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 AUTH. NAME: CURTIS, N.W. AUTHOR AFFILIATION: Pennsylvania Power & Light Co.  
 RECIP. NAME: SCHWENCER, A. RECIPIENT AFFILIATION: Licensing Branch 2

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SUBJECT: Forwards project description for independent design review of safety-related piping sys. Limits & Scope of review & means of disseminating basic design info defined.

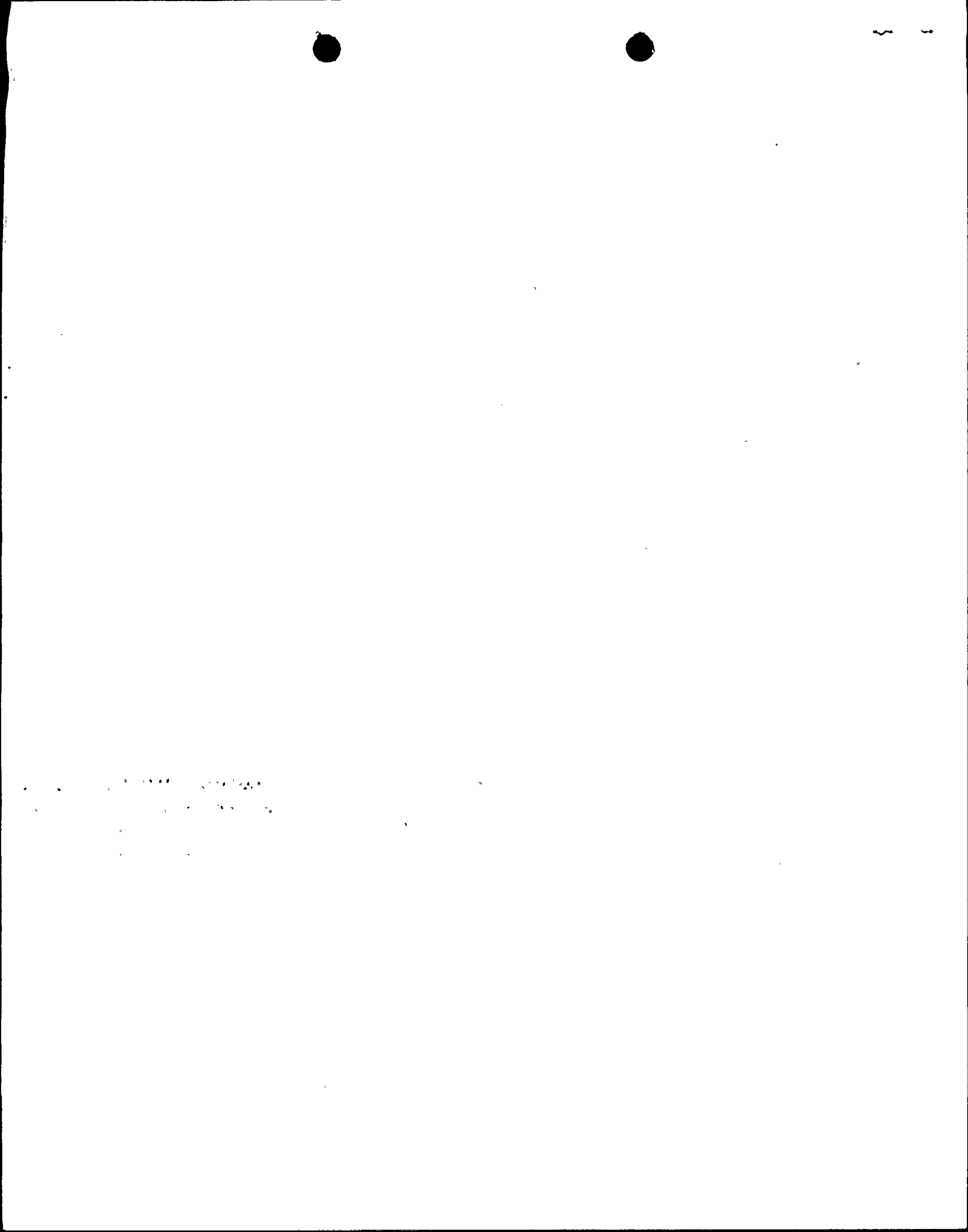
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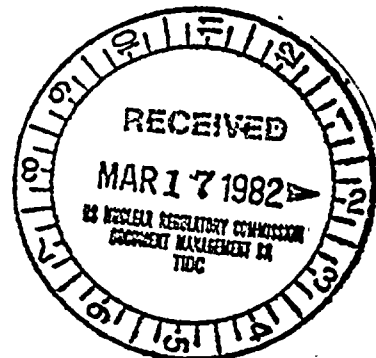
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Norman W. Curtis  
Vice President-Engineering & Construction-Nuclear  
215 / 770-5381

March 16, 1982

50-387

Mr. A. Schwencer, Chief  
Licensing Branch #2  
U.S. Nuclear Regulatory Commission  
Washington, D.C. 20555



SUSQUEHANNA STEAM ELECTRIC STATION  
INDEPENDENT PIPING DESIGN REVIEW  
ER 100450 FILE 905-56  
PLA-1039

Dear Mr. Schwencer:

This letter addresses the recently required independent design review of Susquehanna SES safety-related piping systems and outlines the steps PP&L has taken or will take in order to satisfy this requirement.

The piping selected for the independent design review is part of the Feedwater System located inside containment extending from the Reactor Pressure Vessel (RPV) nozzles to the containment penetration. This line was chosen on the following basis:

- It was constructed by Bechtel Power Corporation to the requirements of Section III of the ASME Boiler and Pressure Vessel Code.
- It is classified as Nuclear Class 1 piping.
- It was designed using all service loads associated with a Class 1 stress analysis including Seismic Category I loads, hydrodynamic loads due to SRV actuation and LOCA events and annulus pressurization loads.

In general the review is to encompass the structural and mechanical aspects of the subject piping. It does not include those areas of design which are verified during preoperational and startup testing such as electrical and instrumentation.

The special requirements by which the review must be performed have been identified in the attached project description. This document will be used to better define the limits and scope of the review and provides a means of disseminating basic design information necessary to the review.

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The independent review organization chosen by PP&L for this task is Teledyne Engineering Services. Two major criteria of the selection process were the reviewer's technical competency and the level of independence achievable. Teledyne has proven itself to be a highly regarded and reputable organization which is technically competent to conduct the review in terms of knowledge and experience in those areas of design under review.

In addressing the question of independence, previous involvement of Teledyne in work relating to Susquehanna SES was investigated. Two areas of involvement which were identified included design work performed on the control rod drive piping and a review of piping analysis procedures used by Bechtel Power Corporation on SSES. The former was done for a subcontractor (NISCO) of Bechtel Power Corporation. The latter was not directly related to the Feedwater line to be reviewed. In addition to the above mentioned items, at one time Mr. Carl Beaulieu of Teledyne was working for PP&L in a consultant capacity. Mr. Beaulieu is no longer associated with Teledyne. Also used were the consulting services of Mr. Roger Stewart of Teledyne for a short period of time. Teledyne is aware of this and have been advised not to use Mr. Stewart as part of the independent review team.

In consideration of the above stated items, PP&L is satisfied that Teledyne's review independence is not compromised.

Additional conditions which are to be satisfied by Teledyne in order to ensure independence of review are specified in Section XIII of the contractual agreement between Teledyne and PP&L, (see attached copy).

An initial meeting between PP&L and Teledyne was held in Allentown, Pa. on March 10, 1982. The purpose of the meeting was to discuss the general scope of the review and related topics. At that time Teledyne was given preliminary copies of the independent review technical requirements with all attachments and the proposed contractual agreement. A meeting between PP&L, Bechtel Power Corporation and Teledyne is tentatively scheduled for March 23, 1982 at Bechtel's San Francisco project office. The primary purpose of the meeting is to address design data required by Teledyne to conduct the review.

Very truly yours,



N. W. Curtis  
Vice President-Engineering & Construction-Nuclear

DPM/mks

Attachment

SUSQUEHANNA SES  
INDEPENDENT DESIGN REVIEW  
PROJECT DESCRIPTION

I. GENERAL

The United States Nuclear Regulatory Commission has requested that an independent design review be performed on Susquehanna SES, Unit 1. This in-depth design review is to be performed on that portion of a piping system which has been constructed by Bechtel Power Corporation in accordance with the requirements of the Susquehanna SES Final Safety Analysis Report (FSAR). The piping chosen for this review is that portion of the Feedwater System inside containment which begins at penetration X-9A at elevation 753'-7" and terminates at the Reactor Pressure Vessel (RPV) nozzles N4D, N4E and N4F, all at elevation 773'-10½". The extent of this review shall be limited to this line and shall not go beyond the containment boundary. All branch connections are considered small bore piping and are excluded from the review, however the effects of any branch connection on the Feedwater line shall be considered.

The review shall encompass all the applicable service levels which are associated with the Feedwater System. It shall include the application of all loads associated with a Class 1 analysis including hydrodynamic loads due to SRV actuation, loads due to a Loss of Coolant Accident (LOCA) event and Annulus Pressurization (AP) loads. The design and selection of those pipe supports/restraints contained within the boundaries of the Feedwater line shall be included in the review including those whose function is the mitigation of the above stated hydrodynamic events.

Areas of design to be assumed correct and not requiring review are the generation of dynamic response spectra for seismic and hydrodynamic events and the validation of verified computer programs used during the course of design.

The attached information provides the technical requirements by which the review is to be performed as well as general design information which will be needed during the course of review. The data supplied here is intended to clarify the boundaries of the line to be reviewed and provide basic design information used in its analysis. The design data included herein is not intended to represent all that is needed to conduct the design review. The balance of information will be identified and subsequently provided in a meeting between PP&L, the reviewer and Bechtel Power Corporation. The reviewer will be provided with the applicable revision of the various procedures and documents needed during the course of the review. In other review areas, such as the piping as-built isometrics, the latest information must be used.

Susquehanna SES, Unit 1 is scheduled to load fuel on July 1, 1982. It is required that an interim report be prepared detailing all findings and comments of the reviewers to date. This interim report is to be provided midway through the scheduled design review process and is intended to reflect review completeness and preliminary results.

In addition a final report documenting the independent design review findings is required to be provided by June 1, 1982. Both the interim and final report will be distributed concurrently to the NRC, Bechtel Power Corporation and PP&L.

If during the course of review, the independent reviewer considers a finding to be significant in terms of reportability under the provisions of 10 CFR 50.55 (e) or 10 CFR Part 21, that information will within 24 hours of such determination be reported in writing to PP&L and the NRC. PP&L will address the significance of the finding in terms of reportability and impact on plant safety. This action is intended to minimize the consequences of late exposure to these items in terms of timely resolution.

All work performed by the reviewer shall be in compliance with the Quality Assurance Program of the reviewing organization which will be subject to approval by PP&L.

All review reports, comments, observations and correspondence shall become Project QA Records of the reviewing organization. If requested by PP&L, copies of any or all of this information will be transmitted. Any design documents used in the review process shall be returned to PP&L upon project completion.

CD/nf

## II. TECHNICAL REQUIREMENTS FOR AN INDEPENDENT DESIGN REVIEW FOR NRC

### A. INTRODUCTION

An independent review is to be performed to determine that the design of the subject feedwater line properly incorporates the application of all applicable service level loads including the hydrodynamic loads due to the automatic depressurization system (ADS) in order to assure that the mechanical and structural aspects of the design are correct. The electrical and instrumentation aspects of the design do not require review because they are verified during preoperational and startup testing.

### B. SCOPE OF WORK

The independent reviewer will review the specified system in accordance with the following guidance:

#### 1. Adequacy of Design Process

- o The reviewer shall review the translation of design bases into design output documentation. This includes interdisciplinary review, external and internal interface control, distribution and use of design data among and within all interfacing design organizations.
- o The reviewer shall review nonconformance and corrective actions to assure that the design has been properly controlled.
- o The reviewer shall review audit findings, follow-up and resolution to assure the design has been properly controlled.
- o The reviewer shall review the control of field changes to assure the design was properly controlled.

#### 2. Adequacy of Translation of Design Output Into Assembled Hardware

- o The reviewer shall make a site inspection of the system to determine that the physical hardware is installed in accordance with and within tolerances of design drawings and that the system configuration conforms to current as-built documentation.

#### 3. Technical Adequacy of Design

- o The reviewer is to review the classification of the piping system including its components and supports to determine they have been properly classified per 10CFR50.
- o The reviewer shall review the adequacy of the technical design including computer analysis (input/output data), design and selection of pipe support, design of auxiliary steel, welded attachments, and transmittal of loading back to structural members.



### III. APPLICABLE CODES AND STANDARDS

The principle document which dictates design criteria is the Susquehanna SES Final Safety Analysis Report - FSAR. The following is pertinent information relating to the requirements of the FSAR.

The Feedwater System was constructed in accordance with the 1971 edition of the ASME Boiler and Pressure Vessel Code, Section III, up to and including the Winter 1972 addenda. Pipe supports were constructed to ANSI B31.1-1973 edition.

In performing the design review the independent reviewer should familiarize himself with the following Bechtel project criteria and specifications.

- SSES Final Safety Analysis Report - FSAR.
- Bechtel Spec. 8856-M-175, Design Specification for Nuclear Piping for the Main Steam and Feedwater Systems.
- Bechtel Spec. 8856-M-406, Design Guidelines for Design and Documentation of Detailed Piping Stress Analysis.
- Bechtel Spec. 8856-M-199, Piping Class Sheets, Summary Sheets and Standards.
- Bechtel Spec. 8856-M-213, Installation, Inspection, Documentation of Pipe Support Hangers and Restraints.
- Bechtel Spec. 8856-M-243, Design Criteria for Design and Documentation of Pipe Supports, Hangers and Restraints for Pipe 2½ Inches and Larger.
- Bechtel Spec. 8856-M-391, Piping As-Built Program.
- Bechtel's Engineering Procedure Manual - EPM-8856.

In addition to those stated above the reviewer should familiarize himself with those Bechtel procedures and instructions which are appropriate to the review.

CD/nf

IV. LIST OF ATTACHMENTS:

Bechtel Specifications -

8856-M-175, Rev. 4 (Attachment #1)  
8856-M-199, Rev. 34 (Attachment #2)  
8856-M-213, Rev. 9 (Attachment #3)  
8856-M-243, Rev. 0 (Attachment #4)  
8856-M-391, Rev. 1 (Attachment #5)  
8856-M-406, Rev. 0 (Attachment #6)

Bechtel Engineering Procedure Manual -

EPM-8856, Sections 4.0 and 5.0, Rev. 7 (Attachment #7)

Design Loading Combinations for ASME Code Class 1, 2 and 3  
Components -

FSAR Table 3.9-17, Rev. 17 (Attachment #8)

Design Criteria for ASME Code Class I Piping -

FSAR Table 3.9-18, Rev. 17 (Attachment #9)

System Flow Diagram - P&ID -

Dwg. No. M-141, Rev. 13 (Attachment #10)

System Piping Drawings -

Dwg. No. M-26-5, Rev. 19 (Attachment #11)  
Dwg. No. M-26-11, Rev. 29 (Attachment #12)

System Fabrication Isometrics -

Dwg. No. DLA-101-1, Rev. 6 (Attachment #13)  
Dwg. No. DLA-102-1, Rev. 5 (Attachment #14)

(MG/DF-4)

XIII. SPECIAL CONDITIONS

- A. The work performed by Consultant pursuant to this Agreement is intended to be an independent review of the Unit 1 feedwater system as requested by the Nuclear Regulatory Commission. To insure the independent nature of Consultant's analysis, Company shall not review any draft or final reports before they are released. Consultant may, however, during the course of its work, contact the Company, Bechtel Power Corporation (Bechtel) or General Electric Company (GE) for documents, other information or interpretations thereof. Furthermore, no individual who meets any of the following criteria shall be used to perform any of the services required of Consultant by this Agreement:
1. any individual who has previously performed design activities for the Susquehanna Steam Electric Station on behalf of the Company, Bechtel or any third party which are in any way associated with the area of review.
  2. any individual previously or currently employed by Company or Bechtel;
  3. any individual who owns or controls Company stock the current value of which exceeds 5% of their gross family annual income;
  4. any individual currently employed by Company or Bechtel; or
  5. any individual that has a member of his or her immediate family or present household employed by Company or Bechtel.