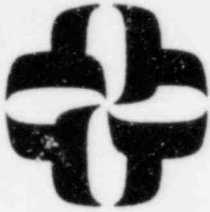


CALCULATION/PROBLEM COVER SHEET



Calculation/Problem No: 1040-001-017

Title: Containment Spray System 2.14

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. Hawley	10-2-81
2	GENERAL MANUAL REVISIONS	N/K Woodward	11/2/83

8312200238 831129
PDR ADOCK 05000346
PDR

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

MASTER LIST
HARSH ENVIRONMENT
CONTAINMENT SPRAY SYSTEM

Index No: 214M-001
Rev.: 2

Prepared by:
Checked by:

N. Lewis
[Signature]

Date:
Date:

11/1/83
11/2/83

Worksheet Index No.	Rev.	Plant ID Number	Generic Name	LOCATION		REMARKS
				Inside Primary Containment	Outside Primary Containment	
214H-004	2	MP0561	Containment Spray Pump Motor			
214H-005	2	MP0562	Containment Spray Pump Motor			
214H-006	2	MV15300	Valve Motor Operator		Rm. 105	
214H-007	2	MV15310	Valve Motor Operator		Rm. 115	
	2	BEL1C	Motor Control Center		Rm. 303	
	2	CDEL1C	Disconnect Switch Cabinet		Rm. 314	
	2	EV15300	Terminal Block Box		Rm. 304	See 2.21
	2	EV15310	Terminal Block Box		Rm. 304	See 2.21
					Rm. 303	See 2.21
					Rm. 314	See 2.21

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

MASTER LIST
NON-HARSH ENVIRONMENT
CONTAINMENT SPRAY SYSTEM

Index No: 214M-002
Rev.: 2

Prepared by:

E. Lewis

Date:

9/30/83

Checked by:

[Signature]

Date:

10/1/83

Worksheet Index No.	Rev.	Plant ID Number	Generic Name	LOCATION		REMARKS
				Inside Primary Containment	Outside Primary Containment	
	0	BE1	Unit Sub-Station		Rm. 429	
	0	BF1	Unit Sub-Station		Rm. 428	
	0	BF11B	Motor Control Center		Rm. 405	
	0	CDF11B	Disconnect Switch Cabinet		Rm. 405	
	0	C5716	Engineering Safety Feature Panel		Rm. 505	

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

MASTER LIST

Index No: 214M-003
Rev.: 2

CONTAINMENT SPRAY SYSTEM

Prepared by:

7 Lewis

Date:

9/30/82

Checked by:

Date:

Worksheet Index No.	Rev.	Plant ID Number	Generic Name	LOCATION		REMARKS
				Inside Primary Containment	Outside Primary Containment	

Facility: Dares-Besse Unit 1
Socket: 50-346

SYSTEM COMPONENT EVALUATION WORKSHEET

Index No.: 214H-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: Containment Spray	Operating Time	1 Year	40 Years	Note 1	Note 2	Analysis	None
Plant ID No. MP0561							
Component: Containment Spray Pump Motor	Temperature (°F)	130.0	Exempt	C-105	Note 3	N/A	None
Manufacturer: General Dynamics	Pressure (PSIA)	16.06	Exempt	C-105	Note 3	N/A	None
Model Number: 60101851							
Function: Drives Containment Spray Pump	Relative Humidity (%)	100.0	Exempt	A	Note 3	N/A	None
Accuracy: Spec: N/A Demon: N/A							
Service: Containment Spray Pump 1-1	Chemical Spray	N/A	N/A	N/A	N/A	N/A	None
Location: Auxiliary Bldg. Rm. 105	Radiation	1.9×10^6 RADS	1.0×10^9 RADS	T	CAL-88 Note 2	Analysis	None
Flood Level Elev: N/A Above Flood Level: N/A	Aging	40 Years	40 Years	I	CAL-88 Note 2	Analysis	None
Needed for: Hot Shutdown <input checked="" type="checkbox"/> Cold Shutdown <input type="checkbox"/>	Submergence	N/A	N/A	N/A	N/A	N/A	None

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

SYSTEM COMPONENT EVALUATION WORKSHEET

Index No.: 214H-004A
Rev.: 2

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

NOTES

1. One-year operating time is used as a conservative maximum specification.
2. Materials evaluation conducted. Materials sensitive to radiation and/or thermal aging summarized on attached evaluation.
3. The harsh environment in Room 105 is caused by a main feedwater line break outside containment. The containment spray pump is exempt from qualification because the containment spray system does not perform an essential safety-related function during a high energy line break accident occurring outside containment. Since the containment spray system is not initiated for this accident, pump motor failure will not degrade other safety-related functions or mislead the operator. The increased radiation dose due to post-LOCA recirculated fluids and the HELB are separate effects. The radiation value utilized is the post-LOCA recirculating fluids dose plus the 40-year normal background dose. Motor lead connections are made using qualified splices. See CAL-60 for lubrication discussion.

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

COMPONENT MATERIALS EVALUATION SHEET

Index No.: 214H-004B
Rev.: 2

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

Plant I.D. No.: MP0561
Manufacturer: General Dynamics

Component: Containment Spray Pump Motor
Model No.: 60101851

Parts List *	Materials List	THERMAL AGING		RADIATION	
		Qualification	Reference	Qualification	Reference
Slot Liner	Polyester	40 Years @ 266°F	CAL-88	1.0×10^9 RADS	CAL-88
Wedge	Fiberglass Mat	Not Sensitive	CAL-38	Not Sensitive	CAL-88
Phase Paper	Polyester	40 Years @ 266°F	CAL-88	1.0×10^9 RADS	CAL-88
Slot Filler	Polyester fiber paper	40 Years @ 266°F	CAL-88	1.0×10^9 RADS	CAL-88
Wire	Copper wire with polyester film	40 Years @ 266°F	CAL-88	1.0×10^9 RADS	CAL-88

Material & Parts List Reference: V-17A

* Only non-metallic parts are listed. Metallic parts are not considered sensitive to thermal aging and are not affected by radiation.

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

SYSTEM COMPONENT EVALUATION WORKSHEET

Index No. 214H-005
Rev.: 2

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

EQUIPMENT DESCRIPTION	ENVIRONMENT			DOCUMENTATION REF.		Qualification Method	Outstanding Items
	Parameter	Specification	Qualification	Specification	Qualification		
System: Containment Spray	Operating Time	1 Year	40 Years	Note 1	Note 2	Analysis	None
Plant ID No. MP0562							
Component : Containment Spray Pump Motor	Temperature (°F)	177.0	Exempt	C-115	Note 3	N/A	None
Manufacturer: General Dynamics	Pressure (PSIA)	15.60	Exempt	C-115	Note 3	N/A	None
Model Number: 60101851							
Function: Drives Containment Spray Pump	Relative Humidity (%)	100.0	Exempt	A	Note 3	N/A	None
Accuracy: Spec: N/A Demon: N/A							
Service: Containment Spray Pump 1-2	Chemical Spray	N/A	N/A	N/A	N/A	N/A	None
Location: Auxiliary Bldg. Rm. 115	Radiation	2.67×10^6 RADS	1.0×10^9 RADS	T	CAL-88 Note 2	Analysis	None
Flood Level Elev: N/A Above Flood Level: N/A	Aging	40 Years	40 Years	I	CAL-88 Note 2	Analysis	None
Needed for: Hot Shutdown <input checked="" type="checkbox"/> Cold Shutdown <input type="checkbox"/>	Submergence	N/A	N/A	N/A	N/A	N/A	None

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

SYSTEM COMPONENT EVALUATION WORKSHEET

Index No.: 214H-005A
Rev.: 2

Prepared by: M. J. Lee Date: 11/1/84
Checked by: B. J. Brundage Date: 11/2/84

NOTES

1. One-year operating time is used as a conservative maximum specification.
2. Materials evaluation conducted. Materials sensitive to radiation and/or thermal aging summarized on attached evaluation.
3. The harsh environment in Room 115 is caused by a main feedwater line break outside containment. The containment spray pump is exempt from qualification because the containment spray system does not perform an essential safety-related function during a high energy line break accident occurring outside containment. Since the containment spray system is not initiated for this accident, pump motor failure will not degrade other safety-related functions or mislead the operator. The increased radiation dose due to post-LOCA recirculated fluids and the HELB are separate effects. The radiation value utilized is the post-LOCA recirculating fluids dose plus the 40-year normal background dose. Motor lead connections are made using qualified splices. See CAL-60 for lubrication discussion.

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

COMPONENT MATERIALS EVALUATION SHEET

Index No.: 214H-005B
Rev.: 2

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

Plant I.D. No.: MP0562
Manufacturer: General Dynamics

Component: Containment Spray Pump Motor
Model No.: 60101851

		THERMAL AGING		RADIATION	
Parts List *	Materials List	Qualification	Reference	Qualification	Reference
Slot Liner	Polyester	40 Years @ 266°F	CAL-88	1.0×10^9 RADS	CAL-88
Wedge	Fiberglass Mat	Not Sensitive	CAL-88	Not Sensitive	CAL-88
Phase Paper	Polyester	40 Years @ 266°F	CAL-88	1.0×10^9 RADS	CAL-88
Slot Filler	Polyester fiber paper	40 Years @ 266°F	CAL-88	1.0×10^9 RADS	CAL-88
Wire	Copper wire with polyester film	40 Years @ 266°F	CAL-88	1.0×10^9 RADS	CAL-88

Material & Parts List Reference: V-17A

* Only non-metallic parts are listed. Metallic parts are not considered sensitive to thermal aging and are not affected by radiation.

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

SYSTEM COMPONENT EVALUATION WORKSHEET

Index No.: 214H-006
Rev.: 2

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

EQUIPMENT DESCRIPTION	ENVIRONMENT			DOCUMENTATION REF.		Qualification Method	Outstanding Items
	Parameter	Specification	Qualification	Specification	Qualification		
System: Containment Spray System	Operating Time	1 Year	1.1 Years	F	M-26 V-24C Note 1	Simultaneous Test	None
Plant ID No. MV15300	Temperature (°F)	218.0	300.0	C-303	M-26 V-24C	Simultaneous Test	None
Component: Valve Motor Operator	Pressure (PSIA)	17.16	84.7	C-303	M-26 V-24C	Simultaneous Test	None
Manufacturer: Limitorque	Relative Humidity (%)	100.0	100.0	A	M-26 V-24C	Simultaneous Test	None
Model Number: SMB-0-15 O/N: 374106A S/N: 182632	Chemical Spray	N/A	N/A	N/A	N/A	N/A	None
Function: Operates Containment Spray Isolation Valve	Radiation	1.16×10^6 RADS	2.0×10^8 RADS	T	M-26 V-24C	Sequential Test	None
Accuracy: Spec: N/A Demon: N/A	Aging	40 Years	40 Years	I	CAL-93	Sequential Test Analysis	None
Service: Containment Spray Isolation Valve	Submergence	N/A	N/A	N/A	N/A	N/A	None
Location: Auxiliary Bldg. Rm. 303							
Flood Level Elev: N/A Above Flood Level: N/A							
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.: 214H-006A
Rev.: 2

Prepared by: N Lewis
Checked by: [Signature]

Date: 11/1/82
Date: 11/2/82

NOTES

1. The test subjected the valve motor operator to a transient of 300°F and 84.7 psia for 32 minutes, followed by a cooldown to 120°F in 3.2 hours. The valve motor operator was then subjected to a second transient of 300°F and 44.7 psia, which was maintained for 92 hours, then a cooldown to 200°F and 24.7 psia, which was maintained for 24 days. The temperature in Room 303 peaks at 218°F in 1.5 seconds. The pressure in Room 303 peaks at 17.16 psia in .038 seconds. The conditions in Room 303 return to ambient after 19 minutes.

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 HELB. 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 HELB. (Reference C-303)

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

SYSTEM COMPONENT EVALUATION WORKSHEET

Index No.: 214H-007
Rev.: 2

Prepared by: N Lewis Date: 11/1/83
Checked by: A McDonald Date: 11/4/83

EQUIPMENT DESCRIPTION	ENVIRONMENT			DOCUMENTATION REF.		Qualification Method	Outstanding Items
	Parameter	Specification	Qualification	Specification	Qualification		
System: Containment Spray System	Operating Time	1 Year	1.1 Years	F	M-26 V-24C Note 1	Simultaneous Test	None
Plant ID No. MV15310	Temperature (°F)	221.0	300.0	C-314	M-26 V-24C	Simultaneous Test	None
Component: Valve Motor Operator	Pressure (PSIA)	17.16	84.7	C-314	M-26 V-24C	Simultaneous Test	None
Manufacturer: Limitorque	Relative Humidity (%)	100.0	100.0	A	M-26 V-24C	Simultaneous Test	None
Model Number: SMB-0-15	Chemical Spray	N/A	N/A	N/A	N/A	N/A	None
O/N: 374106A	Radiation	1.0×10^6 RADS	2.0×10^8 RADS	T	M-26 V-24C	Sequential Test	None
S/N: 182633	Aging	40 Years	40 Years	I	CAL-93	Sequential Test Analysis	None
Function: Operates Containment Spray Isolation Valve	Submergence	N/A	N/A	N/A	N/A	N/A	None
Accuracy: Spec: N/A Demon: N/A							
Service: Containment Spray Isolation Valve							
Location: Auxiliary Bldg. Rm. 314							
Flood Level Elev: N/A							
Above Flood Level: N/A							
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.: 214H-007A
Rev.: 2

Prepared by: N. Lewis
Checked by: S. McDonald

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

NOTES

1. The test subjected the valve motor operator to a transient of 300°F and 84.7 psia for 32 minutes, followed by a cooldown to 120°F in 3.2 hours. The valve motor operator was then subjected to a second transient of 300°F and 44.7 psia, which was maintained for 92 hours, then a cooldown to 200°F and 24.7 psia, which was maintained for 24 days. The temperature in Room 314 peaks at 221°F in 1.55 seconds. The pressure in Room 314 peaks at 19.76 psia in .086 seconds. The conditions in Room 314 return to ambient after 8 minutes.

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 HELB. 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 HELB. (Reference C-314)