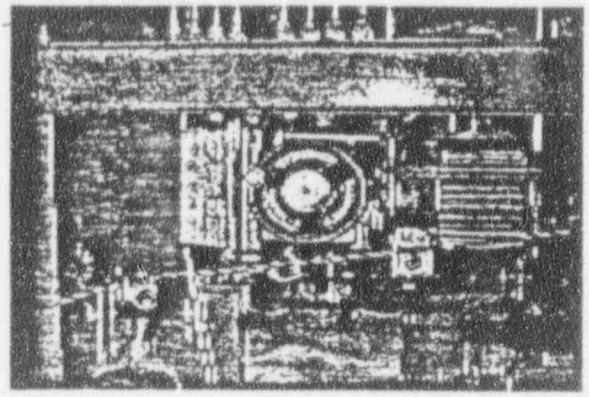
12-17-93

12-17-93

Attachment: Pictures

OUTLIER SEISMIC VERIFICATION SHEET (OSVS)		GIP Rev 2, Corrected 2/14/92 Sheet 2 of 2
ID : BA-MOV-349 (Rev. 0)	Class : 8. Motor-Operated and Solenoid-Operated Valves	
Description : BAMT TO METERING PUMP		
Building : AB	Floor El. : 21.50	Room, Row/Col : BOR AC TK

PICTURES



BA-MOV-349 image 1

OUTLIER SEISMIC VERIFICATION SHEET (OSVS)		GIP Rev 2, Corrected 2/14/92 Sheet 1 of 2
ID : BA-MOV-386 (Rev. 0)	Class : 8. Motor-Operated and Solenoid-Operated Valves	
Description : RWST TO CHARGING PUMPS		
Building : AB	Floor El. : 21.50	Room, Row/Col : BOR AC TK

1. OUTLIER ISSUE DEFINITION - Mechanical and Electrical Equipment

a. Identify all the screening guidelines which are not met. (Check more than one if several guidelines could not be satisfied.)

Capacity vs. Demand	
Caveats	
Anchorage	
Seismic Interaction	X
Other	

b. Describe all the reasons for the outlier (i.e., if all the listed outlier issues were resolved, then the signatories would consider this item of equipment to be verified for seismic adequacy).

ISSUES WITH C FRAME SUPPORT. For the horizontal direction, C channel frame restrains movement of the valve thru a bolt on top of the actuator. Based on discussion with piping engineer the frame serves no function for the pipe.
Also need to resolve field installation problem w/ grout under the stanchion.

2. PROPOSED METHOD OF OUTLIER RESOLUTION (Optional)

a. Defined proposed method(s) for resolving outlier.

Remove/Modify frame to eliminate interference.

b. Provide information needed to implement proposed method(s) for resolving outlier (e.g., estimate of fundamental frequency).

Initiate appropriate plant documentation to implement above describe change.

3. COMMENTS

4. CERTIFICATION:

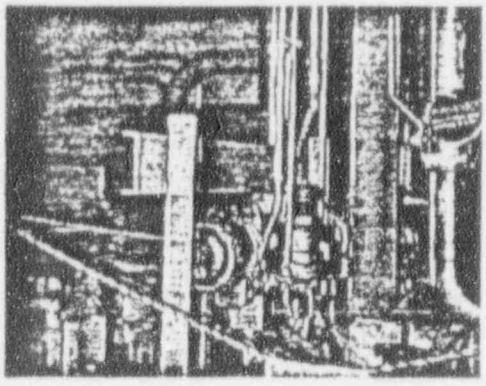
The information on this OSVS is, to the best of our knowledge and belief, correct and accurate, and resolution of the outlier issues listed on the previous page will satisfy the requirments for this item of equipment to be verified for seismic adequacy.

Approved by: C. M. Abramovici — Date: 12.17.93
A Bayer — 12-17-93
[illegible] — 12-17-93

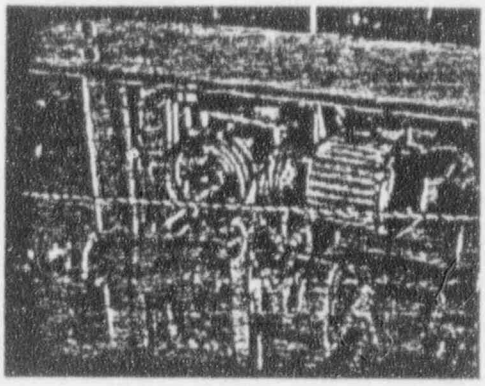
Attachment: Pictures

OUTLIER SEISMIC VERIFICATION SHEET (OSVS)		GIP Rev 2, Corrected 2/14/92 Sheet 2 of 2
ID : BA-MOV-386 (Rev. 0)	Class : 8. Motor-Operated and Solenoid-Operated Valves	
Description : RWST TO CHARGING PUMPS		
Building : AB	Floor El. : 21.50	Room, Row/Col : BOR AC TK

PICTURES



BA-MOV-386 IMAGE 1



BA-MOV-386 IMAGE 2

OUTLIER SEISMIC VERIFICATION SHEET (OSVS)		GIP Rev 2, Corrected 2/14/92 Sheet 1 of 2
ID : BT-1A (Rev. 0)	Class : 15. Batteries on Racks	
Description : BATTERY 1A		
Building : SB	Floor El. : 41.50	Room, Row/Col : A SWGR

1. OUTLIER ISSUE DEFINITION - Mechanical and Electrical Equipment

a. Identify all the screening guidelines which are not met. (Check more than one if several guidelines could not be satisfied.)

Capacity vs. Demand	
Caveats	X
Anchorage	
Seismic Interaction	
Other	

b. Describe all the reasons for the outlier (i.e., if all the listed outlier issues were resolved, then the signatories would consider this item of equipment to be verified for seismic adequacy).

Manufactured by Gould model NCX-1200
Caveat Capacity 4 and 5 regarding close fitting beteen cells and batteries restrained by side and end rails not satified.
Spacing between batteries cells and railings does not have tight fit, gap = 1/2", see image 2 and 3.

2. PROPOSED METHOD OF OUTLIER RESOLUTION (Optional)

a. Defined proposed method(s) for resolving outlier.

Install crushable foam between railing and battery cells or add spacers/shims between the vertical post and side rail to provide snug fit.

b. Provide information needed to implement proposed method(s) for resolving outlier (e.g., estimate of fundamental frequency).

Initiate appropriate plant documentation to implement above described change.

3. COMMENTS

4. CERTIFICATION:

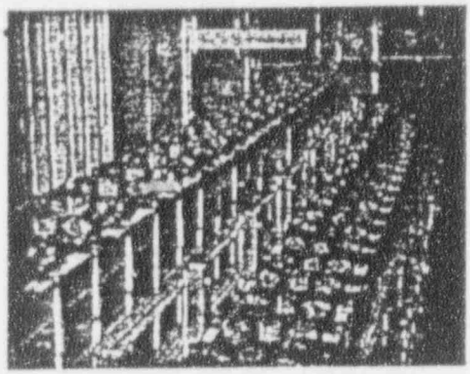
The information on this OSVS is, to the best of our knowledge and belief, correct and accurate, and resolution of the outlier issues listed on the previous page will satisfy the requirments for this item of equipment to be verified for seismic adequacy.

Approved by: C. M. Anderson Date: 12.17.93
A. Gulves 12-17-93
12-17-93

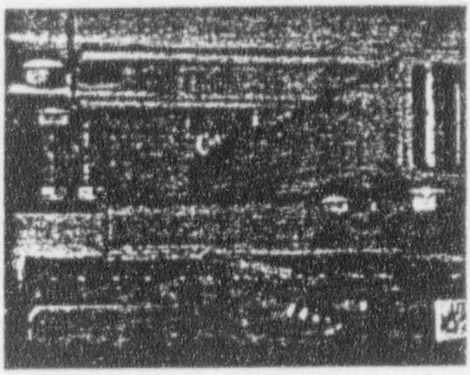
Attachment: Pictures

OUTLIER SEISMIC VERIFICATION SHEET (OSVS)		GIP Rev 2, Corrected 2/14/92 Sheet 2 of 2
ID : BT-1A (Rev. 0)	Class : 15 Batteries on Racks	
Description : BATTERY 1A		
Building : SB	Floor El. : 41.50	Room, Row/Col : A SWGR

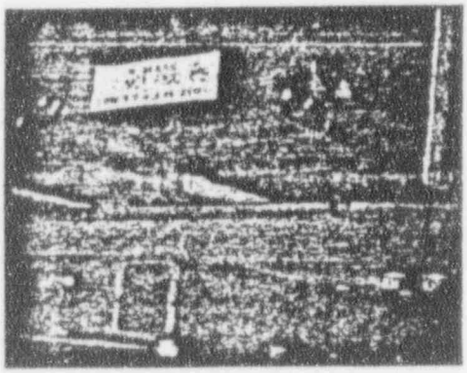
PICTURES



BT-1A IMAGE 1



BT-1A IMAGE 2



BT-1A IMAGE 3

OUTLIER SEISMIC VERIFICATION SHEET (OSVS)		GIP Rev 2, Corrected 2/14/92 Sheet 1 of 3
ID : BUS 1-4 (Rev. 0)	Class : 2. Low Voltage Switchgear	
Description : 480V BUS 1-4		
Building : SB	Floor El. : 41.50	Room, Row/Col : A SWGR

1. OUTLIER ISSUE DEFINITION - Mechanical and Electrical Equipment

a. Identify all the screening guidelines which are not met. (Check more than one if several guidelines could not be satisfied.)

Capacity vs. Demand	
Caveats	
Anchorage	
Seismic Interaction	X
Other	

b. Describe all the reasons for the outlier (i.e., if all the listed outlier issues were resolved, then the signatories would consider this item of equipment to be verified for seismic adequacy).

Seismic Interaction Caveat 1 - maint crane on top of Bus 1-4,5,6,7 is not securred, int concerns.

2. PROPOSED METHOD OF OUTLIER RESOLUTION (Optional)

a. Defined proposed method(s) for resolving outlier.

Modify maintenance procedure to include tie down of maintenance crane when not in use and insure sufficient clearance between crane and adjacent commodities (such as HVAC ducts).

b. Provide information needed to implement proposed method(s) for resolving outlier (e.g., estimate of fundamental frequency).

Indicate specific location where it is acceptable to park the crane. Generate necessary plant documentation to implement above described option.

3. COMMENTS

The maintenance crane interaction concern affects Bus 1-4, 5, 6, and 7 which are on the SSEL, closure and tracking of these outliers are being incorporated into this OSVS.
For elimination of potential interaction concern, recommend maintenance crane to be parked over sections 10, 11, or 12 of the low voltage switchgear.

4. CERTIFICATION:

The information on this OSVS is, to the best of our knowledge and belief, correct and accurate, and resolution of the outlier issues listed on the previous page will satisfy the requirments for this item of equipment to be verified for seismic adequacy.

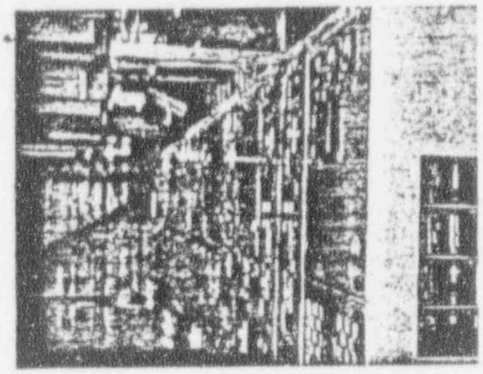
Approved by: C. M. Abe Andre — Date: 12. 17. 93
A Bates — 12-17-93
Tom Dwyer — 12. 17. 93

OUTLIER SEISMIC VERIFICATION SHEET (OSVS)		GIP Rev 2, Corrected 2/14/92 Sheet 2 of 3
ID : BUS 1-4 (Rev 0)	Class : 2 Low Voltage Switchgear	
Description : 480V BUS 1-4		
Building : SB	Floor El. : 41.50	Room, Row/Col : A SWGR

Attachment: Pictures

OUTLIER SEISMIC VERIFICATION SHEET (OSVS)		GIP Rev 2, Corrected 2/14/92 Sheet 3 of 3
ID : BUS 1-4 (Rev. 0)	Class : 2. Low Voltage Switchgear	
Description : 480V BUS 1-4		
Building : SB	Floor El. : 41.50	Room, Row/Col : A SWGR

PICTURES



BUS 1-4 IMAGE 1

OUTLIER SEISMIC VERIFICATION SHEET (OSVS)		GIP Rev 2, Corrected 2/14/92 Sheet 1 of 2
ID : CB/8DB1A (Rev. 0)	Class : 20. Instrumentation and Control Panels and Cabinets	
Description : AUX CONTROL PANEL (EG-2A)		
Building : SB	Floor El. : 59.50	Room, Row/Col : CONTROL AUX

1. OUTLIER ISSUE DEFINITION - Mechanical and Electrical Equipment

a. Identify all the screening guidelines which are not met. (Check more than one if several guidelines could not be satisfied.)

Capacity vs. Demand	
Caveats	X
Anchorage	
Seismic Interaction	
Other	

b. Describe all the reasons for the outlier (i.e., if all the listed outlier issues were resolved, then the signatories would consider this item of equipment to be verified for seismic adequacy).

Existing cabinets 8081A and 9081A are not bolted together, also 8081A is not bolted to adjacent cabinet 9081. (top wireway may provide some restrant for relative displacement, see Picture)

2. PROPOSED METHOD OF OUTLIER RESOLUTION (Optional)

a. Defined proposed method(s) for resolving outlier.

Tie together or provide cushioning between cabinets to preclude any impact.

b. Provide information needed to implement proposed method(s) for resolving outlier (e.g., estimate of fundamental frequency).

Initiate appropriate plant documentation to implement above describe change.

3. COMMENTS

Cabinets are sufficiently stiff in the side to side direction. May be sufficient to provide non crushable cushioning material between the adjacent bays.

4. CERTIFICATION:

The information on this OSVS is, to the best of our knowledge and belief, correct and accurate, and resolution of the outlier issues listed on the previous page will satisfy the requirments for this item of equipment to be verified for seismic adequacy.

Approved by: C. M. Abrahamson Date: 12.17.93

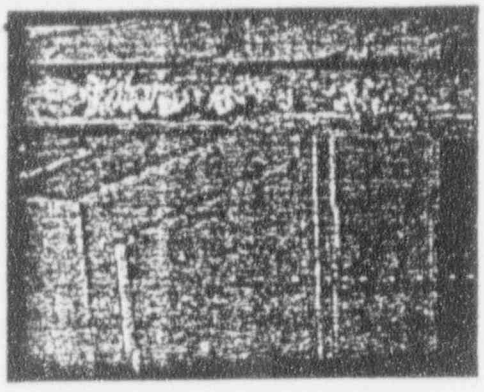
12-17-93

12-17-93

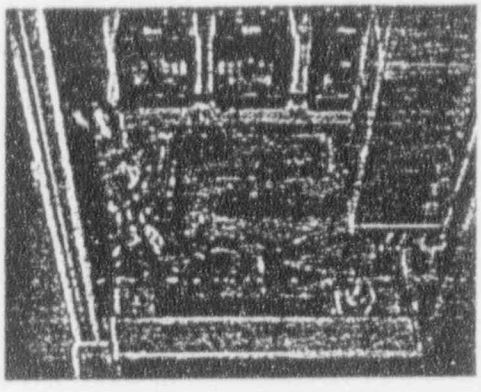
Attachment: Pictures

OUTLIER SEISMIC VERIFICATION SHEET (OSVS)		GIP Rev 2, Corrected 2/14/92 Sheet 2 of 2
ID : CB/8DB1A (Rev. 0)	Class : 20. Instrumentation and Control Panels and Cabinets	
Description : AUX CONTROL PANEL (EG-2A)		
Building : SB	Floor El. : 59.50	Room, Row/Col : CONTROL AUX

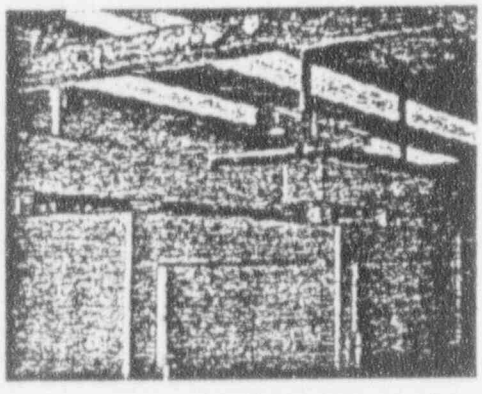
PICTURES



9DB1A (left), 8DB1A (right)



Anchorage for 8DB1A



Top wireway of 8DB1A and 9DB1A

OUTLIER SEISMIC VERIFICATION SHEET (OSVS)		GIP Rev 2, Corrected 2/14/92 Sheet 1 of 1
ID : CB/9DB1 (Rev. 0)	Class : 20. Instrumentation and Control Panels and Cabinets	
Description : AUX CONTROL PANEL (EG-2B)		
Building : SB	Floor El. : 59.50	Room, Row/Col : CONTROL AUX

1. OUTLIER ISSUE DEFINITION - Mechanical and Electrical Equipment

a. Identify all the screening guidelines which are not met. (Check more than one if several guidelines could not be satisfied.)

Capacity vs. Demand	
Caveats	X
Anchorage	
Seismic Interaction	
Other	

b. Describe all the reasons for the outlier (i.e., if all the listed outlier issues were resolved, then the signatories would consider this item of equipment to be verified for seismic adequacy).

Existing cabinets 8DB1A and 9DB1A are not bolted together, also 8DB1A is not bolted to adjacent cabinet 9DB1. (top wireway may provide some restrant for relative displacement, see Picture from CB/8DB1A OSVS)

2. PROPOSED METHOD OF OUTLIER RESOLUTION (Optional)

a. Defined proposed method(s) for resolving outlier.

Tie together or provide cushioning between cabinets to preclude any impact.

b. Provide information needed to implement proposed method(s) for resolving outlier (e.g., estimate of fundamental frequency).

Initiate appropriate plant documentation to implement above describe change.

3. COMMENTS

Cabinets are sufficiently stiff in the side to side direction. May be sufficient to provide non crushable cushioning material between the adjacent bays.

4. CERTIFICATION:

The information on this OSVS is, to the best of our knowledge and belief, correct and accurate, and resolution of the outlier issues listed on the previous page will satisfy the requirments for this item of equipment to be verified for seismic adequacy.

Approved by: C. M. Abu Reddy Date: 12.17.93

12.17.93

12.19.93

OUTLIER SEISMIC VERIFICATION SHEET (OSVS)		GIP Rev 2, Corrected 2/14/92 Sheet 1 of 1
ID : CB/9DB1A (Rev. 0)	Class : 20. Instrumentation and Control Panels and Cabinets	
Description : AUX CONTROL PANEL (EG-2B)		
Building : SB	Floor El. : 59.50	Room, Row/Col : CONTROL AUX

1. OUTLIER ISSUE DEFINITION - Mechanical and Electrical Equipment

a. Identify all the screening guidelines which are not met. (Check more than one if several guidelines could not be satisfied.)

Capacity vs. Demand	
Caveats	X
Anchorage	
Seismic Interaction	
Other	

b. Describe all the reasons for the outlier (i.e., if all the listed outlier issues were resolved, then the signatories would consider this item of equipment to be verified for seismic adequacy).

Existing cabinets 8DB1A and 9DB1A are not bolted together, also 8DB1A is not bolted to adjacent cabinet 9DB1. (top wireway may provide some restrant for relative displacement, see Picture from CB/8DB1A OSVS)

2. PROPOSED METHOD OF OUTLIER RESOLUTION (Optional)

a. Defined proposed method(s) for resolving outlier.

Tie together or provide cushioning between cabinets to preclude any impact.

b. Provide information needed to implement proposed method(s) for resolving outlier (e.g., estimate of fundamental frequency).

Initiate appropriate plant documentation to implement above describe change.

3. COMMENTS

Cabinets are sufficiently stiff in the side to side direction. May be sufficient to provide non crushable cushioning material between the adjacent bays.

4. CERTIFICATION:

The information on this OSVS is, to the best of our knowledge and belief, correct and accurate, and resolution of the outlier issues listed on the previous page will satisfy the requirments for this item of equipment to be verified for seismic adequacy.

Approved by: C. M. Abrahamson Date: 12.17.93

A Sabol 12-17-93

OUTLIER SEISMIC VERIFICATION SHEET (OSVS)		GIP Rev 2, Corrected 2/14/92 Sheet 1 of 2
ID : DA-PRV-27A (Rev. 0)	Class : 18. Instruments on Racks	
Description : EDG AIR TO SUPPORT COMPONENTS		
Building : DG	Floor El. : 21.50	Room, Row/Col : A DIESEL

1. OUTLIER ISSUE DEFINITION - Mechanical and Electrical Equipment

a. Identify all the screening guidelines which are not met. (Check more than one if several guidelines could not be satisfied.)

Capacity vs. Demand	
Caveats	
Anchorage	X
Seismic Interaction	
Other	

b. Describe all the reasons for the outlier (i.e., if all the listed outlier issues were resolved, then the signatories would consider this item of equipment to be verified for seismic adequacy).

DA-PRV-27A has loose bolts.

2. PROPOSED METHOD OF OUTLIER RESOLUTION (Optional)

a. Defined proposed method(s) for resolving outlier.

Tighten anchors

b. Provide information needed to implement proposed method(s) for resolving outlier (e.g., estimate of fundamental frequency).

Generate necessary plant documentation to tighten bolts.

3. COMMENTS

Note that this condition will not preclude the air regulator from fufilling its function nor will impair the tubing.

4. CERTIFICATION:

The information on this OSVS is, to the best of our knowledge and belief, correct and accurate, and resolution of the outlier issues listed on the previous page will satisfy the requirments for this item of equipment to be verified for seismic adequacy.

Approved by: C. M. Allen Rudisill Date: 12-17-93

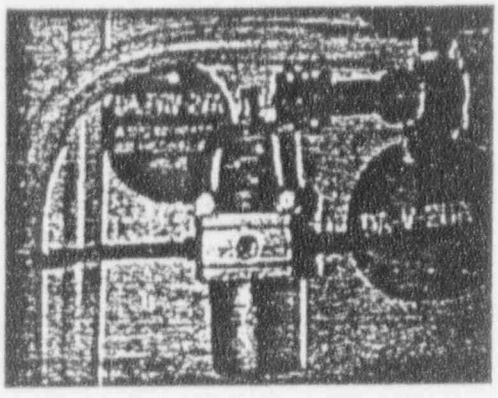
ASelvi 12-17-93

12-19-93

Attachment: Pictures

OUTLIER SEISMIC VERIFICATION SHEET (OSVS)		GIP Rev 2, Corrected 2/14/92 Sheet 2 of 2
ID : DA-PRV-27A (Rev. 0)	Class : 18. Instruments on Racks	
Description : EDG AIR TO SUPPORT COMPONENTS		
Building : DG	Floor El. : 21.50	Room, Row/Col : A DIESEL

PICTURES



DA-PRV-27A IMAGE 1

OUTLIER SEISMIC VERIFICATION SHEET (OSVS)		GIP Rev 2, Corrected 2/14/92 Sheet 1 of 2
ID : EG-2A (Rev. 0)	Class : 17. Engine-Generators	
Description : DIESEL ENGINE		
Building : DG	Floor El. : 21.50	Room, Row/Col : A DIESEL

1. OUTLIER ISSUE DEFINITION - Mechanical and Electrical Equipment

a. Identify all the screening guidelines which are not met. (Check more than one if several guidelines could not be satisfied.)

Capacity vs. Demand	
Cavects	
Anchorage	
Seismic Interaction	X
Other	

b. Describe all the reasons for the outlier (i.e., if all the listed outlier issues were resolved, then the signatories would consider this item of equipment to be verified for seismic adequacy).

Overhead crane beam NOT secured in place, potential interaction with the fuel oil line. Starting Air and Fuel Oil piping are very flexible (not restrained in the horizontal directions).

2. PROPOSED METHOD OF OUTLIER RESOLUTION (Optional)

a. Defined proposed method(s) for resolving outlier.

For overhead crane beam - modify appropiate maintenance or housekeeping procedures to ensure beam does not park in a unacceptable position.
For Starting Air and Fuel Oil piping - evaluate pipe runs.

b. Provide information needed to implement proposed method(s) for resolving outlier (e.g., estimate of fundamental frequency).

Initiate appropriate plant documentation to implement above describe change.

3. COMMENTS

4. CERTIFICATION:

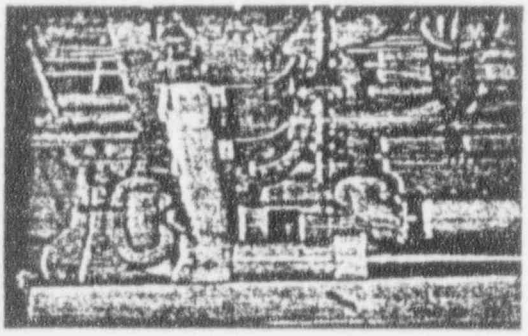
The information on this OSVS is, to the best of our knowledge and belief, correct and accurate, and resolution of the outlier issues listed on the previous page will satisfy the requirments for this item of equipment to be verified for seismic adequacy.

Approved by: C. M. Ohrenuare — Date: 12.17.93
A Sakis — 12.17.93
[illegible] — 12-17-93

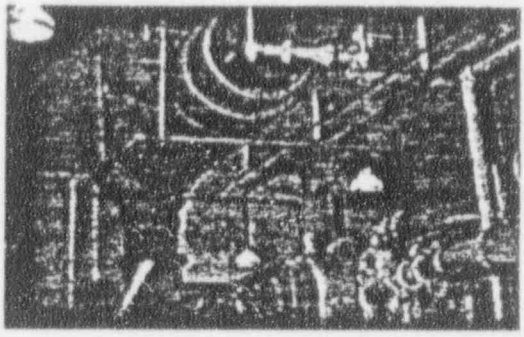
Attachment: Pictures

OUTLIER SEISMIC VERIFICATION SHEET (OSVS)		GIP Rev 2, Corrected 2/14/92 Sheet 2 of 2
ID : EG-2A (Rev. 0)	Class : 17. Engine-Generators	
Description : DIESEL ENGINE		
Building : DG	Floor El. : 21.50	Room, Row/Col : A DIESEL

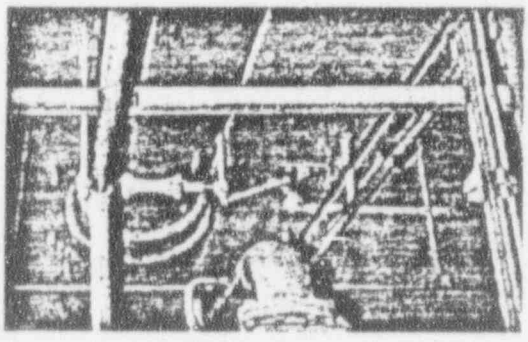
PICTURES



EG-2A image #2, CHECK OVHD CRANE FOR INT.



EG-2A image #4



EG-2A image #5

OUTLIER SEISMIC VERIFICATION SHEET (OSVS)		GIP Rev 2, Corrected 2/14/92 Sheet 1 of 2
ID : EG-2B (Rev. 0)	Class : 17. Engine-Generators	
Description : DIESEL ENGINE		
Building : DG	Floor El. : 21.50	Room, Row/Col : B DIESEL

1. OUTLIER ISSUE DEFINITION - Mechanical and Electrical Equipment

a. Identify all the screening guidelines which are not met. (Check more than one if several guidelines could not be satisfied.)

Capacity vs. Demand	
Caveats	
Anchorage	
Seismic Interaction	X
Other	

b. Describe all the reasons for the outlier (i.e., if all the listed outlier issues were resolved, then the signatories would consider this item of equipment to be verified for seismic adequacy).

Overhead crane beam NOT secured in place, potential interaction with the fuel oil line. Starting Air and Fuel Oil piping are very flexible (not restrained in the horizontal directions).

2. PROPOSED METHOD OF OUTLIER RESOLUTION (Optional)

a. Defined proposed method(s) for resolving outlier.

For overhead crane beam - modify appropiate maintenance or housekeeping procedures to ensure beam does not park in a unacceptable position.
For Starting Air and Fuel Oil piping - evaluate pipe runs.

b. Provide information needed to implement proposed method(s) for resolving outlier (e.g., estimate of fundamental frequency).

Initiate appropriate plant documentation to implement above describe change.

3. COMMENTS

4. CERTIFICATION:

The information on this OSVS is, to the best of our knowledge and belief, correct and accurate, and resolution of the outlier issues listed on the previous page will satisfy the requirments for this item of equipment to be verified for seismic adequacy.

Approved by: C. M. Abrahamse Date: 12.17.93

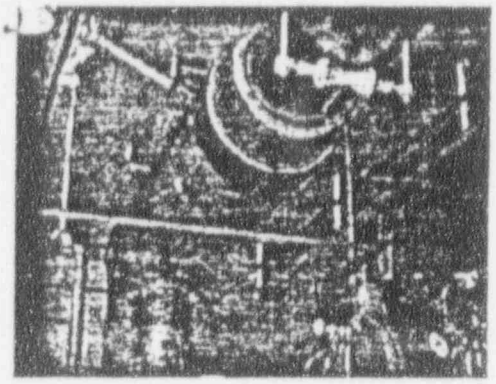
12.17.93

12-17-93

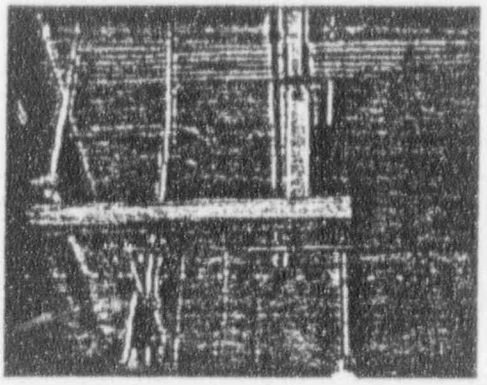
Attachment: Pictures

OUTLIER SEISMIC VERIFICATION SHEET (OSVS)		GIP Rev 2, Corrected 2/14/92 Sheet 2 of 2
ID : EG-2B (Rev. 0)	Class : 17. Engine-Generators	
Description : DIESEL ENGINE		
Building : DG	Floor El. : 21.50	Room, Row/Col : B DIESEL

PICTURES



EG-2B IMAGE 4



EG-2B IMAGE 6

OUTLIER SEISMIC VERIFICATION SHEET (OSVS)		GIP Rev 2, Corrected 2/14/92 Sheet 1 of 2
ID : LT-1700A (Rev. 0)	Class : 18. Instruments on Racks	
Description : EDG FO TANK LVL TRANSMITTER		
Building : DG	Floor El. : 21.50	Room, Row/Col : A DIESEL

1. OUTLIER ISSUE DEFINITION - Mechanical and Electrical Equipment

a. Identify all the screening guidelines which are not met. (Check more than one if several guidelines could not be satisfied)

Capacity vs. Demand	
Caveats	
Anchorage	X
Seismic Interaction	
Other	

b. Describe all the reasons for the outlier (i.e., if all the listed outlier issues were resolved, then the signatories would consider this item of equipment to be verified for seismic adequacy).

3 missing anchors on transmitter LT-1700A.

2. PROPOSED METHOD OF OUTLIER RESOLUTION (Optional)

a. Defined proposed method(s) for resolving outlier.

Replace and tighten anchors

b. Provide information needed to implement proposed method(s) for resolving outlier (e.g., estimate of fundamental frequency).

Generate necessary plant documentation to replace and tighten anchors.

3. COMMENTS

Note that this condition will not preclude the transmitter from fulfilling its intented function nor will impair the tubing.

4. CERTIFICATION:

The information on this OSVS is, to the best of our knowledge and belief, correct and accurate, and resolution of the outlier issues listed on the previous page will satisfy the requirments for this item of equipment to be verified for seismic adequacy.

Approved by: C. M. Abu Bandar Date: 12.17.93

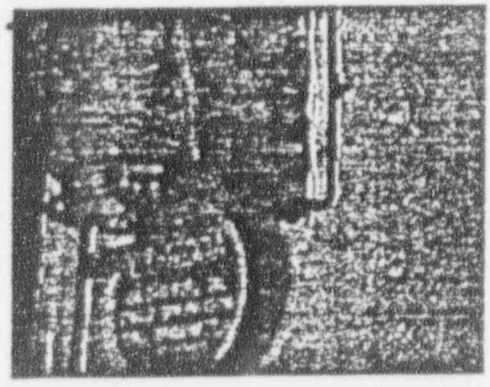
12.17.93

12.17.93

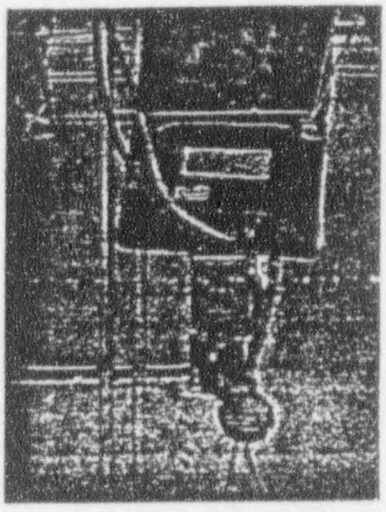
Attachment: Pictures

OUTLIER SEISMIC VERIFICATION SHEET (OSVS)		GIP Rev 2, Corrected 2/14/92 Sheet 2 of 2
ID : LT-1700A (Rev. 0)	Class : 18. Instruments on Racks	
Description : EDG FO TANK LVL TRANSMITTER		
Building : DG	Floor El. : 21.50	Room, Row/Col : A DIESEL

PICTURES



LT-1700A IMAGE 1



LT-1700A IMAGE 2

OUTLIER SEISMIC VERIFICATION SHEET (OSVS)		GIP Rev 2, Corrected 2/14/92 Sheet 1 of 2
ID : LT-1700B (Rev. 0)	Class : 18. Instruments on Racks	
Description : EDG FO TANK LVL TRANSMITTER		
Building : DG	Floor El. : 21.50	Room, Row/Col : B DIESEL

1. OUTLIER ISSUE DEFINITION - Mechanical and Electrical Equipment

a. Identify all the screening guidelines which are not met. (Check more than one if several guidelines could not be satisfied.)

Capacity vs. Demand	
Caveats	
Anchorage	X
Seismic Interaction	
Other	

b. Describe all the reasons for the outlier (i.e., if all the listed outlier issues were resolved, then the signatories would consider this item of equipment to be verified for seismic adequacy).

Transmitter LT-1700B anchorage is loose.

2. PROPOSED METHOD OF OUTLIER RESOLUTION (Optional)

a. Defined proposed method(s) for resolving outlier.

Tighten anchors

b. Provide information needed to implement proposed method(s) for resolving outlier (e.g., estimate of fundamental frequency).

Generate necessary plant documentation to tighten anchors.

3. COMMENTS

Note that this condition will not preclude the transmitter from fulfilling its intented function nor will impair the tubing.

4. CERTIFICATION:

The information on this OSVS is, to the best of our knowledge and belief, correct and accurate, and resolution of the outlier issues listed on the previous page will satisfy the requirments for this item of equipment to be verified for seismic adequacy.

Approved by: C. M. Abu-Nemeh Date: 12.17.93

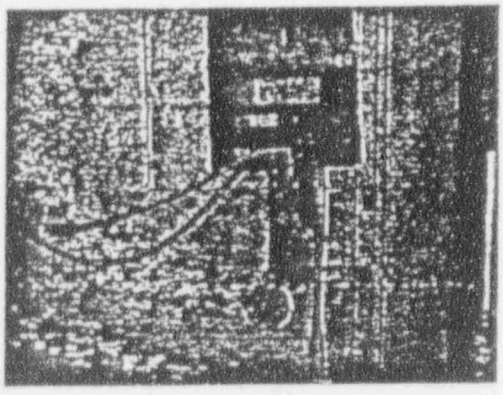
12.17.93

12.17.93

Attachment: Pictures

OUTLIER SEISMIC VERIFICATION SHEET (OSVS)		GIP Rev 2, Corrected 2/14/92 Sheet 2 of 2
ID : LT-1700B (Rev. 0)	Class : 18. Instruments on Racks	
Description : EDG FO TANK LVL TRANSMITTER		
Building : DG	Floor El. : 21.50	Room, Row/Col : B DIESEL

PICTURES



LT-1700B IMAGE 1

OUTLIER SEISMIC VERIFICATION SHEET (OSVS)		GIP Rev 2, Corrected 2/14/92 Sheet 1 of 2
ID : P-13-1A (Rev. 0)	Class : 5. Horizontal Pumps	
Description : COMPONENT COOLING PUMP		
Building : AB	Floor El. : 21.50	Room, Row/Col : WEST HALL

1. OUTLIER ISSUE DEFINITION - Mechanical and Electrical Equipment

a. Identify all the screening guidelines which are not met. (Check more than one if several guidelines could not be satisfied.)

Capacity vs. Demand	
Caveats	
Anchorage	
Seismic Interaction	X
Other	

b. Describe all the reasons for the outlier (i.e., if all the listed outlier issues were resolved, then the signatories would consider this item of equipment to be verified for seismic adequacy).

Seismic Interaction Caveat 1 - Maint Cabinet near P-13-1A is 15" away and is free standing, Interaction concern. Dolly Cart near P-13-1A is not tied down.

2. PROPOSED METHOD OF OUTLIER RESOLUTION (Optional)

a. Defined proposed method(s) for resolving outlier.

Tie down maintenance cabinet to wall and restrain dolly cart or relocate these items.

b. Provide information needed to implement proposed method(s) for resolving outlier (e.g., estimate of fundamental frequency).

Generate necessary plant documentation to anchor or restrain the maintenance cabinet. Provide a work order to add a tie down rope to restrain the cart.

3. COMMENTS

Note: the cart may not be a credible source to damage or impact the pump. However, recommend tie down to be consistent with good housekeeping practice.

4. CERTIFICATION:

The information on this OSVS is, to the best of our knowledge and belief, correct and accurate, and resolution of the outlier issues listed on the previous page will satisfy the requirments for this item of equipment to be verified for seismic adequacy.

Approved by: C. M. Allen Jr. Date: 12.17.93

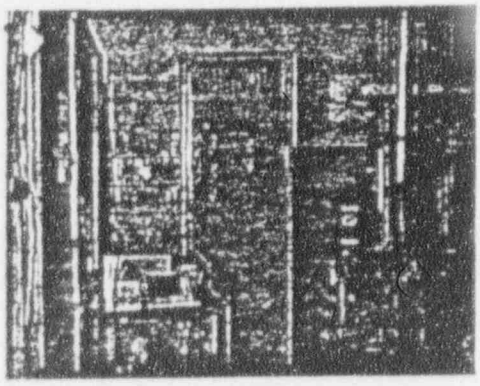
12-17-93

12-17-93

Attachment: Pictures

OUTLIER SEISMIC VERIFICATION SHEET (OSVS)		GIP Rev 2, Corrected 2/14/92 Sheet 2 of 2
ID : P-13-1A (Rev. 0)	Class : 5. Horizontal Pumps	
Description : COMPONENT COOLING PUMP		
Building : AB	Floor El. : 21.50	Room, Row/Col : WEST HALL

PICTURES



P-13-1A IMAGE 7, NEARBY POTENTIAL INTERACTION (MAINTENANCE CABINET UNSUPPORTED,

OUTLIER SEISMIC VERIFICATION SHEET (OSVS)		GIP Rev 2, Corrected 2/14/92 Sheet 1 of 2
ID : T-485 (Rev. 0)	Class : 4. Transformers	
Description : 4160/480V TRANSFORMER		
Building : SB	Floor El. : 41.50	Room, Row/Col : A SWGR

1. OUTLIER ISSUE DEFINITION - Mechanical and Electrical Equipment

a. Identify all the screening guidelines which are not met. (Check more than one if several guidelines could not be satisfied.)

Capacity vs. Demand	
Caveats	
Anchorage	
Seismic Interaction	X
Other	

b. Describe all the reasons for the outlier (i.e., if all the listed outlier issues were resolved, then the signatories would consider this item of equipment to be verified for seismic adequacy).

Overhead spare cabling rolled up, may not be secured, may cause int

2. PROPOSED METHOD OF OUTLIER RESOLUTION (Optional)

a. Defined proposed method(s) for resolving outlier.

Remove or restraint cable

b. Provide information needed to implement proposed method(s) for resolving outlier (e.g., estimate of fundamental frequency).

Generate necessary plant documentation to restrain cabling

3. COMMENTS

Note that cable may not cause credible damage since it will impact outer shell of transformer which performs no electric function except personnel protection. However, this condition should be rectified to avoid concerns with the adequacy of the cable tray.

4. CERTIFICATION:

The information on this OSVS is, to the best of our knowledge and belief, correct and accurate, and resolution of the outlier issues listed on the previous page will satisfy the requirments for this item of equipment to be verified for seismic adequacy.

Approved by: C. M. Abu Tarabe — Date: 12-17-93

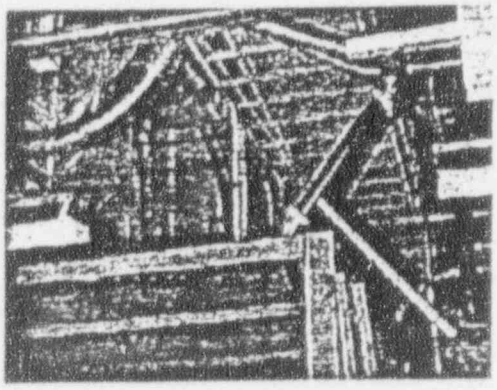
12-17-93

12-17-1993

Attachment: Pictures

OUTLIER SEISMIC VERIFICATION SHEET (OSVS)		GIP Rev 2, Corrected 2/14/92 Sheet 2 of 2
ID : T-485 (Rev. 0)	Class : 4. Transformers	
Description : 4160/480V TRANSFORMER		
Building : SB	Floor El. : 41.50	Room, Row/Col : A SWGR

PICTURES



Overhead spare cabling not secured

OUTLIER SEISMIC VERIFICATION SHEET (OSVS)		GIP Rev 2, Corrected 2/14/92 Sheet 1 of 1
ID : TK-25-1B (Rev. 0)	Class : 21. Tanks and Heat Exchangers	
Description : CST		
Building : YD	Floor El. : 21.50	Room, Row/Col : OTSD RCA

1. OUTLIER ISSUE DEFINITION - Tanks and Heat Exchangers

a. Identify all the screening guidelines which are not met. (Check more than one if several guidelines could not be satisfied.)

Shell Buckling	
Anchor Bolts and Embedment	
Anchorage Connections	
Flexibility of Attached Piping	
Other	X

b. Describe all the reasons for the outlier (i.e., if all the listed outlier issues were resolved, then the signatories would consider this item of equipment to be verified for seismic adequacy).

Ring-type foundation is used to support the Condesate Storage Tank.

2. PROPOSED METHOD OF OUTLIER RESOLUTION (Optional)

a. Defined proposed method(s) for resolving outlier.

On-going detail analysis is being performed by the Civil group to determined adequacy and acceptability of the CST.

b. Provide information needed to implement proposed method(s) for resolving outlier (e.g., estimate of fundamental frequency).

Already initiated.

3. COMMENTS

CST has been replaced as part of PA 89-056.
Reference NUSCO Dwg 16103-29512 sheets 1 to 4 for tank outline and fondation details.

4. CERTIFICATION:

The information on this OSVS is, to the best of our knowledge and belief, correct and accurate, and resolution of the outlier issues listed on the previous page will satisfy the requirments for this item of equipment to be verified for seismic adequacy.

Approved by: C. M. Abu Bucker Date: 12.17.93

12-17-93

12.19.93