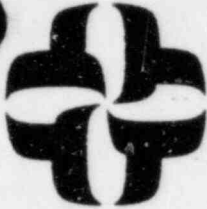


CALCULATION/PROBLEM COVER SHEET



Calculation/Problem No: 1040-001-012

Title: Core Flooding System 2.9

Client: Toledo Edison Company Project: Davis-Besse Unit 1

Job No: 1040-001-671

I & E Bulletin 79-01B
Equipment Qualification

Design Input/References:

Design Inputs are outlined in the Cover Report.

Assumptions:

Assumptions are outlined in the Cover Report.

Method:

Methods are outlined in the Cover Report.

Remarks:

EDS Nuclear Report No. 02-1040-1076.

REV. NO.	REVISION	APPROVED	DATE
0	original	Jeffrey S. Haverly	10-2-81
1	GENERAL MANUAL REVISIONS	NK Woodward	1/3/83
2	GENERAL MANUAL REVISIONS	NK Woodward	11/2/83

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PDR ADOCK 05000346
P PDR

Facility: Davis-Besse Unit 1
Docket: 50-346

MASTER LIST
HARSH ENVIRONMENT
CORE FLOODING SYSTEM

Index No: 209M-001
Rev.: 2

Prepared by: N Lewis Date 11/1/83
Checked by: J. M. [Signature] Date 11/2/83

Worksheet Index No.	Rev.	Plant ID Number	Generic Name	LOCATION		REMARKS
				Inside Primary Containment	Outside Primary Containment	
209H-004	2	MVCF01A	Valve Motor Operator	Rm. 217		
209H-005	2	MVCF01B	Valve Motor Operator	Rm. 214		
	2	MVCF02A	Valve Motor Operator	Rm. 217		See 2.16
	2	MVCF02B	Valve Motor Operator	Rm. 214		See 2.16
	2	MVCF05A	Valve Motor Operator	Rm. 214		See 2.16
	2	MVCF05B	Valve Motor Operator	Rm. 217		See 2.16
	2	BellB	Motor Control Center		Rm. 304	See 2.21
	2	BF11A	Motor Control Center		Rm. 427	See 2.21
	2	CDE11B-1	Disconnect Switch Cabinet		Rm. 304	See 2.21
	2	CDF11A-1	Disconnect Switch Cabinet		Rm. 427	See 2.21

Docket: 50-346

CORE FLOODING SYSTEM

Rev.: 2

Checked by: Amelia Date 11/2/83

[illegible]

[illegible]

Facility: Davis-Besse Unit 1
Docket: 50-346

SYSTEM COMPONENT EVALUATION WORKSHEET

Index No.: 209H-004
Rev.: 2

Prepared by: N Lewis Date: 11/1/83
Checked by: [Signature] Date: 11/2/83

EQUIPMENT DESCRIPTION	ENVIRONMENT			DOCUMENTATION REF.		Qualification Method	Outstanding Items
	Parameter	Specification	Qualification	Specification	Qualification		
System: Core Flooding System	Operating Time	1 Year	1.1 Years	P	M-24 V-24A Note 1	Simultaneous Test	None
Plant ID No. MVCF01A	Temperature (°F)	283.0	329.0	H, X	M-24 V-24A	Simultaneous Test	None
Component: Valve Motor Operator	Pressure (PSIA)	52.0	104.7	G, X	M-24 V-24A	Simultaneous Test	None
Manufacturer: Limitorque	Relative Humidity (%)	100.0	100.0	A	M-24 V-24A	Simultaneous Test	None
Model Number: SMB-3-100	Chemical Spray	Boric Acid 1800 ppm pH 5.0	Boric Acid 1800 ppm pH 5.0	A	M-24 V-24A CAL-40 Note 2	Simultaneous Test, Analysis	None
O/N: 360197B S/N: 148664 Function: Operates Core Flood Tank #2 Injection Isolation Valve	Radiation	1.7 x 10 ⁷ RADS	2.0 x 10 ⁸ RADS	CAL-44	M-25 V-24A	Sequential Test	None
Accuracy: Spec: N/A Demon: N/A Service: Core Flood Tank #2 Injection Isolation Valve	Aging	40 Years	40 Years	I	CAL-93	Sequential Test Analysis	None
Location: Containment Rm. 217 Flood Level Elev: 572'-2" Above Flood Level: No	Submergence	572'-2"	566'-3" Note 3	B	M-7	N/A	None
Needed for: Hot Shutdown <input checked="" type="checkbox"/> Cold Shutdown <input checked="" type="checkbox"/>							

Facility: Davis-Besse Unit 1
Docket: 50-346

SYSTEM COMPONENT EVALUATION WORKSHEET

Index No.: 209H-004A
Rev.: 2

NOTES

Prepared by: N. Lewis Date: 11/1/83
Checked by: Submittal Date: 11/2/83

1. The test subjected the valve motor operator to 1 hour at 329°F and 104.7 psia, then 2 hours at 312°F and 84.7 psia, then 2 hours at 287°F and 54.7 psia, then 19 hours at 256°F and 34.7 psia, and 250°F and 29.7 psia for 6 days. The temperature and pressure inside containment peak at 283°F and 52.0 psia in 17 and 50 seconds, respectively. At 1 hour the conditions are 214.7°F and 32.32 psia; at 3 hours the conditions are 204°F and 29.46 psia; at 5 hours the conditions are 193.2°F and 27.08 psia; and at 24 hours the conditions are 143°F and 18.03 psia. The containment returns to ambient conditions in 7 days.

Based on this information, it can be concluded that the laboratory test subjected the valve motor operator to an overall more severe environment than that which would result from a postulated LOCA. Since the valve motor operator remained operable throughout the test and functional after the test, it can be concluded that the valve motor operator will remain functional during and after exposure to the accident environment which would result from the postulated LOCA. (Reference G, H, and X).

2. CAL-40 qualifies components tested in a high pH boric acid spray to a pH value of 5.
3. This valve motor operator will become flooded during a LOCA. The valve will be submerged in 10 minutes 54 seconds after a LOCA. This is a worst-case value based on a postulated DBA LOCA. For smaller LOCAs, component submergence will occur further into the accident, if it occurs at all. This valve motor operator is the core flooding tank #2 injection isolation valve motor operator. Once this valve is fully opened and before the reactor coolant pressure reaches 725 psig, the breaker of the combination line starter of the valve motor operator will be tripped open and padlocked. This valve motor operator is not required to operate to mitigate the LOCA. Since this valve operator is not required to operate to mitigate the accident, failure of this valve would not impact other safety-related functions or mislead an operator. (Reference CAL-49 and Elem. Wiring Diag. 7749-E52B-SH27)

Facility: Davis-Besse Unit 1
Docket: 50-346

SYSTEM COMPONENT EVALUATION WORKSHEET

Index No.: 209H-005
Rev.: 2

Prepared by: N Lewis Date: 11/1/83
Checked by: [Signature] Date: 11/2/83

EQUIPMENT DESCRIPTION	ENVIRONMENT			DOCUMENTATION REF.		Qualification Method	Outstanding Items
	Parameter	Specification	Qualification	Specification	Qualification		
System: Core Flooding System	Operating Time	1 Year	1.1 Years	F	M-24 V-24A Note 1	Simultaneous Test	None
Plant ID No. MVCF01B	Temperature	283.0	329.0	H, X	M-24 V-24A	Simultaneous Test	None
Component: Valve Motor Operator	(°F)						
Manufacturer: Limitorque	Pressure	52.0	104.7	G, X	M-24 V-24A	Simultaneous Test	None
	(PSIA)						
Model Number: SMB-3-100							
O/N: 360197B							
S/N: 148665	Relative Humidity	100.0	100.0	A	M-24 V-24A	Simultaneous Test	None
Function: Operates Core Flood Tank #1 Injection Isolation Valve	(%)						
Accuracy: Spec: N/A	Chemical	Boric Acid 1800 ppm	Boric Acid 1800 ppm	A	M-24 V-24A	Simultaneous Test,	None
Demon: N/A	Spray	pH 5.0	pH 5.0		CAL-40 Note 2	Analysis	
Service: Core Flood Tank #1 Injection Isolation Valve							
Location: Containment Rm. 214	Radiation	1.7×10^7 RADS	2.0×10^8 RADS	CAL-44	M-25 V-24A	Sequential Test	None
Flood Level Elev: 572'-2"							
Above Flood Level: No	Aging	40 Years	40 Years	I	CAL-93	Sequential Test Analysis	None
Needed for:							
Hot Shutdown <input checked="" type="checkbox"/>							
	Submergence	572'-2"	576'-6"	B	M-1	N/A	None
Cold Shutdown <input checked="" type="checkbox"/>			Note 3				

Facility: Davis-Besse Unit 1
Docket: 50-346

SYSTEM COMPONENT EVALUATION WORKSHEET

Index No.: 209H-005A

Rev.: 2

NOTES

Prepared by: M. Lewis
Checked by: J. H. [Signature]

Date: 11/1/83
Date: 11/2/83

1. The test subjected the valve motor operator to 1 hour at 329°F and 104.7 psia, then 2 hours at 312°F and 84.7 psia, then 2 hours at 287°F and 54.7 psia, then 19 hours at 256°F and 34.7 psia, and 250°F and 29.7 psia for 6 days. The temperature and pressure inside containment peak at 283°F and 52.0 psia in 17 and 50 seconds, respectively. At 1 hour the conditions are 214.7°F and 32.32 psia; at 3 hours the conditions are 204°F and 29.46 psia; at 5 hours the conditions are 193.2°F and 27.08 psia; and at 24 hours the conditions are 143°F and 18.03 psia. The containment returns to ambient conditions in 7 days.

Based on this information, it can be concluded that the laboratory test subjected the valve motor operator to an overall more severe environment than that which would result from a postulated LOCA. Since the valve motor operator remained operable throughout the test and functional after the test, it can be concluded that the valve motor operator will remain functional during and after exposure to the accident environment which would result from the postulated LOCA. (Reference G, H, and X).

2. CAL-40 qualifies components tested in a high pH boric acid spray to a pH value of 5.
3. This valve motor operator will become flooded during a LOCA. The valve will be submerged in 17 minutes 15 seconds after a LOCA. This is a worst-case value based on a postulated DBA LOCA. For smaller LOCAs, component submergence will occur further into the accident, if it occurs at all. This valve motor operator is the core flooding tank #1 injection isolation valve motor operator. Once this valve is fully opened and before the reactor coolant pressure reaches 725 psig, the breaker of the combination line starter of the valve motor operator will be tripped open and padlocked. This valve motor operator is not required to operate to mitigate the LOCA. Since this valve operator is not required to operate to mitigate the accident, failure of this valve would not impact other safety-related functions or mislead an operator. (Reference Elem. Wiring Diag. 7749-E52B-SH27 and CAL-49.)