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NewYorkPower Authority

Michael J. Colomb
Site Executive Officer

October 2, 2000
JAFP-00-0228

United States Nuclear Regulatory Commission
Attn: Document Control Desk
Mail Station P1-137
Washington, D.C. 20555

Subject: **Docket No. 50-333**
LICENSEE EVENT REPORT: LER-00-008-01 (DER-00-03401)

"Reactor Water Recirc Speed Control Mechanical Stops Set Higher Than Value Assumed In Core Operating Limits Report"

Dear Sir:

This report is submitted in accordance with 10 CFR 50.73(a)(2)(ii)(B), " in a condition that was outside the design basis of the plant."

There are no commitments contained in this report.

Questions concerning this report may be addressed to Mr. Robert Steigerwald at (315) 349-6209.

Very truly yours,

MICHAEL J. COLOMB

MJC:RFS:las
Enclosure

cc: USNRC, Region 1
USNRC, Project Directorate
USNRC Resident Inspector
INPO Records Center

NRC FORM 366 (6-1998) 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 06/30/2001

Estimated burden per response to comply with this mandatory information collection request: 50 hrs. Reported lessons learned are incorporated into the licensing process and fed back to industry. Forward comments regarding burden estimate to the 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. If an information collection does not display a currently valid OMB control number, the NRC may not conduct or sponsor, and a person is not required to respond to, the information collection.

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TITLE (4)
Reactor Water Recirc Speed Control Mechanical Stops Set Higher Than Value Assumed in Core Operating Limits Report

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
									N/A	05000
07	28	00	00	008	01	10	02	00	FACILITY NAME N/A	DOCKET NUMBER 05000

OPERATING MODE (9)	N	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)
POWER LEVEL (10)	100		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)
Mr. Robert Steigerwald, Sr. Licensing Engineer	315-349-6209

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

CAUSE	SYSTEM	COMPONENT	MANUFACTURER	REPORTABLE TO EPIX	CAUSE	SYSTEM	COMPONENT	MANUFACTURER	REPORTABLE TO EPIX

SUPPLEMENTAL REPORT EXPECTED (14)				EXPECTED	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 July 28, 2000, with the reactor at approximately 100 percent power, it was discovered that the mechanical stop setting for the " A" Reactor Water Recirculation (RWR) pump speed limiter exceeded the value assumed in the calculation for the flow dependent Minimum Critical Power Ratio (MCPR) contained in the Core Operating Limits Report (COLR). On July 29, the " B" RWR pump mechanical stops were also discovered to be set above 102.5 percent. If a RWR pump transient such as a runaway RWR flow from a low flow condition is postulated, the flow dependent MCPR may be exceeded. This could result in exceeding the Safety Limit MCPR. This condition could have put the plant outside of its design bases and is being reported per 10CFR50.73(a)(2)(ii)(B). Review of plant operating history determined that the plant had not operated in a condition that would have resulted in exceeding Operating Limit MCPR and thus would not have exceeded the SLMCPR. Therefore, the safety significance was determined to be minimal. The cause was determined to be inadequate post work testing due to failure of the post work testing determination process and poor communications between work groups. Corrective actions include: resetting and verifying the mechanical stops set at 102.5 percent, completion of the Root Cause Analysis, planned revision to the Instrument Maintenance Procedure, and reinforcement of expectations with regard to ensuring all affected functions are checked during post-work testing following corrective maintenance.

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EVENT DESCRIPTION

On July 28, 2000, with the reactor at approximately 100 percent power, it was discovered that the mechanical stop setting for the " A" Reactor Water Recirculation (RWR) [AD] pump speed limiter was greater than the value assumed in the calculation for the flow dependent Minimum Critical Power Ratio (MCPR) contained in the Core Operating Limits Report (COLR). Subsequent testing for the " B" RWR pump mechanical stops on July 29 determined that its setting was also greater than the 102.5 percent value assumed in the COLR. The " A" and " B" RWR mechanical stops were last adjusted on April 4, 2000, during a plant shutdown. The post work testing during power ascension following the adjustments was not adequate to ensure settings were </=102.5 percent. The post work testing only verified that a core flow of 100 percent could be achieved.

In the Fall of 1999, the FitzPatrick plant began experiencing difficulty achieving 100 percent core flow. This was following Noble Metals addition and implementation of the Leading Edge Flow Meter (LEFM) modification. Analysis by General Electric and Authority Reactor Engineers determined that core flow behavior was acceptable and that the RWR pump motor generator set limiters, electrical stops, and mechanical stops required adjustments.

The original plan was to perform the RWR pump limiter and stop setting adjustments on line. This would have obviated the need for the required post work testing since adjustments of the settings on-line verifies the setting by using actual flow conditions to set the limiter and stops. However, the opportunity arose to perform the work shutdown, during a forced outage. It was decided to perform the work during the forced outage due to the perception that it was safer, from a plant risk viewpoint, to perform the work off-line. The settings performed during shutdown conditions are based on limiter position measurements that are then extrapolated to determine the limiter position setpoint. Therefore, the new limiter settings needed to be verified during power ascension following startup. System engineering personnel understood this but it was not communicated effectively to the work planning organization or the test procedure writers.

The same post work testing identified for performing the limiter and stop settings on-line was used for performing the limiter and stop settings off-line. The test verified that the RWR flow of 100 percent could be achieved, which ensured that the earlier problem of not being able to achieve 100 percent flow was corrected, but it failed to verify the settings under actual flow conditions.

A few days following startup, the system engineer realized that the post work testing was inadequate in that it did not verify the actual settings. The system engineer discussed this requirement at a planning meeting but did not adequately communicate the importance of the required post work testing with respect to the potential impact on the assumptions in the COLR and the need to promptly conduct the test under actual flow conditions. The post work test procedure was written and performed on July 28 and 29.

A Review of past history determined that the limiter and stops were set during shutdown conditions in the past (5 times since 1991) and the same post work testing was performed which may have lead to previous non-conservative settings.

CAUSE OF THE EVENT

The cause was a failure to specify adequate post work testing in the work planning process due to inadequate procedural and process guidance (Cause Code E) and poor communications (Cause Code A). The following barriers failed to prevent this event.

Process and Procedures:

- The Instrument Maintenance Procedure (IMP) did not specify the proper post-work testing, and did not incorporate the operating experience and guidance specified in General Electric Service Information Letter 228 (SIL-228).
- The guidance for post-work testing in Administrative Procedure AP-05.07 does not address Instrument & Controls work on RWR controls. The job planners assumed that what was done in the past for post-work testing was adequate.

Communications:

- The system engineer understood the need for the required post- work testing, but ineffectively communicated this to the work group and did not ensure the required testing was incorporated into the outage scope (Cause Code A).
- The scope of the work was changed when the task was moved from on-line to outage work, without careful consideration to post-work test changes and without involvement of engineering.

ANALYSIS OF THE EVENT

The mechanical stops are intended to limit flow in the event of a malfunction resulting in a RWR Pump run out to maximum speed. If a RWR pump transient such as a runaway RWR flow from a low flow condition is postulated, the flow dependent MCPR may be exceeded. This could result in exceeding the Safety Limit MCPR. This condition could have placed the plant outside of its design bases and is being reported per 10CFR50.73(a)(2)(ii)(B). The consequences and likelihood of this having an actual impact on plant safety are small due to the fact that JAF operates the RWR pumps individually in manual control. As such, the probability of a run out of both pumps simultaneously is a highly unlikely event. Also, the RWR motor generator electronic limiter settings were found to be approximately 102 percent. The electronic limiter and electrical stops are set at values below the mechanical stop.

The Flow Dependent MCPR Limit, k_f, correction factor is applied to the Operating Limit MCPR (OLMCPR) limits at low core flows to mitigate consequences of a Recirculation Pump run out, ensuring that OLMCPR margin is maintained at higher powers. Higher stop settings are possible, but they require using a more conservative (restrictive with respect to operation) correction factor. Higher stop settings require a greater correction factor. The setting of the RWR limiters is assumed in the function used by the 3D-Monicore computer when applying the k_f correction factor. As such, the discovery of the stops at a value higher than assumed (104.7 and 105.1 percent for " A" and " B" RWR mechanical stops, respectively) created the potential for operation with a non-conservative correction factor applied to MCPR when operating at lower core flows.

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ANALYSIS OF THE EVENT (cont'd.)

Review of the correlation used by 3D-Monicore between April 4 and July 29, 2000, reveals that the correction factor applied by 3D-Monicore in determining k_f was non-conservative between April 4 and April 8, 2000. Review of 3D-Monicore monitoring case records results show that correction for the non-conservative k_f factor during the April 4 and April 8 period did not result in violating OLMCPR. Additionally, an analysis utilizing a hypothesized mechanical stop setting of 107 percent and the associated correction factor determined that the net effect on the margin to thermal limits was negligible.

The previous as found settings of the mechanical stop settings cannot be determined. For the same reasons discussed above the safety significance is minimal; the RWR pump controls are operated individually in manual control and the electronic limiter and electrical stops were set, although unverified, at values less than the mechanical stops.

EXTENT OF CONDITION

An extent of condition review of planned refuel outage 14 adjustments to operational settings will be performed to ensure adequate post work setting verification. Other systems that are regulated by mechanical, hydraulic, or electrical controls are susceptible to inadequate identification of required post-work testing. The changes discussed below will minimize the chance of occurrence.

CORRECTIVE ACTIONS

1. Complete the Root Cause Analysis. **(Completed)**

2. Correct settings were established during the post work testing on July 28 and 29, 2000. **(Completed)**

3. The method for determining the RWR motor generator limiter and stop settings and performing and verifying the settings will be reviewed and revised as necessary. **(Scheduled completion date: prior to start up from refuel outage - October 17, 2000)**

4. The Instrument Maintenance Procedure (IMP-184.5) will be revised to ensure the appropriate post-work testing is performed. **(Scheduled completion date: October 25, 2000)**

5. Revise AP-05.07, " Maintenance Testing and Post Work Testing," to prompt Operations Planner to seek input from system engineering for post-work testing after corrective maintenance on systems that control process parameters that have direct impact on plant operations. **(Scheduled completion date: December 15, 2000)**

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6. Management expectations with regard to communications and the need to follow-up with technical concerns were discussed with the individual involved. **(Completed)**

7. Reinforce expectations to re-test the functions affected by corrective maintenance activities during post-work testing, and that post-work testing should not only test the absence of the problem that caused the work but all functions affected. Reinforce expectation with Central Planning, Operations, and Tech Services departments. **(Scheduled completion date: October 31, 2000)**

8. An extent of condition review of planned refuel outage 14 adjustments to operational settings will be performed to ensure adequate post work setting verification. **(Scheduled completion date: prior to start up from refuel outage - Nov 6, 2000)**

SAFETY SYSTEM FUNCTIONAL FAILURE REVIEW

This event did not result in a safety system functional failure in accordance with NEI 99-02, Revision 0.

PREVIOUS SIMILAR EVENTS

None.