Consumers Power Company

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Dennis M Crutchfield, Chief
Operating Reactors Branch No 5
Nuclear Reactor Regulation
US Nuclear Regulatory Commission
Washington, DC 20555

DOCKET 50-155 - LICENSE DPR-6 -
BIG ROCK POINT PLANT -
FIRE PROTECTION

NRC letter dated April 30, 1982 entitled "Fire Protection Rule - 10 CFR 50.48(c)(5) - Alternative Safe Shutdown - Section III.G.3 of Appendix R to 10 CFR 50 - Big Rock Point", requested Consumers Power Company to provide a complete response to items pertaining to associated circuits indicated in Enclosure 1. On July 9, 1982 Consumers Power Company submitted to the NRC our response to the NRC letter of April 30, 1982. After our letter was submitted on July 9, 1982 we continued to verify the information enclosed to determine if additions or corrections were necessary. This review process coupled with the discussions between the NRC and Consumers Power Company at Big Rock Point (BRP) on September 8 and 9, 1982 has resulted in the attached document. This submittal supersedes Consumers Power Company letter dated July 9, 1982.

Our July 9, 1982 submittal mistakenly classified the approach we used for determining the interaction of associated circuits with shutdown systems as the "Fire Area Approach". The approach we actually used was a combination of the "Systems" and "Fire Area" approaches. The approach taken by Consumers Power Company is as follows. A list of all equipment and valves in the plant was reviewed to determine if maloperation of each item could possibly affect safe shutdown capability. The items having no effect were then deleted from further consideration. The remaining items were analyzed to determine which circuits were contained in the six applicable fire areas. These circuits are listed in Section 1b. Each particular cable was then looked at to see if its failure could contribute to maloperation, if it could, the circuit is marked yes in the asociated circuit column, if not, it is marked no.

It was indicated at the September 9, 1982 meeting with the NRC that our exemption request pertaining to the associated non-safety circuits in the control room (Attachment D, Item 5 of our July 9, 1982 letter) was probably

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unnecessary due to the fact that most, if not all, the circuits entering the control room had already been analyzed in part 1d for the other fire areas with no major problems identified. Thus, we have since analyzed the control room circuits. Each cable for the equipment of concern that comes into the control room is listed under Fire Area number 1 of part 1b. Internal wiring and equipment such as hand-switches are not listed. A review of the internal wiring and equipment has been performed for the equipment of concern and, as suspected, none of the conclusions of part 1d are affected. However, separation of the emergency condenser inlet valve hand-switches, the core spray valve hand-switches and Reactor Depressurization System (RDS) controls do not meet the requirements prescribed in Section III.G.2 of Appendix R to 10 CFR 50. This concern is evaluated in Attachment D, Item 3.

It should be noted that part 1b is addressed for six specific areas of the plant. By letter dated November 24, 1980, the NRC transmitted Appendix R along with a cover letter explaining the requirments of Appendix R that applied specifically to Big Rock Point. Enclosure 2 of that letter contained the requirements of an Alternate Safe Shutdown System. The enclosure states that alternate shutdown capability be provided for six specific areas of the plant. These are the areas addressed in part 1b. It is not clear whether part 1b was supposed to address the rest of the plant in addition to these six areas or not. In any case, due to the combined systems/fire area approach used by Consumers Power Company, all areas of the plant have been covered by the analysis.

Our review of associated circuits in the Fire Areas did identify a number of potential associated circuits. The methods by which Consumers Power Company proposes to protect the capability to safely shutdown from fire induced failures of such circuits are identified in Attachment A. The methods proposed are consistent with the guidelines the NRC provided in Section 3 of enclosure 2 to the April 7, 1982 NRC letter for the Palisades Plant and with the Staff's positions and perspectives as reflected in the Nuclear Utility Fire Protection Group's letter of March 16, 1982 to Richard H Vollmer of the NRC.

A number of changes and additions have been made to this submittal from our July 9, 1982 submittal. A few circuits were deleted, some which were originally listed as not being associated were later determined to be associated, some circuit numbers contained typographical errors and a majority of the potential associated circuits involved revisions to their results and conclusion sections in Part 1d of Attachment A. All changes and additions are shown by a vertical line in the right hand margin.

Attachment B provides Consumers Power Company's response to Enclosure 2 of NRC letter dated April 30, 1982. To support our response to Attachment B, Item 3 we have included Attachment 18 from our letter dated March 30, 1982 as Attachment C to this letter.

Attachment D provides exemption requests to the requirements of Section III.G and III.L of Appendix R to 10 CFR 50. Significant changes have been made to Exemption Requests 1, 2, 3, 6 and 7, with Exemption Request 5 from our July 9,

1982 letter deleted altogether. The last Attachment (F) provides our responses to questions raised during our September 8 and 9, 1982 meeting with the NRC at Big Rock Point.

David J VandeWalle
Nuclear Licensing Administrator

CC Administrator, Region III, USNRC
NRC Resident Inspector-Big Rock Point

Attachments

ATTACHMENT A

Consumers Power Company
Big Rock Point Plant
Docket 50-155

ASSOCIATED CIRCUITS
September 28, 1982

25 pages

ATTACHMENT A
ASSOCIATED CIRCUITS

The following sections provide Consumers Power Company's responses to Enclosure 1 of NRC letter dated April 30, 1982. As stated previously, the fire area approach, as outlined in the NRC letter of April 30, 1982, was used for the analysis and the sections which follow are formatted accordingly.

1a. Provide a table that lists all the power cables in the fire area that connect to the same power supply of the alternative or dedicated shutdown method and the function of each power cable listed.

RESPONSE: The alternate shutdown system has its own battery power supply. Therefore, for all fire areas there are no power circuits connected to the power supply of the alternate shutdown system.

1b. Provide a table that lists all the cables in the fire areas that were considered for possible spurious operation which would adversely affect shutdown and the function of each cable listed.

RESPONSE:

FIRE AREA #1 - CONTROL ROOM

Cable No	Scheme No	Device No	Ref Dwg	Assoc Ckt	Function
C01-N01/5	5414	MO7068	M-123 E-103	Yes	Control Circuit
C01-R01/1	6404	MO7056	M-107 E-112, Sh 1	Yes	Control Circuit
C01-R01/5	6404	MO7056	M-107 E-112, Sh 1	Yes	Control Circuit
C01-C02/14	6606	MO7065	M-121 E-112, Sh 2	Yes	Control Circuit
C01-D01/6	6606	MO7065	M-121 E-112, Sh 2	Yes	Control Circuit
C01-Y01/6	9502	CV4107	M-106 E-107	No	
C01-Z05/3	9502	CV4107	M-106 E-107	No	
C01-Z01/3	2502	CV4090 CV4016	M-106 E-110	Yes	Control Circuit
C01-Z03/2	2502	CV4090	M-106 E-110	No	
C01-Y01/1	2502	CV4090 CV4016	M-106 E-110	Yes	Power
C02-P15/2	2427	P-57	M-106 E-110	No	
C01-R01/2	6406	MO7057	M-107 E-112, Sh 1	Yes	Control

1b. RESPONSE: (Contd)

FIRE AREA #1 - CONTROL ROOM (Contd)

Cable No	Scheme No	Device No	Ref Dwg	Assoc Ckt	Function
C01-R02/3	6405	MO7058	M-107 E-112, Sh 1	No	
C01-R01/5	6405	MO7058	M-107 E-112, Sh 1	No	
C01-R01/6	6406	MO7057	M-107 E-112, Sh 1	Yes	Control
C01-R02/4	6407	MO7059	M-107 E-112, Sh 1	No	
C01-R02/6	6407	MO7059	M-107 E-112, Sh 1	No	
C02-Z14/5	6514	NC27A-A2	0740X30743, Sh 2	Yes	Control
C02-Z15/6	6514	NC27A-A3	0740X30743, Sh 2	Yes	Control
C02-Z16/5	6514	NC27A-A4	0740X30743, Sh 2	Yes	Control
C02-Z17/6	6514	NC27A-A5	0740X30743, Sh 2	Yes	Control
C02-Z18/6	6514	NC27A-B1	0740X30743, Sh 2	Yes	Control
C02-Z19/3	6514	NC27A-B2	0740X30743, Sh 2	Yes	Control
C02-Z20/1	6514	NC27A-B3	0740X30743, Sh 2	Yes	Control
C02-Z21/1	6514	NC27A-B4	0740X30743, Sh 2	Yes	Control
C02-Z22/2	6514	NC27A-B5	0740X30743, Sh 2	Yes	Control
C02-Z23/2	6514	NC27A-B6	0740X30743, Sh 2	Yes	Control
C02-Z24/2	6514	NC27A-C1	0740X30743, Sh 2	Yes	Control
C02-Z25/2	6514	NC27A-C2	0740X30743, Sh 2	Yes	Control
C02-Z26/1	6514	NC27A-C3	0740X30743, Sh 2	Yes	Control
C02-Z27/1	6514	NC27A-C4	0740X30743, Sh 2	Yes	Control
C02-Z28/2	6514	NC27A-C5	0740X30743, Sh 2	Yes	Control
C02-Z29/1	6514	NC27A-C6	0740X30743, Sh 2	Yes	Control
C02-Z30/2	6514	NC27A-D1	0740X30743, Sh 2	Yes	Control
C02-Z31/2	6514	NC27A-D2	0740X30743, Sh 2	Yes	Control
C02-Z32/2	6514	NC27A-D3	0740X30743, Sh 2	Yes	Control
C02-Z33/2	6514	NC27A-D4	0740X30743, Sh 2	Yes	Control
C02-Z34/1	6514	NC27A-D5	0740X30743, Sh 2	Yes	Control
C02-Z35/2	6514	NC27A-D6	0740X30743, Sh 2	Yes	Control
C02-Z36/1	6514	NC27A-E1	0740X30743, Sh 2	Yes	Control
C02-Z37/2	6514	NC27A-E2	0740X30743, Sh 2	Yes	Control
C02-Z38/1	6514	NC27A-E3	0740X30743, Sh 2	Yes	Control
C02-Z39/1	6514	NC27A-E4	0740X30743, Sh 2	Yes	Control
C02-Z40/2	6514	NC27A-E5	0740X30743, Sh 2	Yes	Control
C02-Z41/1	6514	NC27A-E6	0740X30743, Sh 2	Yes	Control
C02-Z42/1	6514	NC27A-F2	0740X30743, Sh 2	Yes	Control
C02-Z43/2	6514	NC27A-F3	0740X30743, Sh 2	Yes	Control
C02-Z44/2	6514	NC27A-F4	0740X30743, Sh 2	Yes	Control
C02-Z45/2	6514	NC27A-F5	0740X30743, Sh 2	Yes	Control
C02-Z14/6	6515	NC27B-A2	0740X30743, Sh 2	Yes	Control
C02-Z15/7	6515	NC27B-A3	0740X30743, Sh 2	Yes	Control
C02-Z16/6	6515	NC27B-A4	0740X30743, Sh 2	Yes	Control

1b. RESPONSE: (Contd)

FIRE AREA #1 - CONTROL ROOM (Contd)

Cable No	Scheme No	Device No	Ref Dwg	Assoc Ckt	Function
C02-Z17/7	6515	NC27B-A5	0740X30743, Sh 2	Yes	Control
C02-Z18/7	6515	NC27B-B1	0740X30743, Sh 2	Yes	Control
C02-Z19/4	6515	NC27B-B2	0740X30743, Sh 2	Yes	Control
C02-Z20/2	6515	NC27B-B3	0740X30743, Sh 2	Yes	Control
C02-Z21/2	6515	NC27B-B4	0740X30743, Sh 2	Yes	Control
C02-Z22/3	6515	NC27B-B5	0740X30743, Sh 2	Yes	Control
C02-Z23/3	6515	NC27B-B6	0740X30743, Sh 2	Yes	Control
C02-Z24/3	6515	NC27B-C1	0740X30743, Sh 2	Yes	Control
C02-Z25/3	6515	NC27B-C2	0740X30743, Sh 2	Yes	Control
C02-Z26/2	6515	NC27B-C3	0740X30743, Sh 2	Yes	Control
C02-Z27/2	6515	NC27B-C4	0740X30743, Sh 2	Yes	Control
C02-Z28/3	6515	NC27B-C5	0740X30743, Sh 2	Yes	Control
C02-Z29/2	6515	NC27B-C6	0740X30743, Sh 2	Yes	Control
C02-Z30/3	6515	NC27B-D1	0740X30743, Sh 2	Yes	Control
C02-Z31/3	6515	NC27B-D2	0740X30743, Sh 2	Yes	Control
C02-Z32/4	6515	NC27B-D3	0740X30743, Sh 2	Yes	Control
C02-Z33/3	6515	NC27B-D4	0740X30743, Sh 2	Yes	Control
C02-Z34/2	6515	NC27B-D5	0740X30743, Sh 2	Yes	Control
C02-Z35/3	6515	NC27B-D6	0740X30743, Sh 2	Yes	Control
C02-Z36/2	6515	NC27B-E1	0740X30743, Sh 2	Yes	Control
C02-Z37/3	6515	NC27B-E2	0740X30743, Sh 2	Yes	Control
C02-Z38/2	6515	NC27B-E3	0740X30743, Sh 2	Yes	Control
C02-Z39/2	6515	NC27B-E4	0740X30743, Sh 2	Yes	Control
C02-Z40/3	6515	NC27B-E5	0740X30743, Sh 2	Yes	Control
C02-Z41/2	6515	NC27B-E6	0740X30743, Sh 2	Yes	Control
C02-Z42/2	6515	NC27B-F2	0740X30743, Sh 2	Yes	Control
C02-Z43/3	6515	NC27B-F3	0740X30743, Sh 2	Yes	Control
C02-Z44/3	6515	NC27B-F4	0740X30743, Sh 2	Yes	Control
C02-Z45/3	6515	NC27B-F5	0740X30743, Sh 2	Yes	Control
C02-Z46/2	6515	SV/NC22B	0740X30743, Sh 2	Yes	Control
C02-Z47/2	6515	SV/NC22D	0740X30743, Sh 2	Yes	Control
C02-Z46/1	6514	SV/NC22A	0740X30743, Sh 2	Yes	Control
C02-Z47/1	6514	SV/NC22C	0740X30743, Sh 2	Yes	Control
C02-Z50/2	6514	SV/NC22F&G	0740X30743, Sh 2	Yes	Control
C02-Z50/2A	6515	SV/NC22H&J	0740X30743, Sh 2	Yes	Control
C02-N01/1	D01	MO7064	M-123 E-103	Yes	Control
D10-N01/1	D01	MO7064	M-123 E-103	Yes	Power
C02-M(H78)/1	D01	MO7064	M-123 E-103	No	
C02-R02/1	D02	MO7072	M-123 E-103	No	
D10-N02/1	D02	MO7072	M-123 E-103	Yes	Power

1b. RESPONSE: (Contd)

FIRE AREA #1 - CONTROL ROOM (Contd)

Cable No	Scheme No	Device No	Ref Dwg	Assoc Ckt	Function
C01-Z02/2	2502	CV4016	E-110	Yes	Control
C01-Z09/4	6512	SVNC22E	0740F30731 Sheet 2	Yes	Control

1b. RESPONSE (Contd)

FIRE AREA #2 - CABLE SPREADING ROOM

All in Control Room plus the following:

Cable No	Scheme No	Device No	Ref Dwg	Assoc Ckt	Function
P22-N01/4	5414	MO7068	M-123 E-103	Yes	Power
D01-R01/18	6606	MO7065	M-121 E-112, Sh 2	Yes	Power
Z05-Z06/4	9502	CV4107	M-106 E-107	Yes	Power
Z06-Z07/1	9502	CV4107	E-107	No	
Y01-Z06/1	9502	CV4107	E-107	No	
P17-P15/1	1407	P-57	E-101 E-102	No	
P11-P17/1	1433	P-57	E-101 E-102	No	
P11-P17/2	1433	P-57	E-101 E-102	No	
N02-R02/4	D02	MO7072	M-123 E-103	Yes	Control and Power
C01-Z09/4	6512	SVNC22E	0740F30731 Sheet 2	Yes	Control
N02-R02/5	D02	MO7072	M-123 E-103	Yes	Control and Power

1b. RESPONSE (Contd)

FIRE AREA #3 - TURBINE GENERATOR BUILDING

Cable No	Scheme No	Device No	Ref Dwg	Assoc Ckt	Function
None					

1b. RESPONSE (Contd)

FIRE AREA #4 - CONDENSATE PUMP ROOM

Cable No	Scheme No	Device No	Ref Dwg	Assoc Ckt	Function
C01-Z01/3	2502	CV4090	M-106 E-110	Yes	Control
Z01-Z03/1	2502	CV4090	M-106 E-110	No	
C01-Z03/2	2502	CV4090	M-106 E-110	No	
Z01-Z02/3	2502	CV4090	M-106 E-110	No	
P15-R01/10	2427	P-57	M-106 E-110	No	
C02-P15/2	2427	P-57	M-106 E-110	No	
P17-P15/1	1407	P-57	E-101 E-102	No	
C01-Z03/2	2502	CV4016	M-106 E-110	Yes	Control
C01-Y01/1	2502	CV4090 CV4016	M-106 E-110	Yes	Power

1b. RESPONSE (Contd)

FIRE AREA #5 - EXTERIOR PENETRATION ROOM

Cable No	Scheme No	Device No	Ref Dwg	Assoc Ckt	Function
N01-R01/33	5414	MO7068	M-123 E-103	Yes	Power and Control
C01-R01/1	6404	MO7056	M-107 E-112, Sh 1	No	
D01-R01/18	6606	MO7065	M-121 E-112, Sh 2	Yes	Power
C01-Z01/3	2502	CV4090	M-106 E-110	Yes	Control
C01-Z03/2	2502	CV4090	M-106 E-110	No	
C01-Y01/1	2502	CV4016	M-106 E-110	Yes	Power
C02-P15/2	2427	P-57	M-106 E-110	No	
P17-P15/1	1407	P-57	E-101 E-102	No	
Z01-Z02/35	6509	CV4029	M-111 E-115, Sh 2	Yes	Control
C01-R01/2	6406	MO7057	M-107 E-112, Sh 1	Yes	Control
C01-R02/3	6405	MO7058	M-107 E-112, Sh 1	No	
C01-R02/5	6405	MO7058	M-107 E-112, Sh 1	No	
C01-R01/5	6404	MO7056	M-107 E-112, Sh 1	Yes	Control
C01-R01/6	6406	MO7057	M-107 E-112, Sh 1	Yes	Control
C01-R02/4	6407	MO7059	M-107 E-112, Sh 1	No	
C01-R02/6	6407	MO7059	M-107 E-112, Sh 1	No	
C02-Z14/5	6514	NC27A-A2	0740X30743, Sh 2	Yes	Control
C02-Z15/6	6514	NC27A-A3	0740X30743, Sh 2	Yes	Control
C02-Z16/5	6514	NC27A-A4	0740X30743, Sh 2	Yes	Control
C02-Z17/6	6514	NC27A-A5	0740X30743, Sh 2	Yes	Control
C02-Z18/6	6514	NC27A-B1	0740X30743, Sh 2	Yes	Control
C02-Z19/3	6514	NC27A-B2	0740X30743, Sh 2	Yes	Control
C02-Z20/1	6514	NC27A-B3	0740X30743, Sh 2	Yes	Control
C02-Z21/1	6514	NC27A-B4	0740X30743, Sh 2	Yes	Control
C02-Z22/2	6514	NC27A-B5	0740X30743, Sh 2	Yes	Control
C02-Z23/2	6514	NC27A-B6	0740X30743, Sh 2	Yes	Control
C02-Z24/2	6514	NC27A-C1	0740X30743, Sh 2	Yes	Control
C02-Z25/2	6514	NC27A-C2	0740X30743, Sh 2	Yes	Control
C02-Z26/1	6514	NC27A-C3	0740X30743, Sh 2	Yes	Control

1b. RESPONSE (Contd)

FIRE AREA #5 - EXTERIOR PENETRATION ROOM (Contd)

Cable No	Scheme No	Device No	Ref Dwg	Assoc Ckt	Function
C02-Z27/1	6514	NC27A-C4	0740X30743, Sh 2	Yes	Control
C02-Z28/2	6514	NC27A-C5	0740X30743, Sh 2	Yes	Control
C02-Z29/1	6514	NC27A-C6	0740X30743, Sh 2	Yes	Control
C02-Z30/2	6514	NC27A-D1	0740X30743, Sh 2	Yes	Control
C02-Z31/2	6514	NC27A-D2	0740X30743, Sh 2	Yes	Control
C02-Z32/3	6514	NC27A-D3	0740X30743, Sh 2	Yes	Control
C02-Z33/2	6514	NC27A-D4	0740X30743, Sh 2	Yes	Control
C02-Z34/1	6514	NC27A-D5	0740X30743, Sh 2	Yes	Control
C02-Z35/2	6514	NC27A-D6	0740X30743, Sh 2	Yes	Control
C02-Z36/1	6514	NC27A-E1	0740X30743, Sh 2	Yes	Control
C02-Z37/2	6514	NC27A-E2	0740X30743, Sh 2	Yes	Control
C02-Z38/1	6514	NC27A-E3	0740X30743, Sh 2	Yes	Control
C02-Z39/1	6514	NC27A-E4	0740X30743, Sh 2	Yes	Control
C02-Z40/2	6514	NC27A-E5	0740X30743, Sh 2	Yes	Control
C02-Z41/1	6514	NC27A-E6	0740X30743, Sh 2	Yes	Control
C02-Z42/1	6514	NC27A-F2	0740X30743, Sh 2	Yes	Control
C02-Z43/2	6514	NC27A-F3	0740X30743, Sh 2	Yes	Control
C02-Z44/2	6514	NC27A-F4	0740X30743, Sh 2	Yes	Control
C02-Z45/2	6514	NC27A-F5	0740X30743, Sh 2	Yes	Control
C02-Z14/6	6515	NC27B-A2	0740X30743, Sh 2	Yes	Control
C02-Z15/7	6515	NC27B-A3	0740X30743, Sh 2	Yes	Control
C02-Z16/6	6515	NC27B-A4	0740X30743, Sh 2	Yes	Control
C02-Z17/7	6515	NC27B-A5	0740X30743, Sh 2	Yes	Control
C02-Z18/7	6515	NC27B-B1	0740X30743, Sh 2	Yes	Control
C02-Z19/4	6515	NC27B-B2	0740X30743, Sh 2	Yes	Control
C02-Z20/2	6515	NC27B-B3	0740X30743, Sh 2	Yes	Control
C02-Z21/2	6515	NC27B-B4	0740X30743, Sh 2	Yes	Control
C02-Z22/3	6515	NC27B-B5	0740X30743, Sh 2	Yes	Control
C02-Z23/3	6515	NC27B-B6	0740X30743, Sh 2	Yes	Control
C02-Z24/3	6515	NC27B-C1	0740X30743, Sh 2	Yes	Control
C02-Z25/3	6515	NC27B-C2	0740X30743, Sh 2	Yes	Control
C02-Z26/2	6515	NC27B-C3	0740X30743, Sh 2	Yes	Control
C02-Z27/2	6515	NC27B-C4	0740X30743, Sh 2	Yes	Control
C02-Z28/3	6515	NC27B-C5	0740X30743, Sh 2	Yes	Control
C02-Z29/2	6515	NC27B-C6	0740X30743, Sh 2	Yes	Control
C02-Z30/3	6515	NC27B-D1	0740X30743, Sh 2	Yes	Control
C02-Z31/3	6515	NC27B-D2	0740X30743, Sh 2	Yes	Control
C02-Z32/4	6515	NC27B-D3	0740X30743, Sh 2	Yes	Control
C02-Z33/3	6515	NC27B-D4	0740X30743, Sh 2	Yes	Control
C02-Z34/2	6515	NC27B-D5	0740X30743, Sh 2	Yes	Control
C02-Z35/3	6515	NC27B-D6	0740X30743, Sh 2	Yes	Control
C02-Z36/2	6515	NC27B-E1	0740X30743, Sh 2	Yes	Control
C02-Z37/3	6515	NC27B-E2	0740X30743, Sh 2	Yes	Control
C02-Z38/2	6515	NC27B-E3	0740X30743, Sh 2	Yes	Control
C02-Z39/2	6515	NC27B-E4	0740X30743, Sh 2	Yes	Control

1b. RESPONSE (Contd)

FIRE AREA #5 - EXTERIOR PENETRATION ROOM (Contd)

Cable No	Scheme No	Device No	Ref Dwg	Assoc Ckt	Function
C02-Z40/2	6515	NC27B-E5	0740X30743, Sh 2	Yes	Control
C02-Z41/2	6515	NC27B-E6	0740X30743, Sh 2	Yes	Control
C02-Z42/2	6515	NC27B-F2	0740X30743, Sh 2	Yes	Control
C02-Z43/3	6515	NC27B-F3	0740X30743, Sh 2	Yes	Control
C02-Z44/3	6515	NC27B-F4	0740X30743, Sh 2	Yes	Control
C02-Z45/3	6515	NC27B-F5	0740X30743, Sh 2	Yes	Control
C02-Z46/2	6515	SV/NC22B	0740X30743, Sh 2	Yes	Control
C02-Z47/2	6515	SV/NC22D	0740X30743, Sh 2	Yes	Control
C02-Z46/1	6514	SV/NC22A	0740X30743, Sh 2	Yes	Control
C02-Z47/1	6514	SV/NC22C	0740X30743, Sh 2	Yes	Control
C02-Z50/2	6514	SV/NC22F&G	0740X30743, Sh 2	Yes	Control
C02-Z50/2A	6515	SV/NC22H&J	0740X30743, Sh 2	Yes	Control
C02-M(H78)/1	D01	MO7064	M-123 E-103	No	
C01-Z09/4	6512	SVNC22E	0740F30731 Sheet 2	Yes	Control

1b. RESPONSE (Contd)

FIRE AREA #6 - CONTAINMENT

Cable No	Scheme No	Device No	Ref Dwg	Assoc Ckt	Function
N01-R01/33	5414	MO7068	M-123 E-103	Yes	Power and Control
P26-R01/1	6404	MO7056	M-107 E-112, Sh 1	Yes	Power
R01-R02/4	6404	MO7056	M-107 E-112, Sh 1	Yes	Power
C01-R01/1	6404	MO7056	M-107 E-112, Sh 1	Yes	Control
Y02-Z01/2	6501	CV4017	M-107 E-112, Sh 1	No	
Y02-R01/1	6501	CV4017	M-107 E-112, Sh 1	Yes	Power
R01-Z01/1	6501	CV4017	M-107 E-112, Sh 1	Yes	Control
R02-Y02/1	6501	CV4018	M-107 E-112, Sh 1	Yes	Power
R02-Z03/1	6501	CV4018	M-107 E-112, Sh 1	Yes	Control
Z01-Z03/5	6501	CV4018	M-107 E-112, Sh 1	No	
Y02-Z01/11	6509	CV4029	M-111 E-115, Sh 2	No	
Z01-Z02/35	6509	CV4029	M-111 E-115, Sh 2	Yes	Control
P26-R01/2	6406	MO7057	M-107 E-112, Sh 1	Yes	Power
R01-R02/5	6406	MO7057	M-107 E-112, Sh 1	Yes	Power
C01-R01/2	6406	MO7057	M-107 E-112, Sh 1	Yes	Control
C01-R02/3	6405	MO7058	M-107 E-112, Sh 1	No	
C01-R02/5	6405	MO7058	M-107 E-112, Sh 1	No	
C01-R01/5	6404	MO7056	M-107 E-112, Sh 1	Yes	Control
C01-R01/6	6406	MO7057	M-107 E-112, Sh 1	Yes	Control
C01-R02/4	6407	MO7059	M-107 E-112, Sh 1	No	
C01-R02/6	6407	MO7059	M-107 E-112, Sh 1	No	
C02-Z14/5	6514	NC27A-A2	0740X30743, Sh 2	Yes	Control
C02-Z15/6	6514	NC27A-A3	0740X30743, Sh 2	Yes	Control
C02-Z16/5	6514	NC27A-A4	0740X30743, Sh 2	Yes	Control

1b. RESPONSE (Contd)

FIRE AREA #6 - CONTAINMENT (Contd)

Cable No	Scheme No	Device No	Ref Dwg	Assoc Ckt	Function
C02-Z17/6	6514	NC27A-A5	0740X30743, Sh 2	Yes	Control
C02-Z18/6	6514	NC27A-B1	0740X30743, Sh 2	Yes	Control
C02-Z19/3	6514	NC27A-B2	0740X30743, Sh 2	Yes	Control
C02-Z20/1	6514	NC27A-B3	0740X30743, Sh 2	Yes	Control
C02-Z21/1	6514	NC27A-B4	0740X30743, Sh 2	Yes	Control
C02-Z22/2	6514	NC27A-B5	0740X30743, Sh 2	Yes	Control
C02-Z23/2	6514	NC27A-B6	0740X30743, Sh 2	Yes	Control
C02-Z24/2	6514	NC27A-C1	0740X30743, Sh 2	Yes	Control
C02-Z25/2	6514	NC27A-C2	0740X30743, Sh 2	Yes	Control
C02-Z26/1	6514	NC27A-C3	0740X30743, Sh 2	Yes	Control
C02-Z27/1	6514	NC27A-C4	0740X30743, Sh 2	Yes	Control
C02-Z28/2	6514	NC27A-C5	0740X30743, Sh 2	Yes	Control
C02-Z29/1	6514	NC27A-C6	0740X30743, Sh 2	Yes	Control
C02-Z30/2	6514	NC27A-D1	0740X30743, Sh 2	Yes	Control
C02-Z31/2	6514	NC27A-D2	0740X30743, Sh 2	Yes	Control
C02-Z32/3	6514	NC27A-D3	0740X30743, Sh 2	Yes	Control
C02-Z33/2	6514	NC27A-D4	0740X30743, Sh 2	Yes	Control
C02-Z34/1	6514	NC27A-D5	0740X30743, Sh 2	Yes	Control
C02-Z35/2	6514	NC27A-D6	0740X30743, Sh 2	Yes	Control
C02-Z36/1	6514	NC27A-E1	0740X30743, Sh 2	Yes	Control
C02-Z37/2	6514	NC27A-E2	0740X30743, Sh 2	Yes	Control
C02-Z38/1	6514	NC27A-E3	0740X30743, Sh 2	Yes	Control
C02-Z39/1	6514	NC27A-E4	0740X30743, Sh 2	Yes	Control
C02-Z40/2	6514	NC27A-E5	0740X30743, Sh 2	Yes	Control
C02-Z41/1	6514	NC27A-E6	0740X30743, Sh 2	Yes	Control
C02-Z42/1	6514	NC27A-F2	0740X30743, Sh 2	Yes	Control
C02-Z43/2	6514	NC27A-F3	0740X30743, Sh 2	Yes	Control
C02-Z44/2	6514	NC27A-F4	0740X30743, Sh 2	Yes	Control
C02-Z45/2	6514	NC27A-F5	0740X30743, Sh 2	Yes	Control
C02-Z14/6	6515	NC27B-A2	0740X30743, Sh 2	Yes	Control
C02-Z15/7	6515	NC27B-A3	0740X30743, Sh 2	Yes	Control
C02-Z16/6	6515	NC27B-A4	0740X30743, Sh 2	Yes	Control
C02-Z17/7	6515	NC27B-A5	0740X30743, Sh 2	Yes	Control
C02-Z18/7	6515	NC27B-B1	0740X30743, Sh 2	Yes	Control
C02-Z19/4	6515	NC27B-B2	0740X30743, Sh 2	Yes	Control
C02-Z20/2	6515	NC27B-B3	0740X30743, Sh 2	Yes	Control
C02-Z21/2	6515	NC27B-B4	0740X30743, Sh 2	Yes	Control
C02-Z22/3	6515	NC27B-B5	0740X30743, Sh 2	Yes	Control
C02-Z23/3	6515	NC27B-B6	0740X30743, Sh 2	Yes	Control
C02-Z24/3	6515	NC27B-C1	0740X30743, Sh 2	Yes	Control
C02-Z25/3	6515	NC27B-C2	0740X30743, Sh 2	Yes	Control
C02-Z26/2	6515	NC27B-C3	0740X30743, Sh 2	Yes	Control
C02-Z27/2	6515	NC27B-C4	0740X30743, Sh 2	Yes	Control
C02-Z28/3	6515	NC27B-C5	0740X30743, Sh 2	Yes	Control
C02-Z29/2	6515	NC27B-C6	0740X30743, Sh 2	Yes	Control

1b. RESPONSE (Contd)

FIRE AREA #6 - CONTAINMENT (Contd)

Cable No	Scheme No	Device No	Ref Dwg	Assoc Ckt	Function
C02-Z30/3	6515	NC27B-D1	0740X30743, Sh 2	Yes	Control
C02-Z31/3	6515	NC27B-D2	0740X30743, Sh 2	Yes	Control
C02-Z32/4	6515	NC27B-D3	0740X30743, Sh 2	Yes	Control
C02-Z33/3	6515	NC27B-D4	0740X30743, Sh 2	Yes	Control
C02-Z34/2	6515	NC27B-D5	0740X30743, Sh 2	Yes	Control
C02-Z35/3	6515	NC27B-D6	0740X30743, Sh 2	Yes	Control
C02-Z36/2	6515	NC27B-E1	0740X30743, Sh 2	Yes	Control
C02-Z37/3	6515	NC27B-E2	0740X30743, Sh 2	Yes	Control
C02-Z38/2	6515	NC27B-E3	0740X30743, Sh 2	Yes	Control
C02-Z39/2	6515	NC27B-E4	0740X30743, Sh 2	Yes	Control
C02-Z40/3	6515	NC27B-E5	0740X30743, Sh 2	Yes	Control
C02-Z41/2	6515	NC27B-E6	0740X30743, Sh 2	Yes	Control
C02-Z42/2	6515	NC27B-F2	0740X30743, Sh 2	Yes	Control
C02-Z43/3	6515	NC27B-F3	0740X30743, Sh 2	Yes	Control
C02-Z44/3	6515	NC27B-F4	0740X30743, Sh 2	Yes	Control
C02-Z45/3	6515	NC27B-F5	0740X30743, Sh 2	Yes	Control
C02-Z46/2	6515	SV/NC22B	0740X30743, Sh 2	Yes	Control
C02-Z47/2	6515	SV/NC22D	0740X30743, Sh 2	Yes	Control
C02-Z46/1	6514	SV/NC22A	0740X30743, Sh 2	Yes	Control
C02-Z47/1	6514	SV/NC22C	0740X30743, Sh 2	Yes	Control
C02-Z50/2	6514	SV/NC22F&G	0740X30743, Sh 2	Yes	Control
C02-Z50/2A	6515	SV/NC22H&J	0740X30743, Sh 2	Yes	Control
M(H78)-R01/1	D01	MO7064	M-123 E-103	Yes	Control
M(H78)-R01/2	D01	MO7064	M-123 E-103	Yes	Control
C01-Z09/4	6512	SVNC22E	0740F30731 Sheet 2	Yes	Control

1c. Provide a table that lists all cables in the fire area that share a common enclosure with circuits of the alternative or dedicated shutdown systems and the function of each cable listed.

RESPONSE:

There are two fire areas which have cables which share a common enclosure with circuits of the alternate shutdown system. These are the Control Room and the Equipment Room.

Control Room Fire Area:

The control panels in the control room are a common enclosure for circuits of the Alternate Shutdown System. Therefore, all circuits in panels C01 and C02 are common enclosure circuits.

1b. RESPONSE (Contd)

FIRE AREA #6 - CONTAINMENT (Contd)

Equipment Room Fire Area:

All circuits in the Motor Control Center MCC1A share the MCC enclosure with the feeder circuit to CRD Pump #2 of the Alternate Shutdown System.

1d. Show that fire induced failures (hot shorts, open circuits or shorts to ground) of each of the cables listed in 1a, 1b and 1c will not prevent operation or cause maloperaton.

METHOD

Analyze the possibility of the above results occurring due to a fire induced failure of each of the circuits from a, b, c by reviewing circuit routing and schematic drawings.

ASSUMPTIONS

1. The correct voltage is available for a hot short to be possible in all cable trays unless otherwise indicated.

2. Other assumptions will be noted where used.

REFERENCES

Plant controlled drawings were used as references and the specific references are listed where used.

The following pages give the required results and conclusions for part (d).

1d.(Contd)

RESPONSE

I. Cables listed in 1a:
N/A since no cables are listed.

II. Cables listed in 1b:

A. Equipment: CV4090 CRD Supply

References: Scheme 2502 M106 E110

RESULTS

Valve desired open for makeup to CRD pump SV4894 energizes to close CV4090.

A short circuit of CO1-ZO1/3 due to a fire in equipment room, exterior penetration room or condensate pump room would energize SV4894 and close CV4090. Opening breaker 1Y-7 would prevent this but circuits CO1-YO1/1 or CO1-ZO1/3 could be hot shorted by the same fire in the equipment room.

CONCLUSIONS

CO1-ZO1/3 and CO1-YO1/1 are associated circuits.

Repair in the form of disconnecting the circuitry at the valve in the condensate pump room if spurious operation occurs is the simplest remedy. The valve is not required open until CRD makeup is needed (at least 9 hours into shutdown).

B. Equipment: CV4016 CRD supply

References: Scheme 2502 M106 E110

RESULTS

CV4016 should be closed for supply to CRD pump. SV4858 is energized to supply air to close CV4016 which fails open on air failure (A fire in the external penetration room, or equipment room or condensate pump room) resulting in an open circuit of CO1-YO1/1 or CO1-ZO1/3 (which also shows up in the scheme for CV4090) would cause valve to open. Open circuit of ZO1-ZO2/3 or CO1-ZO2/2 also cause valve to open.

1d. (Contd)

CONCLUSIONS:

C01-Y01/1 C01/Z01/3 Z01-Z02/3 C0I-Z02/2 are associated circuits.

Repair or manual operation of valve in condensate pump room (or isolation by means of adjacent manual valves) could be accomplished during the 9 hours prior to it being needed if a fire-involved failure occurs.

C. Equipment: PP P57 CRD Booster Pump

References: Scheme 2427 E110 M106

RESULTS:

Pump is essential to ensure adequate supply to CRD pump. Therefore, the following is presented for consideration:

P15-R01/10 - is the normal power circuit and is de-energized on loss of offsite power.

P11-P17/1&2 - are the circuits supplying MCC-1E.

P17-P15/1 - these could be opened by a fire in the equipment room as could C02/P15/2 - the pump control circuit.

CONCLUSIONS:

P15-R01/10, P11-P17/1&2, P17-P15/1 and C02-P15/2 are associated circuits.

The method to insure operability of this pump is to provide an alternate power source such as is being provided to CRD PP#1. Plant has at least 9 hours to complete this work. (See Attachment D, Item 1 of this letter)

D. Equipment: M07065 Main Steam Drain Isolation Valve

References: Scheme 6606 M121 E112, Sh 2

RESULTS:

If valve opens spuriously, primary system water could be diverted. Must occur simultaneously with CV4107 opening spuriously.

Circuit D01-R01/18 125 V dc could hot short the valve open with an improbable combination of hot shorts and short circuits due to a fire in the equipment room, exterior penetration room or containment.

1d. (Contd)

Circuits C01-C02/14 C01-D01/6 could short-circuit to cause the valve to open due to a fire in the equipment room. This is improbable, as the power source to this valve is always open during plant operation (valve has not been utilized in several years and is kept closed with power removed).

CONCLUSIONS:

Circuits D01-R01/1[illegible] C01-C02/14 and C01-D01/6 are associated circuits.

Circuit BRKR#72-14 could be left open to eliminate all but the improbable combination of hot shorts and short circuits required to open the valve. The likelihood of serious consequence due to maloperation of this valve is considered probabilistically insignificant.

E. Equipment: CV4107 Main Steam Drain Isolation Valve

References: Scheme 9502 M106 E107.

RESULTS:

SV4916 energizes to open CV4107

Circuit Z05-Z06/4 could hot short on 120 V ac due to a fire in the equipment room.

Spurious operation must occur simultaneously with spurious operation of M07065 to be detrimental.

CONCLUSIONS:

Circuit Z05-Z06/4 is an associated circuit.

Planned operation of M07065 (ie, power removed) eliminates any concern over maloperation of this valve.

F. Equipment: M07056 Shutdown Heat Exchanger Primary Inlet Valve 480 V AC

References: M107 E112, Sh 1, Scheme 6404

RESULTS:

Spurious operation of both M07056 and M07058 is detrimental but has been addressed in previous CP Co correspondence to NRC (see letter to D M Crutchfield dated May 19, 1981).

1d. (Contd)

Simultaneous opening of M07056 and CV4017 could result in a primary system leak. Breaker 52-2P4 is normally open. An improbable combination of a 3 ∅, 480 V hot short on either P26-R01/1 or R01-R02/4 plus either a 120 V hot short or short circuit of either C01-R01/1 or C01-R01/5 would be required to open M07056.

CONCLUSIONS:

P26-R01/1, R01-R02/4, C01-R01/1 and C01-R01/5 are associated circuits.

Simultaneous opening of M07056 and CV4017 is required for this to be a problem; CV4017 closes as M07056 opens (via interlocks).

As the combination of hot shorts and/or short circuits is improbable, the likelihood of serious consequences due to maloperation of this valve is considered probabilistically insignificant.

G. Equipment: CV4017 Reactor Shutdown System

References: M107 E112, Sh 1, Scheme 6501

RESULTS:

CV4017 is normally open during power operation.

Spurious operation of SV4861 which, when energized, will open CV4017, combined with spurious operation of M07056 is detrimental to safe shutdown. SV4861 is interlocked with M07056 and de-energizes as M07056 opens, closing CV4017.

Short circuit of Y02-R01/1 and R01-Z01/1 energizes SV4861.

Hot short of any 120 V ac to R01-Z01/1 energizes SV4861.

CONCLUSIONS:

Y02-R01/1 and R01-Z01/1 are associated circuits.

Based upon the highly improbable spurious operation of M07056 and the interlock features incorporated, the likelihood of serious consequences due to maloperation of this valve is also considered probabilistically insignificant.

H. Equipment: M07057 Shutdown Heat Exchanger Primary Inlet Valve

References: Scheme 6406 M107 E112, Sh 1

1d. (Contd)

RESULTS:

Spurious operation of M07057 and M07059 is detrimental and has been addressed in previous CP Co correspondence to NRC (see letter to D M Crutchfield dated May 19, 1981).

Simultaneous opening of M07057 and CV4018 could result in a primary system leak.

Breaker 52-2P6 is normally open. An improbable combination of a 3 Ø, 480 V hot short on either P26-R01/2 or R01-R02/5 plus either a 120 V hot short or short circuit of either C01-R01/2 or C01-R01/6 would be required to open M07057.

CONCLUSIONS:

P26-R01/2, R01-R02/5, C01-R01/2 and C01-R01/6 are associated circuits.

Simultaneous opening of M07057 and CV4018 is required for this to be a problem; CV4018 close as M07057 opens (via interlocks).

As the combination of hot shorts and/or short circuits is improbable, the likelihood of serious consequences due to maloperation of this valve is considered probabilistically insignificant.

I. Equipment: CV4018 Reactor Shutdown System

References: M107 E112, Sh 1, Scheme 6501

RESULTS:

CV4018 is normally open during power operation.

Spurious operation of SV4862, which when energized will open CV4018, combined with spurious opening of M07057 is detrimental to safe shutdown. SV4862 is interlocked with M07057 and de-energizes as M07057 opens, closing CV4018.

Short circuit of Y02-R02/1 and R02-Z03/1 energizes SV4861.

Hot short of any 120 V ac to R02-Z03/1 energizes SV4861.

CONCLUSIONS:

Y02-R02/1 and R02-Z03/1 are associated circuits.

Based upon the highly improbable spurious operation of M07057 and the interlock features incorporated, the likelihood of serious

1d. (Contd)

consequences due to maloperation of this valve is also considered probabilistically insignificant.

J. Equipment: CV4029 Shutdown Cooling System

References: Scheme 6509 M111 E115, Sh 2

RESULTS:

If CV4029 spuriously closes due to hot short of signal to I/P 6509, flow through shell of heat exchangers will be lost.

4-20 mA signal hot short to Z01-Z02/35 (due to fire in containment or exterior penetration area) may cause valve to close.

CONCLUSIONS:

Z01-Z02/35 is an associated circuit. Ample repair time (72 hours) is available to accomplish required repair (eg, disconnect signal cable).

K. Equipment: M07064 Reactor Building Emergency Spray Valve

References: Scheme D01 E103 M123

RESULTS:

Spurious operation of this valve actuates the enclosure sprays. The concern here is the eventual flooding of the CRD pumps.

C02-N01/1 can short-circuit and open valve due to fire in the equipment room.

D10-N01/1 a 125 V dc hot short coupled with above short due to fire in equipment room may open valve (assuming 72-10D01 breaker has been opened).

M(H78)-N01/1,2 combination of 125 V dc hot shorts and short circuits can open valve due to fire in equipment room or exterior penetration room.

M(H78)-R01/1,2 same as above, but for a fire in containment.

CONCLUSIONS:

C02-N01/1, D10-N01/1, M(H78)-N01/1,2, M(H78)-R01/1,2 are associated circuits.

1d. (Contd)

Valve can be closed through manual action either at the motor starter or at the valve itself.

L. Equipment: M07068 Reactor Building Emergency Spray Backup Valve

References: E103 M123 Scheme 5414

RESULTS:

M07068 is normally closed. Spurious operation of this valve actuates the enclosure sprays. The concern here is the eventual flooding of the CRD pumps.

C01-N01/5 a short circuit of a 120 V ac hot short due to fire in equipment room may open valve.

N01-R01/33 a 480 V, 3 Ø hot short due to fire in the equipment room, exterior penetration room or containment may open valve.

P22-N01/4 a 480 V, 3 Ø hot short in combination with short circuit of C01-N01/5 due to fire in equipment room may open valve.

CONCLUSIONS:

C01-N01/5, N01-R01/33, P22-N01/4 are associated circuits.

Valve can be closed through manual action either at the motor starter or at the valve itself.

M. Equipment: SV4943 and SV4944 HI Point Vents
SV4945 and SV4946

References: New installation, none available.

RESULTS:

Spurious operation will be evaluated by CP Co prior to utilization of new system. High point vents are currently isolated by manual valves.

CONCLUSIONS:

No action required at this time.

1d. (Contd)

N. Equipment: M07052 and M07062 Emergency Condenser Inlet Valves

References: M107

RESULTS:

Valves have been previously addressed by CP Co and are to be modified as part of the alternate shutdown modification as described in CP Co letter dated May 19, 1981 and Attachment D to this letter.

CONCLUSIONS:

No further action required.

O. Equipment: M07072 Fire Water Bypass Around Core Spray Heat Exchange

References: E103, M123, Sh D02

RESULTS:

Spurious operation of M07072 would result in very slow flooding of the containment building through the open spent fuel pool makeup line.

C02-N02/1 can short-circuit and open valve due to fire in equipment room.

N02-R02/4,5 combination of hot (125 V dc) shorts and short circuits can open valve due to fire in the electrical equipment room. Short circuits alone would do it if normal power did not fail.

D01-N01/2 125 V dc hot short combined with short circuit of C02-N02/1 could open valve due to fire in the equipment room.

CONCLUSIONS:

C02-N02/1, N02-R02/4,5 are associated circuits.

The valve is accessible in the core spray pump room and could be disconnected and manually closed. Ample time is available for corrective action.

1d. (Contd)

P. Equipment: CV4180 & SV4984 CV4182 & SV4986
CV4181 & SV4985 CV4183 & SV4987

References: A203

RESULTS:

Spurious operation of one or more of these valves would result in a rapid blowdown of the primary coolant system.

Consumers Power Company letter dated August 31, 1979 provided design criteria, as requested by the NRC's Fire Protection SER of April 4, 1979, for protection of Reactor Depressurization System (RDS) cables. The NRC states by letter dated December 17, 1979 that our RDS insulation design description and the areas where protection will be provided are adequate to protect the RDS system from fire which could cause inadvertent operation of RDS.

CONCLUSIONS:

No further action required.

Q. Equipment: Control Rod Drive System — SVNC22A, B, C, D & E, SVNC22F, G, H & J, SVNC27AXX*, SVNC27BXX

References: 0740X30743, Sh 2
M122

RESULTS:

The following is a description of the potential control rod drive system failures that may occur as a result of a fire in either the electrical equipment room, the exterior containment penetration room or the interior containment penetration room. The circuits whose failure could cause malfunction due to fire induced damage may be found in Section 1b.

CV-NC11
CV-NC12 — If either of the valves hot-short open, they could drain the RX vessel - requires hot shorts of SV-NC22A or B and SV-NC22 C or D and failure of (open circuit) SV-NC22E.

CV-NC14
and
CV-NC15 — If both hot short closed, it could eventually cause control rods to drift out. Requires hot shorts of SV-NC22F or H and SV-NC22G or J.

1d. (Contd)

CV-NC10XX* If this valve (there is one of these for for each CRD) hot-shorts closed, rod will not scram. If SV-NC13A or C or SV-NC13E or G also fails to open (open circuit), rod will not insert at all. Requires hot shorts of SV-NC27(A or B)XX and SV-NC22(A or B). This will prevent one rod from SCRAM, to have two rods requires another hot short of an SV-NC27YY(A or B), the third requires another SV-NC27ZZ(A or B).

CONCLUSIONS:

The circuits identified above are associated circuits.

It is Consumers Power Company's position that the failures described above, all of which involve multiple hot shorts, are incredible and therefore should not be considered further in the design of the Big Rock Point fire protection system. In addition, for each of the fire areas identified above the fire loading is classified as light and the area is protected by installed P.O.C. detectors and sprinkler systems and/or hose stations.

*XX Refers to the designator for an individual control rod.

III. Cables listed in 1c:

Control Room Fire Area:

The control panels C01 and C02 are common enclosures to the control panel circuits and the control and indication circuits for valves M07053, M07063 and M07050. However, all of the circuits of the alternate shutdown system can be isolated by transfer switches (Ref. 0740G03112S2), thus preventing maloperation.

Equipment Room Fire Area:

The MCC 1A is a common enclosure to the new Control Rod Drive Pump #1 power cable of the alternate shutdown system and all of the other MCC 1A circuits. The CRD pump #1 circuit can be isolated on a transfer switch to a new power supply remote to the equipment room, thus preventing maloperation.

ATTACHMENT B

Consumers Power Company
Big Rock Point Plant
Docket 50-155

RESPONSE TO STAFF POSITION
ON CERTAIN ISSUES OF PLANT
ALTERNATE SAFE SHUTDOWN DESIGN
NRC LETTER DATED APRIL 30, 1982
ENCLOSURE 2

September 28, 1982

4 pages

ATTACHMENT B

RESPONSE TO STAFF POSITION
ON CERTAIN ISSUES OF PLANT
ALTERNATE SAFE SHUTDOWN DESIGN

The following sections provide Consumers Power Company's response to Enclosure 2 of NRC letter dated April 30, 1982. Enclosure 2 provides the Staff's position on certain issues of the Big Rock Point Alternate Safe Shutdown design.

1. Consumers Power Company's proposed method of shutdown includes repairing the power cables to the CRD pump which is used to provide primary coolant system makeup. Section III.G of Appendix R requires all equipment needed to achieve and maintain hot shutdown to be free of fire damage. Consumers Power must either request an exemption to the requirements of Appendix R with appropriate justification or provide alternative makeup capability.

   Response:

   Consumers Power Company requests an exemption from this requirement of Appendix R. The justification for this request is described in Item 1 of Attachment D.

2. Consumers Power Company's proposed modification for alternative shutdown includes moving the controls for the emergency condenser from the control room to the auxiliary shutdown control station. Thus, in the event of a control room fire or loss of offsite power (the emergency condenser is used for shutdown in event of a loss of offsite power), the operator would go to the auxiliary shutdown control station to operate the emergency condenser. However, in the event of a fire at the auxiliary shutdown control station or a fire involving the control cables for the emergency condenser coincident with a loss of offsite power, the operator could not achieve hot shutdown using the emergency condenser. The licensee has analyzed the probability of a fire at the auxiliary shutdown control station coincident with a loss of offsite power and concludes that the events are unlikely. It is our position that since the emergency condenser is used for hot shutdown in the event of a loss of offsite power without considering a fire, control of the emergency condenser should be provided at both the control room and the auxiliary control station. The licensee should propose modifications to meet our position.

   Response:

   There appears to be some confusion regarding the details of our proposed modifications to assure the ability to take the plant to safe shutdown in the event of a fire at Big Rock Point. The proposed modifications are described in Consumers Power Company letters to the NRC dated March 19, 1981 and May 19, 1981. It was stated in our March 19, 1981 letter that: "The modified valve operator control scheme for all valves will feature a transfer switch which disconnects the valve operator, its power supply and its control system from the operator control switches and position

indicating lights at the main control panel, and enables the operator control switches at the new auxiliary shutdown control station." (underlined emphasis added) Thus control of the emergency condenser outlet valves is provided at both the control room and the auxiliary control station.

It should be noted that although the above is true, a fire in the auxiliary control station could destroy (1) the battery used to power the emergency condenser outlet valves, or (2) the associated transfer switches, thereby disabling the emergency condenser. Consumers Power Company, as described in our letter dated September 24, 1981, concluded that this was not a safety problem for several reasons including:

1) A fire in the area of the alternate shutdown station will not cause a loss of offsite power; and the likelihood of an event involving a fire in that area coincident with a random loss of offsite power is extremely remote. Thus the means of safe shutdown heat removal in the event of a fire in the area of the alternate shutdown station will in all likelihood be the normal plant heat removal system, e.g. the main feedwater system or control rod drive pumps and the main condenser.

2) As unlikely as this event appears to be, Consumers Power Company identified in our letter of September 24, 1981 that reactor depressurization and core spray systems would actuate to prevent core damage from occuring if the event did in fact occur.

For the reasons described above, Consumers Power Company is requesting an exemption from those portions of Appendix R that pertain to this matter. (See Item 2 of Attachment D.)

3. The review of SEP Topic VII-3, "Systems Required for Safe Shutdown" indicated that the use of the emergency condenser was limited to 36 hours whenever the fire water system is used for emergency condenser makeup. Based on the SEP Review, it is our position that the licensee provide the capability to achieve cold shutdown with limited use of the emergency condenser as defined in the SEP review or present justification that corrosion will not limit usage of the emergency condenser for a period of 72 hours.

Response:

Consumers Power Company, in letter dated March 30, 1982, provided specific comments to the NRC draft evaluation of SEP Topic VII-3 issued May 13, 1981. The NRC draft evaluation stated that based on the potential for emergency condenser materials corrosion, the operating procedures for the Big Rock Point Plant should be modified to direct the operator to cooldown and depressurize the reactor within 36 hours whenever the fire water system is used for emergency condenser makeup. The NRC evaluation cites the VanBooyen and Kendig "Impure Water in the Steam Generators and

Isolation Generators," BNL-NUREG-28147,June, 1980 report for its position that caustic stress corrosion cracking of the emergency condenser tube materials could occur in less than 72 hours for both stainless steel and Inconel tube materials through NaOH concentration if fresh water makup is used. Consumers Power Company has reviewed the subject report and concluded that the VanRooyen and Kendig basis used by the NRC does not appear valid for extrapolation to the Big Rock Point emergency condenser application. The evaluation of emergency condenser caustic attack as provided in Consumers Power Company letter of March 30, 1982 is enclosed as Attachment C.

Consumers Power Company concludes that caustic stress on the emergency condenser does not appear to be of significant concern and that 72 hours is acceptable to reach cold shutdown without limiting use of the emergency condenser.

4. The licensee indicated that material for repairs would not be stored onsite because the materials are readily available offsite. Appendix R, Section III.L, Paragraph 5 states, "Materials for such repairs shall be readily available onsite...". The licensee must provide a commitment to store the materials needed for repairs onsite.

Response:

Consumers Power Company stated by letter dated May 19, 1981 that shutdown cooling can be provided within two days considering the common availability of electrical cable and transformers as needed to install a temporary 480 V power source connected to the power feeder through containment for the shutdown cooling system. It was considered unnecessary to obtain and store the required material and equipment because of their ready availability from within Consumers Power Company and/or from commercial electrical equipment and materials suppliers.

Although Consumers Power Company still considers our original position to be justified, we will store the materials needed for repairs onsite.

5. The licensee indicated by letter dated May 19, 1981, that fire damage and spurious closing of the emergency condenser inlet valves would be prevented by removing operating power from these valves. It is our understanding that the licensee now wishes to leave the power to these valves and provide separation of the power cables to prevent fire damage to the redundant cables. The licensee should verify that the separation of the redundant cables to the emergency condenser inlet valves meets the requirements of Section III.G.2 of Appendix R.

Response:

During the NRC meeting at Big Rock Point on September 8 and 9, 1982 it was determined that an additional evaluation was necessary by Consumers Power Company for the emergency condenser inlet valve circuitry. Our response to Question 7 of Attachment E states how we propose to meet the requirements of Section III.G.2 of Appendix R.

ATTACHMENT C

Consumers Power Company
Big Rock Point Plant
Docket 50-155

EVALUATION - EMERGENCY CONDENSER
CAUSTIC ATTACK

September 28, 1982

9 pages

Evaluation - Emergency Condenser Caustic Attack

Consumers Power Company has reviewed the Van Rooyen and Kendig position(1) from which the NRC concluded,(2) "if raw freshwater were used, caustic stress corrosion cracking of tube materials could occur in less than 72 hours for both stainless steel and Inconel tube materials through NaOH concentration." In developing this conclusion, Van Rooyen and Kendig cited Westinghouse laboratory tests(3-6) performed in deaerated 10% NaOH on U-bends of Type 304 stainless steel at 600°F. Extrapolation of such test data to conditions that could exist in the Big Rock Point (BRP) emergency condenser (cooled by Lake Michigan water) appears questionable for several reasons:

A. Temperature

All referenced test data were at or above typical PWR steam generator operating temperatures (600° to 630°F). The maximum temperature that could be reached in the BRP emergency condenser would be 613°F (for approximately five hours)(2) on the tube condensing side and much less on the shell (lake water) side. The tendency for caustic cracking is known to decrease with decreasing temperature (Figure 1).(7)

B. Stress

The Type 304 stainless steel samples that cracked within three days were U-bend specimens. "The U-bend specimen has a considerable level of plastic strain on the outer surface, which means that a higher stress exists which will lead to a more rapid initiation of cracking. The propagation of cracks in a U-bend should also be more rapid due to the large amount of stored elastic energy in the legs of the U when they are bolted together".(4) When tests were run with specimens stressed in the range of 90% to 110% yield, rapid cracking did not occur.(6)

C. Concentration

As reported by Van Rooyen and Kendig, cracking of Type 304 stainless steel occurred in a 10% NaOH test solution unbuffered with any other chemical compounds. Van Rooyen and Kendig cited previous NWT (8) work in which a concentration of 0.1 molal NaOH was reached in an isolated crevice of a steam generator (280°C) during a hypothetical influx of Mississippi River water. Such a solution was predicted analytically at a concentration factor of 10^6 above a very dilute solution of river water that originally was more alkaline forming than Lake Michigan water on a relative basis. Because of the high dilution and, at the higher temperature, the carbon dioxide was stripped almost quantitatively in the PWR steam generator simulation whereas in the BRP emergency condenser application only a portion of the carbon dioxide will be evolved as a gas. Recent calculations (Enclosure A) indicate the probable maximum concentration of NaOH at the boiling surface will be on the order of 10^{-3} molal or 0.004% NaOH in

the emergency condenser. Berge, et al(9) found that caustic attack of Type 316 stainless steel was not a problem below a 0.5% NaOH concentration (Figure 2). Above that concentration, the NaOH concentration had a strong influence on the rate of caustic attack. Such behavior was summarized by Speidel(7) who also considered temperature (Figure 1). It can be seen that in the worst case, failures would be in the 100- to 300-day category at an NaOH concentration < 1%.

In conclusion, the Van Rooyen and Kendig basis used by the NRC does not appear valid for extrapolation to the BRP emergency condenser application. Based on a review of the specific application, caustic attack does not appear to be a significant concern in the proposed application of the emergency condenser.

REFERENCES

(1)Van Rooyen, D; and Kendig, M W, "Impure Water in Steam Generators and Isolation Generators," Brookhaven National Laboratory, BNL-NUREG-29147 (June, 1980).

(2)Letter: D M Crutchfield (USNRC) to D P Hoffman, "Big Rock Point - SEP Topics V-10.B, RHR Reliability; V-11.B, RHR Interlock Requirements; and VII-3, Systems Required for Safe Shutdown (Safe Shutdown Systems Report)," attached Draft Evaluation, Page A-4.

(3)Pement, F W; Wilson, I L W; and Aspden, R G, Paper No 50, Annual NACE Conference, Atlanta, Georgia, March 12-16, 1979.

(4)Wilson, I L W; and Aspden, R G, Corrosion 32, 193 (1976).

(5)Wilson, I L W; Pement, F W; Aspden, R G; and Begley, R T, Nuclear Technology 31, 70 (1976).

(6)Wilson, I L W; Pement, F W; and Aspden, R G, Corrosion 34, 311 (1978).

(7)Speidel, M O, "Handbook on Stress Corrosion Cracking and Corrosion Fatigue," to be published by Advanced Research Projects Agency, Washington, DC; IN Sedriks, J A, "Corrosion of Stainless Steel," John Wiley & Sons, New York, 1979.

(8)Pearl, W L; and Sawochka, S G, "PWR Secondary Water Chemistry Study, Tenth Progress Report, October through December 1977," Nuclear Water and Waste Technology Corporation, February, 1978 (NWT 116-10).

(9)Berge, Ph; Donati, J R; and Villard, D, "Caustic Stress Corrosion Cracking of Austenitic Fe-Cr-Ni Alloys," presented at 6th International Congress on Metallic Corrosion, Sydney, December, 1975.

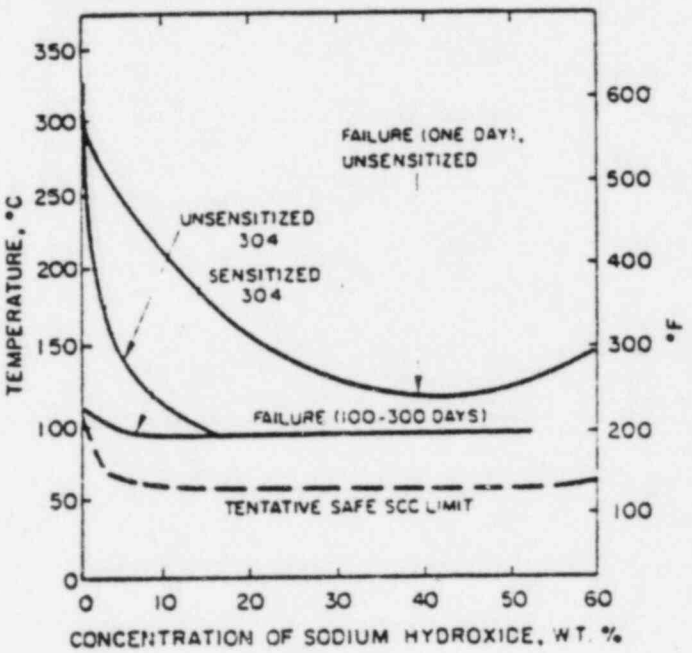

Figure 1. Temperature and concentration limits for caustic cracking of type 304, 347, 316, and 321 stainless steels. (After Speidel.)

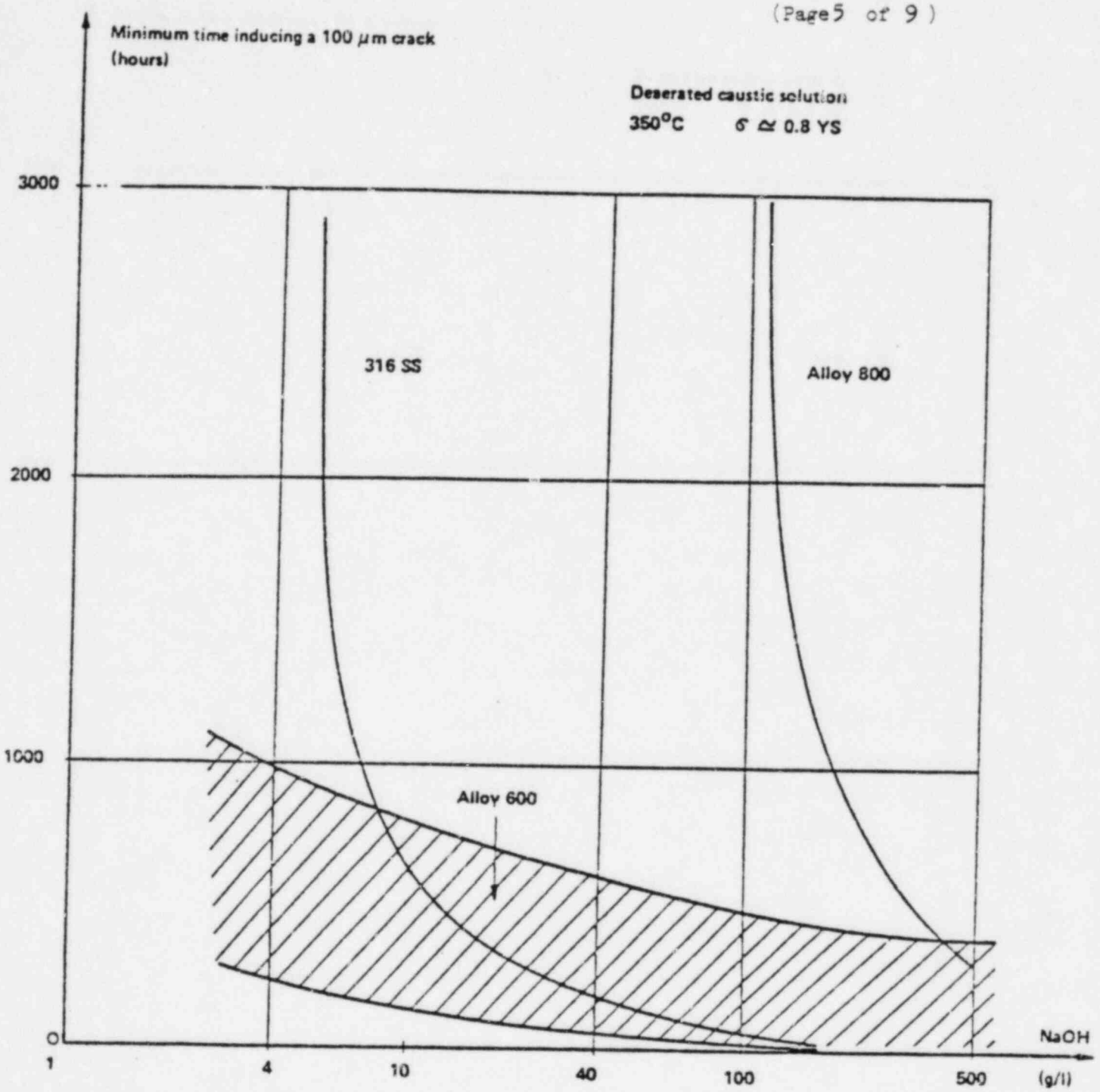
Minimum time inducing a 100 μm crack
(hours)
Deaerated caustic solution
350°C σ ≃ 0.8 YS
3000
2000
1000
0
316 SS
Alloy 800
Alloy 600
1
4
10
40
100
500
NaOH
(g/l)

Figure 2

ENCLOSURE A

Chemistry Variation of Lake Michigan Water
in Big Rock Point BWR Plant Emergency Condenser

The average Lake Michigan water composition(1) is given in Table 1.

TABLE 1
Average Lake Michigan Water Composition

	Ppm	Molal
Calcium	32	0.00080
Magnesium	11	0.00045
Sodium	3.2	0.00014
Chloride	2.1	0.000060
Bicarbonate	149	0.00244
Carbon Dioxide	3.8	0.000865
Fluoride	0.25	0.000013
Sulfate	7	0.000073
Nitrate	1.6	0.000026
Phosphate	0.6	0.000006
Silica	5	0.000083

Shell side operating conditions are specified for storage of 5,000 gallons of water above the bottom of the heat transfer surface and an evaporation rate of 17,500 lb/hr with carry-over limit of 3% maximum.

(1)Pearl, W L; and Sawochka, S G, "PWR Secondary Water Chemistry Study, Research Project 404-1 Interim Report," Electric Power Research Institute, February, 1977 (NP-516).

Assuming interactions with silica are negligible, the calculated variation of the OH^- ion concentration upon concentrating the solution by steaming is shown in Figure 1 as a function of the concentration factor, CF, defined as the ratio of the mass of water considered (in liquid and steam phase) to the mass of water in the residual liquid phase. It is seen that after reaching a maximum OH^- ion concentration of 0.001 molal (equivalent to 40 ppm NaOH), the solution becomes less basic. Such behavior is qualitatively different from that predicted in a steam generator crevice with Lake Michigan cooling water ingress.(1) The difference can be understood as follows:

1. In the steam generator, the cooling water impurities (from condenser inleakage) enter the crevice at very low concentration. At operating conditions, the steam generator solution is nearly neutral (pH = 5.6, although at room temperature the pH is about 9). Upon steaming in the crevice, the CO_2 is rapidly purged completely from the crevice without appreciable pH effect before the crevice solution is appreciably concentrated. The excess of cationic over anionic impurities results in increasing basicity upon concentrating.

2. In the emergency condenser where Lake Michigan water is expected to enter without dilution, a sharp pH rise is calculated to occur with CO_2 purging, before appreciably concentrating the solution. The sharp pH rise displaces the following equilibria to the right side:

$$CO_2 + OH^- = HCO_3^- \qquad (1)$$

$$HCO_3^- + OH^- = CO_3^{=} + H_2O \qquad (2)$$

$$CO_3^{=} + Ca = CaCO_3 \qquad (3)$$

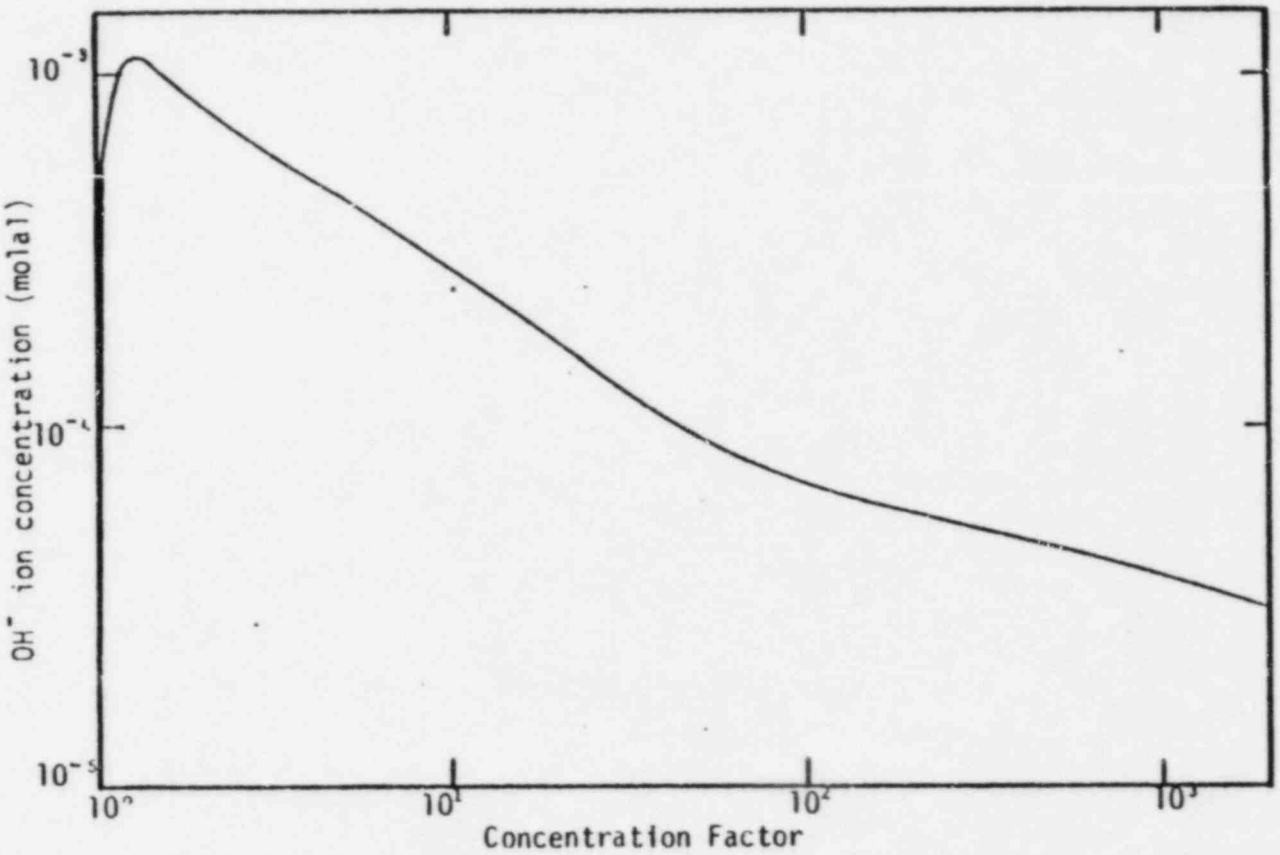

Figure 1 Variation of OH^- ion concentration upon concentrating Lake Michigan water by steaming at 100°C

As a result, the system retains an appreciable inventory of CO_2 in the form of a $CaCO_3$ precipitate. It follows that the excess of cationic over anionic impurities is much smaller than in the case of ingress in the steam generator crevices from condenser inleakage. Together with the calcium carbonate, magnesium hydroxide precipitation contributes to limit the pH increase. Upon concentrating the solution, calcium carbonate and magnesium hydroxide precipitation reduces the excess of cationic impurities and, correspondingly, the OH^- ion concentration. The solution state moves towards neutrality.

Calculations have been limited to a concentration factor of 2,000 for lack of data on the dissociation constant of water at ionic strengths greater than unity. However, this limitation should not be of concern in the present application because as the OH^- ion concentration decreases, the chemical equilibria 1-3 are moved back to the left; ie, CO_2 purging becomes more efficient. Also, the large inventory of calcium carbonate precipitate represents a large buffer capacity.

ATTACHMENT D

Consumers Power Company
Big Rock Point Plant
Docket 50-155

EXEMPTION REQUESTS

September 28, 1982

8 pages

EXEMPTION REQUEST
Item 1

10 CFR 50 Appendix R Section III.G.1.a contains the requirement that all equipment necessary to achieve and maintain hot shutdown be free of fire damage. In Item 1 of Enclosure 2 attached to NRC letter dated April 30, 1982 it is stated that repairing the power cables to the Control Rod Drive (CRD) pumps (used to provide Primary Coolant System (PCS) makeup), does not meet this requirement. The following is our justification for an exemption request to the above requirement for the CRD pump and the CRD Booster pump.

Consumers Power Company letter dated September 24, 1981 contains the results of an analysis performed to assess the amount of time available at hot shutdown before makeup would be required to maintain PCS water level above the low reactor water level setpoint assuming maximum allowable PCS leakage. These results show that the minimum time available before PCS makeup is needed, assuming maximum leakage and a very slow cooldown rate, is 9 hours. Consumers Power Company considers a time period of 9 hours to be more than adequate for an operator to connect the cables from the No 1 CRD Pump transfer switch to the emergency diesel generator and to the CRD Booster pump in order that the CRD pumps can be powered to provide PCS makeup in the event of a fire and loss of off-site power.

It was stated further in our September 24, 1981 letter that Consumers Power Company contends that providing this cable connection is merely an operator action required to attain safe shutdown and should not be classified as a "repair", as cables with plug-in connectors on each end will be stored on site and procedures will be provided.

For the reasons stated above, Consumers Power Company hereby requests an exemption from the requirements of Section III.G.1.a of Appendix R for the CRD pumps so that these pumps may be inoperative for up to 9 hours while the cable connections are being made to the emergency diesel generator.

EXEMPTION REQUEST
Item 2

10 CFR 50 Appendix R Section III.L contains the requirement that "during the post fire shutdown, the reactor coolant system process variables shall be maintained within those predicted for a loss of normal ac power." Big Rock Point would not meet this requirement for an event involving a fire which would render the emergency condenser inoperable. This outcome could only result from a fire destroying the control/power cables of the emergency condenser outlet valves or a fire causing a possible hot short and maloperation of the control cables for the inlet valves.

The requirement of Appendix R, Section III.L is unnecessary in the event of a fire involving the outlet valve cables for the following reasons:

(1) A fire involving the outlet valve cables between the control room and the alternate shutdown station area would not disable the emergency condenser because control of the emergency condenser outlet valves is provided at both the control room and the alternate shutdown station.

(2) Although a fire in the alternate shutdown station could disable the emergency condenser, Consumers Power Company concludes that this is not a safety problem for the reasons discussed in our response to the NRC position which is described in Item 2 of Enclosure 2 of NRC letter dated April 30, 1982 (refer to Attachment B of this letter). These reasons are summarized below:

a. The likelihood of occurrence of an event involving a fire in the area of the alternate shutdown station and a coincident random loss of station power is extremely remote.

b. As unlikely as the event of a fire in the alternate shutdown station area coincident with loss of normal ac power appears to be, Consumers Power Company identified in our September 24, 1981 letter that reactor depressurization and core spray systems would actuate to prevent core damage from occuring if this event did in fact occur. These systems would not be disabled by either a fire in the alternate shutdown[1] area or the loss of offsite power. Even though the plant state would not be maintained in this event as in the event of loss of normal ac power, the integrity of the fission product boundary, as it is defined in Section III.L, should not be adversely affected.

(3) The outlet valve cabling from the alternate shutdown station area to the outlet valves will be protected from the reactor depressurizaton and core spray systems and associated cabling by one of the means specified in Appendix R, Section III.G. Again, the likelihood of a fire involving the outlet valve cabling inside containment coincident with a random loss of offsite power is extremely remote.

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[1] Although the alternate shutdown panel is in the same room as the core spray pumps, the alternate shutdown panel and cables will be enclosed by a fire barrier having a 3-hour rating.

A fire involving the control cables for the inlet valves is discussed in Exemption Request Item 3.

For the reasons stated above, Consumers Power Company hereby requests an exemption from Section III.L of Appendix R as it pertains to the loss of the emergency condenser.

EXEMPTION REQUEST
Item 3

If fire-induced hot shorts closes both emergency condenser inlet valves in addition to a loss of offsite power, Big Rock Point will utilize the RDS and Core Spray Systems to safely shutdown the plant. These systems will be protected from the inlet valve circuitry according to Section III.G of Appendix R in all areas, except for the control room and the deck of the steam drum enclosure.

10 CFR 50 Appendix R Section III.G.2 contains the requirement that "where cables or equipment, including associated non-safety circuits that could prevent operation or cause maloperation due to hot shorts, open circuits, or shorts to ground, of redundant trains of systems necessary to achieve and maintain hot shutdown conditions are located in the same fire area outside of primary containment, one of the following means of ensuring that one of the redundant trains is free of fire damage shall be provided:

a. Separation of cables and equipment and associated non-safety circuits of redundant trains by a fire barrier having a 3-hour rating. Structural steel forming a part of or supporting such fire barriers shall be protected to provide fire resistance equivalent to that required of the barrier:

b. Separation of cables and equipment and associated non-safety circuits of redundant trains by a horizontal distance of more than 20 feet with no intervening combustible or fire hazards. In addition, fire detectors and an automatic fire suppression system shall be installed in the fire area; or

c. Enclosure of cable and equipment and associated non-safety circuits of one redundant train in a fire barrier having a 1-hour rating. In addition, fire detectors and an automatic fire suppression system shall be installed in the fire area;"

Consumers Power Company has concluded that the requirement for separation as it specifically pertains to the control room hand-switches of the emergency condenser inlet valves, RDS controls and Core Spray hand-switches is unnecessary for the following reasons:

1. Separation of the above safety systems is provided by the placement of the hand-switches in different electrical panels. One set of core spray valve hand-switches and the inlet valve hand-switches are located on a panel which is separated by open space between the panel containing the other set of core spray valve hand-switches. And the RDS controls are located altogether on another separate panel.

2. The Big Rock Point Plant control room is manned continuously 24 hours a day during normal Plant operation. Each operator is trained in dealing with possible control room fires.

3. The Big Rock Point Plant's control room contains five (5) smoke detectors, distributed throughout the control room and walk-in panels. It also contains two portable CO_2 fire extinguishers. In the corridor adjacent to the control room there are two 2-1/2 gallon water extinguishers and a standpipe with 50 feet of 1-1/2 inch fire hose along with an extra length of 1-1/2 inch hose. The water extinguishers and hose are less than 20 feet from the control room door. Consumers Power Company believes that these fire safety features coupled with the separation between system circuitry which presently exists and a continuously manned control room is sufficient to safety contain a control room fire and to limit fire damage to no more than one equipment panel.

The other area where separation between the Emergency Condenser inlet valve cables and RDS cables does not meet the requirements of Section III.G.2 of Appendix R is on the deck of the steam drum enclosure. One inlet valve is within two feet of the RDS valves and the other inlet valve is separated by approximately a foot from the RDS valves. We can meet Section III.G.2 of Appendix R for one inlet valve by placing a noncombustible radiant energy shield between itself and the RDS valves but it would be virtually impossible to provide this same fire protection feature between the other inlet valve and RDS valves due to the lack of physical separation and the congestion of piping and other components.

Consumers Power Company has concluded that the requirement for separation as it specifically pertains to the emergency condenser inlet valves and RDS valves on the deck of the steam drum enclosure, is unnecessary for the following reasons:

1. One inlet valve will be protected from the RDS valves by a noncombustible radiant energy shield. The emergency condenser can be functional with only one of the two condenser tube bundles utilized.

2. The combustible or fire hazard loading on the steam drum enclosure deck is negligible, thereby making a transient exposure fire extremely unlikely. With the modification proposed above in addition to the location of the valves in containment we believe that a fire on the steam drum enclosure deck which would close both inlet valves due to two simultaneous short-circuits and destroys the RDS valves or circuits in addition to a coincident random loss of off-site power is not credible.

For the reasons stated above, Consumers Power Company hereby requests an exemption from the portions of Section III.G.2 of 10 CFR 50 Appendix R pertaining to the requirement for separation of cables and equipment as it applies to the control room and steam drum enclosure deck for the emergency condenser inlet valve circuitry and the RDS and Core Spray system circuits.

EXEMPTION REQUEST
Item 4

10 CFR 50 Appendix R Section III G.3 contains the requirement that a fire detection and a fixed fire suppression system be installed in fire areas requiring alternative or dedicated shutdown capabilities. Consumers Power Company has concluded that the requirement for a fixed fire suppression system for the Big Rock Point containment (excluding the recirculation pump room), a designated fire area, is unnecessary for the following reasons:

1. Subsequent to the issuance of the staff SER dated April 4, 1979 Consumers Power Company completed the following modifications in containment to improve the existing fire protection program:

   a. Fire detection systems in the following; core spray pump room, control rod drive accumulator area; and shutdown heat exchanger room. A fire detection system was previously installed in the interior cable spreading area.

   b. Two additional fire hose stations so that all areas containing safety-related equipment could be reached by an effective interior hose stream.

   c. One Model 150 wheeled ABC type dry chemical fire extinguisher was located in the fuel pool filter area elevation 600'-6".

      For additional information refer to our letter of August 31, 1979.

      With the installation of Products of Combustion (P.O.C.) detectors in the safety related areas that annunciate in the control room, we will receive an early alarm so that through the rapid response of our trained fire brigade with portable fire extinguishers and the installed fire hoses, damages will be minimized.

2. Previous SER Approval. The NRC provided a Safety Evaluation Report (SER) in letter dated April 4, 1979, which summarized the results of the NRC's evaluation of the fire protection program at the Big Rock Point Plant. Section 5.1.6 of this SER contains a description of modifications to be made to Big Rock Point containment, a designated fire area, in order for it to satisfy the objectives of Section 2.2 of the SER. The aforementioned modifications were implemented, thus bringing the Big Rock control room up to the required fire protection standards.

3. Alternate Shutdown System. Consumers Power Company has committed to install an alternate shutdown system. The proposed modifications are described in our letters of March 19, 1981 and May 19, 1981.

For the above stated reasons, Consumers Power Company hereby requests an exemption from the requirement stated in Section III.G.3 of Appendix R for a fixed fire suppression system for the Big Rock Point Plant containment (excluding the recirculation pump room).

EXEMPTION REQUEST
Item 5

It is stated in 10 CFR 50.48 paragraph (c)(4) "Those fire protection features that require prior NRC approval...shall be implemented.. (during the first refueling outage) commencing 180 days after NRC approval..." Consumers Power Company's proposed alternate shutdown system falls under the above requirement.

The design stage of our alternate shutdown system has been completed and procurement of the necessary equipment has been initiated. However, due to long vendor lead times for certain necessary components of the system, installation is unlikely during the next refueling outage. The next refueling outage is presently scheduled to begin in April of 1983, but could be as late as July of 1983.

Therefore, if NRC approval is obtained for our design of the alternate shutdown system prior to February 1, 1983, Consumers Power Company requests a schedular exemption from the timetable set forth in 10 CFR 50.48, paragraph (c)(4).

Consumers Power Company plans to install the proposed alternate shutdown system during the 1984 refueling outage and will make every effort to expedite delivery of the necessary equipment in time to meet this commitment.

EXEMPTION REQUEST
Item 6

10 CFR 50 Appendix R Section III G.3 contains the requirement that a fire detection and a fixed fire suppression system be installed in fire areas requiring alternative or dedicated shutdown capabilities. Consumers Power Company has concluded that the requirement for a fixed fire suppression system for the Big Rock Point control room, a designated fire area, is unnecessary for the following reasons:

1. Control Room Staffing. The Big Rock Point Plant control room is manned continuously 24 hours a day during normal Plant operations. Each operator is trained in dealing with possible control room fires.

2. Fire Suppression and Detection Equipment. The Big Rock Point Plant's control room contains five (5) smoke detectors, distributed throughout the control room and walk-in panels. It also contains two portable CO_2 fire extinguishers. In the corridor adjacent to the control room there are two 2-1/2 gallon water extinguishers and a standpipe with 50 feet of 1-1/2 inch fire hose along with an extra length of 1-1/2 inch hose. The water extinguishers and hose are less than 20 feet from the control room door. Consumers Power Company believes that these fire safety features coupled with the continuous manning of the control room is sufficient to safely contain a control room fire.

3. Previous SER approval. The NRC provided a Safety Evaluation Report (SER) in letter dated April 4, 1979 which summarized the results of the NRC's evaluation of the fire protection program at the Big Rock Point Plant. Section 5.3.6 of this SER contained a description of modifications to be made to the Big Rock Point control room, a designated fire area, in order for it to satisfy the objectives of Section 2.2 of the SER. The aforementioned modifications were implemented, thus bringing the Big Rock Point control room up to the required fire protection standards.

Based on the hereinbefore stated reasons, Consumers Power Company does not consider a fixed fire suppression system necessary for the Big Rock Point Plant control room and hereby requests an exemption from such a requirement.

ATTACHMENT E

Consumers Power Company
Big Rock Point Plant
Docket 50-155

RESPONSES TO NRC QUESTIONS GENERATED DURING THE SEPTEMBER 8 AND 9, 1982 MEETING WITH THE NRC AT BIG ROCK POINT

September 28, 1982

3 pages

RESPONSES TO NRC QUESTIONS GENERATED DURING THE
SEPTEMBER 8 AND 9, 1982 MEETING WITH THE NRC AT BIG ROCK POINT

Question 1: If a fire destroys both control rod drive (CRD) pumps coincident with an unrelated loss of off site power, is there an alternate method to provide makeup to the primary system?

Response: Part of the design of the Big Rock Point alternate shutdown system is to provide an alternate power supply to a CRD pump in order to provide a source of high pressure makeup to the primary system. This high pressure makeup assures the ability to keep primary system level well above the core.

In the case of a fire that destroys this high pressure makeup, low pressure makeup can be used provided that the system pressure is reduced before makeup is required. A normal cooldown rate starting at approximately 100F per hour will result in a pressure reduction that allows low pressure makeup to begin before the level drops to the top of the core. Low pressure makeup could be provided by the fire system through the core spray valves.

Question 2: If a fire destroys the CRD booster pump coincident with an unrelated loss of off site power, is there an alternate method to provide makeup to the primary system?

Response: See response to Question 1. In addition, there is a hose connection available in the condensate pump room where fire water or well water could be supplied in place of the booster pump.

Question 3: If a fire destroys both shutdown cooling system pumps or both reactor cooling water pumps coincident with an unrelated loss of off site power, is there an alternate method for achieving cold shutdown?

Response: There is a method available in which cold water is added to the primary system while warm water is bled off. The cold water could be supplied by the control rod drive system or the fire system. Water can be bled off through the normal cleanup system blowdown path or through a number of other manual and remote vent and drain paths. AC power could be provided by the diesel generator. As the emergency condenser has already cooled the system to somewhere near 212F, this method of "feed and bleed" would eventually reduce the temperature to less than 212F.

Consumers Power Company, however, is not convinced that this would be a good method of assuring safe shutdown. There is no reason why the emergency condenser cannot be left in service indefinitely. It would provide adequate heat removal capability to keep the primary system temperature near 212F. To introduce this method of feed and bleed for the sole purpose of lowering the temperature a few more degrees is unreasonable. It would be

much better to repair the damaged pumps as soon as possible; it may take much longer than 72 hours, but this does not create any unacceptable risks. In other words, an alternate method does exist to cool down the primary system, but Consumers Power Company will not commit to using it.

Question 4: If a fire destroys both fire pumps in the screenhouse coincident with an unrelated loss of off site power, can safe shutdown be achieved?

Response: The method to reach cold shutdown is the same as that in question 3 (excluding the fire system). For other postulated fires, fire water is relied on for makeup to the shell-side of the emergency condenser. In this case, it is not required as the normal source of makeup from the demin water pump is available and can be powered from the diesel generator.

Question 5: Will the equipment of the alternate shutdown system be separated from the core spray pumps by a three hour fire barrier?

Response: The design will be modified to assure that all DC equipment/-cables will be separated from the core spray pumps and associated valves by a three hour rated fire barrier.

Question 6: If a fire destroys the control cables for the emergency condenser outlet valves inside containment, can safe shutdown be achieved?

Response: The plant can be safely shutdown by the Reactor Depressurization System (RDS) and Core Spray System. These systems will be protected from the emergency condenser outlet valve cables by one of the means specified in Section III.G.2 of Appendix R. A radiant energy shield will be installed between the RDS cables and the outlet valve cables on the steam drum enclosure wall.

Question 7: If fire-induced hot shorts caused the emergency condenser inlet valves to close, can safe shutdown be achieved?

Response: The plant can be safely shutdown by the RDS and Core Spray System. Presently, the emergency condenser inlet valve cables are routed from the control room through the containment penentration area to the valve operator reversing starter. Most of the fire areas which incorporate the inlet valve circuitry do not provide the necessary protection between the inlet valve circuits and RDS or Core Spray System Circuitry. Therefore, Consumers Power Company is proposing a modification to ensure adequate protection from fire is provided to the above systems.

The control wire for closing of each inlet valve will be rerouted from the reversing starter to the control room in a similar manner as the outlet valve cables i.e., from the control

room to the general vicinity of the core spray equipment room, then through the electrical penetration at the equipment lock. Once this modification is complete, fire protection features between the inlet valve circuits and RDS and Core Spray System circuits will satisfy the requirements of Section III.G.2 of Appendix R for all areas except the control room and the deck of the steam drum enclosure. Attachment D-Item 3 provides our request for an exemption to the applicable section of Appendix R for these two areas and justification for why additional modification are unnecessary.