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May 4, 1982

Mr. H. R. Denton, Director
Office of Nuclear Reactor Regulation
U. S. NUCLEAR REGULATORY COMMISSION
Washington, D. C. 20555

Attention: Mr. D. G. Eisenhut, Director
Division of Licensing

Gentlemen:

DOCKET NOS. 50-266 AND 50-301
ADDITIONAL RESPONSE TO NRC
GENERIC LETTER NO. 81-14
POINT BEACH NUCLEAR PLANT, UNITS 1 AND 2

Wisconsin Electric's first response to NRC's Generic Letter No. 81-14, "Seismic Qualification of Auxiliary Feedwater Systems", was transmitted to you by our letter dated July 16, 1981. That response was predominantly directed to the mechanical portions of the auxiliary feedwater (AFW) system and discussed AFW seismic qualification from the overall system viewpoint. However, at that time the level of detail requested by NRC was not clearly understood. Subsequently, additional information was requested by the NRC Staff through Mr. R. A. Clark's letter of January 25, 1982. The purpose of this transmittal is to provide that additional information as contained in the attachments hereto.

Attachment 1 to this letter discusses the seismic qualification of the AFW system and the pertinent Point Beach Nuclear Plant structures, equipment, and electrical components which we have examined. We have recently completed an inspection of the important, and reasonably accessible, portions of these systems using our IE Bulletin 79-14 experience and engineering judgment. These inspection results are also contained in Attachment 1 to this letter. This inspection identified several reasonable actions that we will pursue to enhance the seismic resistance of the important AFW system components. We expect that most of these modifications will be completed by the end of 1982.

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We have concluded that the major mechanical components of the Point Beach Nuclear Plant AFW system have been seismically designed except for the condensate storage tanks which are the

primary source of auxiliary feedwater and some inter-connected branch piping. However, the secondary water source (the service water system) is a seismically-designed system. The AFW system electrical systems are consistent with other safety-grade systems at Point Beach Nuclear Plant. As requested in Paragraph A of the enclosure to your February 10, 1981 letter, we have identified on a copy of Table 1 from that letter those components and structures associated with the AFW system which are not seismically qualified. This table is included as Attachment 2. We trust that this transmittal adequately addresses your request for further information. If additional information is required, please contact us.

Very truly yours,

C. W. Fay

Assistant Vice President

Attachments

Copy to NRC Resident Inspector

ATTACHMENT 1
WISCONSIN ELECTRIC'S APRIL 1982 RESPONSE
TO NRC GENERIC LETTER 81-14

SEISMIC QUALIFICATION OF THE
PBNP AUXILIARY FEEDWATER SYSTEM

I. INTRODUCTION

NRC's Generic Letter No. 81-14 dated February 11, 1981 is entitled "Seismic Qualification of Auxiliary Feedwater Systems" and was received by Wisconsin Electric on March 18, 1981. The letter requests information to identify the extent of seismic qualification of PWR auxiliary feedwater systems (AFWS). Wisconsin Electric's response to Generic letter 81-14 for the Point Beach Nuclear Plant (PBNP) was transmitted by letter dated July 16, 1981.

By letter dated January 25, 1982, the NRC requested that additional information be provided. This transmittal provides the additional requested information that is available. The January 1982 NRC letter contains two questions, one of which has five subitems, which relate back to the generic letter 81-14. The basic organization of Section III of this attachment is directly related to the January 1982 letter in a question and answer format. Information provided in the Wisconsin Electric July 1981 submittal is not repeated.

II. PBNP DESIGN AND EQUIPMENT LAYOUT

The PBNP is a two-unit pressurized water reactor nuclear power plant that utilizes some shared facilities, including a portion of the AFWS. The basic plant layout is discussed in Chapter 1 of the Final Facility Description and Safety Analysis Report (FFDSAR) and the buildings and seismic design are further discussed in Appendix A of the FFDSAR. Figure 1 (FFDSAR, Figure 1.2-6), is a cross-section of the plant which denotes the structures and AFWS equipment that were seismically designed and constructed. The major items of AFWS equipment are also located on this figure. This figure does not show the Seismic Class I service water pumps which are located in the plant pump house.

Generic Letter 81-14, as clarified by the January 25, 1982 letter, requires that items necessary for operation of the AFWS system be considered. Table 1 is a listing of these items and summarizes the status of the seismic qualification of each.

Figure 2 schematically shows the relationship of the AFWS piping to the plant structures and the major items of equipment. The figure shows both sources of pump suction water (primary source from the condensate storage tanks with backup from the service water system), the discharge piping into containment, and the steam supply piping to the AFW turbine-driven pumps. As indicated by Figure 2, most of the piping is located within seismically designed structures. A portion of the service water piping is underground and inaccessible, a portion of the AFW pump

suction supply piping is in the Turbine Building, and a portion of the steam supply piping to the steam driven pumps is in the Facade, and the upper elevations of the Auxiliary Building.

The AFWS piping system has been included within our IE Bulletin 79-14 program. The piping system was specifically discussed in our July 1981 submittal. As an aid in understanding our IE Bulletin 79-14 program and the extent to which the AFWS was involved, attached hereto are copies of the following piping isometrics:

a. P-118; showing the piping in the vicinity of the condensate storage tanks, a portion of the AFW pump suction piping, and the branch piping which was included in the piping evaluation.

b. P-117; showing the P-118 piping continuation to all four AFWS pumps.

c. P-103; showing part of the AFWS pump discharge piping, including the important motor-operated valves.

Following discussions with the NRC staff concerning the July 1981 submittal, we have re-evaluated the "boundaries" between the AFWS piping and interconnected piping and have completed inspections of additional portions of this system. The inspection results are contained in Table 2. The inspection was performed by an electrical engineer and a mechanical engineer experienced in the Bulletin 79-14 program and was general in nature. The inspection covered most of the branch piping connections and the electrical components but did not trace individual electrical circuits. The inspection resulted in 17 action items including 16 modifications which we feel are reasonable and which will enhance the seismic resistance of components in the AFWS.

III. RESPONSE TO NRC'S SPECIFIC QUESTIONS IN JANUARY 1982 LETTER

QUESTION 1.a

Enclosure 1 to Generic Letter 81-14 identified the items and boundaries of the AFW system which were to be considered in responding to that letter.

Verify that all such considerations were applied to your evaluation and that all the indicated items and boundaries to assure system function are Seismic Category I and designed to resist the SSE specified for the plant.

RESPONSE

Figure 3 is a reduced copy of Figure 10.2-5 of the FFDSAR and is the principle piping diagram for the AFWS. Figure 4 is a copy of Figure 3 marked to identify the piping which was considered during the evaluation of IE Bulletin 79-14. These lines are numerically marked to aid in the following discussion of piping connection boundaries.

a. Pipe connections 1 through 5 and 29 are small diameter piping for chemical addition pots. These have two manual, normally closed valves and were recently inspected.

b. Pipe connections 6 through 9 are the outlet connections for the pump recirculation piping. These connections were recently inspected. The recirculation valve is shown on the drawing as normally closed. However, following a recent modification these recirculation valves are normally open. These valves close, as before, upon receipt of a pump discharge flow signal. Thus, the overall operation of the system has not changed significantly.

c. Pipe connections 10 through 13 were not inspected but are connected to piping included in the IE Bulletin 79-14 program (isometric P-159).

d. Connections 14 through 19 are overflow, drain, and instrument connections on the CST.

e. Connections 20 and 21 go to the Unit 1 and 2 Condensers through a single air-operated valve (2122A) which is normally closed. These pipelines were not originally required to be seismic (nor was the condenser). A portion of this branch piping has structurally been included in the IE Bulletin 79-14 program (isometric P-118). While the Unit 1 piping is fully shown on isometric P-118, the analytical model terminated at support H-43, drawing zone C-3.

f. Connection 22 is a 1.5 inch connection to the Waste and Blowdown Evaporator Distillate Processing System. This piping was not required to be seismically designed, has many branch connections, and normally shut manual valves.

g. Connection 23 is a 4-inch connection to the heating boiler feed pump through a normally open valve and a check valve that prevents flow from the CST. The IE Bulletin 79-14 program (isometric P-118) included the piping through the manual valve but not through the check valve. This piping was not originally required to be seismic.

h. Connection 24 is a 2-inch diameter connection that provides a source of water to the turbine plant chemical addition tanks through normally closed valves close to the tanks. This piping was not originally required to be seismic.

i. Connection 25 is a 3-inch diameter connection to the mixed bed demineralizer in the makeup water treatment system through a closed valve. This piping was not originally required to be seismic.

j. Connections 24 and 25 are shown with check valves to prevent flow from the CST's. However, the discs have been removed from these valves in order to provide water supply to the turbine plant chemical addition system. Manual isolation valves are provided. This piping was not originally required to be seismic.

k. Connections 26, 27 and 28 are protected by check valve 118 which was included in the IE Bulletin 79-14 program (isometric P-159). These connections are protected by a check valve (on drawing M-214) to prevent flow from the CST's. This piping was not originally required to be seismic.

The piping branch connections considered do not correspond to the NRC's boundary definition because most of the connections do not have a second normally closed valve nor were the connections required to be seismically designed when the plant was licensed. The foregoing discussion, in combination with the figures, identifies the existing plant configuration and define what has been considered.

The structural boundaries considered for the AFWS have been indicated in Figures 1 and 2 and Table 1. The Turbine Building, the Facade structure, and the superstructure of the Auxiliary Building were not designed as seismic structures.

l. The original plant Architect/Engineer (Bechtel Power Corporation) has advised that the Turbine Building was seismically analyzed with the loaded turbine building crane located above the control building. This included response spectra analysis for the two orthogonal horizontal directions with an analysis of the overhead crane bridge for vertical seismic loads. The analysis concluded that the Turbine Building was capable of withstanding a SSE with the crane located over the control building

m. The Facade structures are not conventional buildings and were not required to be seismically designed. They are basically structural steel frameworks with exterior siding and were included in the plant to provide winter weather protection and architectural treatment of the containment structures. Some AFWS pipelines pass through the facade.

n. Based upon the recent inspection of electrical components associated with the AFWS, we have concluded that the AFWS electrical system design is consistent with other safety-grade electrical systems in the plant.

QUESTION 1.b.

Provide a schematic sketch of the AFW system from suction to discharge which indicates the seismic qualification of the boundaries and items of the AFW system, as specified in Enclosure 1 to Generic Letter 81-14.

RESPONSE

To the extent practical, this is shown in the following figures :

Figure No.

1 Schematic representation of plant with structures and major AFWS components

2 Schematic showing AFWS piping on Figure 1,

3 FFDSAR Figure 10.2-5

4 FFDSAR Figure 10.2-5 showing piping in the IE Bulletin 79-14 program and identification of pipe connections

Also included are preliminary piping isometrics from the IE Bulletin 79-14 program. The seismic/non-seismic designation is, or will be, shown on these isometrics prior to finalization of the drawings.

QUESTION 1.c.

Justify the acceptability of any deviations of the items and boundaries as described in the Generic Letter.

RESPONSE

With respect to branch piping, the IE Bulletin 79-14 program pertained to 2½" diameter and larger piping and considered connecting piping only if the ratio of the pipe diameters (main pipe to branch pipe) was 3 or more and the branch piping is considered large. For example, on P-103 there is a 1½" DB-3 connection to the pump discharge piping which is the pump recirculation piping (connections 6 through 9 on Figure 3). This size piping is considered small, is field-run during construction, and supported under guidelines that are intended to make the small piping rigid. Thus, this piping would have an insignificant effect on the main piping. Even though the small pipe itself is not directly considered, the analysis utilizes a stress intensification factor for the stress in the main pipeline at the branch connection. For large branch piping, the piping is evaluated by including a sufficient number of downstream seismic supports and changes of direction of the piping in the analysis.

A review of documentation indicates that, when PBNP was designed and constructed, standard seismic designs for Class 1E cable tray supports were developed. During PBNP construction, these cable tray supports were inspected in the field. However, as-built drawings were not developed and further records of cable tray support design and location do not exist. The design and construction of the AFWS electrical components are consistent with the other safety-grade systems in the plant.

QUESTION 1.d.

Since the condensate storage tanks were not designed to resist an SSE, summarize your procedures for transfer from this primary source to the SSE qualified secondary source, as requested in Generic Letter 81-14.

RESPONSE

The PBNP Emergency Operating Procedures for all emergency situations requiring auxiliary feedwater system operation, direct the operator as follows:

"Observe Condensate Storage Tank Levels

When the low level (20% or four feet) occurs open the auxiliary feedwater pump service water system suction valves."

These valves are shown on Figure 3. No further operations are necessary to ensure a seismically qualified source of auxiliary feedwater.

QUESTION 1.e.

Provide the information requested in Generic Letter 81-14 for those items that were not addressed in your response.

RESPONSE

We consider that the level of detail desired has been adequately addressed when this submittal and the July 1981 submittal are both considered.

QUESTION 2

Provide the completion date for the modification of the piping supports identified under your IE Bulletin 79-14 review.

RESPONSE

In our December 30, 1981 submittal to NRC on our IE Bulletin 79-14 program, we advised that subject to the delivery of equipment, all physical work was expected to be completed by the end of the spring 1982 Unit 2 refueling outage which began on April 16, 1982. As some of our equipment is not scheduled to be shipped until mid-May, we now expect that all physical work will be completed by the end of June 1982. There will be drawing corrections and finalization of documentation subsequent to the completion of physical work.

IV. ADDITIONAL INFORMATION

Emergency AC power is provided to all applicable safety systems, including the auxiliary feedwater system, by the diesel generators. DC control power is provided to these systems by the station batteries. Thus, the AFWS power supplies are consistent with other safety systems in the plant.

The auxiliary feedwater pump recirculation valves are now normally open and fail closed. The pump discharge valves are normally open and fail open. Thus, the instrument air system, which powers these valve operators is not required for AFWS functioning.

The inclusion of applicable pipeline valves in the IE Bulletin 79-14 program is noted on page 5 of the July 1981 submittal. While the piping analyses do not analyze the valve itself, the general guideline for valve operator structural acceptability was that as long as the "g" loadings at the valve were less than 3, the valve operator was acceptable. This guideline was satisfied, or the valve received additional evaluation, in all cases.

V. SUMMARY

The PBNP AFWS is consistent with requirements imposed during PBNP design and construction. While portions of the system do not have the level of documentation necessary to demonstrate this on paper, a walk down and inspection of the system has been performed and reasonable actions have been identified that will enhance the seismic resistance of this system. These actions will be pursued. Nonetheless, even without these inspection actions, the AFWS seismic resistance is comparable to and consistent with other safety-grade systems at PBNP.

TABLE 1

EQUIPMENT AND ITEMS NECESSARY

FOR OPERATION OF THE PBNP AFWS

GENERAL ITEM	TITLE	STATUS OF SEISMIC QUALIFICATION
A. Mechanical		
1. Discharge Piping	DB-3, EB-10, and EB-9	IEB 79-14
a. Branch Connections	Various	See Discussion
2. Pumps	4 AFW Pumps	Original - Class 1
a. Pump Lube oil	Self-contained by pump	By pump
1. Lube oil cooling	HB-19 (4" and 1½" dia.)	Small piping; IEB 79-14 and inspected
3. Primary Suction Piping	JG-4 (various dia.)	IEB 79-14
a. Branch Connections	Various	See Discussion
4. Secondary Suction Piping	6"-HB-19	IEB 79-14
a. Branch connections	Various	See Discussion
5. Primary Water Source	Condensate Storage Tanks (CST)	Class II per Design Specification
6. Secondary Water Source	Service Water	Lake Michigan - no Classification
a. Secondary pumps	6 Service Water Pumps	Class I
7. Valves & Operators	Various	IEB 79-14
8. Steam Piping	3" EB-8	IEB 79-14
a. Branch Connections	Four per unit	See Discussion

TABLE 1 (Continued)

GENERAL ITEM		TITLE	STATUS OF SEISMIC QUALIFICATION
B. Structural			
1.	All involved structures	Containment	Original - Class I
		Facade	Not Seismically Qualified
		Auxiliary Building	Orig. Class I to elev. 66'
		Pipeways	Original - Class I
		Control Bldg.	Original - Class I
		Turbine Bldg.	See Discussion in Text
		Service Water Pumphouse	Original - Class I for water supply to pumps.
C. Electrical			
1.	Control Panels	Main Control Boards	Consistent with other safety systems in plant - see Discussion in Text
2.	D.C. Control Power System	Various	
3.	A.C. Power System	Various	
4.	Electrical Cable Supports	Various	
D. Other			
1.	Primary Water Source Indication	CST Level Indicators	None. Inspected, and to be replaced.

TABLE 2

AUXILIARY FEEDWATER SYSTEM INSPECTION
POINT BEACH NUCLEAR PLANT

Item		Inspection Results
Main Piping	1.	The main system piping has been covered by the IEB 79-14 program which applies to 2½" diameter and larger piping. All 79-14 modifications previously issued will be completed by June 1982.
	2.	The 1½"DB-3 recirculation pipe for each of the four AFW pumps is not well supported. Each recirculation pipeline contains an air-operated valve (2-CV-4002, CV-4014, CV-4017, and 1-CV-4002) near the middle of a horizontal piping span. Each air operated valve will be independently supported.
	3.	In the discharge piping of each pump, there is either a set of drain valves (2) or connections to the chemical addition pot which has two shutoff valves. These lines will be provided with additional support.
	4.	The small service water cooling pipes (1½" dia.) to the pumps (for lube oil cooling) are considered adequate.
	5.	The piping P&ID shows check valves upstream of valves 4 and 7 in the 3"-JG-3 piping that connects to the JG-4 piping to the condensate storage tanks. The discs have been removed to provide water supply to the turbine plant chemical treatment system.
Battery Room	1.	The two station batteries are required to provide power to the valves which admit steam to the turbine-driven pumps, to provide power to the valves (which are normally open) in the pump discharge piping, as well as operate the controls for the electric pumps. The seismic resistance of the battery racks is questionable and will be upgraded.
	2.	At Panel 2S4001, conduit 2-4001 will be clamped to the wall near its upper end.
	3.	Above the Safeguards Switchgear equipment, conduit D01-2 is routed in both the east-west and north-south directions. At least one perpendicular support will be installed, or verified to exist, in each direction.
Electrical	1.	At panel P38B, the first conduit support up the wall from this panel will be upgraded.
	2.	In 1-P29 cubicle, conduits 1-4000 & 1-4001 will be clamped to west wall close to their upper end.

Item	Inspection Results
	3. In P38A and P38B cubicle, the main power cable conduits (four inch diameter) for the motors will have new horizontal restraining supports installed.
	4. In 2P29 cubicle:
	a. Conduit 2-4001 from MOV 4001 will be clamped to unistrut.
	b. Conduits CJ-2 and 2V4002 will be provided with additional clamps.
Cable Spreading Room	1. Conduit above panel D12 will be clamped.
	2. Above panel D13, conduits will be clamped to wall.
	3. Above panel D14, conduits will be clamped to wall.
	4. Panel D11 is considered acceptable.
Instruments	1. The condensate storage tank level indicators appear acceptable. In the Control Building, the conduit is supported by threaded rod with little, if any, horizontal restraint. However, as these instruments and conduit are to be replaced by mid-august 1982 with seismic grade equipment, further actions at this time are not reasonable.
	2. The new auxiliary feedwater flowmeters, and instrument supports, in the Auxiliary Building, are considered adequate.
Auxiliary Building	1. The four safeguards motor control centers (1B32, 1B42, 2B32, and 2B42) are presently not anchored to the floor. While the attached cabling would provide some resistance to motion, supports will be installed to independently restrain the cabinets.

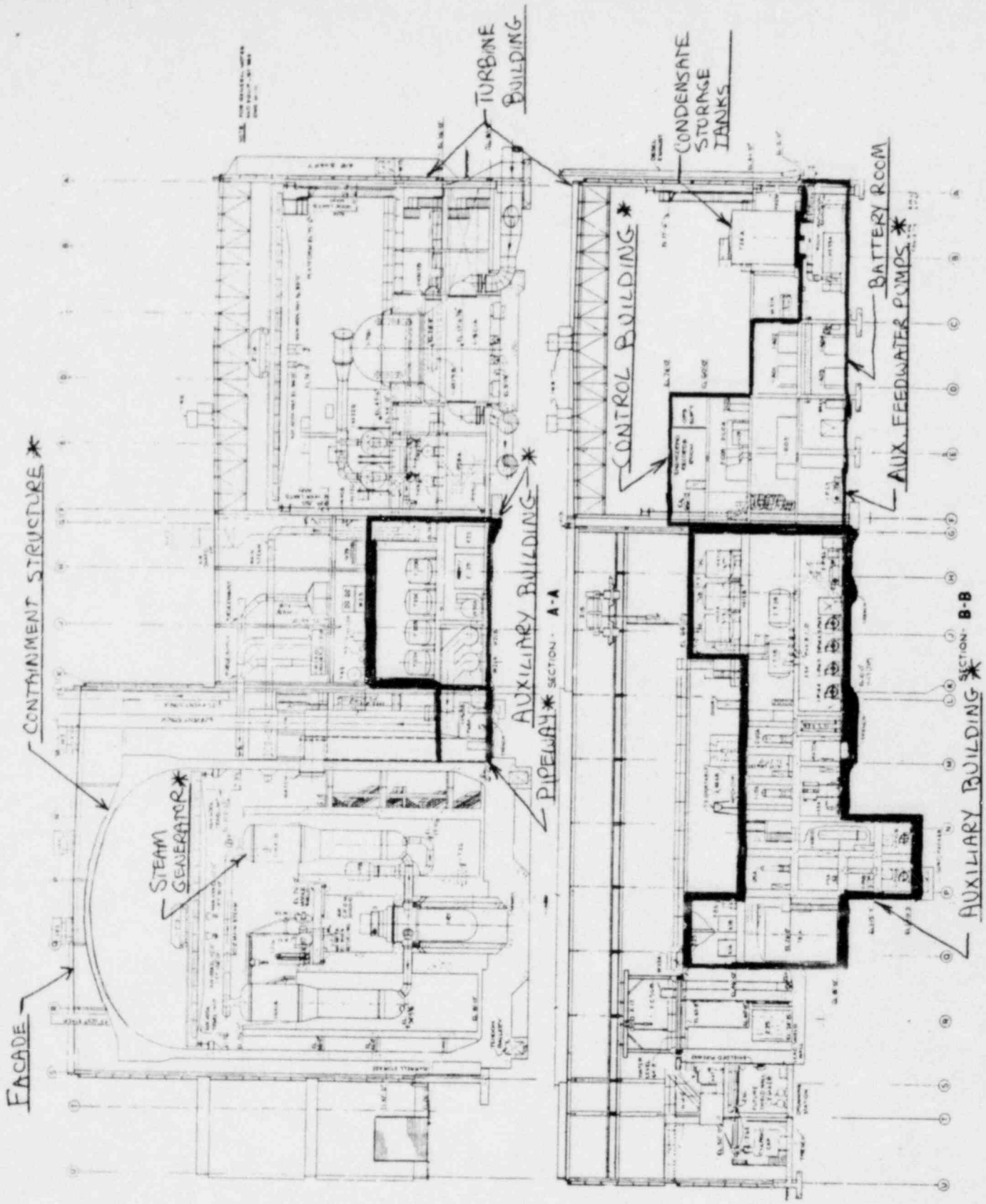

Figure 1.2-6

* Denotes Seismic Class I Equipment or Structures

Figure 1

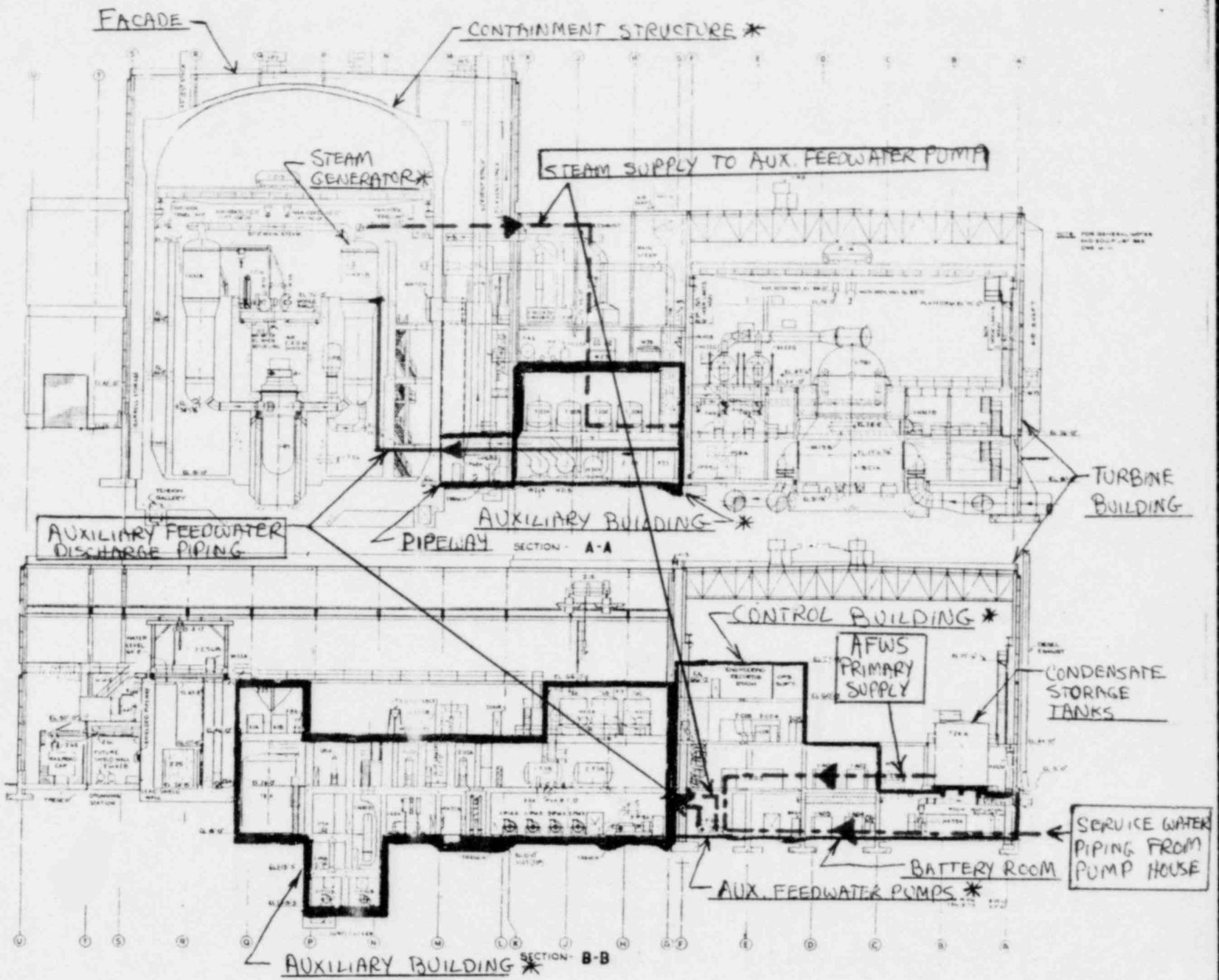

Figure 1.2-6

Schematic Representation of Auxiliary Feedwater System Piping

Figure 2

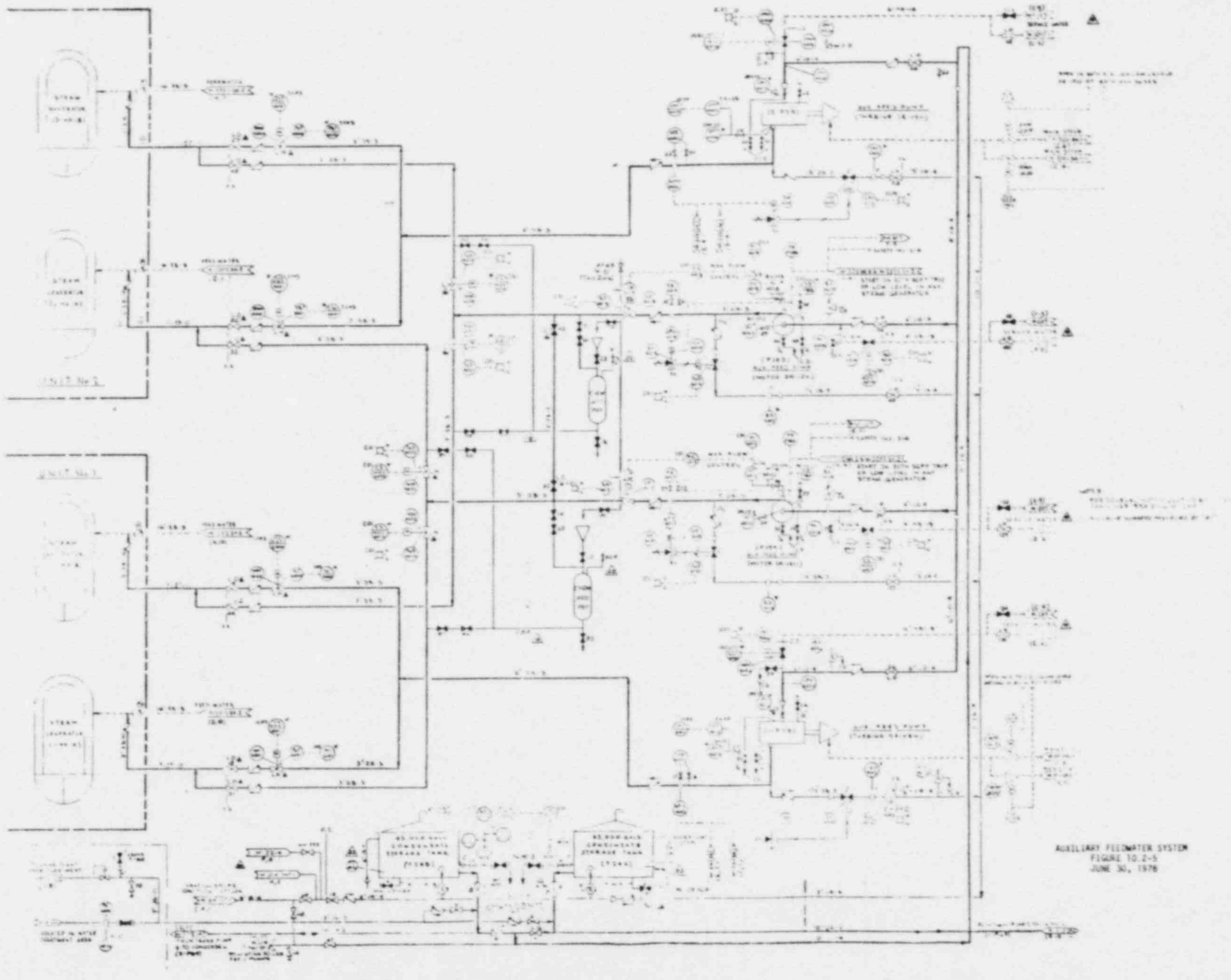

Figure 3

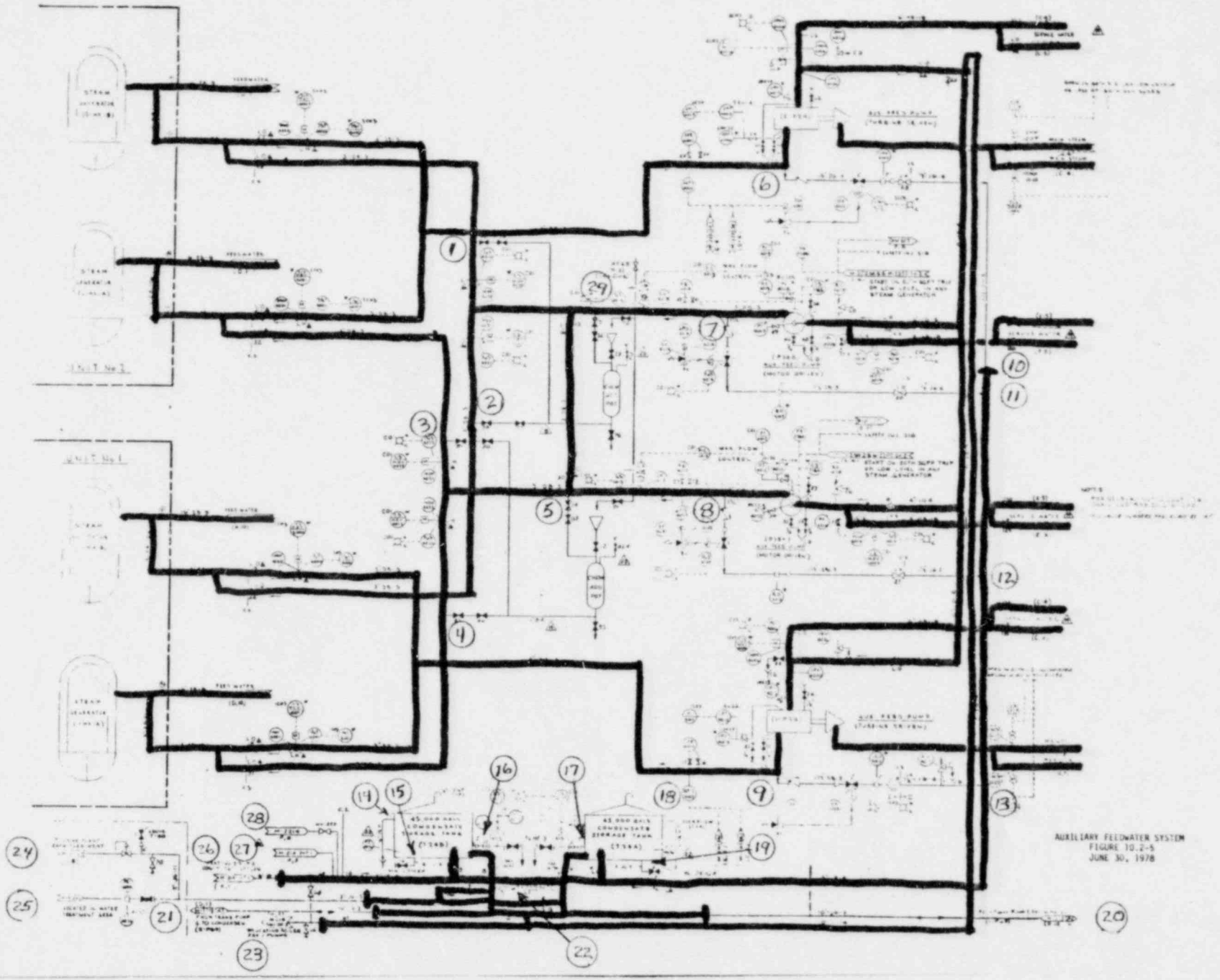

Figure 4

ATTACHMENT 2

WISCONSIN ELECTRIC'S APRIL 1982 SUBMITTAL
FOR NRC'S GENERIC LETTER NO. 81-14

TABLE 1

AUXILIARY FEEDWATER SEISMIC QUALIFICATION

(1) **Pumps/Motors**

(2) **Piping** - Branch Connections

(3) **Valves/Actuators**

(4) **Power Supplies**

(5) **Primary Water and Supply Path** - Condensate Storage Tanks

(6) **Secondary Water and Supply Path***

(7) **Initiation and Control System**

(8) **Structures Supporting or Housing these AFW System Items**
Turbine Building
Auxiliary Building Superstructure
Containment Facades

This table lists those components and structures associated with the AFWS which are not seismically qualified. See Attachment 1, Text, for Discussion of these items.

*Applicable only to those plants where the primary water supply or path is not provided, however, a seismically qualified alternate path exists.