NRC FORM 366 (5-92) U.S. NUCLEAR REGULATORY COMMISSION

LICENSEE EVENT REPORT (LER)

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

APPROVED BY OMB NO. 3150-0104
EXPIRES 5/31/95

ESTIMATED BURDEN PER RESPONSE TO COMPLY WITH THIS INFORMATION COLLECTION REQUEST: 50.0 HRS. FORWARD COMMENTS REGARDING BURDEN ESTIMATE TO THE INFORMATION AND RECORDS MANAGEMENT BRANCH (MNBB 7714), 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)	DOCKET NUMBER (2)	PAGE (3)
Indian Point 3	05000286	1 of 5

TITLE (4) Steam Driven Auxiliary Feedwater Pump Full Flow Testing Inadequate Due To Improper Procedure Change In 1978, A Condition Prohibited By Technical Specification

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
08	28	97	97	-019-	00	09	25	97		05000
									FACILITY NAME	DOCKET NUMBER

OPERATING MODE (9)	N
POWER LEVEL (10)	000

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

	20.402(b)		20.405(c)		50.73(a)(2)(iv)		73.71(b)
	20.405(a)(1)(i)		50.36(c)(1)		50.73(a)(2)(v)		73.71(c)
	20.405(a)(1)(ii)		50.36(c)(2)		50.73(a)(2)(vii)		OTHER
	20.405(a)(1)(iii)	✓	50.73(a)(2)(i)		50.73(a)(2)(viii)(A)		(Specify in Abstract below and in Text, NRC Form 366A)
	20.405(a)(1)(iv)		50.73(a)(2)(ii)		50.73(a)(2)(viii)(B)		
	20.405(a)(1)(v)		50.73(a)(2)(iii)		50.73(a)(2)(x)		

LICENSEE CONTACT FOR THIS LER (12)

NAME	TELEPHONE NUMBER (Include Area Code)
Floyd Gumble, Senior Reactor Engineer	(914) 681-6724

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).	✓ NO				

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

On August 28, 1997, the unit was in cold shutdown for a refueling outage. Engineering determined that the Technical Specification required auxiliary feedwater pump full flow testing criteria was inadequate for the turbine driven pump. The flow rate acceptance criteria needed to be higher when considering the delay for control room operator action to speed-up the turbine driven pump and open its discharge valves during a postulated loss of normal feedwater transient. The safety evaluation report and final safety analysis report credit the auxiliary feedwater system as having pumps driven by diverse principles. The accident analysis assumed the flow rate of only one of two fully automatic motor driven pumps to mitigate design basis accidents. Therefore, redundancy to the extent of the required flow rate and the power supply to their motors can be assured with the two fully automatic motor driven pumps without crediting the semi-automatic turbine driven pump. An analysis and reasonable assurance of safety were performed to establish new testing and operating criterion to meet the license condition for diversity. A full flow test was performed satisfactorily with the new criteria. Emergency operating procedures were revised to assure the appropriate operator actions for the steam driven pump if a failure were to occur that rendered the two motor driven pumps inoperable during a postulated loss of feedwater transient. This event had no effect on the health and safety of the public.

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

Note: The Energy Industry Identification System Codes are identified within the brackets{}.

DESCRIPTION OF EVENT

On August 28, 1997, with the plant in cold shutdown for a refueling outage, engineering determined that the Technical Specification (TS) required auxiliary feedwater full flow testing criteria was inadequate for the turbine driven pump.

TS section 4.8.1.a states in part that each auxiliary feedwater pump {BA} will be started manually from the control room with full flow established to the steam generators at least once per 24 months. The test, 3PT-R007B, "#32 Auxiliary Boiler Feed Water Pump Full Flow Test", was performed to meet the TS and indicated an acceptance criteria of 400 gpm. A review of past tests indicates that in 1978 the full flow test resulted in the turbine driven pump achieving 750 gpm. At that time the procedure was changed to lower the acceptance criteria for the steam driven pump from 800 gpm to 400 gpm which was equal to the motor driven pump flow rate acceptance criteria.

The Final Safety Analysis Report (FSAR), section 10.2, states that the turbine driven pump was designed to supply 800 gpm. Redundancy of auxiliary feedwater supply is provided by utilizing two pumping loops using two different types of motive power to the pumps. It also states that all three pumps receive an automatic start signal but the steam driven pump must be throttled manually in order to bring the unit up to speed and prevent damage to the pump. In addition, the steam driven pump discharge flow control valves are manually opened as necessary to provide adequate auxiliary feedwater flow. One motor driven pump can maintain a sufficient water inventory in the steam generators to which it is connected to prevent water relief through the primary coolant system pressurizer relief valve following a reactor/turbine trip.

The original Safety Evaluation Report states in part the principal design criteria for the auxiliary feedwater system is that the pumps are driven by diverse principles - two are electric driven pumps and one is steam driven. However, the SER also states in part that one motor-driven auxiliary feedwater pump is capable of satisfying the plant's design criteria for preventing primary coolant from discharging liquid from the pressurizer relief valve after a loss of offsite power.

FSAR sections on accident analysis and transients describe the limiting event for performance of the auxiliary feedwater system as the Loss of Normal Feedwater (LONF) scenario. For this scenario, the FSAR recognizes that both the motor driven auxiliary feedwater pumps and the steam driven auxiliary feedwater pump provide the necessary protection. Each motor driven pump is capable of meeting the flow requirements as stated in the design basis accident analyses. Each motor driven pump is supplied by its independent 480V safety related buses which are also backed independently by safety related emergency diesels. However, the analysis only assumes one motor driven pump at a flow rate of 340 gpm within one minute is available to mitigate the scenario.

The steam driven pump requires manual operator action from the control room to speed-up the turbine and open the pump discharge valves, therefore a delay must be accounted for in establishing flow. The acceptable full flow rate must be higher than the fully automatic motor driven auxiliary feedwater pumps in order to mitigate the accident scenario and meet the license condition for a diverse means of auxiliary feedwater supply. The original full flow test criteria of 800 gpm for the steam driven auxiliary feedwater pump was based on a design capability but may not have been established via an accident analysis. Therefore, a quantitative analysis was performed to establish a required flow rate of 600 gpm for the turbine driven pump to respond to a LONF scenario considering manual action by the operator within ten minutes. Based on this analysis, a Reasonable Assurance of Safety (RAS) was performed until such time as an accident analysis can be performed by Westinghouse using a computer code approved by the NRC. Based on the RAS establishing a full flow rate for the steam driven auxiliary feedwater pump, full flow testing was satisfactorily performed and appropriate emergency operating procedures were revised prior to restart of the plant.

CAUSE OF EVENT

The cause of the event was an inappropriate procedure change performed in 1978 that lowered the acceptance criteria from 800 gpm to 400 gpm for the full flow test of the steam driven auxiliary feedwater pump. It is reasonable to believe that the current procedure change process in accordance with Technical Specification section 6.5.0, "Review and Approval Of Programs and Procedures," will preclude a repeat of this event or similar events from occurring. This process was instituted as an amendment to Technical Specifications issued on January 17, 1995.

CORRECTIVE ACTIONS

Engineering performed an analysis for loss of normal feedwater (LONF), which bounds the Loss Of Offsite Power (LOOP) event, using the Westinghouse TREAT computer code, until such time as an analysis can be performed by Westinghouse using a code approved by the NRC. The assumptions included no automatic start of either motor driven pumps and 600 gpm of auxiliary feedwater being supplied within ten minutes from the steam driven pump with manual operator action from the control room. Engineering then performed a Reasonable Assurance of Safety (RAS) based on the analysis, to codify the new testing and operating criterion, and which concluded there is a reasonable assurance that no unreviewed safety question exist.

Operations revised 3PT-R007B, "#32 Auxiliary Boiler Feed Water Pump Full Flow Test", to include acceptance criteria based on the RAS and engineered consideration for instrument inaccuracies. Operations satisfactorily performed this test prior to plant restart.

Operations revised emergency operating procedures E-0, Revision 12, "Reactor Trip or Safety Injection," and ES-0.1, Revision 12, "Reactor Trip Response," to assure operator action to establish at least 660 gpm indicated flow upon determining that no motor driven pump automatically started during a LONF. These revisions were based on the RAS and engineered consideration for instrument inaccuracies.

Engineering will continue to work with Westinghouse to provide an analysis using a computer code approved by the NRC for Loss of Normal Feedwater, which bounds the Loss of Offsite Power accident scenario, allowing for the effect, capacity and functionality of the steam driven auxiliary feedwater pump, including maximum allowable delay time prior to pump full flow. Engineering will perform a safety evaluation based on the analysis and revise the FSAR where appropriate. This will be completed by March 31, 1998.

ANALYSIS OF EVENT

The event is reportable in accordance with 10CFR50.73(a)(2)(i)(B) for a condition prohibited by Technical Specifications 4.8.1.a in that the full flow testing of the steam driven pump was not tested to the required full flow rate.

A historical review of the past two years of Licensee Event Reports did not identify similar events.

SAFETY SIGNIFICANCE

This event had no effect on the health and safety of the public.

A single fully automatic motor driven auxiliary feedwater pump is adequate to respond to the design basis accidents and the two motor driven auxiliary feedwater pumps supply redundancy to the extent of their independent power supply to their motor and their pump flow rate. The auxiliary feedwater pumps were required to be operable when the plant was above 350 degrees F in accordance with the Technical Specifications. The steam driven pump was capable of supplying more flow than the test criterion value upon demand from the operator and most likely the operator would establish more flow from the steam driven pump than that required by the procedure based on their knowledge and experience.