James A. FitzPatrick
Nuclear Power Plant
P.O. Box 41
Lycoming, New York 13093

315-342-3840

NewYorkPower Authority

Michael J. Colomb
Plant Manager

October 4, 1996
JAFP-96-0393

U.S. Nuclear Regulatory Commission
ATTN: Document Control Desk
Mail Station P1-137
Washington, D.C. 20555

SUBJECT: **James A. FitzPatrick Nuclear Power Plant**
Docket No. 50-333
Licensee Event Report: LER-96-008

High Pressure Coolant Injection System Declared Inoperable Due to a Failed DC to AC Power Inverter

Dear Sir:

This report is being submitted in accordance with 10 CFR 50.73(a)(2)(v), "Any event or condition that alone could have prevented the fulfillment of the safety function of structures or systems that are needed to: (A) Shut down the reactor and maintain it in a safe shutdown condition".

There is one (1) commitment contained in this report.

Questions concerning this report may be addressed to Mr. Gordon Brownell at (315) 349-6360.

Very truly yours,

MICHAEL J. COLOMB

MJC:GJB:las
Enclosure

cc: USNRC, Region I
USNRC Resident Inspector
INPO Records Center

110014

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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 20666-0001, AND TO THE PAPERWORK REDUCTION PROJECT (3150-0104), OFFICE OF MANAGEMENT AND BUDGET, WASHINGTON, DC 20603.

LICENSEE EVENT REPORT (LER)

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

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TITLE (4)

High Pressure Coolant Injection System Declared Inoperable Due To A Failed DC To AC Power Inverter

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
09	06	96	96	-- 008 --	00	10	04	96	NA	05000
									FACILITY NAME: NA	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)	50.73(a)(2)(iv)	OTHER
20.2203(a)(2)(iii)	50.36(c)(1)	X 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
X	BJ	INVT	T248	Y						

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 September 6, 1996, at 0819 hours, with the mode switch in the RUN position, the plant operating at 100 percent of rated power, and the High Pressure Coolant Injection System (HPCI) operable, the HPCI DC to AC power inverter failed causing Control Room annunciators to alarm and de-energizing the HPCI flow control instrumentation. HPCI was declared inoperable. Alternate Emergency Core Cooling Systems required to be operable by Technical Specifications when HPCI is inoperable were in an operable status.

The cause for the inverter failure was determined to be a shorted capacitor located in the inverter.

Corrective actions included replacing the failed capacitor, completing system testing, and returning HPCI to an operable status. Additional corrective actions included scheduling the replacement of capacitors in similar type inverters installed in the plant.

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

EIIS Codes are in []

EVENT DESCRIPTION

On September 6, 1996, at 0819 hours, with the mode switch in the RUN position, the plant operating at 100 percent of rated power, and the High Pressure Coolant Injection System (HPCI) [BJ] operable, HPCI DC to AC power inverter 23INV-79 failed. Inverter 23INV-79 is located in Control Room Panel 09-03. This failure caused annunciators 09-3-3-9 (HPCI INVERTER FAILURE) and 09-4-0-14 (DIV II PNL PWR LOSS) to alarm and de-energized the HPCI flow control instrumentation. HPCI turbine steam inlet pressure, HPCI turbine exhaust pressure, HPCI pump suction pressure, and HPCI pump discharge pressure indication instrumentation were also de-energized. HPCI was declared inoperable and the plant entered a seven (7) day Limiting Conditions for Operation (LCO) per Technical Specification (TS) section 3.5.C. Other systems required to be operable per TS were in an operable status.

Following receipt of the Control Room annunciator alarms, Instrument and Controls (I & C) technicians commenced troubleshooting efforts to determine the cause for the inverter failure. Results from these efforts determined that an oil filled capacitor, located in the inverter, failed in the shorted condition. The failed capacitor shorted the secondary winding of the output transformer which in turn caused the failure of the inverter to supply power to the associated HPCI control and indication instrumentation.

On September 7, 1996 at 0546 hours, I & C technicians completed replacement and testing activities associated with inverter repair. The LCO was then cleared and HPCI was returned to an operable status. The High Pressure Coolant Injection System was inoperable for twenty one hours and twenty seven minutes.

EVENT CAUSE

The cause of this event was the random failure of oil filled capacitor C11 located in HPCI inverter 23INV-79. An Equipment Failure Evaluation was completed by I&C engineering that included a review of manufacturer data associated with installation environment conditions and expected equipment life. It was determined that the operating age of the failed C11 capacitor based on equipment operating conditions was significantly less than the rated life expectancy. Further determination of the failure could not be completed due to polychlorinated biphenyls (PCBs) contained in the capacitor oil.

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

ANALYSIS

This event is reportable in accordance with 10 CFR 50.73(a)(2)(v), "Any event or condition that alone could have prevented the fulfillment of the safety function of structures or components that are needed to shut down the reactor and maintain it in a safe shutdown condition."

The High Pressure Coolant Injection System is an engineered safety feature designed to inject a highly reliable source of water into the reactor at rated pressure and in sufficient volume to maintain core coverage through a broad spectrum of hypothetical accident conditions.

HPCI is required by TS to be operable whenever reactor pressure is greater than 150 psig, reactor coolant temperature is greater than 212 degrees Fahrenheit and fuel is in the vessel. A 7 day LCO is provided for repairs to HPCI if specified alternate Emergency Core Cooling Systems (ECCS) are available.

The inoperability of HPCI for twenty one hours and twenty seven minutes was of minimal significance. The Automatic Depressurization System (ADS) [SB], Reactor Core Isolation Cooling System (RCIC) [BN], Core Spray System (CS) [BM] and the Low Pressure Coolant Injection mode of the Residual Heat Removal System (LPCI/RHR) [BO] were verified and maintained operable for the duration of the LCO.

CORRECTIVE ACTIONS

1. The failed C11 capacitor located in HPCI inverter 23INV-79 was replaced.

2. An Equipment Failure Evaluation was completed on C11 capacitor to provide assurance that the component failure was appropriately reviewed for potential causes and assurance that no other components in similar applications are subject to a common mode failure.

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

CORRECTIVE ACTIONS (cont.)

3. A review of the Work Control data base revealed that there were no previous Topaz Electronic DC to AC Power inverter failures at FitzPatrick that were attributable to faulty C11 capacitors. Industry Operating Experience Reports were reviewed for similar type capacitor failures, none were found.

4. A review of electrical equipment was completed to identify safety related and non-safety related components utilizing oil filled capacitors whose failure could potentially impact plant operation. The review identified:

   - Five (5) similar Topaz model inverters, two safety related (RCIC inverters 13INV-801A & B) and three non-safety related (RCIC inverter 13INV-152, and Feedwater System [SJ] inverters 06INV-1A & B). Although the operating age of these capacitors is significantly less than the calculated capacitor life expectancy, as a precautionary measure, the C11 capacitors located in the five inverters are scheduled for replacement during the Fall 1996 RF-12 Refuel Outage (planned outage completion date is December 6, 1996).

   - Other safety related and non-safety related equipment, however, based on the Equipment Failure Evaluation, no additional corrective actions were required.

ADDITIONAL INFORMATION

A. Failed Component

Component ID:	23INV-79
System:	High Pressure Coolant Injection
Identification:	125V DC to 120 VAC Power Inverter
Manufacturer:	Topaz Electronics
Model Number:	N250-GWR-125-60-115
NPRDS Manufacturer Code:	T248

B. Similar Events

The plant has experienced several previous events involving the inoperability of the High Pressure Coolant Injection System. However, there were no events involving component failures similar to the one identified in this report.

Attachment 1

LER-96-008

Commitment Status

Number	Commitment	Due Date
JAFP-96-0393-01	The review identified five (5) similar Topaz model inverters, two safety related (RCIC inverters 13INV-801A & B) and three non-safety related (RCIC inverter 13INV-152, and Feedwater System [SJ] inverters 06INV-1A & B). Although the operating age of these capacitors is significantly less than the calculated capacitor life expectancy, as a precautionary measure, the C11 capacitors located in the five inverters are scheduled for replacement during the Fall 1996 RF-12 Refuel Outage.	12/06/96