NRC FORM 366 (4-95) U.S. NUCLEAR REGULATORY COMMISSION

APPROVED BY OMB NO. 3150-0104
EXPIRES 04/30/98

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.

LICENSEE EVENT REPORT (LER)

(See reverse for required number of digits/characters for each block)

FACILITY NAME (1)	DOCKET NUMBER (2)	PAGE (3)
Harris Nuclear Plant Unit-1	50-400	1 OF 4

TITLE (4)

Spent Fuel Pool water level not maintained greater than 23 feet above stored BWR fuel assemblies.

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
9	22	97	97	-- 021 --	01	10	22	97	FACILITY NAME	DOCKET NUMBER 05000

OPERATING MODE (9)	1
POWER LEVEL (10)	100%

THIS REPORT IS SUBMITTED PURSUANT TO THE REQUIREMENTS OF 10 CFR §: (Check one or more) (11)

	20.2201(b)		20.2203(a)(2)(v)	X	50.73(a)(2)(i)		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	TELEPHONE NUMBER (Include Area Code)
Michael Verrilli Sr. Analyst - Licensing	(919) 362-2303

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)				EXPECTED SUBMISSION DATE (15)	MONTH	DAY	YEAR
	YES (If yes, complete EXPECTED SUBMISSION DATE).	X	NO				

ABSTRACT (Limit to 1400 spaces, i.e., approximately 15 single-spaced typewritten lines) (16)

On August 14, 1997, with the plant at approximately 100% power in mode 1, a condition was identified during a Technical Specification (TS) surveillance procedure review project related to inadequate maintenance of Spent Fuel Pool water level. Specifically, Technical Specification (TS) 3/4.9.11 requires that "at least 23 feet of water shall be maintained over the top of irradiated fuel assemblies seated in the storage racks." This depth of water will provide sufficient "scrubbing" to remove 99% of the assumed 10% iodine gap activity released from the rupture of an irradiated fuel assembly. Contrary to this requirement, water level has not been verified greater than 23 feet above the boiling water reactor (BWR) fuel assemblies received from CP&L's Brunswick Plant, which are currently stored in the Harris Plant fuel pools. These BWR assemblies have a bail handle that extends approximately 6 inches above the top nozzle base plate. When the BWR storage racks were installed in 1988, the 23 foot water level reference mark was established from the top nozzle base plate of the BWR fuel seated in the storage racks, not from the top of the bail handles. This approach was determined at the time to be conservative since the base plate elevation exceeds that of the fuel rods which would be the source of any released fission gasses. However, verbatim compliance with the TS requirements would require 23 feet of water over the BWR fuel assembly structure, including the top bail handle.

This condition was caused by a misinterpretation of TS requirements and design inputs during the establishment of the 23 foot water level reference mark and the subsequent setup of water level indicators, when the BWR fuel storage racks were initially installed at the Harris Plant.

Corrective actions included directions to Operations to maintain and monitor fuel pool level at or above 23 feet 7 inches to ensure required water level over the BWR bail handles. This was completed by issuing an Operations night order and revising the daily surveillance procedures. Additional actions will include reviewing this event with appropriate Engineering personnel to emphasize the importance of verbatim TS compliance and an evaluation of the fuel pool level alarm setpoints.

This revision is submitted to report additional conditions related to the Fuel Handling Building and Reactor Auxiliary Building Emergency Exhaust Systems that were identified during the on-going Technical Specification Procedure Review Project.

EVENT DESCRIPTION:

On August 14, 1997, with the plant at approximately 100% power in mode 1, a condition was identified during a Technical Specification (TS) Surveillance Procedure Review Project related to inadequate maintenance of Spent Fuel Pool water level. Specifically, Technical Specification (TS) 3/4.9.11 requires that "at least 23 feet of water shall be maintained over the top of irradiated fuel assemblies seated in the storage racks." As described in the TS Bases section for this TS, this depth of water will provide sufficient "scrubbing" to remove 99% of the assumed 10% iodine gap activity released from the rupture of an irradiated fuel assembly. Contrary to this, water level has not been verified greater than 23 feet above the boiling water reactor (BWR) fuel assemblies received from CP&L's Brunswick Plant, which are currently stored in the Harris Plant (HNP) fuel pools. These BWR assemblies have a bail handle that extends approximately 6 inches above the top nozzle base plate. When the BWR storage racks were installed in 1988, the 23 foot water level reference mark was established from the top nozzle base plate of the BWR fuel seated in the storage racks, not from the top of the bail handles. This approach was determined at the time to be conservative since the top nozzle base plate elevation exceeds that of the fuel rods which would be the source of any released fission gasses. However, verbatim compliance with the TS requirements would require 23 feet of water over the BWR fuel assembly structure, including the top bail handle. The method of verifying adequate water level in the Spent Fuel Pools at HNP involved confirming that the low-level alarm was not present. The low level alarm setpoint was established at 23 feet 2.5 inches and was consistent with the 23 foot reference mark from the top nozzle base plate. Therefore water levels could have dropped below 23 feet above the top of the BWR assembly bail handles and not result in a low level alarm.

On September 22, 1997, two additional conditions identified during the on-going TS Surveillance Procedure Review Project were determined to be reportable. The first condition pertains to a design deficiency in the Fuel Handling Building Emergency Exhaust System (FHBEES). Specifically, the FHBEES contains two units (E-12 & E-13) which each consist of a fan, charcoal adsorber beds and HEPA filters. To prevent degradation of the charcoal bed removal efficiency, the units contain heaters to control the humidity of the air passing through the charcoal. To prevent potential auto-ignition of the charcoal in the idle unit due to heat from the decay of radionuclides captured by the charcoal, the system is designed to provide cooling flow or "bleed flow" (approximately 5% of total flow) through the idle unit. NRC Reg. Guide 1.52 and the HNP Final Safety Analysis Report (FSAR) section 6.5.1 indicate that the bleed flow passes from the discharge of the idle unit to the suction of the on-line unit. Any releases would thus be filtered through a charcoal filter with the appropriate design efficiency. Contrary to this, the bleed flow on the FHBEES units passes from the discharge of the idle unit to the discharge of the on-line unit. Since the heaters that control relative humidity do not run when the unit is not in service, the humidity in the idle unit is not controlled. Therefore, efficiency of the charcoal in the idle unit could potentially be degraded and air flowing through this idle unit could be filtered with an efficiency lower than the assumed 95% contained in the FSAR chapter 15 fuel handling accident analysis. This would have resulted in higher calculated off-site doses had fuel movement occurred as assumed in the FSAR analysis and allowed by plant procedures. Therefore, this condition is being voluntarily reported as a condition that could have resulted in operation outside the design basis of the plant per 10CFR50.73.a.2.ii.

The second reportable condition involves inadequate surveillance testing of the FHB and RAB Emergency Exhaust system charcoal adsorber beds. Specifically, HNP Technical Specifications require that a laboratory analysis be performed on the charcoal "after every 720 hours of charcoal adsorber operation". The hours of operation have only been accumulated based on the time period that the on-line unit was in service. The accumulation should also have included the time that bleed flow was passing through the idle unit. This condition was considered to be a violation of TS surveillance requirements 4.7.6.c and 4.9.12.c

CAUSE:

This condition was caused by a misinterpretation of TS requirements and design inputs during the establishment of the 23 foot water level reference mark (above the BWR top nozzle base plate) and the subsequent setup of water level indicators, when the BWR fuel storage racks were initially installed at the Harris Plant.

The cause of the FHBEES design deficiency was engineering oversight during initial plant design and construction. The cause of the TS surveillance violation related to charcoal testing after 720 hours of operation was incorrect interpretation of TS testing requirements. Surveillance test procedures were initially set up to satisfy the 720 hour requirement based on accumulation of hours for the in-service unit only.

SAFETY SIGNIFICANCE:

There were no actual safety consequences associated with this event. Adequate water depth (23 feet) has been maintained above the active fuel rods, which would be the source of any released fission gasses. This ensures the iodine removal capability required by TS in the event of a ruptured irradiated fuel assembly. This condition is being reported per 10CFR50.73.a.2.i as a condition prohibited by Technical Specifications.

There were no actual safety consequences associated with the additional items reported in this LER revision. Had a fuel handling accident occurred in the FHB with the improperly configured bleed flow between the filtration units, the resulting off-site dose rates would not have exceeded the maximum value analyzed in the HNP FSAR and would have remained within 10CFR100 limits. This result is based on the fact that fuel off-load during past HNP refueling outages has never occurred prior to 257 hours following reactor shutdown, which allowed for substantial iodine decay resulting in a lower fuel handling accident source term than that assumed in the FSAR. It is also based on past charcoal efficiency surveillance testing, which has indicated a worst case value of 98%, which is greater than the 95% assumed efficiency value in the FSAR accident analysis. Administrative controls have also been in place to ensure that filter charcoal is replaced if surveillance testing indicates an efficiency less than 99% Therefore, this condition is being voluntarily reported as a condition that could have resulted in operation outside the design basis of the plant per 10CFR50.73.a.2.ii.

There were no consequences as a result of the TS surveillance requirement violation based on the charcoal surveillance test results described above. This condition is being reported as a condition prohibited by Technical Specifications per 10CFR50.73.a.2.i

PREVIOUS SIMILAR EVENTS:

There have been no previous events related to inadequate verification of Spent Fuel Pool water level or improperly configured bleed flow between air handling units as a result of design oversight. HNP submitted LER 96-002 to report numerous deficiencies caused by incorrectly interpreting TS testing requirements during initial surveillance test development. These were a result of HNP's actions to address NRC Generic Letter 96-01.

CORRECTIVE ACTIONS COMPLETED:

1. Directions were provided to Operations to maintain and monitor Spent Fuel Pool water level at or above 23 feet 7 inches to ensure required water level over the BWR bail handles. This was completed by issuing an Operations Night Order on August 14, 1997, revising the Reactor Auxiliary Building Operator Logs on August 25, 1997 and requiring the actual Spent Fuel Pool water level to be entered in the daily surveillance requirement test, rather than the previous practice of confirming the absence of the low level alarm.

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TEXT (If more space is required, use additional copies of NRC Form 366A) (17)

CORRECTIVE ACTIONS COMPLETED: (continued)

2. This event was reviewed with appropriate Engineering personnel to emphasize the importance of verbatim TS compliance. This was completed on October 6, 1997.

3. A Justification for Continued Operation (JCO) was approved and implemented for the FHBEES bleed flow issue on October 10, 1997.

4. As an interim measure, Operations personnel will record run times on both the in-service filtration unit and the idle filtration unit in the FHB and RAB Emergency Exhaust Systems. This was directed by an Operations Night Order on October 15, 1997.

CORRECTIVE ACTIONS PLANNED:

1. The Spent Fuel Pool water level alarm setpoints will be evaluated and modified as needed to ensure 23 feet of water over the BWR assembly bail handles. The evaluation and implementation schedule will be completed by November 15, 1997.

2. A long term resolution for the improperly configured FHBEES bleed flow issue will be provided via Engineering Service Request 97-00737. This will ensure that the systems satisfy the appropriate FSAR and Reg. Guide 1.52 design requirements and will be completed prior to the next fuel off-load.

3. Revisions will be performed to operations procedures that require recording run times for FHB and RAB Emergency Exhaust System filtration units (OP-170 "Fuel Handling Building HVAC" and OP-172 "Reactor Auxiliary Building HVAC"). This will be completed by October 30, 1997.