

SARGENT & LUNDY
ENGINEERS

Calc. for EQ Impact Due to Static
Blackout Conditions
X Safety-Related Non-Safety Related

Calc. No. C00-055096
Rev 00 Date 05-11-92
Page 1 of 7

Client	Commonwealth Edison Company	Prepared by	<i>H. Mac...</i>	Date	5-11-92		
Project	LaSalle County Station - Units 1&2	Reviewed by	<i>S. Lee</i>	Date	5-12-92		
Proj. No.	9012-26	Equip. No.	VARIOUS	Approved by	<i>J. Hennigan</i>	Date	5-13-92

1.0 PURPOSE

To perform Environmental Qualification impact assessme. for equipment affected by a temperature increase during a Station Blackout at LaSalle County Station - Units 1 and 2.

2.0 REFERENCES

- 2.1 LaSalle County FSAR, Table 3.11. (Not Included)
- 2.2 Ingresoll-Rand Drawing Nos. VPF #3069-7-5, VPF #3069-137-6, VPF #3069-143-1, VPF #3069-29- VPF #D830389, VPF #2993-36-10, VPF #2993-411-1, VPF #2993-412-1, VPF #2993-177-4.
- 2.3 John Crane Shaft Seals, Bulletin Nos. S-2003-1 and S-282-3.
- 2.4 Specification T-1211, "GE Purchase Order Specification 21A9526 for Auxiliary Drive Steam Turbine", Rev. 03. (Not Included)
- 2.5 Bingham-Willamette Co. Drawings: B-26351, VPF #3059-24-2 and VPF #3059-24(1)-2.
- 2.6 O-Ring Design Data - Lyons Valve Designers Handbook.
- 2.7 "Static Seals and Their Application", ORNL-TM-3308.
- 2.8 Garlock Gasketing Materials, Feb 1, 1978.
- 2.9 Bingham-Willamette Co. Instruction Manual Order No. 205-AC776 and Series 10324.

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Client	Commonwealth Edison Company	Prepared by	Date
Project	LaSalle County Station - Units 1&2	Reviewed by	Date
Proj. No.	9012-26	Equip. No. Various	Approved by
			Date

2.10 Bingham-Willamette Co. Letter to K. Raja dated 10-24-83.

3.0 ASSUMPTIONS

- The following are the only adverse conditions anticipated due to the Station Blackout:

<u>Location</u>	<u>Maximum Temperature</u>	<u>Duration of Event</u>
Main Control Room	< 120°F	4 hours
Auxiliary Electrical Equipment Room	< 120°F	4 hours
RCIC Pump Room (ambient)	< 212°F	4 hours
(Suppression Pool Ambient)	< 215°F	4 hours
HPCS & RHR Pump Rooms (Suppression Pool Ambient)	< 233°F	4 hours
Drywell	< 300°F	6 hours
	< 250°F	18 hours

- The metallic and inorganic materials are not age sensitive to the postulated environmental conditions.

4.0 METHOD OF ANALYSIS

The equipment that is required to operate under the Station Blackout's adverse environment has been environmentally qualified for normal operating conditions including the accident and post-accident environment. This analysis shows

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Calc. for EQ Impact Due to Station	
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<input checked="" type="checkbox"/> Safety-Related	<input type="checkbox"/> Non-Safety Related

Calc. No. CQD-05509F	
Rev. 00	Date 05-11-92
Page 3	of 7

Client	Commonwealth Edison Company	Prepared by	Date
Project	LaSalle County Station - Units 1&2	Reviewed by	Date
Proj. No.	9012-26	Equip. No.	Various
		Approved by	Date

that the SBO adverse environment does not exceed the conditions under which the subject equipment has been qualified to operate.

5.0 QUALIFICATION ANALYSIS

5.1 Main Control Room and Auxiliary Electrical Equipment Room

The electrical equipment located inside the Main Control Room and the Auxiliary Electrical Equipment Room is qualified to operate under mild environment at LaSalle County Station. The mild environment is defined in 10CFR50.49 as "... environment that would at no time be significantly more severe than the environment that would occur during normal plant operation, including anticipated operational occurrences". The maximum temperature inside this rooms under SBO, will not exceed 120°F; therefore, the equipment will not be exposed to a severe environment.

5.2 Drywell Equipment

The EQ equipment inside containment is identified in the attachments. All of the equipment is qualified to meet the environmental requirements specified in LaSalle County Station FSAR, Table 3.11 (see Figure 1). The high temperature event caused by a Station Blackout would cause the temperature to increase to a peak temperature of less than 300°F. The power would be restored within

Calc. for <u>7</u> Impact Due to Station	
Blackout Conditions	
<input checked="" type="checkbox"/> Safety-Related	<input type="checkbox"/> Non-Safety Related

Calc. No. COD-055096	
Rev. 00	Date 05-11-92
Page 4	of 7

Client	Commonweath Edison Company	Prepared by	Date
Project	LaSalle County Station - Units 1&2	Reviewed by	Date
Proj. No.	9012-26	Equip. No.	Various
		Approved by	Date

a maximum of 4 hours into the event. The temperature will begin to drop and would be less than 250°F within 2 hours after the power is restored. Hence, the conditions specified in the LSCS-FSAR LOCA design specification envelop the SBO with adequate margin.

The existing DBE qualification for the above equipment demonstrates the equipment's ability to function under the postulated conditions. However, subsequent to the postulated SBO, the equipment would not be able to immediately return to service since the DBE portion of the qualification is assumed to be used. In order to declare the equipment operable following the SBO, the equipment must be evaluated to show the ability to perform its safety function under the actual DBE conditions.

5.3 RCIC Turbine

The Reactor Core Isolation Cooling Systems auxiliary steam turbine drive assemblies would experience a peak ambient temperature of less than 212°F and a process fluid temperature of less than 215°F.

Per GE Specification (Ref. 2.4), the subject equipment is designed to withstand the ambient temperature of 212°F for 6 hours. The equipment that would see a temperature exceeding 212°F is the Bingham-Willamette RCIC Pump, Model No. 21A9243BU (Equipment Tag Nos. 1(2)E51-C001).

Client	Commonwealth Edison Company	Prepared by	Date
Project	LaSalle County Station - Units 1&2	Reviewed by	Date
Proj. No.	9012-26	Equip. No.	Various
		Approved by	Date

Per the manufacturer's drawing (Ref. 2.5), the following age sensitive materials are located inside the RCIC pump and will be exposed to the process fluid temperature:

<u>Component</u>	<u>Material</u>	<u>Ref.</u>	<u>Temperature Threshold</u>	<u>Ref.</u>
Case Gaskets	Asbestos	2.9, 2.10	950°F	2.7
O-Rings	Ethylene Propylene Terepolymer	2.9, 2.10	300°F	2.6
Bearing Cover to Bearing Housing Gasket	Garlock 660, Cork, Vegetable Fiber	2.10	221°F	2.8
O-Ring	Buna N	2.9, 2.10	250°F	2.6

Hence, the non-metallic components in the subject pumps are designed to withstand the postulated process fluid temperature of 215°F.

5.4 HPCS and RHR SUP Pool Pumps

The High Pressure Core Spray Pump and Residual Heat Removal Pump would be exposed to a Suppression Pool ambient temperature of less than 233°F.

The components that are sensitive to the above temperature are made of non-metallic (age-sensitive) materials. The list of non-metallic components inside the subject pumps is given below.

Client	Commonwealth Edison Company	Prepared by	Date
Project	LaSalle County Station - Units 1&2	Reviewed by	Date
Proj. No.	9012-26	Equip. No. Various	Approved by
			Date

Equipment: HPCS Pump Tag Nos.: 1,2E22C001
 Manufacturer: Ingresoll-Rand
 Model No.: 21A9243CK

RHR Pump Tag Nos.: 1,2E12C002A,B,C
 Manufacturer: Ingresoll-Rand
 Model No.: 29-APKD-3

Reference 2.2, the materials of construction for the above pumps are:

<u>Material</u>	<u>Max. Serv Temp</u>	<u>Refs.</u>
Ethylene Propylene	300°F	2.3
Canadian Asbestos Paper	1400°F	2.3
Asbestos	750°F	2.3
Graphite	700°F	2.3

The non-metallic components inside the subject pumps are designed to withstand the postulated ambient temperature of 233°F.

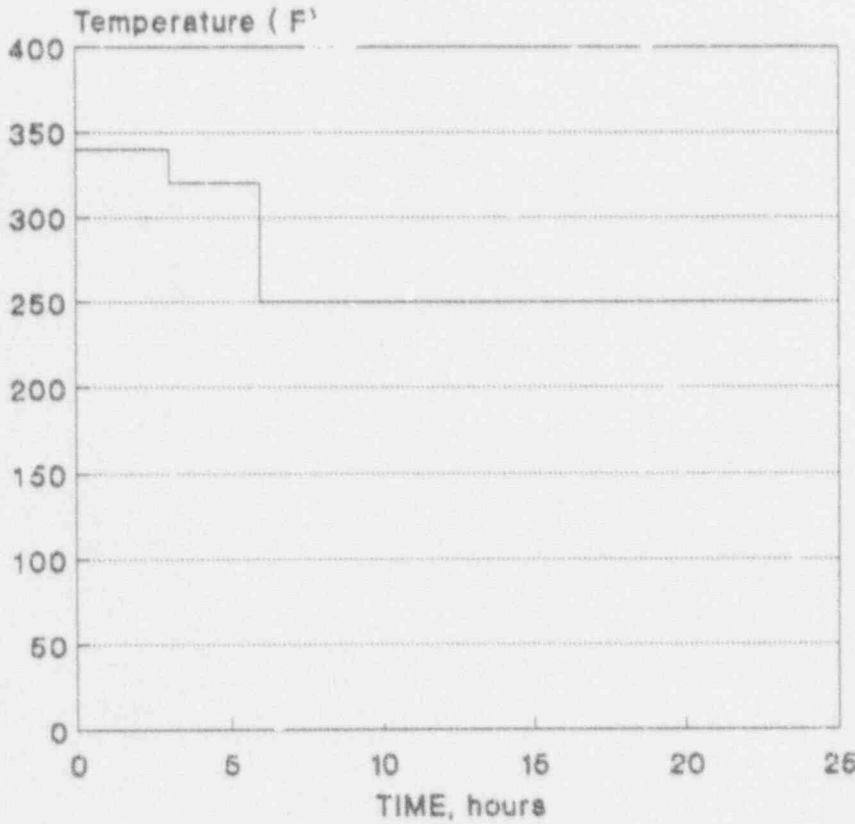
6.0 CONCLUSION

Based on the above, the subject equipment would perform its intended function during the postulated BBO conditions.

Following the postulated event, an evaluation is required to be performed, documenting the change in the Qualified Life for the equipment exposed to the abnormal conditions.

Client	Commonwealth Edison Company	Prepared by	Date
Project	LaSalle County Station - Units 1&2	Reviewed by	Date
Proj. No.	9012-26	Equip. No.	Various
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Temperature Profile LaSalle County Station



— Drywell DBE Profile

Figure 1