Consumers Power Company

James W Cook
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April 5, 1982

Harold R Denton, Director
Office of Nuclear Reactor Regulation
US Nuclear Regulatory Commission
Washington, DC 20555

MIDLAND PROJECT
MIDLAND DOCKET NO 50-329, 50-330
SER ADDITIONAL INFORMATION CONCERNING MEB ISSUES
FILE: 0505.83 SERIAL: 16614
ENCLOSURES: (1) CP CO TELECONS OF TELEPHONE CONFERENCES BETWEEN NRC STAFF AND CP CO DURING NOVEMBER 1981
(2) APPROVED SAR CHANGE NOTICES FOR TABLES 3.2-1, 3.2-3 AND 3.2-6
(3) B&W COMPUTER PROGRAMS USED IN THE SEISMIC SUBSYSTEM ANALYSES
(4) TABLE 1.0 HIGH ENERGY BRANCH LINES FOR WHICH BREAK SELECTION HAS BEEN COMBINED WITH MAIN RUNS

The purpose of this letter is to document information provided in a meeting between the NRC staff and Consumers Power Company held on March 31, 1982. The meeting was held to resolve issues with regard to the Safety Evaluation Report (SER) on Sections 3.2.1, 3.2.2, 3.6.2, 3.7.3 and 3.9 of the FSAR.

Enclosure 1 is notes of a series of telephone conferences held in November 1981 to clarify the FSAR information and resolve as many of the draft SER issues as possible. Enclosure 2 consists of the approved SAR Change Notices we committed to provide, as early documentation concerning Tables 3.2-1, 3.2-3 and 3.2-6. Enclosure 3 is a response from B&W concerning their computer codes and verification used in seismic subsystem analysis. This response is applicable to the FSAR Subsection 3.7.3 and will be incorporated in Revision 43 of the FSAR.

The NRC staff has expressed a concern regarding the number of significant modes used in the NSSS seismic analysis. B&W has responded in a memo to Consumers Power Company by stating:

B001
s
1/1

> "In the seismic dynamic analysis, all the modes below 50 HZ are selected. The modes above 50 HZ are selected on the basis of higher participation factors of the critical component. This procedure takes into account all rigid body modes if they were above 50 HZ."

oc0482-0059a100

This information is also scheduled to be incorporated in FSAR Revision 43.

Tables 3.2-6 designates the safety classification of the decay heat removal coolers as I-3 for the tube side and I-4 (nonsafety) for the shell side. We can confirm that the decay heat removal coolers are treated as safety class I-2 for the tube side and I-3 for the shell side for preservice and inservice inspections. This is documented in "Volume I - Preservice Inspection Plan" submitted to the staff for review.

During the March 31, 1982 meeting, more documentation was requested on the method for postulating pipe breaks at branch connections. Break locations have not been selected at the large branch to main run intersections unless the calculated stress or usage factor has exceeded the threshhold criteria. Enclosure 4.0 is a table listing some of the plant systems which contain high energy piping requiring postulated breaks. For each system, the main run size is given along with the size of the smallest branch run for which break selections have been combined with the main runs. For branch connections smaller than those in Table 1.0, a terminal end is postulated at the branch connection.

We believe this letter and the enclosures adequately document and clarify the issues discussed earlier with the NRC staff concerning the preparation of the SER.

for J. W. Cook

JWC/WJC/dsb

CC PChen, ETEC, w/a
RJCook, Midland Resident Inspector, w/o
RHernan, NRC, w/a
RWHuston, Washington, w/a
DBMiller, Midland, w/a
JRajan, NRC, w/a

ENCLOSURE 1

CP Co Telecons of Telephone Conferences
Between NRC Staff and CP Co During November 1981

MIDLAND PROJECT

SAFETY & LICENSING DEPARTMENT

TELECON RECORD

Date 11/5/81

Participants	Company
Frank Cherney	NRC
Tony Capucci	NRC
Bob Bosnak*	NRC
DMBudzik*	CPCo
Bruce Henley	CPCo
Dave Perry	CPCo
Harry Daykin	CPCo
Don Lewis	Bechtel
Rob Burg	Bechtel
Bill Cloutier	CPCo

*Part Time

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TJS X
JEB ___
DMB X
BLH ___
MJS ___
JWC ___
GSK X
DTP X
DFL X
RCB X

SUBJECT:

FSAR Chapter 3 Preliminary Draft SER

Copies To:

File 0505.8C

UFI: _____

DISCUSSION:

The purpose of this telephone conference was to discuss a change in plans for the review meeting on open items on the subject draft SER. This meeting was scheduled for November 17, 1981. The new plan is to postpone or cancel this meeting and try and resolve as many of the draft SER issues through a series of telephone conferences. This would allow the staff to utilize their time more efficiently on reviewing the underground piping issue. Another meeting on the reactor vessel anchor bolt issue will be held early in December. Bob Bosnak suggested we reassess our progress in resolving the issues during the last week of November to determine if a review meeting needs to be rescheduled.

We spent the rest of the telephone conference discussing the issues CPCo identified in their letter serial 14538, dated October 16, 1981. We were able to provide some information and also determine which issues had to be deferred for later telecon. Bill Cloutier and Tony Capucci will speak again on Monday, November 11, 1981 to schedule some of the telephone conferences.

MIDLAND P. ECT

SAFETY & LICENSING DEPARTMENT

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TELECON RECORD

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RCB X
DMB X
BFH X
HWD X
JWC ___
GSK X

Date 11/9/81

Participants	Company
Tony Capucci	NRC
Bill Cloutier	CPCo

SUBJECT:

Copies To:

Telephone conference schedule to resolve MEB FSAR Chapter 3 Issues.

File 0505.80

UFI: _____

CCramer X
RBurg X
DFL X
RWH X
DHood X
DTP X

DISCUSSION:

I returned the call to Tony to schedule telephone conferences to resolve Draft SER issues. The following schedule was agreed upon:

DATE	TIME	TOPIC (SECTION)
11/12/81	1:00 pm	BC-TOP-9 and BN-TOP-2 (Section 3.6.2 P.3-2)
11/12/81	1:00 pm	Break Freeze Criteria (Section 3.6.2, P.3-3)
11/12/81	1:00 pm	Criteria for Bolt Analysis & Seismic Anchor Displacement (Section 3.9.3, Page 3-16)
11/12/81	1:00 pm	Method of Postulating Breaks - May 21, 1972 Meeting (Section 3.6.2, Page 3-3)
11/16/81	1:00 pm	Reg Guide 1.92 - (Section 3.7.3, Page 3-6, 7 item 3)
11/19/81	1:00 pm	Confirmatory Piping Analysis - BPC to make updated submittal by 11/16/81 (Section 3.9.1, Page 3-9)
11/18/81	1:00 pm	Table 3.9-9-10-11 and 15 and Code Case 1441 - B & W issue (Section 3.9.1, P 3-13)
11/23/81	1:00 pm	Inservice Inspection (Section 3.9.6, P3-20 and 3-21)

DISCUSSION:

The following issues listed in the CPCo October 16 letter are considered confirmatory, or will be handled seperately:

ISSUE (SECTION, PAGE)	STATUS
LOCA and jet impingement analysis (Section 3.6.2, Page 3-3)	Confirmatory
Class 1 piping analyzed using Class 2 procedures (Section 3.6.2, Page 3-3)	Confirmatory
B & W computer codes for NSSS analysis (Section 3.7.3, Page 3-5)	Confirmatory (submit 1 month ahead of Feb. 1982 FSAR Rev.)
Analysis of Piping and components for interactive effects (Section 3.7.3, Page 3-5)	Confirmatory (submit 1 month ahead of Feb. 1982 FSAR Rev.)
Verification of ME101	Confirmatory (Feb. 1982 FSAR Revision)
Interactive effects of Cat I piping with Non-Cat I piping	Waiting NRC Feedback on response to Reg Guide 1.29
18 inch containment purge valves	To be handled seperately by Equipment Qualification Branch
Underground Piping	Currently being discussed with the staff
RVAB Problem	To be discussed at a meeting in Bethesda in December, 1981

MIDLAND PROJECT

SAFETY & LICENSING DEPARTMENT

TELECON RECORD

Date 11/12/81

Participants		Company
AJCappucci	NRC	
PCCherny	NRC	
MHartzman	NRC	
PChen	ETEC	
JBrammer	ETEC	
DTPerry	CPCo	
[redacted]		7:00 @ 11/12/81
HWDaykin	CPCo	
DDKopinski	BPC	
RJBurg	BPC	
DTScribner	BPC	
JALegette	BPC	
MElgaaly	BPC	
BFHenley	CPCo	

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File 0505.80
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SUBJECT:

Telephone Conference to Resolve Chapter 3 Draft SER Issues

DISCUSSION:

The first issue discussed was the design criteria for embedded support bolts and the support seismic displacement load combinations. (Section 3.9.3, Pg 3-16). Mark Hartzman clarified the earlier discussion on seismic load combinations being combined as primary stresses rather than secondary stresses. John Legette BPC, confirmed that Midland was already combining the stresses in accordance with what the NRC was requesting. BPC licensing is actioned to check that the FSAR states this compliance or issue and SCN to reflect this compliance.

Concerning the design criteria for the bolts we stated that .9 FY was used for the normal stress allowable under fault conditions. The NRC staff has to review FSAR section 3.8.6 to check the applicable design codes and standards.

Seperately M. Hartzman was under the impression that Bechtel report BP-TOP-1 concerning seismic design and closely spaced modes was applicable to the Midland Project. We stated that this Topical was not applicable to the Midland Project and CPCo position on Reg Guide 1.92 would be discussed with them on 11/19/81. The staff stated that they felt strongly in favor of applying Reg Guide 1.92 to the Midland seismic analysis.

The next topic for discussion was the BC-TOP-9 and BC-TOP-2 (Section 3.6.2, Pg 3-2). The NRC staff feels that a dynamic intensification factor (DIF) of 1.10 SY should be used in pipe break analysis. Don Scribner (BPC) stated that Midland is using a 1.2 DIF based on BC-TOP-9A which the staff has reviewed and accepted. The staff will have to do more research on this matter. CPCo offered to send references which justify the higher DIF via Roger Huston.

The next topic for further discussion was the break freeze criteria for HELBA analysis (Section 3.6.2, Pg 3-3). We reaffirmed our position that we do not intend to postulate new intermediate breaks if our stress analysis results in new high stress positions which are not greater than 2.4Sm or 0.1 usage factor. The staff agreed that the revision to the SRP 3.6.1 was vague on what is meant by verifying the consequences of the new high stress position to other safety related systems. They stated that this was meant to be left in our engineering judgement as to when to verify the consequences of the new higher stress positions. We agreed to justify any particular break points of interest to staff at a later date.

The final topic for discussion was the method for postulating pipe breaks at branch connection (Section 3.6.2, Pg 3-3). Don Kopinski BPC stated the agreement resulting from the May 21, 1976 meeting minutes. There does not seem to be any disagreement on what should be done, but there is some confusion with ETEC on interpretation of what Midland is doing. We agreed to send a copy of the subject meeting minutes to the staff and ETEC. complete

F

MIDLAND PROJECT

SAFETY & LICENSING DEPARTMENT

TELECON RECORD

Date 11/18 & 11/19/81

Participants	Company
WJCloutier 11/24/81	CPCo
HWDaykin	CPCo
DTPerry	CPCo
DFLewis	BPC
RLBaker	B&W
FJLevandoski	B&W
* HBaker	B&W
JBrammer	ETEC
AJCappucci	NRC
** MHartzman	NRC
** EMorgan	B&W

* First Day Only
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RWH ✓

File 0505.803

SUBJECT:

Telephone Conference To Resolve Chapter 3 Draft SER Issues.

DISCUSSION:

The purpose of this telecon is to document our recent discussion with the MEB staff on draft SER issued during 11/18/81 and 11/19/81.

On November 18 we discussed Table 3.9-9-10-11 and 15 and Code Case 1441 (Section 3.9.3, Page 3-13). John Brammers concern was that there are some points in the tables that show stresses above the elastic allowables. B&W stated that those points were analyzed on an elastic-plastic evaluation and the allowable was based on the usage factor per code case 1441. This was acceptable to the staff and we agreed to clarify the tables to indicate that wherever the calculated stress was above the elastic allowable the usage factor became the applicable allowable.

Tony Cappucci was concerned that the three code class 1 valves identified in Table 3.9-3b had no apparent justification for not having a fatigue analysis. On November 19, B&W stated that these valves did not require a fatigue analysis because their sizes were 4 inch diameter or less. B&W will initiate an SCN to footnote Table 3.9-3b to indicate this fact for the next FSAR revision in February.

On November 19 Dave Perry discussed the CPCo position on the applicability of Regulatory Guide 1.92 concerning closely spaced modes and the design based seismic analysis. He stated that the CPCo position was not to implement R.G. 1.92. Tony Cappucci questioned us on the margins to code allowables from our sample study in Table 3D. Dave Perry stated that the margin was changing because of the changes in the building design. He suggested a better seismic margin analysis will be done in our Seismic Margin Review program, which would include the effects R.G. 1.92. This program would analyze a sample of the safe shutdown components as

an offline licensing analysis. John Brammer and the staff was concerned about the extent of the sample size of components to be reviewed in this Seismic Margin Review. We stated that we were still formulating the sample of equipments to be reviewed. Tony Cappucci stated that this issue would have to be discussed further with their management before it could be resolved. Bill Cloutier agreed to send a copy of the CPCo proposed Seismic Margin Review Program which we submitted to the staff earlier in August.

ENCLOSURE 2

Approved SAR Changes Notices for
Tables 3.2-1, 3.2-3 and 3.2-6

ORIGINAL

QUALITY ASSURANCE PROGRAM
SAR CHANGE NOTICE

1. ~~ORIGINAL~~ FSAR

OB NO. 7220 2. DISCIPLINE/COMPANY Licensing & Safety / Bechtel 3. No. 3152

4. ORIGINATOR S Khan 5. DATE March 11, 1982

6. REFERENCED SECTIONS OF SAR

Tables 3.2-1, 3.2-3, & 3.2-6.

7. DESCRIPTION OF CHANGE

Applicable Codes

8. REFERENCED SPECIFICATIONS OR DRAWINGS

NA

9. JUSTIFICATION

NRC request (attached)

10. BECHTEL DISCIPLINE INTERFACE REVIEW:

- ☐ ARCH
- ☑ CIVIL
- ☐ CONTROL SYS
- ☐ ELEC
- ☑ ~~MECH~~/NUCLEAR
- ☐ PLANT DSN
- ☐ PQAE
- ☐ STRESS
- ☐ OTHER

INTERFACING STAFF REVIEW:

- ☐ ARCH
- ☐ CIVIL
- ☐ CONTROL SYSTEM
- ☐ ELEC
- ☐ GEOTECH
- ☐ M & QS
- ☐ MECH
- ☐ NUCLEAR
- ☐ PLANT DSN
- ☐ RELIABILITY
- ☐ STRESS
- ☐ OTHER

MECH All tables applied 3/22/82

Rec'd for D.F. Lewis	3/12/82	S Khan	3/12/82	C Atwell	4/1/82
11. REVIEWED BY (Group Supervisor)	DATE	12. REVIEWED BY (SAR COORDINATOR)	DATE	13. REVIEWED BY (NUCLEAR ENGINEER)	DATE
D F Lewis for E M Hughes	3/29/82	Mary E. Clyde	4/1/82		
14. CONCURRENCE BY (PROJECT ENGINEER)	DATE	15. APPROVED BY (CPCo)	DATE	16. CONCURRENCE BY (NSSS SUPPLIER)	DATE

AA G 110473 REV 9 79
MIDLAND

0003152

UNITED STATES
NUCLEAR REGULATORY COMMISSION
WASHINGTON, D. C. 20555

FEB 22 1982

Return To
WJ Cloutier
For Info

ORIGINAL

Docket Nos.: 50-329 and 50-330

MEMORANDUM FOR: Robert L. Tedesco, Assistant Director for Licensing, DL

FROM: James P. Knight, Assistant Director for Components & Structures Engineering, DE

SUBJECT: SAFETY EVALUATION REPORT FOR MIDLAND PLANT, UNIT NOS. 1 AND 2, SECTIONS 3.2.1, 3.2.2, 5.2.1.1 AND 5.2.1.2

The Safety Evaluation Report for Section 3.2.1, Seismic Classification; Section 3.2.2, System Quality Group Classifications; Section 5.2.1.1, Codes and Standards Rule, 10CFR Part 50, Section 50.55a; and Section 5.2.1.2, Applicable Code Cases; as applicable to Midland Units 1 and 2 was issued June 6, 1979.

We reviewed all the applicable Amendments to the Midland FSAR issued after June 6, 1979 in order to assure that the Safety Evaluation Report for the above sections is still valid. Our review indicated that Table 3.2-1 had been extensively revised in the interim. Enclosure 1 identifies a number of errors and omissions that have been introduced into the table. We request that the applicant revise Table 3.2.1 to include our comments in a future Amendment to the FSAR. We find that although Table 3.2-1 has undergone considerable revision the Seismic and Quality Group classification are acceptable. Therefore, there is no need to update the SER for the above sections, provided the changes indicated in the enclosure are made in the FSAR.

James P. Knight, Assistant Director for
Components & Structures Engineering
Division of Engineering

Enclosure: As stated

cc: R. Vollmer, DE
D. Eisenhut, DL
R. Purple, DL
E. Adensam, DL
D. Hood, DL
R. Hernan, DL
H. Brammer, DE
F. Cherny, DE
R. Kirkwood, DE

Contact: R. Kirkwood, DE:MEB, x28436

ENCLOSURE 1

For Info Only
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0614Qi
Midland Units 1 and 2

ORIGINAL

The following comments are based on the MEB review of Table 3.2-1, 3.2-3 and 3.2-6 of the Midland FSAR. The appropriate tables should be revised to the satisfaction of the MEB in a future Amendment to the FSAR.

Table 3.2-1

Sheet 1. The seismic Category I classification of the containment building has been omitted.

Sheet 6. The feedwater ring header is incorrectly classified non-seismic Category I. This component was previously classified correctly as seismic Category I in Revision 28 and other previous revisions to the FSAR.

Sheet 8. Hydrazine pumps of the reactor building spray system have been omitted from the table. These pumps should be classified Quality Group B and seismic Category I. The construction code is Section III, Class 2.

Sheet 9. The construction code for containment piping is incorrectly classified as Section III, Class 3. This piping should be identified as Section III, Class 2, for the Combustible Gas Control System.

Sheet 16. Note D which is referenced under Seismic Category for the Fuel Handling System is missing.

Sheet 18. What does note "By amendment" mean which is referenced for the design code/standard for the RB spray pump seal coolers.

✓ Sheet 6. The tube side of the heat exchanger for the decay heat removal system is incorrectly identified as Section III, Class 3C. These components should be identified as Section III, Class C.

for Info only

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ORIGINAL

Table 3.2-3

Sheet 1. Same comment as for Table 3.2-1, Sheet 6. The core folding tanks are also incorrectly identified as Section III, Class 3C. These components should be identified as Section III, Class C.

Per Rev 52 these are III-3

Table 3.2-6

Sheet 2. The tube side of the DH removal cooler is incorrectly identified as Safety Classification I-3. This component should be identified as Safety Classification I-2.

The tube side of the DHR Ht ex is Safety Class 3, and not Safety Class 2.

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TABLE 3.2-1

DESIGN CRITERIA SUMMARY (1)

ORIGINAL

System/Component	FSAR Section	Location	Quality Group	Design Code/ Standard	Seismic Category	
SEISMIC CATEGORY I STRUCTURES						
Concrete Containment	3.8.1					
Containment building		C	NA	ACI-318(2) AWS D1.1	I	30
Crane supports		C	NA	ACI-318(2) AISC AWS D1.1	I	
Liner plate		C	NA	ACI-318(2) AISC AWS D1.1	I	
Penetration sleeve		C	NA	ACI-318(2)	I	
Personnel lock, emergency airlock, equipment hatch		C	NA	ACI-318(2) AISC ASME	I	30
Containment Internal Structures	3.8.3					
NSSS supports		C	NA	ACI-318(2) AISC AWS D1.1	I	
Other internal structures		C	NA	ACI-318(2) AISC AWS D1.1	I	
Auxiliary Building	3.8.4	A	NA	ACI-318(2) AISC AWS D1.1	I	
Diesel Generator Building	3.8.4	G	NA	ACI-318(2) AISC AWS D1.1	I	

TABLE 3.2-1 (continued)

System/Component	FSAR Section	Location	Quality Group	Design Code/ Standard	Seismic Category	
REACTOR COOLANT SYSTEM						
Reactor Vessel	5.3					
Vessel		C	(7)	III-A	I	
Closure head		C	(7)	III-A	I	
Closure head O-ring		C	(7)	III-A	I	
Closure assembly flanges for incore detector		C	(7)	III-A	I	30
Head studs, nuts, and washers		C	(7)	III-A	I	
Reactor Coolant Pumps	5.4.1					
Casing and internals		C	(7)	III-1	I	
Motor		C	(7)	SIP	I	
Motor stand		C	(7)	SIP	I	30
Steam Generators	5.4.2					
Tube side		C	(7)	III-A	I	
Shell side		C	(7)	III-A	I	
Feedwater header		C	(7)	B31.1	~~NA~~ I	30
Reactor Coolant Piping	5.4.3	C	(7)	B31.7	I	
Decay Heat Removal System	5.4.7					
Pumps		A	(7)	III-2	I	
Pump drive		A	(7)	SIP	I	
Heat exchanger						
Tube side		A	(7)	III-3C	I	
Shell side		A	(7)	VIII	I	8
Piping and valves		A,C	(7)	III-2	I	

SAN-3152 original

TABLE 3.2-1 (continued)

System/Component	FSAR Section	Location	Quality Group	Design Code/ Standard	Seismic Category	
ENGINEERED SAFETY FEATURES						
Reactor Building Spray System	6.2.2.1					
Spray pumps		A	B	III-2	I	13
Spray pump motors (Hydrazine Pumps)		A A	NA B	NEMA MG-1 III-2	I I	
Piping						
Spray header		C	B	III-2	I	
Other		0,C,A	B	III-2	I	13
Spray nozzles		C	NA	NA	NA	30
Valves						
Motor operated		A	B	III-2	I	13
Other		A,C	B	III-2	I	
Tanks						
Hydrazine		A	B	III-2	I	
Borated water storage		0	B	III-2 III-2	I	30
Recirculating Air Cooling Units	6.2.2.2					
Motors		C	NA	IEEE-323/ 334/344	I	34
Fans		C	NA	AMCA	I	
Cooling coils						
Tube side - service water		C	C	III-3	I	
Shell side - air		C	NA	NA	I	
Combustible Gas Control	6.2.5					
Hydrogen recombiners		C	NA	IEEE-323/344	I	30
Motors		A	NA	NEMA MG-1	NA	
Fans		A	NA	AMCA	NA	
Demisters		A	NA	MSAR-71-45	NA	30
Electric heater		A	NA	NEC, UL	NA	
HEPA filter		A	NA	HSI-306	NA	
Carbon adsorber		A	NA	CS-8T	NA	
Ductwork		A	NA	SMACNA	NA	
Dampers		A	NA	ANSI N509	NA	30

SAN-3152 S 31-82

BLIND NOTE: This addition duplicates information on table 3.2-3. Put on this table per NRC request. ltr dtd 3/31/82

ORIGINAL
SCN-315?

TABLE 3.2-1 (continued)

System/Component	FSAR Section	Location	Quality Group	Design Code/ Standard	Seismic Category	
Piping and valves						
Containment isolation valves and piping		C,A	B	III-2	I	30
Other containment piping		C	~~B~~ C (7)	III-3	I	34
Piping outside containment		A	D	B31.1	NA	
Core Flood System	6.3.2					34
Core flooding tank		C	(7)	III-C	I	
Piping and valves						
Tank to check valve		C	B	III-2	I	
Check valve to reactor		C	A	III-1	I	
Core flood tank vent system piping and valves		C	B	III-2	I	37
Reactor Building Penetration Pressurization System	6.8					
Pressurized water storage tanks		A	B	III-2	I	
Nitrogen tanks		U	B	III-2	I	30
Piping and valves						
Associated with isolation valve seal water system and penetration air pressurization system		A,C	B	III-2	I	
Containment penetrations		A,C	B	III-2	I	
Other		A,C	D	B31.1	NA	

Dimensions OK w/Mech. per JFG (LMS) 4/K 3/29/82

TABLE 3.2-3

MAJOR COMPONENTS DESIGN CODE[3] | 32

System/Component	FSAR Section	Design Code	Date or Rev.	Addendum	
Reactor Coolant System	5.0				
Reactor vessels		ASME III, Class A	1968	Summer 1968	
Steam generators		ASME III, Class A	1968	Summer 1968	
Feedwater ring headers		ANSI B31.1	1968	Errata, March 1969	| 32
Pressurizers		ASME III, Class A	1968	Summer 1968	
Reactor coolant pumps		ASME III, Class 1	1971	None	
Reactor coolant piping		ANSI B31.7	1968	Errata, June 1968	| 19
Decay Heat Removal System	5.4.7				
Decay heat removal (LPI) pumps		ASME III, Class 2	1971	Winter 1971	
Decay heat removal coolers:					
Tube side		ASME III, Class ~~A~~ C	1968	Winter 1969	
Shell side		ASME VIII	1968	Winter 1969	| 39
Core flooding tanks		ASME III, Class 3	1968	Summer 1968	| 32
Containment Heat Removal System	6.2.2				
Hydrazine pump		ASME III, Class 2	1977	Winter 1978	| 13
Reactor building spray pump		ASME III, Class 2	1971	Summer 1973	
Hydrazine tank		ASME III, Class 2	1974	Winter 1977	
Recirculating air cooling units:					| 32
Fans		AMCA-210	1974	None	
		AMCA-300	1967	1971	
Cooling coils		ASME III, Class 3	1974	Summer 1975	
Combustible Gas Control in Containment	6.2.5				
Hydrogen recombiners		IEEE/323/344			
Reactor Building Penetration Pressurization System	6.8				
Pressurized water storage tanks		ASME III, Class 2	1974	Winter 1976	| 32
Onsite Power Systems	8.3				
Emergency diesel generators		ASME III, Class 3	1974	Summer 1976	
		IEEE-387	1972	None	| 15
		DEMA	1972	None	

TABLE 3.2-6 (continued)

ORIGINAL

Decay heat removal system	
a. DH removal pumps	
Main steam safety valves	32
Core flooding tank	
a. Core flooding tank manway gaskets	32
Safety Classification I-3	
DH removal cooler (tube side)	32
Makeup purification system	
a. Seal return cooler b. Letdown cooler (shell side)	32
Safety Classification I-4	
DH removal cooler (shell side)	32
Valve - Main FW control	
Valve - Startup FW control	
Valve - Turbine bypass	
Lithium hydroxide mix tank	
Boric acid mix tank	
Lithium hydroxide pump	
Hydrazine pump	

STET remains I-3 DS2

STET

QUALITY ASSURANCE PROGRAM
SAR CHANGE NOTICE

ORIGINAL

1. ~~PSAR~~ FSAR

JOB NO. 7220 2. DISCIPLINE/COMPANY NUCLEAR/BECHTEL 3. No. 3-99

4. ORIGINATOR L. BAUER JB 5. DATE 2/23/82

6. REFERENCED SECTIONS OF SAR

TABLE 3.2-1

7. DESCRIPTION OF CHANGE

PROVIDE DESIGN CODE FOR RB SPRAY PUMP SEAL COOLERS

8. REFERENCED SPECIFICATIONS OR DRAWINGS

SPECIFICATION 7220-M54(Q), REV. 5 SECTION 4.2.1
VENDOR PRINT 7220-M54-11-9 PART # 7110

9. JUSTIFICATION

UPDATE SAR

RWS # N-30006IAA

10. BECHTEL DISCIPLINE INTERFACE REVIEW:

- ☐ ARCH
- ☐ CIVIL
- ☐ CONTROL SYS
- ☐ ELEC
- ☑ MECH/~~NUCLEAR~~
- ☐ PLANT DSN
- ☐ PQAE
- ☐ STRESS
- ☐ OTHER

INTERFACING STAFF REVIEW:

- ☐ ARCH
- ☐ CIVIL
- ☐ CONTROL SYSTEM
- ☐ ELEC
- ☐ GEOTECH
- ☐ M & QS
- ☐ MECH
- ☐ NUCLEAR
- ☐ PLANT DSN
- ☐ RELIABILITY
- ☐ STRESS
- ☐ OTHER

[signature] 3/3/82

[signature]	2/22/82	[signature]	3/1/82	[signature]	3/18/82
11. REVIEWED BY (Group Supervisor)	DATE	12. REVIEWED BY (SAR COORDINATOR)	DATE	13. REVIEWED BY (NUCLEAR ENGINEER)	DATE
D.S. Lewis, for E M HUGHES	3/4/82	Gary E. Clyde	3/17/82	N/A	
14. CONCURRENCE BY (PROJECT ENGINEER)	DATE	15. APPROVED BY (CPCo)	DATE	16. CONCURRENCE BY (NSSS SUPPLIER)	DATE

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MIDLAND

TABLE 3.2-1 (continued)

System/Component	FSAR Section	Location	Quality Group	Design Code/ Standard	Seismic Category
Self-cleaning strainer					
Vessel		W	C	III-3	I
Motors		W	NA	IEEE/323/344	I
Component Cooling Water System	9.2.2				
Surge tank		A	C	III-3	I
CCW pumps		A	C	III-3	I
CCW heat exchangers		A	C	III-3	I
CCW booster pumps		A	D	HI	NA
RCP seal coolers		C	(7)	III-1	I
RCP motor coolers		C	(7)	TEMA-C	NA
CRDM		C	(7)	NA	NA
Letdown coolers		C	(7)	III-3	NA
Fuel pool heat exchangers		A	C	III-3	I
Radwaste evaporator condensers		A	D	VIII	NA
Degasifiers, effluent coolers, and condensers		A	D	VIII	NA
Waste gas compressors		A	D	NA	NA
Reactor plant sample system coolers		A	D	VIII	NA
Seal return coolers		A	(7)	III-3	NA
Decay heat removal heat exchangers		A	(7)	VIII	I
RB spray pump seal coolers		A	C	III-2 ~~By amendment~~	I
Decay heat removal pump seal coolers		A	(7)	III-3	I
Chemical pot feeders		A	D	NA	NA
Makeup pump lube oil coolers		A	(7)	TEMA-C	I

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ENCLOSURE 3

B&W Computer Programs Used in the Seismic Subsystem Analyses

Section 3.7.3

Extensive use was made of several Babcock and Wilcox computer programs for the seismic analyses. Some of them were structural analysis codes and the remaining were data reduction codes. These codes have been verified by hand calculations, compared with classic solutions, experimental test data or public domain computer codes. All codes used were Q/A certified which means that they are verified in accordance with NRC Standard Review Plan. In addition, there is an in-house program going on for verification using NUREG/CR-1677, "Piping Benchmark Problems," dated August 1980. All of these codes represent state of the art.

1.0 Structural Analysis Codes

1.1 STALUM Version 16.0 and Up

1.2 HYDROE Version 3.0 and Up

1.3 RESPECT Version 9.6 and Up

2.0 Data Reduction Codes

2.1 STDEC Version 9.2 and Up

2.2 SI235 Version 4.0 and Up

3.0 STALUM

A computer program for analyzing three-dimensional, finite segment systems consisting of uniform or nonuniform piping segments, closed-loop arrangements and supporting elements. STALUM performs both static and dynamic structural analyses undergoing small linear, elastic deformations. The static analysis is

based on the matrix displacement method. The static loadings are static mechanical forces, thermal and/or support displacement loadings. The dynamic analysis is based on lumped-mass and normal-mode extraction techniques. The dynamic input loadings can be response spectra or force time history.

The essential input to the program consists of the physical properties of the system, the boundary conditions and/or the loading information; the essential output consists of the resultant point displacement, rotations, forces and moments at both ends of each segment and stresses at various locations in each segment.

4.0 HYDROE

A computer program which calculates the hydrodynamic mass matrix for a system of coaxial cylindrical shells coupled by a fluid gap. The boundary condition of the shells can be arbitrary whereas the end conditions of the fluid gaps can be pressure released or hard wall. The solution is based on a wave equation for the fluid region with structural motion imposed on the boundary conditions. The structural mode shapes are then expanded as an eigenfunction series in terms of the acoustical mode shape.

5.0 RESPECT

A computer program which calculates maximum acceleration response of a single degree of freedon (SDOF) oscillator subjected to an input acceleration time history at the base. A SDOF is described by a second order differential equation which contains a coefficient described as the eigenvalue or natural frequency squared. When this equation is solved for an input acceleration

time history with varying eigenvalues, the resulting maximum acceleration response and natural frequency form an acceleration response spectra (ARS).

This program also calculates an ARS due to structural amplification between a known point and an attachment point. This technique requires a structural response spectra solution (accelerations and inertia forces) and the associated acceleration time history).

6.0 STDEC

A pre- and post-processor code used to link various codes to edit the data and to calculate key frequencies. This code tabulated frequencies and component participation in a more usable format.

7.0 SI235

A post-processor program used to tabulate force moments, displacements and rotations in a report format.

ENCLOSURE 4.0
Table 1.0

High Energy Branch Lines for Which Break
Selection Has Been Combined With the Main Runs

TABLE 1.0

High Energy Branch Lines for Which Break Selection Has Been Combined With the Main Runs

System	Main Run Size	Branch Run Size
Inside Containment		
Main Steam	36"	26"
Main Feedwater	18"	14"
Steam Generator Recirculation	3"	2"
	3"	1-1/2"
Decay Heat	2-1/2"	2"
Outside Containment		
Main Steam	36"	26"
Evaporator Steam	36"	26"
Letdown	2-1/2"	1-1/2"
Makeup and Purification	2"	1-1/2"
	4"	2-1/2"