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

LICENSEE EVENT REPORT (LER)

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

FACILITY NAME (1)	DOCKET NUMBER (2)	PAGE (3)
James A. FitzPatrick Nuclear Power Plant	05000333	01 OF 07

TITLE (4)

Manual Reactor Scram Due to Fouling of Circulating Water System Traveling Screens

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	23	97	97	-- 001 --	01	02	13	98	N/A	05000
									FACILITY NAME: N/A	DOCKET NUMBER: 05000

OPERATING MODE (9)	N
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)		50.73(a)(2)(i)		50.73(a)(2)(viii)
	20.2203(a)(1)		20.2203(a)(3)(i)		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)	X	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)
Mr. Gordon J. Brownell, Licensing Engineer	(315) 349-6360

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 January 23, 1997 at 2210 hours with the plant operating at 100 percent, power reduction was commenced due to potential loss of water inventory in the Circulating Water System's (CWS) intake bays. A high differential water level annunciator indicated fouling of the CWS traveling screens. Attempts to clean the screens resulted in the screens becoming inoperable due to shear pin failures. At 2224 hours, with power level reduced to approximately 57 percent, and following unsuccessful attempts to start the screens, a manual scram was initiated.

Cause of the event was a potential loss of CWS intake water due to restriction of flow through the three CWS traveling screens. A contributing cause was less than adequate work scheduling.

Actions taken included reviewing event lessons learned with plant personnel, revising Operating Procedure OP-4, "Circulating Water System", and evaluating the adequacy of the shear pins used on the screens.

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EVENT DESCRIPTION

On January 23, 1997 at 2210 hours with the plant operating at 100 percent, power reduction was commenced due to Control Room annunciator 09-6-1-17 indicating a high differential water level across the Circulating Water Systems (CWS) [KE] three traveling screens (36TS-2A, 2B, & 2C) located in the Screenhouse [NN]. The traveling screens are 12 foot conveyer type devices, situated between the trash racks and the CWS pump sluice gates, normally not rotating, and used to prevent small debris from entering the CWS. Each of the three screens may be operated automatically or manually. In the automatic mode, the system is activated when differential level across the screen reaches 4 inches water column (W.C.). Annunciator 09-6-1-17 alerts the operator of continued debris build up when level across the screens reaches 6 inches W.C.

At the time of the event, screens B and C had their automatic start function disabled in order to support scheduled maintenance inspections. Manual start capability remained available. Inspections were completed on screens B and C at approximately 2145 hours. Administrative release of the tagouts for screens B and C was in progress by the Control Room as the event began. Screen A was fully operable in the automatic mode.

At approximately 2200 hours and in response to annunciator 09-6-1-17, operators were dispatched to the Screenwell while Control Room operators raised the CWS tempering gate to help eliminate potential frazzle ice accumulation on the screens. Reactor power was being lowered to permit securing a CWS pump in accordance with Abnormal Operating Procedure AOP-56, "High Traveling Screen or Trash Rack Differential Level".

Investigation identified that the motor for 36TS-2A was running, however, the shear pin for traveling screen A was broken preventing the screen from rotating and freeing itself of accumulated debris. During attempts to manually start Screens B and C, their shear pins also sheared due to heavy debris accumulation. Continued attempts to restore the Screens to an operable status were unsuccessful.

At 2224 hours, with power level reduced to approximately 57 percent, the reactor was manually scrammed.

The sequence of events leading up to and immediately following the manual scram is presented below.

January 23, 1997

22:00 hours	Received Control Room Annunciator 09-6-1-17 (Traveling Screen Differential level Hi-Hi). Screen differential level indicated approximately 8 inches and trending up.
22:04 hours	Water level in CWS pump intake bays lowering to 244.0 feet.

DESCRIPTION (Cont.)

22:05 hours	Commenced opening tempering gate in an attempt to eliminate potential ice accumulation on the screens.
22:10 hours	Entered AOP-56.
22:13 hours	Reactor power lowered to 72.5 percent.
22:14 hours	Intake bay water level at 242.0 feet and trending down. All three traveling screen pins reported sheared.
22:16 hours	Intake bay water level at 241.2 feet, secured "C" CWS pump, reactor power at 61.9 percent.
22:21 hours	Entered Abnormal Operating Procedure AOP-64, "Loss of Intake Water Level". Intake bay water level at 240.7 feet.
22:24:13 hours	Intake bay water level at 240.0 feet, inserted reactor manual scram.
22:24:16 hours	Entered Emergency Operating Procedure EOP-2, "RPV Control" due to reactor water level less than 177 inches.
22:24:23 hours	Group II Primary Containment isolation, Reactor Building Ventilation System isolation, Reactor Water Cleanup System (RWCU) [CE] Isolation.
22:25 hours	Exited EOP-2, entered EOP-3, "Failure to Scram" due to multiple control rods noted to not have green full-in lights. EPIC provided confirmation that all rods were fully in, exited EOP-3, re-entered EOP-2.
22:25:39 hours	Main turbine [TA] trip.
22:26 hours	Intake bay water level at 239.2 feet and lowering, secured "B" CWS pump.
22:29 hours	Intake bay water level at 240.8 feet and rising.
22:30 hours	All control rods [AA] verified full in, reactor scram reset.
22:33 hours	Group II Primary Containment [NH] isolation verified.
22:40 hours	Intake bay water level remained at approximately 241 feet.

DESCRIPTION (Cont.)

22:52 hours	Control Room notified that cause of traveling screen trouble was probably fish accumulation on screens.
23:22 hours	Commenced normal reactor cooldown.

January 24, 1997

00:03 hours	Secured "A" CWS pump.
00:16 hours	Control Room notified that CWS traveling screens 36TS-2A, 2B and 2C have been repaired, large accumulation of small fish were cause for shear pin failure and flow blockage on all three screens.

CAUSE OF EVENT

The cause for the manual reactor scram was the potential loss of intake water to the Normal Service Water System (SWS) [KE], Emergency Service Water System (ESW) [BI], Residual Heat Removal Service Water System (RHRSW) [BI], and heat sink (Main Condenser) [KE] for the reactor. A restriction of CWS intake flow through the CST Traveling Screens A, B, and C, created by a large accumulation of small fish on the screens, resulted in a lowering of water level in the CWS pump suction bay.

Although screen A was in the "auto start" mode, and received its start signal on differential level, the weight of the accumulated fish on the screen and the increased loading due to the differential water level caused a shear pin to break rendering the screen inoperable.

A contributing cause to this event was less than adequate work planning. At the time of the event, two of the three travelling screens were protective tagged for the performance of scheduled preventive maintenance. A "striped" protective tag was applied to the controls for these two screens. The "striped" protective tag transferred control of those two travelling screens to the worker (tagholder) performing the preventive maintenance. Worker control was required to permit local jogging of the screens to permit screen inspections.

Plant procedures required that a device that has a "striped" protective tag be placed in the protected position whenever the equipment under maintenance is not being operated or personnel protection is required.

CAUSE OF EVENT (Cont.)

Operations personnel concluded that the "striped" protective tag could quickly be transferred back to Operations if the screens were needed due to an influx of aquatic weed or fish. In reality, after the worker(s) completed the preventive maintenance and placed the protective tagged device in the protected (off) position, during the transient time to the Control Room, the one travelling screen operating in the automatic start mode started on high screen differential pressure, but was unable to clear the accumulated fish load. Consequently, its drive pin sheared.

The striped protective tag resulted in the auto start function of two of the three travelling screens to be taken to the inoperable status. The potential consequences of this arrangement were not adequately addressed in the work planning process. Having one additional screen available in the automatic start mode may have prevented the travelling screen shear pins from failing.

ANALYSIS

This report is being submitted in accordance with 10 CFR 50.73 (a) (2) (iv), "any event or condition that resulted in a manual or automatic actuation of an engineered safety feature (ESF) including the reactor protection system (RPS)".

This event is bounded by the previously analyzed main turbine trip with bypass system operation as described in the FitzPatrick Updated Final Safety Analysis Report (UFSAR). The plant responded as designed following the manual scram from approximately 57 percent of rated power. There was no challenge to the reactor coolant pressure boundary or the fuel cladding integrity. Therefore, the safety significance of this event was minimal.

The Post Transient Review revealed that the Shift Manager prepared for and directed insertion of a manual reactor scram when faced with a potential loss of intake water inventory. The operating crew took manual actions to control RPV and primary containment parameters within prescribed limits.

The intake structure supplies water to the CWS, SWS, ESW, RHRSW, and Fire Protection Systems. The event is significant because if operators had not taken compensatory actions upon identifying the loss of water level in the Screenwell, water level could have dropped below the minimum required for operation of the ESW and RHRSW pumps. The RHRSW and ESW pumps are required to mitigate the effects of a Design Basis Accident. Minimum water elevation in the Screenwell during the transient was approximately 239 feet, at this level the ESW and RHRSW pumps would have been able to perform their safety function if called upon. Intake water level was restored to normal when the CWS pumps (non-safety related) were removed from service.

CORRECTIVE ACTIONS

1. An evaluation was completed of current Lake Ontario fish population, including the three spine stickleback species, for potential impact on plant operations. This review concluded that the current fish population in the vicinity of FitzPatrick has little, if any, potential for a negative impact on plant operation when the traveling screens are operated in the normal design configuration.

2. An evaluation has been completed to determine the adequacy of the shear pins used on the traveling screens. Evaluation results concluded that the proper pins as supplied by the manufacturer were installed in the applications. Additionally, reviews were completed to determine if a pin with greater shear strength could be used without affecting its protective function for the screens. Vendor recommendations were to remain with as installed pin material.

3. Operating Procedure OP-4, "Circulating Water System", has been revised to add restrictions for removing a traveling screen from service to ensure: (1) the amount of time an intake bay is removed from service is minimized; (2) only one bay is removed from service at a time; and (3) remaining traveling screens are operated in continuous mode.

4. Lessons learned from this event were reviewed with Operations Department and Planning Department personnel.

5. A review of plant procedures associated with work control and equipment status control was completed to assess protective tagging processes and assure adequate guidance was provided on taking redundant trains and/or equipment out of service.

6. Administrative Procedure AP-12.01, "Equipment and Personnel Protective Tagging" was revised to clearly state that when equipment tagged for maintenance with Striped Tags, the equipment is considered inoperable and unavailable.

7. Administrative Procedure AP-12.03, "Administration of Operations" was revised to provide additional guidance for removing redundant trains and/or components from service. When removing such equipment from service, personnel are to ensure a risk assessment of the work has been performed.

ADDITIONAL INFORMATION

A. Previous Similar Events:

Two previous events at FitzPatrick involved low intake water level resulting in manual reactor scrams (LER 93-004 and LER 90-023).

ADDITIONAL INFORMATION (Cont.)

In the 1990 event, one CWS traveling screen was inoperable prior to the scram due to scheduled preventive maintenance. During pre-maintenance preparations, the traveling screen differential pressure alarm was unintentionally disabled due to a procedural deficiency. This resulted in: (1) the elimination of the early detection of screen fouling; and (2) the disabling of the automatic start function of the two remaining screens. Subsequent screen fouling occurred and resulted in shear pin failures. Corrective actions resulting from this event included (1) procedural enhancements to provide operator guidance when removing traveling screens from service and operator response to high screen differential pressure · and (2) adding screen differential pressure indication to operator round sheets.

The 1993 event was caused by either the formation of frazzle ice or the presence of slush ice in front of the intake bar racks obstructing intake flow. The corrective actions resulting from this event included (1) establishing computer alarm points to monitor CWS temperature changes to provide early indication of potential ice blockage; and (2) generating a new Abnormal Operating Procedure to provide operator guidance when low screenwell level is observed.

Corrective actions associated with these events were successful in elevating operator awareness, response and sensitivity to external environmental conditions which may rapidly change and impact intake flow conditions. These previous corrective actions would not be expected to have prevented this event since the cause of each of the events were different.

B. Failed Component: NONE