

LICENSEE EVENT REPORT (LER)

(See reverse for required number of
digits/characters for each block)ESTIMATED BURDEN PER RESPONSE TO COMPLY WITH THIS MANDATORY
INFORMATION COLLECTION REQUEST: 50.0 HRS. REPORTED LESSONS
LEARNED ARE INCORPORATED INTO THE LICENSING PROCESS AND FED
BACK TO INDUSTRY. FORWARD COMMENTS REGARDING BURDEN
ESTIMATE TO THE INFORMATION AND RECORDS MANAGEMENT BRANCH
(T-6 F33), U.S. NUCLEAR REGULATORY COMMISSION, WASHINGTON, DC
20555-0001, AND TO THE PAPERWORK REDUCTION PROJECT (3150-
0104), OFFICE OF MANAGEMENT AND BUDGET, WASHINGTON, DC
20503.

FACILITY NAME (1)

Hope Creek Generating Station

DOCKET NUMBER (2)

05000354

PAGE (3)

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TITLE (4)

Inconsistency Between Filtration, Recirculation, and Ventilation System Technical Specifications
and the Ability to Withstand Prescribed Single Failures Under Design Basis Conditions

EVENT DATE (5)			LER NUMBER (6)			REPORT DATE (7)			OTHER FACILITIES INVOLVED (8)	
MONTH	DAY	YEAR	YEAR	SEQUENTIAL NUMBER	REVISION NUMBER	MONTH	DAY	YEAR	FACILITY NAME	DOCKET NUMBER
01	17	97	97	-- 002	-- 00	02	14	97		05000
OPERATING MODE (9)		1	THIS REPORT IS SUBMITTED PURSUANT TO THE REQUIREMENTS OF 10 CFR §: (Check one or more) (11)							
POWER LEVEL (10)		100	20.2201(b)		20.2203(a)(2)(v)		50.73(a)(2)(i)(B)		50.73(a)(2)(viii)	
			20.2203(a)(1)		20.2203(a)(3)(i)		X 50.73(a)(2)(ii)		50.73(a)(2)(x)	
			20.2203(a)(2)(i)		20.2203(a)(3)(ii)		50.73(a)(2)(iii)		73.71	
			20.2203(a)(2)(ii)		20.2203(a)(4)		50.73(a)(2)(iv)		OTHER	
			20.2203(a)(2)(iii)		50.36(c)(1)		50.73(a)(2)(v)		Specify in Abstract below or in NRC Form 366A	
			20.2203(a)(2)(iv)		50.36(c)(2)		50.73(a)(2)(vii)			

LICENSEE CONTACT FOR THIS LER (12)

NAME

John W. Karrick, Hope Creek LER Coordinator

TELEPHONE NUMBER (Include Area Code)

(609) 339-5298

COMPLETE ONE LINE FOR EACH COMPONENT FAILURE DESCRIBED IN THIS REPORT (13)

CAUSE	SYSTEM	COMPONENT	MANUFACTURER	REPORTABLE TO NPRDS	CAUSE	SYSTEM	COMPONENT	MANUFACTURER	REPORTABLE TO NPRDS

SUPPLEMENTAL REPORT EXPECTED (14)

YES (If yes, complete EXPECTED SUBMISSION DATE).	X	NO	EXPECTED SUBMISSION DATE (15)	MONTH	DAY	YEAR
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ABSTRACT (Limit to 1400 spaces, i.e., approximately 15 single-spaced typewritten lines) (16)

On January 17, 1997, an inconsistency between Technical Specifications (TS) and design basis documents for the Filtration, Recirculation, and Ventilation System (FRVS) was discovered. The Recirculation subsystem of FRVS consists of six units with 25% capacity fans. Four of the six units are credited in the design basis for post accident conditions. A recently completed 10CFR50.59 safety evaluation revealed that the current TS does not assure that the design requirements of FRVS are maintained. Since TS 3.6.5.3.2 only requires five of the six units to be operable, the sixth unit could be (and has been) unavailable for indefinite amounts of time. Given that the sixth unit was allowed to be unavailable, the system may not have met its design basis under specific circumstances.

The apparent cause of the inconsistency was the failure to consider the postulated single failures when developing the FRVS TS during the initial licensing phase. The unique design of FRVS compared to other Boiling Water Reactor plants was a contributor. There were no actual safety consequences associated with this condition. Potential safety consequences consisted of a slight reduction in the margins used within design calculations. Corrective actions include administrative controls to prevent unlimited unavailability of the sixth unit and the submittal of a TS amendment request to include the sixth unit.

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PLANT AND SYSTEM IDENTIFICATION

General Electric - Boiling Water Reactor (BWR/4)
Filtration, Recirculation, and Ventilation System (FRVS) - EIIS Identifier {BH}

IDENTIFICATION OF OCCURRENCE

Discovery date: January 17, 1997
Problem Report: 970117104

CONDITIONS PRIOR TO OCCURRENCE

The plant was in OPERATIONAL CONDITION 1 (POWER OPERATION) at 100% of rated thermal power. There were no other structures, systems, or components that were inoperable at the beginning of the event that contributed to the event.

DESCRIPTION OF OCCURRENCE

On January 17, 1997, during preparation of a 10CFR50.59 safety evaluation to support a plant modification, an inconsistency was discovered between the Hope Creek Generation Station (HCGS) Technical Specifications (TS) and the design basis documents of the Filtration, Recirculation, and Ventilation System (FRVS). TS 3.6.5.3.2 does not assure the availability of the prescribed number of FRVS recirculation units to fulfill system functions in the presence of a postulated single failure in accordance with the Updated Final Safety Analysis Report (UFSAR).

Specifically, given the TS (3.6.5.3.2) required complement of only five of the total of six recirculation units, and in the event of a design basis Loss of Coolant Accident (LOCA) with a Loss of Offsite Power (LOP) and either the active single failure of the "A" or "B" Emergency Diesel Generator (EDG) or the passive failure of one Safety Auxiliaries Cooling System (SACS) loop, the available number of recirculation units would have been less than that assumed in the UFSAR.

At the time of discovery of this discrepancy, all six FRVS recirculation units were operable. Administrative controls were immediately established to enter the 7 day Limiting Condition for Operation (LCO) pursuant to TS 3.6.5.3.2.a if one (of the six) recirculation units is declared inoperable. This provides the needed control of the sixth FRVS recirculation unit to ensure the system is operated within the current design basis assumptions.

This event is being reported pursuant to 10CFR50.73(a)(2)(ii)(B) for previous operations of the FRVS system that resulted in the plant being operated outside of its design basis.

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ANALYSIS OF OCCURRENCE

The FRVS Recirculation subsystem consists of six safety related units with 25% capacity fans, cooling coils, filters, ducts, controls and instrumentation. This subsystem is provided to recirculate and filter the air in the Reactor Building, maintain air flow from low to high contamination areas, and cool the air following a LOCA or other high radioactivity event. These six independent FRVS recirculation fans, cooling coils and charcoal adsorber trains are powered by the Emergency Diesel Generator (EDG) backed, class 1E on-site power distribution system. The FRVS recirculation system cooling coils are supported by the Safety Auxiliaries Cooling System (SACS) with three units aligned to each SACS loop.

The expected system response upon a LOCA signal is that all six FRVS recirculation units start. Four of the six FRVS recirculation units are required to recirculate the Reactor Building air for the first 10 minutes following a LOCA to limit the expansion and temperature of the reactor building air. Each 100 percent capacity SACS loop supports three recirculation units. The "A" and "B" EDG each support two FRVS Recirculation units, and the "C" and "D" EDG each support one.

The Limiting Condition for Operation (LCO) for TS 3.6.5.3.2 states "Five FRVS recirculation units shall be OPERABLE." Meeting the minimum LCO requirements and assuming a single active failure of the "A" or "B" EDG does not assure that the design basis of the system is maintained. Meeting the minimum LCO requirement and assuming a passive failure of a SACS loop also does not assure the design basis of the system is maintained. With only five of a total of six operable units (as allowed by TS), a single unit can be (and has been in the past) allowed to remain out of service for indefinite periods of time. Given the current design basis assumptions, the TS should have required all six FRVS recirculation units to be operable with applicable action statements for the inoperability of one or more units.

This specification has essentially remained unchanged since initial licensing. Since the first draft TS were written, the effects of the single active failure of the "A" or "B" EDG or the passive failure of one loop of SACS was not considered when determining the LCO requirements associated with the FRVS Recirculation units.

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APPARENT CAUSE OF OCCURRENCE

The apparent cause of the inconsistency between the TS and the UFSAR assumptions was the failure to consider the above single failures when developing the FRVS Technical Specifications during the initial licensing phase in the 1980's.

The unique design of the FRVS system is considered a contributing factor to this discrepancy. The Standby Gas Treatment System (SBGT) is typical to most other General Electric Boiling Water Reactor (BWR) plants, which is what Standard TS were based upon. The FRVS TS were developed without the benefit of information gained through industry experience for SBGT systems during the initial licensing phase.

ASSESSMENT OF SAFETY CONSEQUENCES

The FRVS Recirculation System is an Engineered Safety Feature System, located inside the Reactor Building, that reduces offsite doses significantly below 10CFR100 guidelines during a LOCA, Refueling accident or high radioactivity event in the Reactor Building. The FRVS Recirculation system is designed to accomplish the following objectives:

1. Recirculate and filter the air in the Reactor Building following a LOCA, or other high radioactivity event, to reduce the concentration of radioactive halogens and particulates present in the Reactor Building.
2. Maintain air flow from the low to the high contamination areas.
3. Cool the air in the reactor building to limit its expansion and reduce its temperature to the maximum average of 140 degrees F and to a maximum localized temperature of 148 degrees F during a LOCA.

The FRVS system functions in maintaining exposures below 10CFR100 guidelines by establishing a filtered and monitored release path. The reactor building drawdown time is a significant contributor to doses assumed at site boundaries because it is assumed that all FRVS system filtration is bypassed until the negative pressure is established. The FRVS Ventilation system is the primary means of establishing the negative pressure. The contribution from the FRVS recirculation system to the drawdown analysis includes the cooling provided, the recirculation air flow for mixing, and the added heat loads from the fan motors.

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ASSESSMENT OF SAFETY CONSEQUENCES (continued)

Per Hope Creek design calculation GU-5(Q), the reduction in pressure needed to establish the negative 0.25 inches of water is principally achieved by mass removal by the FRVS Ventilation system rather than the cooling provided by FRVS Recirculation. The FRVS Ventilation system consists of two trains with 100% capacity fans, charcoal adsorbers, and HEPA filters. There was no impact on the FRVS Ventilation system by this event. The postulated single failures would result in one of the two Ventilation trains remaining fully functional. Additionally, the last six 18-month drawdown surveillance tests (HC.OP-ST.GU-0002(Q)) resulted in an average drawdown time of 26.4 seconds compared to the TS requirement of less than or equal to 375 seconds. Therefore it is judged that the potential impact of this condition to the drawdown time and therefore the 10CFR100 guidelines is negligible.

The potential dose consequence from Iodine and particulates from this condition is minimized by the redundant filtering of the exhausted effluents by the overall FRVS system design (adsorbers and HEPA filters in both the Recirculation and Ventilation subsystems). Additionally, based upon the charcoal loading calculation of the FRVS Recirculation adsorber trains (Calculation GU-25(Q)), each adsorber is capable of completing approximately 90% of the required Iodine removal. With three recirculation units available during this scenario, 270% capability remained available for Iodine removal. Therefore the potential consequences of this event regarding Iodine and particulate removal by FRVS Recirculation are minimal.

In reference to the loss of a SACS loop after the LOP LOCA, an estimate of the impact on maximum Reactor Building temperature indicates the potential to slightly exceed the 148 degree F requirement by 0.3 degrees F (148.3). The referenced calculation (GU-9(Q)) used for this estimate includes a 20% safety factor as a conservative margin. Therefore, this scenario, had it actually occurred, would have resulted in a slightly reduced margin regarding the Reactor Building maximum temperature and potential Environmental Qualification concerns.

A review of maintenance records revealed that a single FRVS Recirculation unit had been removed from service for greater than 7 days a total of ten times in the last two years. The longest period was for 27 days from July 25, 1995, to August 21, 1995. The interim administrative controls and permanent corrective actions will prevent this condition from recurring.

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PREVIOUS OCCURRENCES

A review of Hope Creek LERs for the last two years identified LERs 95-037-00, 96-006-01, 96-009-00, 96-014-01, 96-015-00, 96-022-02, and 97-001-00 that involved either design basis or non-conservative TS issues. Due to the timing of this event (initial licensing), corrective actions from the other events could not have prevented this occurrence; however, the training and heightened awareness to design and licensing basis issues associated with some of the event corrective actions contributed to the self-identification of this event.

CORRECTIVE ACTIONS

1. The administrative controls to assure a 7 day LCO is entered with one of the six FRVS recirculation units inoperable will remain in place until a TS Amendment can be implemented.
2. A TS amendment to include the sixth unit will be submitted to the NRC by April 30, 1997.