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February 5, 1996

ComEd

U. S. Nuclear Regulatory Commission
Attn: Document Control Desk
Washington, D.C. 20555

Subject: LaSalle County Nuclear Power Station Units 1 and 2
ComEd Response to NRC Staff Request for Additional Information (RAI) Regarding the Main Steamline Isolation Valve (MSIV) Leakage Control System (LCS) Alternate Leakage Treatment (ALT) Path
NRC Docket Nos. 50-373 and 50-374

References: (a) G. Benes letter to U. S. NRC, dated August 28, 1995, LaSalle Submittal Regarding Elimination of MSIV LCS.

(b) R. Latta letter to D. Farrar, dated November 16, 1995, NRC Staff RAI.

(c) G. Benes letter to U. S. NRC, dated December 15, 1995, Response to November 15, 1995 NRC Staff RAI.

The purpose of this letter is to respond to the NRC staff's RAI regarding the Reference (a) and (c) submittals involving LaSalle Station's MSIV LCS ALT Path. Reference (a) provided LaSalle Station's proposal for revising the Technical Specification requirements regarding the MSIV LCS ALT Path. In addition, Reference (a) proposed an exemption request from the requirements of 10 CFR 50, Appendix J. The NRC staff requested additional information in Reference (b) to support the review of LaSalle's submittal. ComEd responded to the NRC Staff's RAI (Reference (b)) in Reference (c). Subsequent to Reference (c), the NRC staff has requested additional clarification. LaSalle's responses to provide clarification are provided as an attachment to this letter.

If there are any further questions, please contact this office.

Sincerely,

Gary G. Benes
Nuclear Licensing Administrator

Attachments: A - Responses to NRC Comments - Main Steamline Isolation Valve (MSIV) Leakage Control System (LCS) Alternate Leakage Treatment (ALT) Path

cc: H. J. Miller, Regional Administrator - RIII
M. D. Lynch, Project Manager - NRR
P. G. Brochman, Senior Resident Inspector - LaSalle
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ATTACHMENT

Responses to NRC Comments - Main Steamline Isolation Valve (MSIV) Leakage Control System (LCS) Alternate Leakage Treatment (ALT) Path

RESPONSES TO NRC COMMENTS
MAIN STEAMLINE ISOLATION VALVE (MSIV)
LEAKAGE CONTROL SYSTEM (LCS)
ALTERNATE LEAKAGE TREATMENT (ALT) PATH

Note: In the following responses, the phrase "prior to Unit start-up" indicates that the work identified on each unit will be completed prior to start-up from that unit's outage in which the MSIV-LCS was eliminated from service.

NRC Comment 1

Confirm that all references to the BWR Owners Groups (BWROG) earthquake experience database will be deleted from the pending amendment request to remove the Main Steamline Isolation Valve (MSIV) Leakage Control System (LCS).

Response to Comment 1

This is confirmed. The BWR Owners Group (BWROG) earthquake experience data base is not utilized to qualify piping and supports in either the primary or secondary Alternate Leakage Treatment paths. The BWR Owners Group earthquake experience data base is also not utilized to qualify the structural ruggedness of the main condenser or Turbine Building roof structure.

NRC Comment 2

Provide a clear description of the MSIV alternate leakage treatment (ALT) path and indicate which portions you take credit for in your radiological dose model. Provide assurance of the reliability of the entire ALT path, including all of its boundary valves. Additionally, state whether all the motor-operated valves which are a part of the ALT path will be included in the plant IST program.

Response to Comment 2

A. Description of ALT Path and Radiological Dose Model

As shown in "Isometric View of Leakage Control Path and Boundaries" and the "Alternate Leakage Treatment Path Functional Diagram", Attachments 2-1 and 2-2 of this submittal, leakage through the outboard MSIVs [1(2)B21-F028A,B,C,D] is contained by the closed isolation valves identified on the "Alternate Leakage Treatment Path Boundary and Control Valves" table, Attachment 2-3.

Leakage from the outboard MSIVs travels down the four 26" main steam lines to either the upstream drain line (Primary ALT Path A) or to the downstream drain line (Primary ALT Path B) into the main condenser and out of the LP Turbine seals.

Each of the leakage paths consists of the following:

1. Four main steam lines from their respective MSIV to their respective drain lines.

2. A 2" drain line connected to each steam line.

3. A 12" drain header, receiving leakage from each of the four 2" drain lines.

4. A 3" line is routed from the 12" drain header and branches into the 1" normal operating orifice drain line and the 3" start-up drain line as follows:

   a) An operating 1" drain line with an 0.875" orifice connected to the condenser at elevation 696'-7" (condenser bottom is 690'-7") and a normally open motor-operated globe valve. [1(2)B21-F071, 1(2)B21-F073]

   b) A start-up 3" drain line (no orifice) connected to the condenser at elevation 696'-7" and a normally closed motor-operated globe valve [1(2)B21-F070, 1(2)B21-F072].

During normal plant operation, the operating drains [1(2)B21-F071 and 1(2)B21-F073] are open and the start-up drains are closed. For the ALT Path mode of operation, the two operating drain valves remain open and either of the start-up drains [1(2)B21-F070 or 1(2)B21-F072] is opened. This assures an initial flow path, although restricted, until a start-up drain [1(2)B21-F070 or 1(2)B21-F072] is open. No credit is taken in the radiological dose model for the two operating drain lines being open.

The radiological dose model took credit for the path from the Reactor Vessel, through the main steam 26" lines, through either of the two drain lines downstream of the outboard MSIV (both paths were analyzed), to the main condenser with leakage from the Turbine Seals. The radiological model showed the difference between the two primary ALT paths to be insignificant.

B. Reliability of the ALT Path Including Boundary Valves

The ALT Path to the main condenser has high reliability because LaSalle has provided redundant, seismically qualified ALT paths to the main condenser. With two independent seismically qualified ALT paths, mechanical failure of a single valve in one ALT drain path does not prevent routing MSIV leakage through the other full size path to the condenser. Even in the remote chance of failure of all three power sources, two offsite power sources and the Safety Related Diesel Generator, a restricted flow path through the operating drain orifices will exist to the main condenser. LaSalle start-up drain stop valves [1(2)B21-F070 and 1(2)B21-F072] also have local reach rod operators outside of Heater Bay shield walls.

The highly reliable boundary isolation valves fall into four categories; 1) Remote manual motor operated valves powered from ESS Division 2 busses, 2) Local manual valves that remain in their normal operating (closed) position in the ALT path mode of leakage treatment, 3) EHC operated valves, and 4) Dual acting, quick closing MSIVs.

1. All seven (per unit) of these valves and motor operators [1(2)B21-F418A/B, 1(2)B21-F070/72, 1(2)B21-F071/073 and 1(2)B21-F020] were originally seismically qualified. They were reclassified as non-safety related; however, they are powered from their original power sources, ESS Division 2 busses and have a reliable source of power.

2. Local manual valves used as boundary valves are seismically qualified and remain in their normal operating positions and require no operator action.

3. The Main Steam High Pressure Turbine Main Stop Valves [1(2)B21-MSV-1/2/3/4] are operated utilizing EHC pressure and fail closed upon loss of electrical power to EHC, EHC pressure, or upon Turbine Trip. The Main Steam Bypass Valves [1(2)B21-MSBPV-1/2/3/4/5] are also operated utilizing EHC pressure and fail closed upon loss of electrical power to EHC or loss of EHC pressure. These valves were evaluated and determined to be seismically rugged.

4. The dual acting, quick closing MSIVs are safety-related valves and are seismically qualified.

The piping and piping supports are highly reliable because the piping and piping supports within the ALT boundary will be seismically qualified prior to start-up from that unit's outage in which the MSIV-LCS was eliminated from service. The majority (piping shown on Attachment 2-2 except the small bore instrument sensing lines and subsystem 2MS71) of the piping and piping supports within the boundary was originally seismically analyzed. The remaining instrument piping and subsystem 2MS71, pipe stands, instrument racks and supports being subsequently analyzed and required modifications being made prior to start-up from that unit's outage in which the MSIV-LCS was eliminated from service. Further details of the piping and piping support capability is provided in response to NRC Comments 3, 4 and 6.

C. Motor Operated Valve Inclusion in IST Program:

Motor operated valves utilized as either boundary valves or ALT path control valves will be included in the plant IST program. They will be stroke tested once per fuel cycle.

NRC Comment 3

Provide an independent summary of the seismic analysis of subsystems 2MS-31B and 2MS5, which you have stated in your letter dated December 15, 1995, to have been seismically analyzed. Summary should include, as a minimum, the following:

A. The basis for selecting these two subsystems as being the representative lines.

B. A clear functional and physical description of these two lines including their routing, materials of construction, diameters and thickness.

C. Their analysis methodology and design criteria.

D. The seismic input motions and design loadings used in their seismic analysis.

E. A description of the of the computer codes used in the seismic analysis.

F. A general summary of the analysis which leads you to conclude that the piping system is seismically adequate, including a discussion of the pipe stresses and support loads, as well as a comparison with the corresponding allowables and capacities.

Response to Comment 3

Following is a summary of the two subsystems which we submitted with our December 15, 1995 letter. (Please note that the identification number in NRC comments for one of the piping subsystems should be corrected to read 2MS-56 and not 2MS-5.)

A. The two subsystems which were submitted, 2MS-31B and 2MS-56, were selected arbitrarily from the total population of affected subsystems that were analyzed in accordance with the UFSAR. Subsystem 2MS-71 will have additional seismic qualification and/or modifications performed so that the design of the 2MS-71 piping and supports will be in accordance with the UFSAR prior to start-up from that unit's outage in which the MSIV-LCS was eliminated from service. The seven (7) Pressure Sensing Lines per unit are discussed in the response to NRC Comment 6.

B. Subsystem 2MS-31B is the Warm-up By-pass Line to the Main Steam lines downstream of MSIVs (pressure boundary for ALT path), and Subsystem 2MS-56 is the Upstream Drain Header from the Main Steam lines to the Condenser (ALT flow path to condenser). Material and piping physical information pertinent to these subsystems are provided in the following table:

	2MS-31B	2MS-56
1. Pipe size	Combination of pipe sizes ranging in sizes 3/4" - 12"	Combination of pipe sizes 1" - 12"
2. Pipe thickness	Schedule 80 piping, thickness ranging from 0.154" for the 3/4" piping & 0.687" for the 12" piping	Schedule 80 piping, thickness ranging from 0.179" for the 1" piping & 0.687" for the 12" piping
3. Max. Oper. Pres.	1025 psi	1025 psi
4. Max. Oper. Temp.	550 °F	550 °F
5. Design Pressure	1250 psi	1250 psi
6. ASME Pipe Class	Class D, except Class A piping between Penetration M-22 and Valve 2B21-F019	Class D
7. Seismic Class	Seismically analyzed	Seismically analyzed

C. The seismic analysis methodology is in accordance with the LaSalle County Station licensing commitments as delineated in the appropriate subsections of LaSalle UFSAR, Section 3.7.3. The following table delineates the pertinent data:

	2MS-31B	2MS-56
Damping Value	OBE 1/2%; SRV 1%; Faulted 1 %*	OBE and SSE 1/2%
Modal Combination Method	Absolute Double Sum	Absolute Double Sum
Cut-Off Frequency	Above 33 Hz	Above 33 Hz
Seismic Direction Combination	SRSS	SRSS

* Faulted includes SSE, SRV, and Building Filtered Dynamic Loads (BFDL).

Load combinations and Acceptance Criteria are as delineated in Table 3.9-16 "Load Combinations and Acceptance Criteria" of LaSalle UFSAR. The following table briefly delineates the pertinent data:

I. **Piping Load Combinations and Acceptance Criteria**

A. Subsystem 2MS-31B

Load Case	Acceptance Criteria
• Weight + Pressure + $(OBE^2+SRV^2)^{1/2}$	Upset/Service Level B
• Weight + Pressure + Faulted	Faulted/Service Level D

B. Subsystem 2MS-56

Load Case	Acceptance Criteria
• Weight + Pressure + OBE	Upset/Service Level B
• Weight + Pressure + SSE	Faulted/Service Level D

II. **Support Load Combinations & Acceptance Criteria**

A. Subsystem 2MS-31B

Load Case	Acceptance Criteria
• Weight + Thermal + $(OBE^2+SRV^2)^{1/2}$	Upset/Service Level B
• Weight + Thermal + Faulted	Faulted/Service Level D

B. Subsystem 2MS-56

Load Case	Acceptance Criteria
• Weight + Thermal + OBE	Upset/Service Level B
• Weight + Thermal + SSE	Faulted/Service Level D

The pipe stress allowable limits are in accordance with the Section III of the ASME, B&PV code, 1974 edition. Load capacities for pipe supports are in accordance with vendor provided allowables for standard components and the AISC Manual of Steel Construction for Auxiliary Steel design.

D. The floor response spectra at LaSalle County Station are generated per Section 3.7.2.5 of LaSalle UFSAR. The floor response spectra used for analyzing 2MS-31B and 2MS-56 are:

1. For Subsystem 2MS-31B

a) The enveloped OBE Spectra consists of:

- Auxiliary Building Elevation 731'-0" Wall Spectra
- Auxiliary Building Elevation 731'-0" Slab Spectra
- Auxiliary Building Elevation 749'-0" Wall Spectra
- Auxiliary Building Elevation 749'-0" Slab Spectra
- Reactor Building Elevation 740'-0" Wall Spectra
- Reactor Building Elevation 740'-0" Slab Spectra
- Reactor Building Elevation 761'-0" Wall Spectra
- Containment Wall Elevation 740'-0" Wall Spectra

b) The enveloped SRV Symmetric and Asymmetric Spectra consists of:

- Reactor Building Elevation 740'-0" Wall Spectra
- Reactor Building Elevation 740'-0" Slab Spectra

- Reactor Building Elevation 761'-0" Wall Spectra
- Containment Wall Elevation 740'-0" Wall Spectra

c) The enveloped Faulted (SSE + SRV + BFDL) Spectra consists of:

- Auxiliary Building Elevation 731'-0" Wall Spectra
- Auxiliary Building Elevation 731'-0" Slab Spectra
- Auxiliary Building Elevation 749'-0" Wall Spectra
- Auxiliary Building Elevation 749'-0" Slab Spectra
- Reactor Building Elevation 740'-0" Wall Spectra
- Reactor Building Elevation 740'-0" Slab Spectra
- Reactor Building Elevation 761'-0" Wall Spectra
- Containment Wall Elevation 740'-0" Wall Spectra

2. <u>For Subsystem 2MS-56</u>

The enveloped OBE/SSE Spectra consist of:

- Auxiliary Building Elevation 687'-0" Wall Spectra
- Auxiliary Building Elevation 692'-6" Slab Spectra
- Auxiliary Building Elevation 710'-6" Wall Spectra
- Auxiliary Building Elevation 710'-6" Slab Spectra

E. The seismic analysis was performed using Sargent & Lundy's Piping Analysis Program (PIPSYS). PIPSYS is one of the computer codes listed in LaSalle UFSAR, Appendix F.

F. The highest seismic stresses in Subsystems 2MS-31B and 2MS-56 and corresponding stress allowable limits are summarized below:

Subsystem	Highest Upset Condition Stress Level (psi)	Upset Condition Allowable (psi)	Highest Faulted Condition Stress Level (psi)	Faulted Condition Allowable (psi)
2MS-31B Class 1 Portion	7820	25313	9290	50625
2MS-31B Class D Portion	12800	17100	14200	34200
2MS-56 Class D Portion	14830	17100	22408	34200

Results for a sample of the supports for these two subsystems are provided as part of the response to Comment 4. The support designs meet the UFSAR limits.

Since the piping components and supports are within UFSAR limits, ComEd has concluded that the piping subsystems are seismically acceptable.

NRC Comment 4

Provide a summary in tabular form for the evaluation of all piping supports included in the MSIV ALT path, including the calculated safety margins for the design loads.

Response to Comment 4

As discussed in the response to Comment 3, the piping systems which constitute the MSIV primary ALT path, with the exception of the sensing line subsystems, were seismically qualified in the original LaSalle County Station design. For Subsystem 2MS71, additional seismic qualification and/or modifications will be performed so that the design of the 2MS71 piping and supports will be consistent with the other drain lines to be used in the MSIV alternate leakage treatment system. The tables in Attachments 4-1, 4-2 and 4-3 provide representative sample of piping supports associated with the MSIV primary and secondary ALT path. Supports associated with the pressure sensing lines are addressed in the response to NRC Comment 6.

Attachment 4-1 "MSIV LCS Support Summary" lists the piping subsystems, quantity of supports selected for this sampling, and the number of supports for each of these subsystems that will provide seismic restraint.

Attachments 4-2 "Load Table - Unit 1" and 4-3 "Load Table - Unit 2" are the detailed listing of the selected supports. Each of these tables have four major sections, as follows:

A. Support References:

Lists the pipe support number and a sequential indexing number to facilitate future references to this data.

B. Piping References:

Lists the piping subsystem number and its associated piping analysis report number for each support. This information is provided for cross referencing purposes only.

C. Structural Components Evaluation:

Lists the limiting structural component for each support and its associated design margin. Included in the structural components are auxiliary steel (rolled steel section which is part of the pipe support), welds, or connection to the main building structure (including anchor bolts). The calculation number is also provided for information.

D. Mechanical Components Evaluation:

Lists the limiting standard support component (i.e. strut, rod, clevis...) and its associated design margin. The subsystem calculation number is also provided for information.

Supports that provide seismic restraint were arbitrarily selected for this sample from a listing of support drawings associated with each piping subsystem to obtain at least 5% sample population. One support was selected from each of these subsystems and approximately one additional support for each additional 20 supports. The design margin for this evaluation is the Level D (SSE) allowable stress/capacity divided by the actual Level D stress/load.

As the sample shows, the supports on the affected piping meet UFSAR requirements. This is consistent with the remaining population of supports (which are available for further review, if required).

NRC Comment 5

Provide an evaluation demonstrating that the structural components of the condenser are seismically adequate. The potentially significant adverse effects due to components of the condenser impacting on the adjacent foundation piers should also be addressed and resolved.

Response to Comment 5

An evaluation of the condenser structural components and the condenser anchorage has concluded that the condenser structure and anchorage will be adequate for all SSE forces. The anchorage will be modified and longitudinal supports will be added near the centroid of the condenser to prevent the condenser from impacting on the adjacent turbine piers. The evaluation is summarized below.

Condenser Structure:

The Turbine condenser is a single shell, single pass, deaerating type condenser with a divided water box constructed in accordance with the Heat Exchange Institute standards.

The hot well contains horizontal and vertical baffles. The circulating water flow is 617,000 gpm. The total effective surface area of the 40,462 tubes is 950,000 square feet. The overall dimensions of the condenser is 70' high, 35' wide, and 90' long (tube length). See Attachment 5-1 for an isometric view.

The normal operating pressure in the steam compartment is between approximately 1" HgA and 5" HgA (approximately 0.5 psia and 2.5 psia). The inlet and outlet water boxes, condenser tubes, and wet well at the base of the condenser are full of water during normal operation. The 7/8" thick shell of the condenser is stiffened by the tube support plates interconnected by struts that connect the support plates to the side walls and bottom. These support plates are spaced approximately 40" along the length of the tubes.

Materials used for the major structural elements of the condenser are as follows:

• Shell	Integrally welded composite construction; 7/8 in. thick ASTM A285, Grade C material, flange quality copper bearing carbon steel plate.
• Water Boxes	1 in. thick ASTM A285, Grade C, flange quality copper bearing carbon steel. 30 psi test pressure.
• Tube Sheets	1-1/8 in. A240 type 304 Stainless steel.
• Tube Support Plates	3/4 in. thick ASTM A285, Grade C, flange quality copper bearing carbon steel.

The condenser is supported on eight concrete piers arranged in a symmetrical fashion about the condenser's longitudinal and transverse center lines. The four interior condenser piers are 6' x 8'-10" and integral with the substantially larger turbine pedestal piers. The four corner piers are the same size and are also integral with the larger adjacent turbine pedestal piers as depicted in Attachment 5-2. Each support uses six 1-5/8 in. diameter A36 bolts to anchor the condenser to the pier. One of the interior supports acts as the stationary anchor point while the other seven are sliding supports used to accommodate the condenser's thermal movement through the use of oversized bolt holes in the base plates.

A. Condenser Structural Components

The condenser is isolated from the turbine through the use of rubber expansion joints. The condenser was hydro-tested by filling the shell with water to a level 2 feet above the turbine isolation expansion joints. The hydrostatic test loading condition applies twice the operating weight to the condenser base and support pier than is present during normal operating conditions. The reactions on the condenser support pedestals from this hydro test exceed the reactions from operating loads plus vertical seismic and overturning by 70%. This load test demonstrates the condenser's ability to adequately resist the vertical affects of SSE.

The seismic loads in the N-S direction are resisted by the connections at the base through the axial stiffness of the longitudinal shell plates. The shell is 7/8" thick and is laterally braced every 40" by struts used to support the tube support sheets. The shell side walls would experience a maximum shear stress of less than 2 ksi from the N-S force. This relatively small stress demonstrates the minor effect SSE has in the N-S direction.

The effect of E-W seismic loads on the local load carrying capacity of the shell is also small in comparison with the hydrostatic test load. The water pressure at the top of the steam compartment walls during hydro is 11 psi and increases to 28 psi at the base of the condenser. The equivalent lateral seismic load that the tubes would apply on the side walls is less than 4 psi. Similarly, the lateral pressure from water in the hot well will be less than 2 psi. Comparison of these equivalent design pressures demonstrates that there is substantial design margin relative to resisting the E-W seismic loads from the condenser tubes and hot well.

The loads associated with the heaters and the water boxes are not distributed loads. They act more like concentrated loads and are carried to the E-W support points through girder action of the overall condenser. A simple representation of the stresses induced by E-W seismic loads would be to treat the condenser itself as a 35' deep girder, with both ends cantilevering past the interior supports. The resulting moment would cause flexural stresses in the side plates, which act as the flanges of the beam, of less than 1.5 ksi. Finally, the stiffness required to resist the E-W reaction at the interior support points is provided by the interior tube support plates and their support brackets. These large steel plates and internal support components have been assessed and found to be within SSE allowables with respect to the applied reaction.

In summary, the condenser shell and internal components are seismically rugged and will adequately transfer SSE forces to the supporting structure.

B. Condenser Anchorage

The operating weight of the condenser is 6,206 kips. The seismic loads in each of the 3 principle directions are :

N-S 1,862 kips
E-W 2,172 kips
VERT. 1,179 kips

As discussed in our response to Comment 8, the Turbine Building shares the north-south wall with the Auxiliary Building and the Diesel Generator room (both category I structures) and was included in the seismic model. The structural elements i.e., the shear walls and slab diaphragms included in the seismic model have been designed for the appropriate seismic forces (shears and moments) obtained from the seismic analysis.

Under normal operating conditions, six of the condenser supports experience a net downward reaction while the other two supports experience minor uplift (9 kips). The anchor bolts are adequate to resist the tensile effect of operating loads, vertical seismic loads, and overturning from the N-S seismic load using the SRSS method of combination for seismic loads. The most highly stressed bolt group in tension has a margin of 2.0. Overturning from the E-W seismic loads will be eliminated by restraining the condenser in the E-W direction as described below.

Seismic loads in the E-W direction will be resisted by filling the gap between the condenser wall and the turbine pedestals for the four interior supports in a manner that will allow thermal growth as well as provide lateral seismic restraint for the condenser, similar to guided pipe supports. The gaps will be filled with structural steel members that will be attached to the condenser as conceptually shown in Attachment 5-3.

To resist the N-S seismic shear loads, guide supports will be added at the base of the condenser. See Attachment 5-4 for the conceptual detail. These restraints will be designed for a 2400 kip seismic load in order to provide additional margin over the 1862 kip seismic force. In addition to these restraints, the existing anchor bolts possess a 1625 kip shear capacity after deducting the affect of tension.

The following is a summary of the applied loads to the condenser and anchorage capacities:

E-W seismic shear load at base	0 kips
N-S seismic shear load at base	1862 kips
N-S restraint seismic load capacity at base	2400 kips
Bolt shear capacity after tension	1625 kips

No credit has been taken for friction.

C. Effects on Turbine Building Structures

The turbine pedestal piers which are nominally 12' by 12' in section are more than adequate to resist the condenser seismic loads. The centroid of the E-W seismic reaction on the pedestal piers is at el. 712'-6" (refer to Attachment 5-3). The piers on the West side of the condenser are laterally supported to the west by a 3'-6" thick slab at el. 710'-6" . The piers on the east side are laterally supported to the east at el.

704'-6" by a 5'-0" thick slab. The close proximity of these substantial slabs to the E-W supports limits the amount of bending introduced into the piers. The turbine pedestal piers are capable of resisting the moments and shears generated by the condenser seismic loads by a margin of at least 2.5 in bending and shear.

The slabs also have substantial axial capacity because the load is applied through compression only. These slabs are, in turn, supported by substantial structural elements (shear walls) which are a part of the overall lateral load resisting system.

The condenser piers were evaluated for the effect of tension from the anchors and shear. This evaluation indicated that the design margin for tension is about 3.0 and shear is greater than 2.0

In summary, the condenser supports and foundation(s) will have adequate design margins.

NRC Comment 6

Since the GIP methodology contained in the USI A-46 program is not applicable to piping, provide a separate seismic analysis summary, similar to Item 3 above, for the pressure sensing line which was not seismically analyzed.

Response to Comment 6

There are seven (7) pressure sensing lines in the pressure boundary of the Alternate Leakage Treatment Path for each unit. These lines will be seismically analyzed consistent with the UFSAR and supports modified, if required, prior to start-up from that unit's outage in which the MSIV-LCS was eliminated from service. The following is a brief summary for each of these lines similar to the summary provided in the response to Comment 3 above:

A. Unit 1

Four of the pressure sensing lines are connected to the Main Steam header (1MS-09) near the Main Steam High Pressure Turbine Main Stop valves, routed through the Heater Bay Area (HBA), through a 4'-8" foot thick solid block wall, to the pressure sensors. The block wall is being modified for seismic loads to support the ALT path pressure boundary integrity. The block wall openings through which these sensing lines penetrate are filled with high density silicone as fire and radiation barrier. For analysis purposes the block wall penetration has been considered as an anchor, therefore two piping models have been generated for each one of the following lines, in the HBA and outside the HBA:

1. Line 1MS93AA-1"
   Piping Analysis: 1MS-M4 in the HBA and 1MS-M4O outside the HBA

2. Line 1MS93AB-1"
   Piping Analysis: 1MS-M5 in the HBA and 1MS-M5O outside the HBA

3. Line 1MS93AC-1"
   Piping Analysis: 1MS-M6 in the HBA and 1MS-M6O outside the HBA

4. Line 1MS93AD-1"
   Piping Analysis: 1MS-M7 in the HBA and 1MS-M7O outside the HBA

The following information is applicable to the above four lines:

- Pipe size: 1" and 1/2" Schedule 80
- Pipe thickness : 0.179", 0.147" (respectively)
- Design Pressure: 1,250 psi
- Max. Oper. Pres: 1,025 psi
- Max. Oper. Temp.: Ambient temperature 140°F in the Heater Bay Area and Ambient Temperature 70°F outside the Heater Bay Area. Thermal displacements at the header piping interface will be accounted for in the piping analysis.
- ASME Pipe Class: Class D
- Seismic Class: Seismically analyzed, utilizing the envelope of Turbine Building wall and slab response spectra curves at Elevations 735'-0" and 768'-0". Header displacements due to seismic loads have been considered in the piping analysis.

Two of the pressure sensing Lines, 1MS68AA/AB-1" and 1MS68BA/BB-1", are composed of 1" and 1/2" piping and 3/8" stainless steel tubing. They are connected to Main Steam Line 1MS01BC-26". The last pressure sensing Line, 1MS69AA-3/4" / 1MS69AB/AC/AD-1/2", is composed of 3/4", 1/2" piping and 3/8", 1/4" stainless steel tubing. It is connected to the Main Steam Pressure Equalizing Header 1MS32A-36".

The following information is applicable to the above three lines:

- Pipe size: 1", 3/4", 1/2" Schedule 80
- Pipe thickness : 0.179", 0.154", 0.147" (respectively)
- Tubing size: 3/8", 1/4"
- Tubing Wall Thickness: 0.065"
- Design Pressure: 1,250 psi
- Max. Oper. Pres: 1,025 psi
- Max. Oper. Temp.: Ambient temperature 140°F in the Heater Bay Area and Ambient temperature of 70°F outside the Heater Bay Area. Thermal displacements at the header piping interface will be accounted for in the piping analysis
- ASME Pipe Class: Class D
- Seismic Class: Seismically analyzed, utilizing the envelope of Turbine Building wall and slab response spectra curves at Elevations 710'-6" and 735'-0". Header displacements due to seismic loads have been considered in the piping analysis

Piping analyses in accordance with the UFSAR requirements have been completed. The seismic analysis methodology is consistent with the UFSAR requirements. The piping analysis results for the pressure sensing lines for Unit 1 are provided in Attachment 6-1. Also provided in Attachment 6-1 is a sample of three existing supports which have been seismically qualified for the newly analyzed loads.

B. Unit 2

Similar pressure sensing lines will be seismically analyzed in accordance with the UFSAR requirements using the methodology presented in response to Comment 3 and pipe supports modified, if required, prior to start-up from that unit's outage in which the MSIV-LCS was eliminated from service.

Since the pressure sensing lines and supports will be within UFSAR limits, ComEd has concluded that the pressure sensing lines will be seismically acceptable prior to start-up from that unit's outage in which the MSIV-LCS was eliminated from service.

NRC Comment 7

Confirm that all hardware modifications and actions necessary for resolving these issues will be completed prior to the restart of the plant from the current outage.

Response to Comment 7

All required modifications (i.e., mechanical component supports, structural pipe supports, blockwall reinforcements, and condenser supports) and actions necessary for resolving these issues will be completed prior to start-up from that unit's outage in which the MSIV-LCS was eliminated from service.

ADDITIONAL NRC COMMENT

NRC Comment 8

Provide an evaluation demonstrating that the Turbine Building roof structure remains elastic under SSE conditions.

Response to Comment 8

The 1970 UBC seismic zone 1 (z=0.25) was used in the original seismic evaluation of the Turbine Building roof structure. These seismic loads are less than the LaSalle SSE. However, the original design was governed by tornado wind loads which, as demonstrated below, impose lateral loads that are larger than the SSE in both the north/south and east/west directions. The following provides a detailed description of the structural framing system of the Turbine Building, seismic modeling, and qualification of roof structure for seismic loads.

A. Framing System:

The Turbine Building is an integral part of the plant seismic model for LaSalle. The Turbine Building is a 678'-0" long, 122'-0" wide and 75'-6" high (above main floor) structure (Units 1 and 2 combined) located between the Auxiliary/Diesel Generator Buildings (both Category I structures) to the East and the heater bay and radwaste structure to the West. The Turbine Building roof is in continuation of the Auxiliary Building roof (Elevation 843'-6"). This roofing system is ultimately connected to the Reactor Building refueling floor which is a very stiff concrete slab diaphragm. (See Attachments 8-1 and 8-2.)

The rigidity of the structural framing system above the Turbine Building Main floor (El. 768'-0") is also evidenced by comparing the corresponding horizontal response spectra at the Main Floor to the spectra at the roof level as shown on pages C-91, C-92, C-110D and C-110E of Design Criteria DC-SE-02-LS, Revision 0. No significant amplification in the seismic response is observed.

The Turbine Building roof has 74 inch deep plate girders at every column line, spanning

122'-0" in the E-W direction. Nine horizontal roof trusses spanning 122'-0" in the east/west direction have been installed to transfer north/south horizontal loads to Column Rows 'R' and 'W'. Additionally, a horizontal truss system has been installed along the entire periphery of the roof structure to transfer the north/south and east/west horizontal loads. Along Column Line 'R', which is a common wall for the Turbine Building and the Auxiliary Building, there is a concrete shear wall from the basemat to the roof level. The vertical bracing system supporting the roof horizontal bracing system is as follows. (See Attachment 8-1.)

1. North-South Bracing

Along Column Line R:	Between Columns 1 through 3 Between Columns 26 through 28
Along Column Line W:	Between Columns 1 through 3 Between Columns 11 through 13 Between Columns 17 through 19 Between Columns 27 through 29

2. East-West Bracing

Along Column Line 1:	Between Columns S through V
Along Column Line 29:	Between Columns S through V
Along Column Line 15:	In Auxiliary Building and Heater Bay
Along Column Lines 6, 9, 15, 21 & 24:	Between Columns R and N

B. Seismic Model:

Since the Turbine Building is integral with the safety-related structures, the Turbine Building was included in the original seismic model. The structural elements, i.e., the shear walls and slab diaphragms, that were included in the seismic model have been designed for the resulting seismic forces obtained from the seismic analyses.

C. Roof Evaluation:

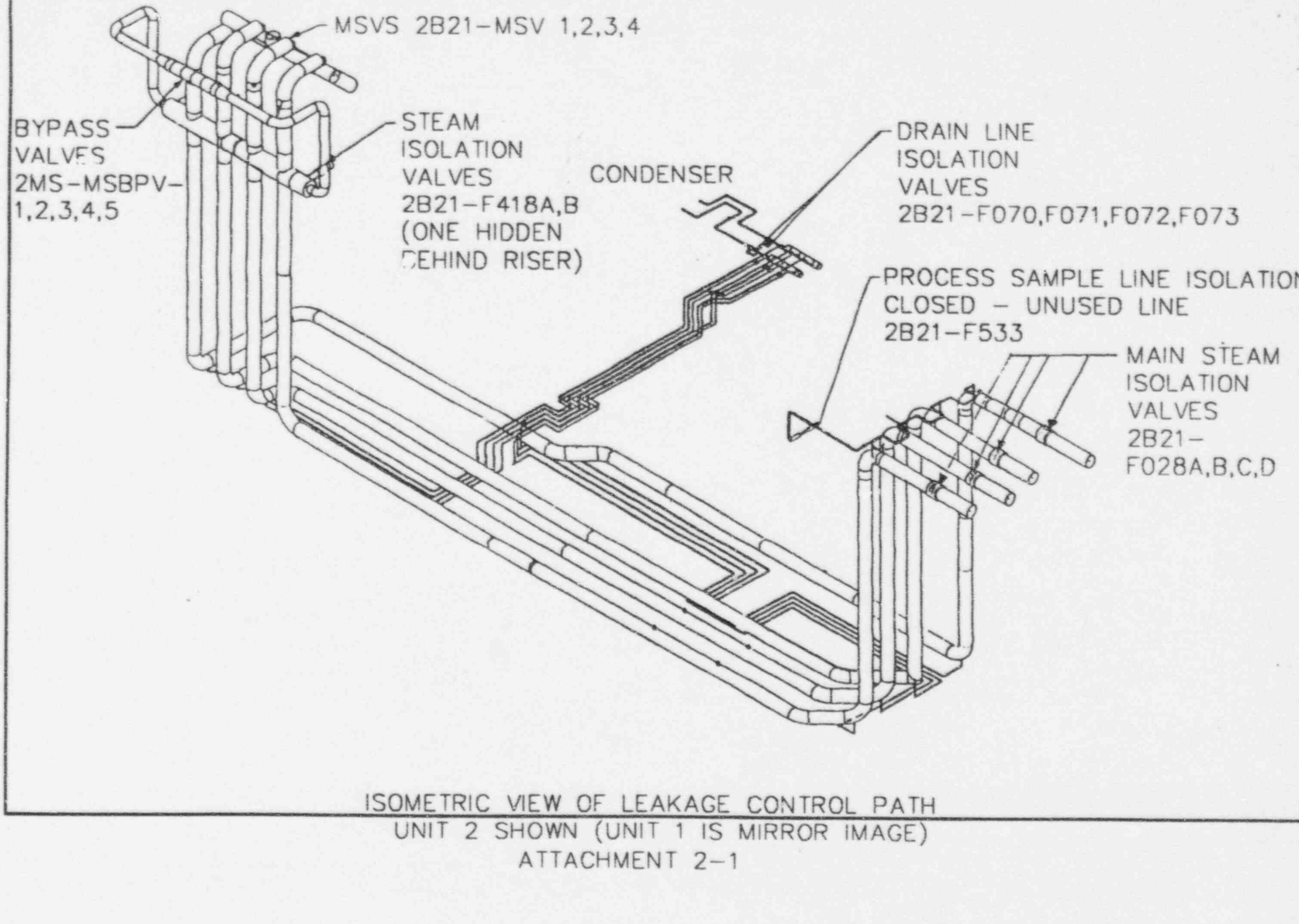
The Turbine Building roof structural steel was originally designed to resist seismic loads, (UBC zone 1) wind loads and tornado wind loads. The design of the roof steel structure was governed by the tornado wind loads. Using the tornado loading shears in the N-S and E-W directions and converting these shears to equivalent seismic acceleration levels, by dividing the shear force by the mass used to generate the seismic load, one obtains an equivalent horizontal acceleration of approximately 0.73g in the N-S direction and approximately 0.57g in the E-W direction. The Turbine Building roof response spectra for the two horizontal directions are shown on pages C-110D and C-110E of Design Criteria DC-SE-02-LS, Revision 0. These spectra give the ZPA 'g' values of 0.39g in N-S and 0.42g in E-W directions. Therefore, the design margins for the roof structure in N-S direction is 1.87 (=0.73/0.39) and in E-W direction the design margin is 1.35 (=0.57/0.42). Therefore, the Turbine Building roof structure has a minimum design margin of 1.35 against SSE allowables in the horizontal direction.

In the vertical direction, the increase in allowables for SSE and normal loads for flexure is 1.6. The roof vertical ZPA is 0.35g which is shown on page C-110F of DC-SE-02-LS. Therefore, the design margin in the vertical direction is 1.19 (=1.6/1.35) based on UFSAR allowables.

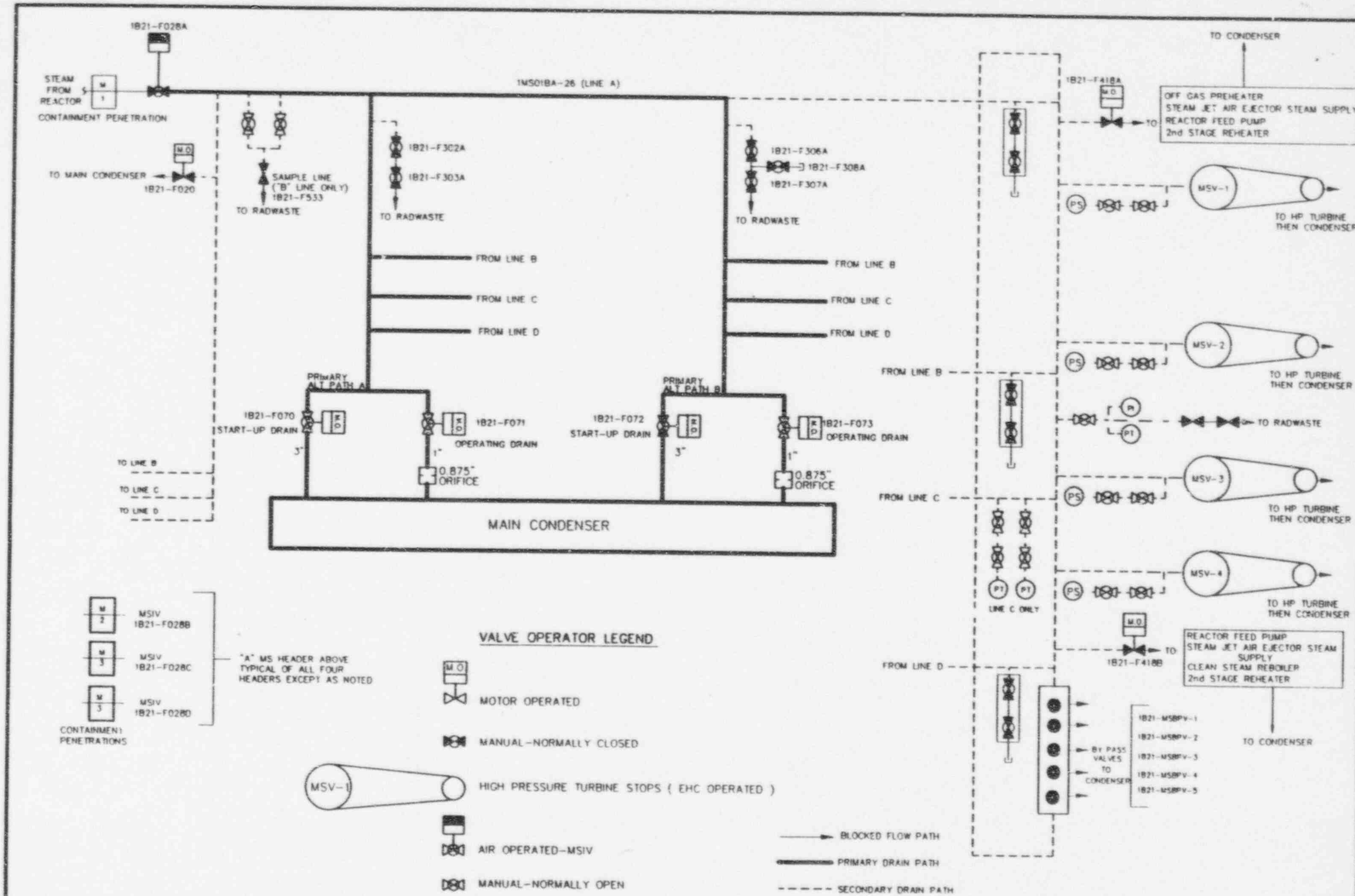
Based on the above evaluation, it is concluded that the Turbine Building roof structure remains elastic and meets UFSAR allowables under SSE seismic conditions.

LIST OF ATTACHMENTS

Attachment	Description
2-1	Isometric View of Leakage Control Path
2-2	Alternate Leakage Treatment Path Functional Diagram (ALT Mode)
2-3	Alternate Leakage Treatment Path Boundary and Control Valves (Table)
4-1	MSIV LCS Support Summary
4-2	Load Table - Unit 1
4-3	Load Table - Unit 2
5-1	LaSalle Condenser Isometric View
5-2	Condenser Foundation Details
5-3	Condenser East-West Seismic Supports (Conceptual Detail)
5-4	Condenser North-South Seismic Supports (Conceptual Detail)
6-1	Unit 1 Pressure Sensing Line Piping Stress Summary Unit 1 Supports For Pressure Sensing Lines
8-1	Plan (Turbine Building Roof)
8-2	Section A-A



ISOMETRIC VIEW OF LEAKAGE CONTROL PATH
UNIT 2 SHOWN (UNIT 1 IS MIRROR IMAGE)
ATTACHMENT 2-1



ALTERNATE LEAKAGE TREATMENT PATH FUNCTIONAL DIAGRAM (ALT MODE)
ATTACHMENT 2-2

Equipment Piece Number	Equipment Noun Name	Valve Type	Valve Operator Type	Power Supply	Valve Position During Unit Operation	Primary Method of Actuation	Secondary Method of Actuation	ALT Path Position
1(2)B21-F028A	Main Steam A Outboard Isolation Valve	Globe Valve	Air Operator	ESS Div 1	Open	Automatic Containment Isolation Valve	Remote Manual	Closed ***
1(2)B21-F028B	Main Steam B Outboard Isolation Valve	Globe Valve	Air Operator	ESS Div 1	Open	Automatic Containment Isolation Valve	Remote Manual	Closed ***
1(2)B21-F028C	Main Steam C Outboard Isolation Valve	Globe Valve	Air Operator	ESS Div 1	Open	Automatic Containment Isolation Valve	Remote Manual	Closed ***
1(2)B21-F028D	Main Steam D Outboard Isolation Valve	Globe Valve	Air Operator	ESS Div 1	Open	Automatic Containment Isolation Valve	Remote Manual	Closed ***
1(2)B21-F418A	Main Steam Auxiliary Supply Steam Stop Valve	Gate Valve	Motor Operated	ESS Div 2	Open	Remote Manual	Local Manual	Closed
1(2)B21-F418B	Main Steam Auxiliary Supply Steam Stop Valve	Gate Valve	Motor Operated	ESS Div 2	Open	Remote Manual	Local Manual	Closed
1(2)B21-F020	Main Steam Equalizing Line Stop Valve	Globe Valve	Motor Operated	ESS Div 2	Closed	Remote Manual	Local Manual	Closed
1(2)B21-F070	Main Steam Outboard Isolation Valve Start-up Drain Stop	Globe Valve	Motor Operated	ESS Div 2	Closed	Remote Manual	Local Manual	Open **#
1(2)B21-F071	Main Steam Outboard Isolation Valve Operating Drain Stop	Globe Valve	Motor Operated	ESS Div 2	Open	Remote Manual	Local Manual	Open**

ATTACHMENT 2-3

ALTERNATE LEAKAGE TREATMENT

PATH BOUNDARY AND CONTROL VALVES

Equipment Piece Number	Equipment Noun Name	Valve Type	Valve Operator Type	Power Supply	Valve Position During Unit Operation	Primary Method of Actuation	Secondary Method of Actuation	ALT Path Position
1(2)B21-F072	Main Steam Line Start-up Drain Stop	Globe Valve	Motor Operated	ESS Div 2	Closed	Remote Manual	Local Manual	Closed ** #
1(2)B21-F073	Main Steam Outboard Isolation Valve Operating Drain Stop	Globe Valve	Motor Operated	ESS Div 2	Open	Remote Manual	Local Manual	Open**
1(2)B21-F533	Process Sample Stop Valve from Main Steam Line B	Globe Valve	Manual	N/A	Closed*	Manual	N/A	Closed
1(2)B21-F302A	Main Steam Line A Drain to Radwaste Upstream Stop Valve	Globe Valve	Manual	N/A	Closed	Manual	N/A	Closed
1(2)B21-F302B	Main Steam Line B Drain to Radwaste Upstream Stop Valve	Globe Valve	Manual	N/A	Closed	Local Manual	N/A	Closed
1(2)B21-F302C	Main Steam Line C Drain to Radwaste Upstream Stop Valve	Globe Valve	Manual	N/A	Closed	Local Manual	N/A	Closed
1(2)B21-F302D	Main Steam Line D Drain to Radwaste Upstream Stop Valve	Globe Valve	Manual	N/A	Closed	Local Manual	N/A	Closed
1(2)B21-F306A	Main Steam Line A Steam Tunnel Drain to Radwaste Upstream Stop Valve	Globe Valve	Manual	N/A	Closed	Local Manual	N/A	Closed
1(2)B21-F306B	Main Steam Line B Steam Tunnel Drain to Radwaste Upstream Stop Valve	Globe Valve	Manual	N/A	Closed	Local Manual	N/A	Closed

ATTACHMENT 2-3
ALTERNATE LEAKAGE TREATMENT
PATH BOUNDARY AND CONTROL VALVES

Equipment Piece Number	Equipment Noun Name	Valve Type	Valve Operator Type	Power Supply	Valve Position During Unit Operation	Primary Method of Actuation	Secondary Method of Actuation	ALT Path Position
1(2)B21-F306C	Main Steam Line C Steam Tunnel Drain to Radwaste Upstream Stop Valve	Globe Valve	Manual	N/A	Closed	Local Manual	N/A	Closed
1(2)B21-F306D	Main Steam Line D Steam Tunnel Drain to Radwaste Upstream Stop Valve	Globe Valve	Manual	N/A	Closed	Local Manual	N/A	Closed
Unnumbered	Drain Valve for Instruments PI-1(2)B21-R500 & 1(2)B21-N511	Instrument Valve	Manual	N/A	Closed	Local Manual	N/A	Closed
B21-MSV-1	Main Steam High Pressure Turbine Main Stop Valve #1	Globe Valve	Electro/ Hydraulic Control (EHC)	EHC	Open	Auto Close on Turbine Trip ***	N/A	Closed
1(2)B21-MSV-2	Main Steam High Pressure Turbine Main Stop Valve #2	Globe Valve	EHC	EHC	Open	Auto Close on Turbine Trip ***	N/A	Closed
1(2)B21-MSV-3	Main Steam High Pressure Turbine Main Stop Valve #3	Globe Valve	EHC	EHC	Open	Auto Close on Turbine Trip ***	N/A	Closed
1(2)B21-MSV-4	Main Steam High Pressure Turbine Main Stop Valve #4	Globe Valve	EHC	EHC	Open	Auto Close on Turbine Trip ***	N/A	Closed
1(2)B21-MSBPV-1	Main Steam Bypass Valve #1	Globe Valve	EHC	EHC	Closed	Auto Close on EHC Pressure Control ***	N/A	Closed
1(2)B21-MSBPV-2	Main Steam Bypass Valve #2	Globe Valve	EHC	EHC	Closed	Auto Close on EHC Pressure Control ***	N/A	Closed

ATTACHMENT 2-3
ALTERNATE LEAKAGE TREATMENT
PATH BOUNDARY AND CONTROL VALVES

Equipment Piece Number	Equipment Noun Name	Valve Type	Valve Operator Type	Power Supply	Valve Position During Unit Operation	Primary Method of Actuation	Secondary Method of Actuation	ALT Path Position
1(2)B21-MSBPV-3	Main Steam Bypass Valve #3	Globe Valve	EHC	EHC	Closed	Auto Close on EHC Pressure Control ***	N/A	Closed
1(2)B21-MSBPV-4	Main Steam Bypass Valve #4	Globe Valve	EHC	EHC	Closed	Auto Close on EHC Pressure Control ***	N/A	Closed
1(2)B21-MSBPV-5	Main Steam Bypass Valve #5	Globe Valve	EHC	EHC	Closed	Auto Close on EHC Pressure Control ***	N/A	Closed

* Originally designed as "normally open". Sample line is no longer used. Valve will be administratively controlled until line is removed or blanked.
** Valves used to control leakage path to condenser
*** Fail closed on loss of power
# For Primary ALT Path A; For Primary ALT Path B, 1B21-F070 is closed and 1B21-F072 is open

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UNIT 1

Piping Subsystem	Total Supports	Sampled Supports
1MS05	4	1
1MS06	4	1
1MS07	4	1
1MS08	4	1
1MS09	31	3
1MS31A	32	2
1MS51A	Note 1	0
1MS52	11	1
1MS53	9	1
1MS54	11	1
1MS55	11	1
1MS56	47	3
1MS57	46	3
1MS70	58	2
1MS71	73	5
1LC01	Note 2	0
Totals	345	26

7.5 % Sampling of Supports

UNIT 2

Piping Subsystem	Total Supports	Sampled Supports
2MS05	4	1
2MS06	4	1
2MS07	4	1
2MS08	3	1
2MS09	39	3
2MS31	25	1
2MS51A	Note 1	0
2MS52	11	1
2MS53	12	1
2MS54	10	1
2MS55	10	1
2MS56	37	1
2MS57	37	2
2MS70	50	1
2MS71	Note 3	0
2LC01	Note 2	0
Totals	246	16

6.5 % Sampling of Supports

Notes:
1. 1(2)MS51A subsystem consists of four lines each connecting to the body of one outboard MSIV (on the upstream side). Each of these lines currently branch, with one branch going to the MSIV leakage control system (LCS) and the other branch to Main Steam drains. The branch to LCS will be eliminated as part of the MSIV alternate leakage treatment system modification. The remaining portion of the piping will continue to serve as Main Steam drains. Since this remaining piping is not part of the ALT path, no supports are included in this sampling.

2. Subsystems 1(2)LC01 are the outboard drain piping for the original MSIV leakage control system. As part of the modification for the MSIV alternate leakage treatment system theses lines will be cut and capped near (approximately 8 inches) the Main Steam headers. No support sampling is provided since 1(2)LC01 will have no remaining supports for the pipe segment for the MSIV alternate leakage treatment system.

3. As explained in the response to question 4, for subsystem 2MS71, additional seismic qualification and or modifications will be performed so that the design of 2MS71 piping and supports will be consistent with the other drain lines used in the Unit 2 MSIV alternate leakage treatment system. Therefore, no support sampling is provided for this subsystem at this time.

ATTACHMENT 4-1
MSIV-LCS SUPPORT SUMMARY

Support References		*Piping References*		*Structural Components Evaluation*			*Mechanical Components Evaluation*		
Suppport Count	**Pipe Support Number**	**Subsystem Number**	**Piping Analysis Report No.**	**Auxiliary Steel Calc No.**	**Limiting Structural Component**	**Aux Steel Design Margin**	**Standard Component Calc. No.**	**Limiting Standard Component**	**Component Design Margin**
1	M09-MS01-1288X	1MS05	65681	828	EMB. PLATE	1.84	1MS05-5	CLAMP	3.03
2	M09-MS01-1291X	1MS06	65683	828	EMB. PLATE	1.49	1MS06-5	CLAMP	5.60
3	M09-MS01-1287X	1MS07	65684	813	EMB. PLATE	1.49	1MS07-4	R/E BRACKET	1.16
4	M09-MS01-1286X	1MS08	65682	813	EMB. PLATE	1.84	1MS08-5	R/E BRACKET	3.99
5	M09-MS01-1213S	1MS09	L1-MS-09	M09-MS01-1213S	EMB. PLATE	2.08	M09-MS01-1213S	SNUBBER	1.67
6	M09-MS01-1229S	1MS09	L1-MS-09	M09-MS01-1229S	EMB. PLATE	1.52	M09-MS01-1229S	R/E BRACKET	2.08
7	M09-MS01-1341S	1MS09	L1-MS-09	M09-MS01-1341S	STR. STEEL	1.27	M09-MS01-1341S	SNUBBER	1.79
8	M09-MS19-1027X	1MS31A	37809	L-000184	AUX. STEEL	3.45	1MS31A-52	R/E BRACKET	3.39
9	M09-MS14-1004G	1MS31A	37809	L-000184	AUX. STEEL	1.23	1MS31-54	Note 1	Note 1
10	M09-MS25-1009G	1MS52	19815	829	AUX. STEEL	>2	Note 1	Note 1	Note 1
11	M09-MS25-1055X	1MS53	17644	815	AUX. STEEL	5.00	L-000184	STRUT	1.66
12	M09-MS25-1031G	1MS54	17645	815	AUX. STEEL	3.00	Note 1	Note 1	Note 1
13	M09-MS25-1054X	1MS55	17646	815	AUX. STEEL	>5	L-000184	STRUT	3.24
14	M09-MS25-1078X	1MS56	14662	815	AUX. STEEL	1.03	Note 1	Note 1	Note 1
15	M09-MS25-1152X	1MS56	14662	815	BASE PLATE	1.06	Note 1	Note 1	Note 1
16	M09-MS28-1097G	1MS56	14662	815	BASE PLATE	1.06	Note 1	Note 1	Note 1
17	M09-MS28-1013X	1MS57	18805	830	AUX. STEEL	7.10	L-000184	U-BOLT	4.28
18	M09-MS28-1099X	1MS57	18805	830	AUX. STEEL	2.86	L-000184	STRUT	8.00
19	M09-MS30-1008S	1MS57	18805	830	ANCHORS	>5	L-000184	SNUBBER	1.05
20	M09-MS25-1114S	1MS70	31315	830	STR. STEEL	2.50	1MS70-14	SNUBBER	19.7
21	M09-TEE2-1008G	1MS70	31315	830	STR. STEEL	>10	1MS70-54	U-BOLT	19.4
22	M09-MS28-1037S	1MS71	30823	L000065	STR. STEEL	5.77	L-000057	SNUBBER	10.7
23	M09-MS28-1057S	1MS71	30823	L000065	STR. STEEL	10	L-000057	SNUBBER	8.83
24	M09-MS28-1078S	1MS71	30823	L000065	AUX. STEEL	>2.1	L-000057	SNUBBER	6.83
25	M09-TEE3-1004X	1MS71	30823	L000065	STR. STEEL	10	L-000058	EXT. PIPE	4.55
26	M09-TEE3-1010X	1MS71	30823	L000065	AUX. STEEL	>1.2	L-000058	STRUT	10.9

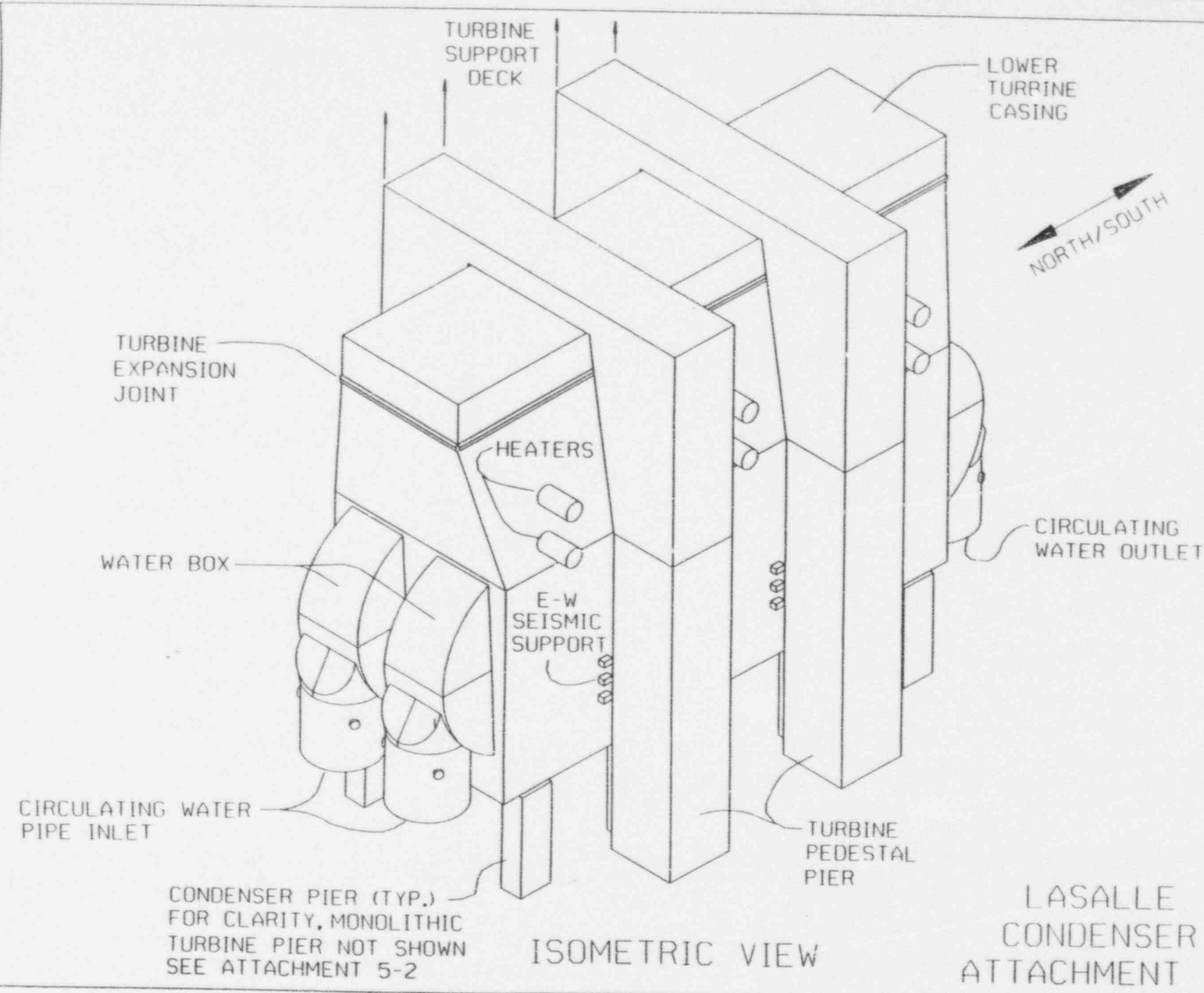
Note 1. This support consists of auxiliary steel members only. It does not include any standard piping components to evaluate.

ATTACHMENT 4-2
LOAD TABLE - UNIT 1

Support References		*Piping References*		*Structural Components Evaluation*			*Mechanical Components Evaluation*		
Suppport Count	**Pipe Support Number**	**Subsystem Number**	**Piping Analysis Report No.**	**Auxiliary Steel Calc No.**	**Limiting Structural Component**	**Aux Steel Design Margin**	**Standard Component Calc. No.**	**Limiting Standard Component**	**Component Design Margin**
1	M09-MS01-2807X	2MS05	65380	839	EMB. PLATE	1.84	QUAD 1-81-937	STRUT ASS'Y	3.11
2	M09-MS01-2816X	2MS06	65381	L-0000185	EMB. PLATE	5.78	2MS06-5	STRUT ASS'Y	5.60
3	M09-MS01-2825X	2MS07	65382	839	PLATE	1.49	65382	STRUT ASS'Y	1.16
4	M09-MS01-2837X	2MS08	65383	839	EMB. PLATE	1.84	QUAD 1-81-937	STRUT ASS'Y	3.65
5	M09-MS01-2850X	2MS09	27044	M09-MS01-2850X	WELD	1.25	M09-MS01-2850X	CLAMP	1.18
6	M09-MS01-2873X	2MS09	27044	M09-MS01-2873X	WELD	1.08	M09-MS01-2873X	CLAMP	1.18
7	M09-MS01-2905S	2MS09	27044	M09-MS01-2905S	WELD	1.08	M09-MS01-2905S	SNUBBER	1.23
8	M09-MS25-2968G	2MS52	30176	QUAD 1-81-504	AUX. STEEL	5.55	Note 1	Note 1	Note 1
9	M09-MS25-2993S	2MS53	30178	QUAD 1-81-505	AUX. STEEL	10.0	QUAD 1-81-505	U-BOLT	3.61
10	M09-MS25-2984G	2MS54	27048	QUAD 1-81-506	AUX. STEEL	6.67	Note 1	Note 1	Note 1
11	M09-MS25-2961G	2MS55	30177	QUAD 1-81-507	AUX. STEEL	3.84	Note 1	Note 1	Note 1
12	M09-MS27-2802X	2MS56	37954	L-0000185	AUX. STEEL	5.00	2MS56-36	STRUT ASS'Y	6.65
13	M09-MS28-2808R	2MS57	37840	L-0000185	AUX. STEEL	4.00	2MS57-13	ROD ASS'Y	3.37
14	M09-MS30-2999X	2MS57	37840	L-0000185	AUX. STEEL	5.00	2MS57-39	STRUT ASS'Y	3.14
15	M09-MS25-2944G	2MS70	33124	L-0000185	AUX. STEEL	1.38	2MS70-113	STRUT ASS'Y	2.12
16	M09-MS19-2803X	2MS31B	42129	QUAD 1-81-937	AUX. STEEL	10.0	2MS31B-27	STRUT ASS'Y	22.2

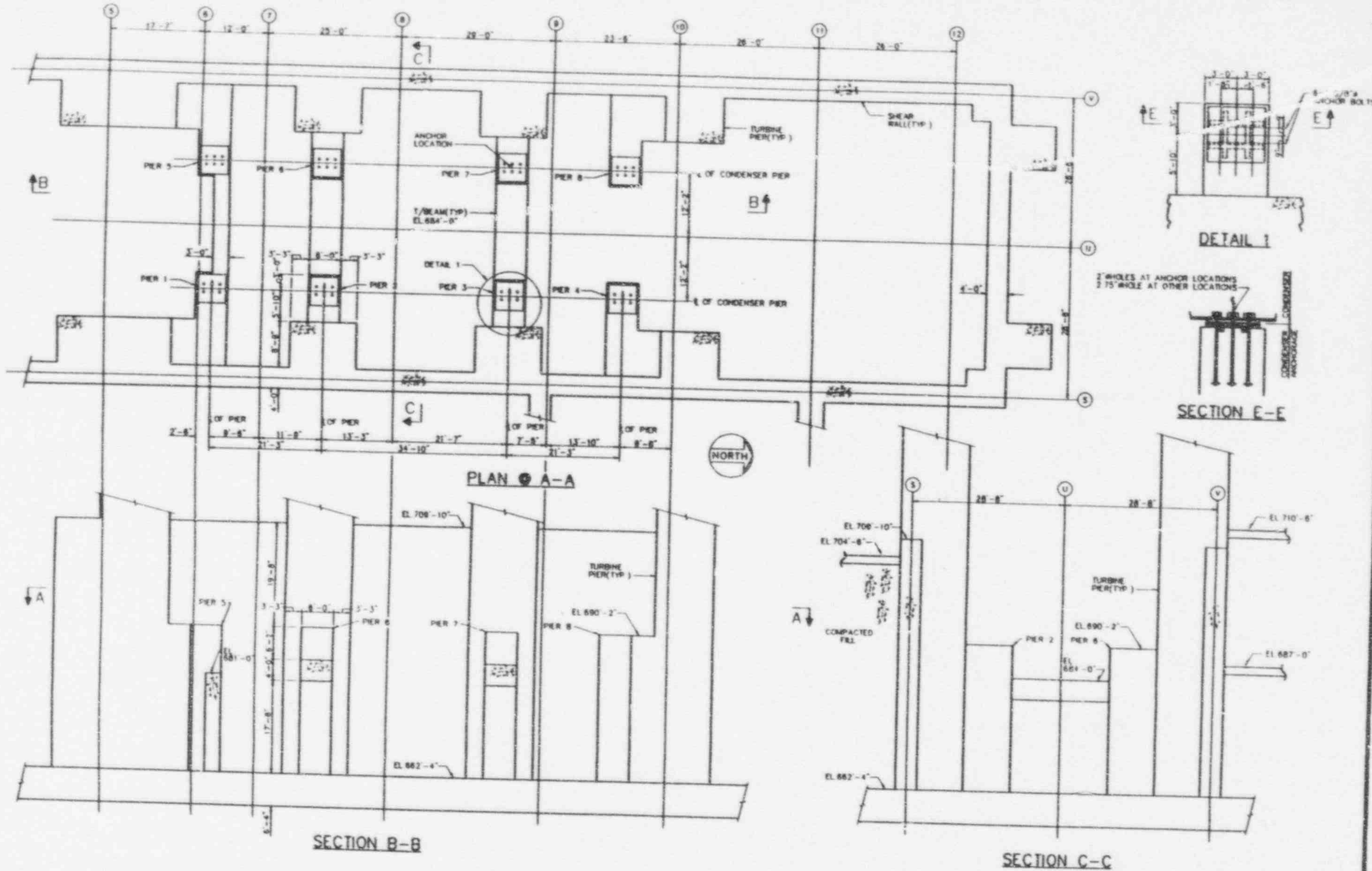
Note 1. This support consists of auxiliary steel members only. It does not include any standard piping components to evaluate.

ATTACHMENT 4-3
LOAD TABLE - UNIT 2



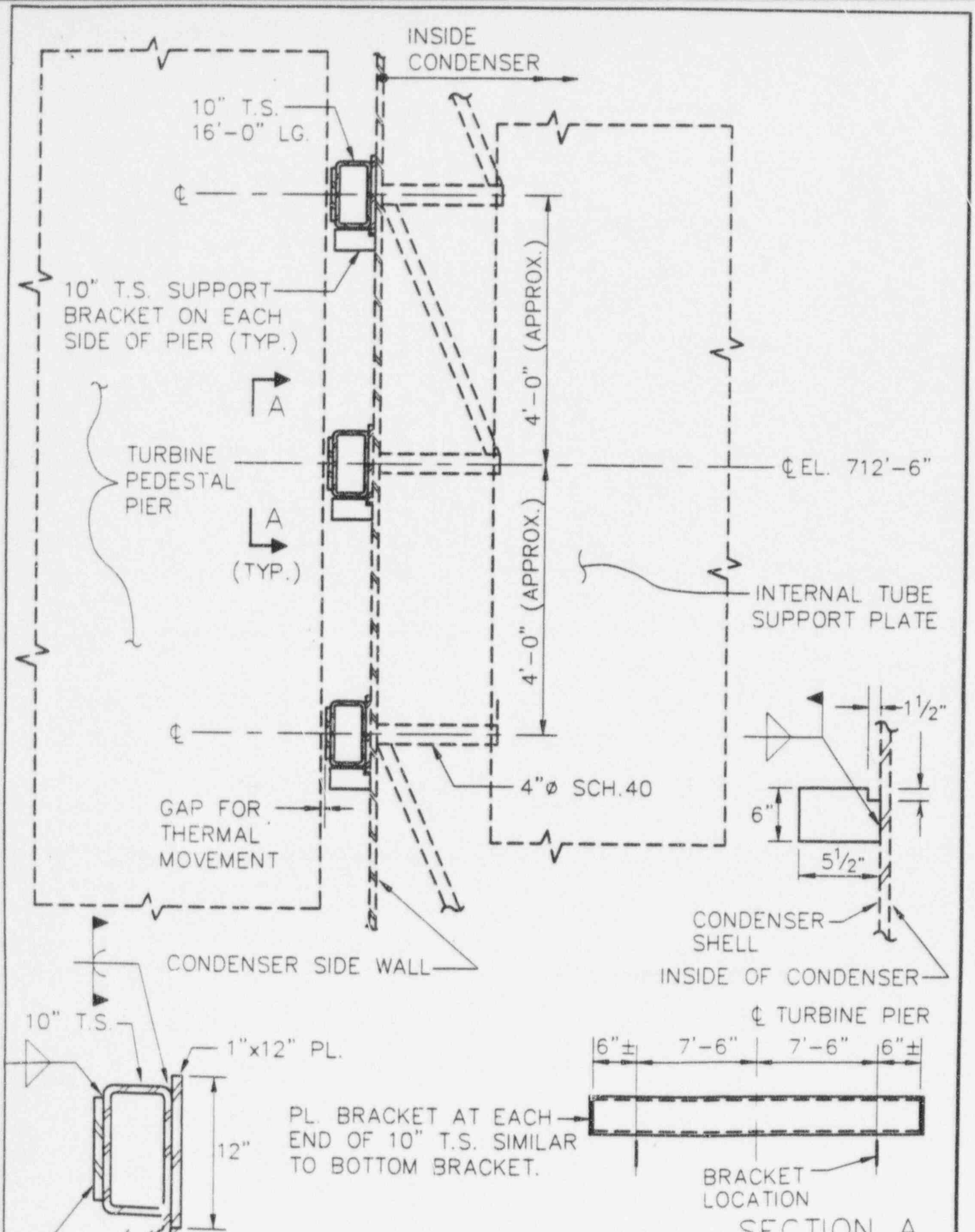
ISOMETRIC VIEW

LASALLE CONDENSER
ATTACHMENT 5-1



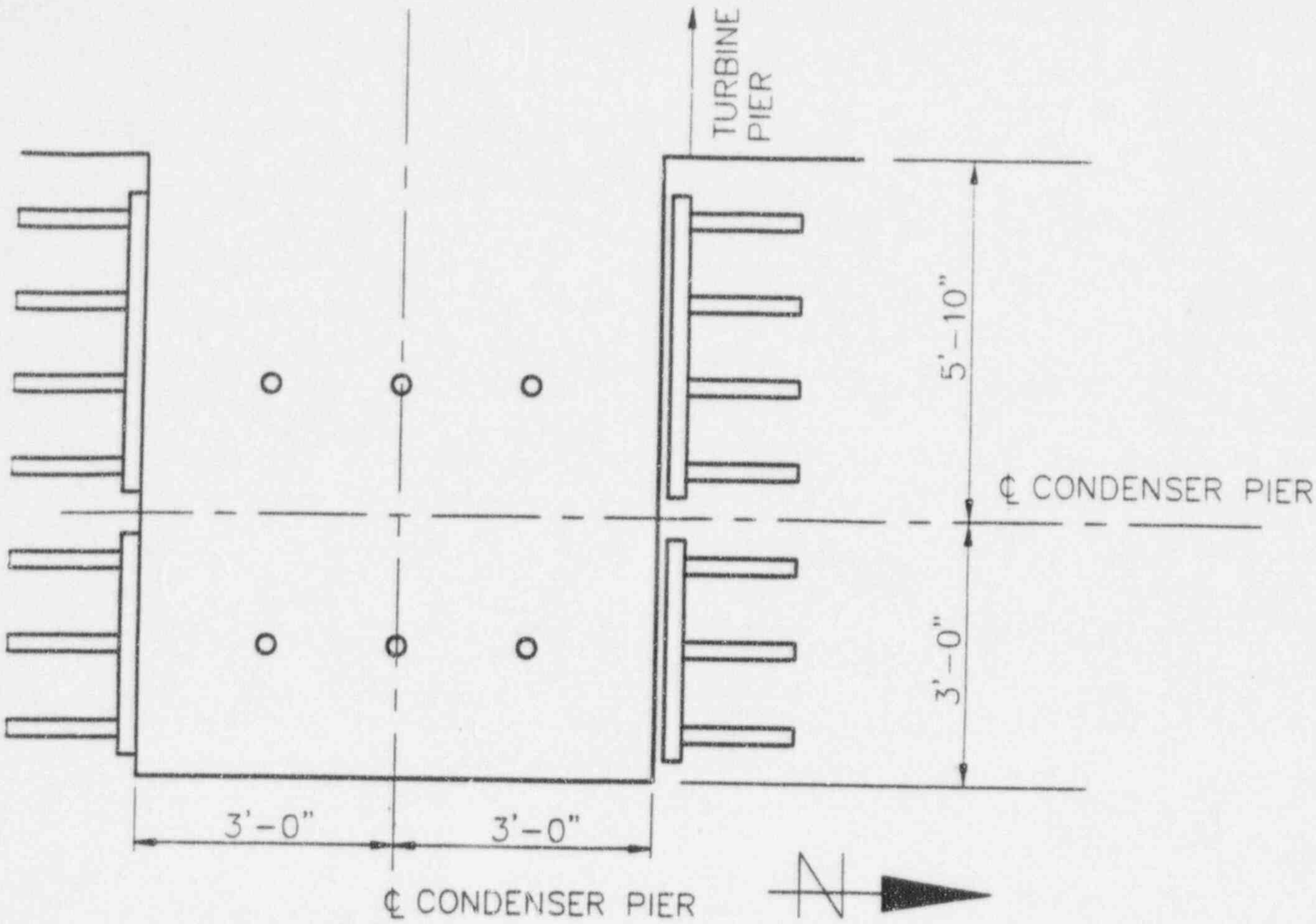
CONDENSER FOUNDATION DETAILS

ATTACHMENT 5-2

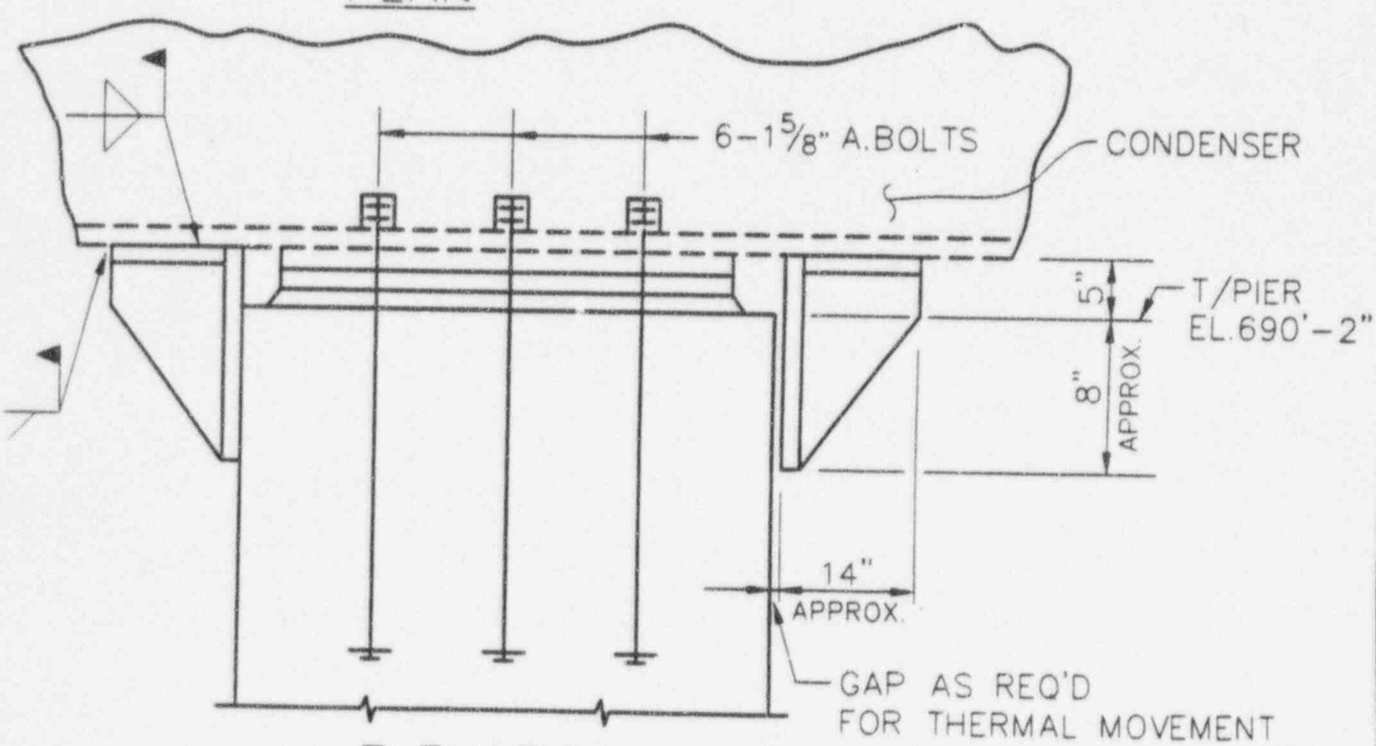


ATTACHMENT 5-3

CONDENSER EAST/WEST SEISMIC SUPPORTS (CONCEPTUAL DETAIL)



PLAN



ELEVATION

CONDENSER NORTH/SOUTH SEISMIC SUPPORTS (CONCEPTUAL DETAIL)

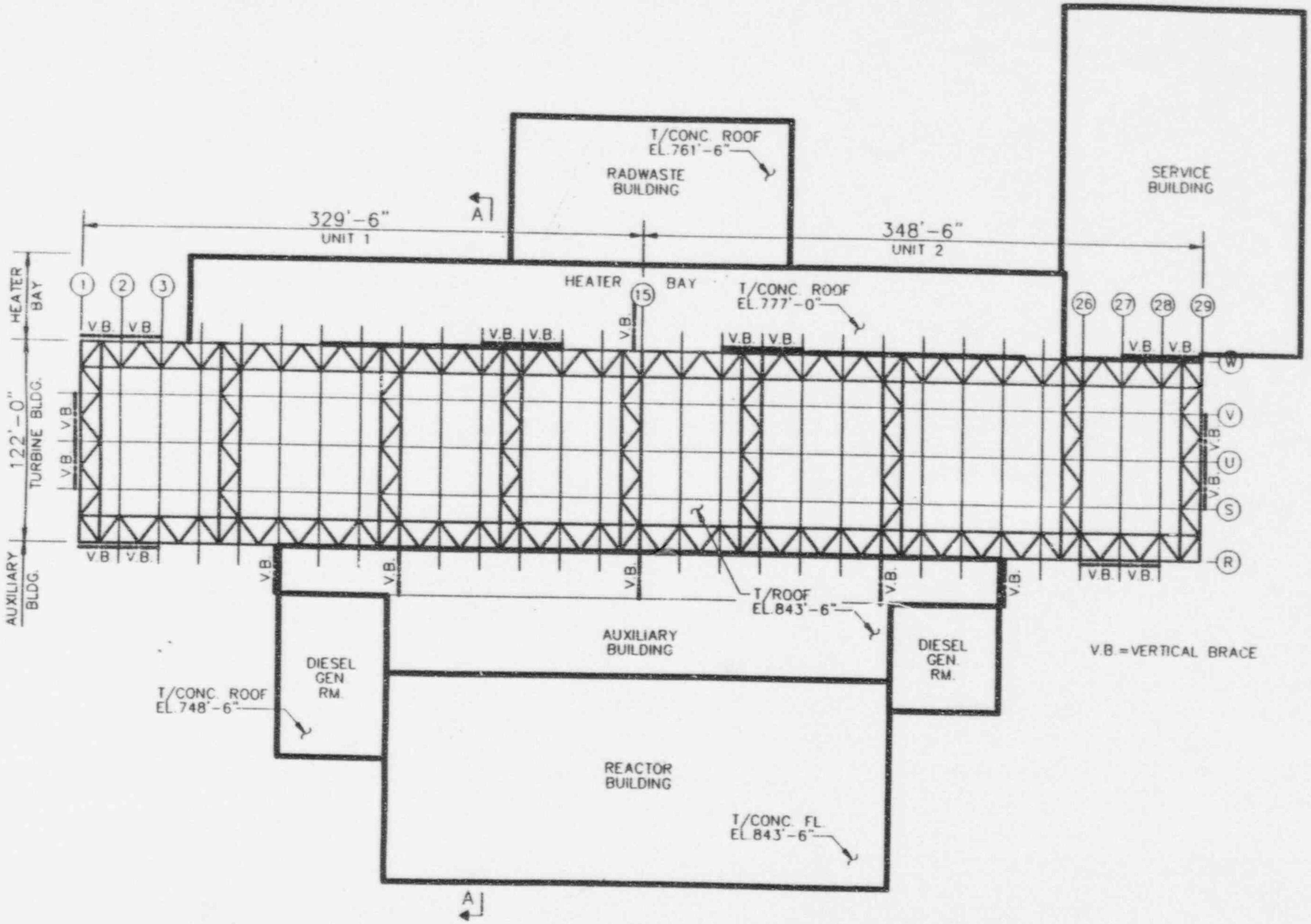
ATTACHMENT 5-4

UNIT 1 - PRESSURE SENSING LINE PIPING STRESS SUMMARY

	SUBSYSTEM IDENTIFICATION	SERVICE LEVEL D STRESS EQ.9	ALLOWABLE STRESS LIMITS	IR	COMMENTS
1	1MS93AA CLASS D	15,800	36,000	0.44	Analysis for piping inside Heater Bay
	1MS93AA CLASS D	16,000	36,000	0.44	Analysis for piping outside Heater Bay
2	1MS93AB CLASS D	32,000	36,000	0.89	Analysis for piping inside Heater Bay
	1MS93AB CLASS D	5,020	36,000	0.14	Analysis for piping outside Heater Bay
3	1MS93AC CLASS D	28,100	36,000	0.78	Analysis for piping inside Heater Bay
	1MS93AC CLASS D	4,670	36,000	0.13	Analysis for piping outside Heater Bay
4	1MS93AD CLASS D	35,800	36,000	0.99	Analysis for piping inside Heater Bay
	1MS93AD CLASS D	4,660	36,000	0.13	Analysis for piping outside Heater Bay
5	1MS68AA/AB CLASS D	8,730	36,000	0.24	Analysis was for piping both inside and outside Heater Bay
6	1MS68BA/BB CLASS D	8,730	36,000	0.24	Analysis was for piping both inside and outside Heater Bay
7	1MS69AA/AB/AC/AD CLASS D	31,000	36,000	0.86	Analysis was for piping both inside and outside Heater Bay

UNIT 1 - SUPPORTS FOR PRESSURE SENSING LINES

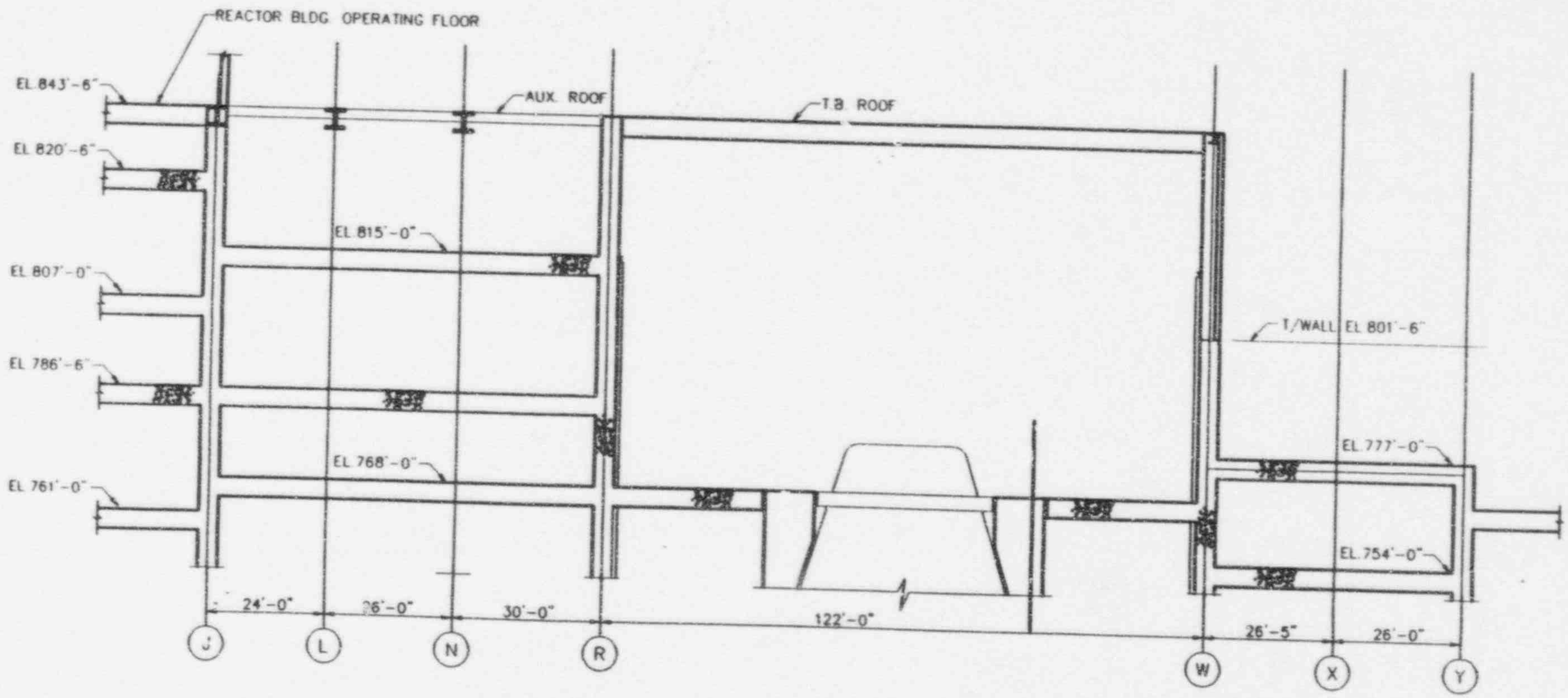
				Structural Components Evaluation		*Mechanical Components Evaluation*	
	Line Number	Analysis Node Number	Calc Number	Limiting Structural Component	Aux Steel Design Margin	Limiting Standard Component	Component Design Margin
1	1MS69AA/AD	NP 280	L-000186	Aux. Steel	1.74	U-Bolt	>10
2	1MS93AD	NP 90	L-000186	Conc. Exp. Anchors	2.7	U-Bolt	>10
3	1MS68BA/BB	NP 130	L-000186	Conc. Exp. Anchors	1.49	U-Bolt	>10



PLAN (TURBINE BUILDING ROOF)

(N.T.S.)

ATTACHMENT 8-1



SECTION A–A

(N.T.S.)

ATTACHMENT 8-2