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January 6, 1992

U. S. Nuclear Regulatory Commission
Washington, DC 20555

ATTENTION: Document Control Desk

SUBJECT: Calvert Cliffs Nuclear Power Plant
Unit Nos. 1 & 2; Docket Nos. 50-317 & 50-318
Revised Response to NRC Generic Letter 89-13,
"Service Water System Problems Affecting Safety Related Equipment" (TAC Nos. M73978 and M73979)

REFERENCES:
(a) NRC Generic Letter 89-13, "Service Water System Problems Affecting Safety Related Equipment," dated July 18, 1989

(b) Letter from Mr. G. C. Creel (BG&E) to NRC Document Control Desk, dated January 29, 1990, Response to NRC Generic Letter 89-13, same subject

Gentlemen:

NRC Generic Letter 89-13, Reference (a), outlined concerns regarding the safe operation and maintenance of the service water systems and identified several recommendations associated with ensuring proper heat transfer capability of service water system components. Recommendations were provided to confirm that plant service water systems continue to meet the heat removal requirements associated with their safety functions.

Baltimore Gas and Electric Company's response to Generic Letter 89-13 was provided in Reference (b). In that response we outlined a program of surveillance and control techniques to significantly reduce the potential for flow blockage as a result of biofouling (Task I - Saltwater Biofouling Program). We also outlined a test program for the safety-related heat exchangers within the Saltwater, Service Water and Component Cooling Systems to demonstrate that the required heat transfer capability can be met (TASK II - Test Program). The purpose of this letter is to inform you of changes which we have made to these two programs. No changes have been made to Tasks III, IV, or V.

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REVISIONS TO TASK I - SALTWATER BIOFOULING PROGRAM

In Reference (b) we committed to install a new chlorination (sodium hypochlorite) system to reduce biofouling in the Saltwater System. System installation was completed in April 1990. Following further study and operating experience with the Sodium Hypochlorite System, we have found that the system is not effective in controlling heat exchanger tube blockage due to macrofouling (grass, mollusks, etc). Instead, we are now successfully controlling macrofouling in the Saltwater System by performing routine cleaning of the intake structure cavity walls, relocation of the ECCS cooler supply line penetration from the bottom of the 24-inch Saltwater header piping to the side of the piping, and removing unnecessary, stagnant water piping runs (dead legs) in the Saltwater System.

Operation of the Sodium Hypochlorite System is no longer deemed essential to assure the capability of the Saltwater System to perform its safety function; it is being retained for possible use in controlling microfouling (e.g., algae) as an enhancement to heat exchanger performance. Its use can potentially reduce the frequency of Service Water Heat Exchanger tube bulleting.

We originally stated that a new program would be established to ensure that Saltwater loops are properly placed in lay-up with biocide if the need arose. To date, cleaning of the intake structure cavity walls has significantly reduced the sloughing and intake of macrofouling debris and the need for lay-up with biocide has not arisen. We will continue periodic inspections of isolated portions of the system and re-evaluate the need for lay-up with biocide if significant macrofouling is observed in the future.

REVISIONS TO TASK II - TEST PROGRAM

NRC Generic Letter 89-13 recommended that a test program be conducted to verify the heat transfer capability of all safety-related heat exchangers cooled by service water. The Reactor Vessel Support Coolers and the Steam Generator Support Coolers are classified in the CCNPP Q-List as non-safety related (NSR) and do not perform any safety-related heat removal function. The Containment Penetration Coolers and LPSI Pump Seal and Bearing Coolers are safety grade components but only for the function of being a pressure boundary (PB) in a safety system. They do not perform a safety-related heat removal function. Because these coolers do not have a safety-related heat removal function, we have eliminated them from this test program.

Generic Letter 89-13 stated that an alternative to testing the heat removal capacity of safety-related heat exchangers is to either inspect or functionally test them. Functional testing verifies that a heat exchanger performs its intended function at operating conditions. This alternative is intended for those heat exchangers for which the design heat removal rate cannot be quantified due to testing limitations. One possible testing limitation is measuring flow in small diameter pipes. The High Pressure Safety Injection (HPSI) Pump Seal and Bearing Coolers have a small diameter pipe which may prevent flow measurement. If the pipe diameter of these coolers does prevent flow measurement, we may conduct a functional test instead of testing their heat removal capacity.

Attachment (1) contains an updated version of the Heat Exchanger Test Program. Page 4 of this attachment reflects the modifications to the program.

Should you have any further questions regarding this matter, we will be pleased to discuss them with you.

Very truly yours,

GCC/LMD/lmd/bjd/dlm

Attachment

cc: D. A. Brune, Esquire
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ATTACHMENT (1)

HEAT EXCHANGER TEST PROGRAM

SYSTEM	HEAT EXCHANGER	IN TEST PROGRAM	TEST TYPE	PERIODIC TEST FREQUENCY	COMMENTS
SALTWATER SYSTEM	Component Cooling Heat Exchangers	Y	I II.B	I At least quarterly. II.B. At least once per Refueling Cycle.	Test Type II.B will also be performed prior to and following HX bulleting. Per the recommendation of GL 89-13, periodic test frequencies will be adjusted based on results of testing.
	Service Water Heat Exchangers	Y	I II.B	I At least quarterly. II.B At least once per Refueling Cycle.	Test Type II.B will also be performed prior to and following HX bulleting. Per the recommendation of GL 89-13, periodic test frequencies will be adjusted based on results of testing.
	ECCS Pump Room Air Coolers	Y	I III.A. or III.B	At least once per Refueling Cycle.	Based on the results of initial tests, the appropriate periodic test type will be selected. Per the recommendation of GL 89-13, periodic test frequencies will be adjusted based on results of testing.
	Intake Structure Air Coolers	N	--	--	These coolers do not perform a safety-related function. Saltwater flow is isolated on Safety Injection Actuation Signal.

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SYSTEM	HEAT EXCHANGER	IN TEST PROGRAM	TEST TYPE	PERIODIC TEST FREQUENCY	COMMENTS
SERVICE WATER SYSTEM	Containment Air Coolers	Y	III.A. or III.B	*	* Periodic testing will only be conducted if it is shown that a system wide corrosion induced fouling problem exists.
	Spent Fuel Pool Cooling Heat Exchangers	Y	II.B.	*	
	Diesel Generator Coolers	Y	II.A	*	
	Main Turbine Lube Oil Coolers	N	--	--	These HXs do not perform a safety function. Service Water flow to these HXs is isolated on a Safety Injection Actuation Signal.
	Main Feed Pump Turbine Lube Oil Coolers	N	--		
	EHC Oil Coolers	N	--	--	
	Generator/Exciter Air Coolers	N	--	--	
	Stator Liquid Cooling Heat Exchangers (U-1)	N	--	--	
	Hydrogen Seal Oil Coolers (U-2)	N	--	--	

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SYSTEM	HEAT EXCHANGER	IN TEST PROGRAM	TEST TYPE	PERIODIC TEST FREQUENCY	COMMENTS
SERVICE WATER SYSTEM	Aux Feedpump Room Air Coolers	N	--	--	These HXs do not perform a safety function. Service Water flow to these HXs is isolated on a Safety Injection Actuation Signal.
	Isophase Bus Duct Coolers	N	--	--	
	Condenser Air Removal Pump Seal Coolers	N	--	--	
	Waterbox Priming Pump Seal Coolers	N	--	--	
	Condensate Booster Pump Lube Oil Coolers	N	--	--	
	Instrument and Plant Air Compressor Coolers	N	--	--	
	Turbine Plant Sample Coolers	N	--	--	
	M/U Demin Vacuum Pump Cooler (U-1)	N	--	--	
	N_2 Compressor After Coolers (U-1)	N	--	--	
	Steam Generator Blowdown Recovery System Heat Exchanger	N	--	--	HX does not remove heat from safety-related system/component. HX is safety related for pressure boundary purposes only.

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SYSTEM	HEAT EXCHANGER	IN TEST PROGRAM	TEST TYPE	PERIODIC TEST FREQUENCY	COMMENTS
COMPONENT COOLING SYSTEM	Shutdown Cooling Heat Exchangers	Y	II.B.	*	* Periodic testing will not be performed unless it is shown that a system wide corrosion induced fouling problem exists.
	HPSI Pump Seal & Bearing Coolers	Y	IV.B.	*	* Periodic testing will not be performed unless it is shown that a system wide corrosion induced fouling problem exists. Initial testing will verify adequate component cooling flow and the bearing and seal cooler temperatures can be maintained below the design limit.
	LPSI Pump Seal & Bearing Coolers	N	--	--	These Heat Exchangers do not perform a safety-related function. They are safety related for pressure boundary purposes only.
	Containment Penetration Coolers Main Steam Main Feedwater Letdown RC Sample S/G Blowdown	N	--	--	
	Reactor Vessel Support Coolers	N	--	--	These Heat Exchangers do not perform any safety-related heat removal function. They are classified as non-safety related.
	S/G Lateral Support Coolers	N	--	--	

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SYSTEM	HEAT EXCHANGER	IN TEST PROGRAM	TEST TYPE	PERIODIC TEST FREQUENCY	COMMENTS
COMPONENT COOLING SYSTEM	Reactor Coolant Waste Evaporators	N	--	--	
	Control Element Drive Mechanism Coolers	N	--	--	These HXs perform no safety-related function. Component Cooling flow is isolated on Containment Isolation Signal.
	Reactor Coolant Pump Seal and Lube Oil Coolers	N	--	--	
	Reactor Coolant Drain Tank Heat Exchangers	N	--	--	
	Letdown Heat Exchanger	N	--	--	
	Waste Gas Compressor Coolers	N	--	--	
	RCW Degasifier Vacuum Pump Coolers	N	--	--	These HXs perform no safety-related function. They are classified as safety related for Component Cooling System pressure boundary purposes only.
	NSSS Sample Coolers RC Sample SG Blowdown Sample MWS Sample	N	--	--	
	Post Accident Sample System Cooler	N	--	--	

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SYSTEM	HEAT EXCHANGER	IN TEST PROGRAM	TEST TYPE	PERIODIC TEST FREQUENCY	COMMENTS
COMPONENT COOLING SYSTEM	Gas Analyzer Sample Coolers	N	--	--	These HXs perform no safety-related function. They are classified as safety related for Component Cooling System pressure boundary purposes only.
	MWS Heat Exchanger	N	--	--	
	S/G Blowdown RAD Monitor Sample Cooler	N	--	--	

ATTACHMENT (2)

HEAT EXCHANGER TEST PROGRAM

TEST TYPES

I. Monitor and [illegible]ling water flow and inlet and outlet temperatures for all affected heat exchanger[illegible]s of [illegible]ration in which cooling water is flowing through the heat exchange[illegible]ement, verify that the cooling water temperatures and flows are within desig[illegible]ions of the measurement. The test results from periodic testing should [illegible] that flow blockage or excessive fouling accumulation does not exist.

II.A. Perform f[illegible]nctional [illegible] exchanger operating, if practical, at its design heat removal rate to verify [illegible]apabil[illegible]emperature and flow compensation should be made in the calculations to adjust the [illegible]sults of the design conditions. Trend the results, as explained above, to monitor degradation.

II.B. If it is not practical to test the heat exchanger at the design heat removal rate, then trend test results for the heat exchanger efficiency or the overall heat transfer coefficient. Verify that heat removal would be adequate for the system operating with the most limiting combination of flow and temperature.

III.A Perform efficiency testing with the heat exchanger operating under the maximum heat load that can be obtained practically. Test results should be corrected for the off-design conditions. Design heat removal capacity should be verified. Results should be trended, as explained above, to identify any degraded equipment.

III.B If it is not possible to test the heat exchanger to provide statistically significant results (for example, if error in the measurement exceeds the value of the parameter being measured), then

1. Trend test results for both the air and water flow rates in the heat exchanger.

2. Perform visual inspections, where possible, of both the air and water sides of the heat exchanger to ensure cleanliness of the heat exchanger.

IV.A. If plant conditions allow testing at design heat removal conditions, verify that the heat exchanger performs its intended functions. Trend the test results, as explained above, to monitor degradation.

IV.B. If testing at design conditions is not possible, then provide for extrapolation of test data to Design conditions. The heat exchanger efficiency or the overall heat transfer coefficient of the heat exchanger should be determined whenever possible. Where possible, provide for periodic visual inspection of the heat exchanger. Visual inspection of a heat exchanger that is an integral part of a larger component can be performed during the regularly scheduled disassembly of the larger component. For example, a motor cooler can be visually inspected when the motor disassembly and inspection a[illegible]heduled.