LICENSEE EVENT REPORT (LER) Form Rev. 2.0

Facility Name (1)	Docket Number (2)	Page (3)
Quad Cities Unit One	0 5 0 0 0 2 5 4	1 of 0 5

Title (4)

Single Loop Operation In An Unanalyzed Condition Due To Management Systems Deficiency

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 Names	Docket Number(s)
												0 5 0 0 0
1 0	0 2	9 4	9 4	--	0 1 5	--	0 0	1 1	0 1	9 4		0 5 0 0 0

OPERATING MODE (9)		THIS REPORT IS SUBMITTED PURSUANT TO THE REQUIREMENTS OF 10CFR (Check one or more of the following) (11)				
04		20.402(b)	20.405(c)	50.73(a)(2)(iv)	73.71(b)	
POWER LEVEL (10)	0 3 1	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 (Specify in Abstract below and in Text)	
		20.405(a)(1)(iii)	50.73(a)(2)(i)	50.73(a)(2)(viii)(A)		
		20.405(a)(1)(iv)	X 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
	AREA CODE
Milton H. Richter, SEC, Ext. 2545	3 0 9 6 5 4 - 2 2 4 1

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
E									

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 fifteen single-space typewritten lines) (16)

ABSTRACT:

On October 2, 1994, Quad Cities Unit 1 entered Single Loop Operation (SLO) in order to support planned maintenance on the motor generator set [MG] for the '1A' Reactor Recirculation (RR) [AD] Pump [P]. Following shutdown of the '1A' RR Pump, core flow changes were made with the '1B' RR Pump (active loop) to acquire SLO jet pump baseline data. Upon completion of the data gathering, a final power level of 225 MWe was established (with a core flow of approximately 31% of rated) while work continued on the motor generator set. At 0915 hours, in preparation for restart of the '1A' RR Pump, the Unit 1 NSO identified a temperature difference of greater than 50 degrees F between the RR loops. As required by QCOP 202-2, "Reactor Recirculation Start-Up", a unit shutdown was performed Subsequent to shutdown of the unit (October 3, 1994), it was determined that the unit (RR System) had been in an unanalyzed condition. The root cause of this event was determined to be the failure to previously establish, in procedures and operator training, a minimum core flow limit during SLO in order to avoid the potential cooldown of the idle loop. Corrective actions include procedure revisions and training on the minimum core flow limit during SLO.

PLANT AND SYSTEM IDENTIFICATION:

General Electric - Boiling Water Reactor - 2511 MWt rated core thermal power.

EVENT IDENTIFICATION: Single Loop Operation in an Unanalyzed Condition due to Management Systems Deficiency.

A. CONDITIONS PRIOR TO EVENT:

Unit: One Event Date: October 2, 1994 Event Time: 0915
Reactor Mode: 04 Mode Name: RUN Power Level: 031

This report was initiated by Licensee Event Report 254\94-015.

RUN (4) - In this position the reactor system pressure is at or above 825 psig, and the reactor protection system is energized, with APRM protection and RBM interlocks in service (excluding the 15% high flux scram).

B. DESCRIPTION OF EVENT:

At 0255 hours on October 2, 1994, the '1A' Reactor Recirculation (RR) [AD] Pump [P] was shutdown in order to support planned maintenance on its motor generator set [MG]. Following shutdown of the '1A' RR Pump, core flow changes were made with the '1B' RR Pump (active loop) to acquire SLO jet pump baseline data in accordance with QCTS 920-8, "Jet Pump Base Data." Upon completion of the surveillance, a final power level of 225 MWe was established (at approximately 0450 hours) while work continued on the motor generator set. The core flow established at 225 MWe was approximately 31% of rated, which was below the recommended value (of 40%) to avoid the potential cooldown of the idle loop (GE SIL 517, "Single Loop Operation"). It should be noted that the existing procedures pertaining to Single Loop Operation (SLO) did not include a minimum core flow limit. Monitoring of the temperature in the active and inactive loops during this timeframe, which is required on a shiftly basis by procedure, had not identified any marked temperature difference.

Shift turnover occurred at 0630 hours. Unit 1 panel [PL] walkdowns during the turnover did not identify any abnormal temperature difference between the RR loops. Following completion of the maintenance on the motor generator set, preparation for startup of the '1A' RR Pump began in accordance with QCOP 202-2, "Reactor Recirculation Start-Up". At 0915 hours, prior to pump startup, it was identified that a temperature difference of greater than 50 degrees F existed between the RR loops. As required by QCOP 202-2, a unit shutdown began. Previous monitoring of the RR System status by the unit NSO during the shift had concentrated on the onscale jet pump flow indication for the idle loop which was assumed to be indicative of flow through the loop. However, the actual flow rate in the idle loop was insufficient to maintain the temperature of the loop within 50 degrees F of the active loop. During the unit shutdown, the temperature difference between the loops reached a maximum of 190 degrees F.

Following a review of the existing SLO analyses for the RR System, it was determined that the unit had been in an unanalyzed condition during the event. As a result, an NRC notification was made in accordance with 10CFR50.72(b)(1)(ii). Further evaluation determined the resultant loadings for this event were within FSAR limits. A subsequent drywell walkdown of the RR System identified no obvious support or structure deficiencies.

An investigation was performed on this event utilizing corporate and station personnel. The results of that investigation are presented in this report.

C. APPARENT CAUSE OF EVENT:

The root causes of this event have been determined to be:
- Change Management for a recent SLO Technical Specification amendment was inadequate; and
- Work Practices associated with the implementation of the Operating Experience information (GE SIL 517) were inadequate.

SLO Technical Specification Amendment

In March 1993, a Technical Specification amendment request was submitted which would allow for SLO with the suction and discharge valves [V] of the idle recirculation loop open. This amendment (Unit 1/2 - amendment 147/143) was issued in June 1994. Previously, for SLO which was to extend beyond 12 hours, the Technical Specifications required the suction valve in the idle loop to be closed and electrically isolated except when the idle loop is being prepared for return to service. The impetus for eliminating this requirement was to increase plant reliability. By operating with the suction valve open, the temperature of the idle loop would remain near reactor operating temperatures, and thereby, eliminate the potential for high stress conditions on the piping and maintain the system within currently analyzed conditions. The documentation associated with the SLO Technical Specification amendment request which was provided to Training, Operations, and System Engineering, for the purposes of revising procedures and training, did not provide sufficient information to ensure a thorough revision. Specifically, the documentation provided did not contain the recommended lower limit for total core flow while in SLO (from SIL 517).

Operating Experience Information - SIL 517 ("Single Loop Operation")

Contrary to the station procedure associated with the review and response of Operating Experience information, the Training Department did not receive SIL 517 when it was issued (in 1990). In addition, the initial response to the SIL did not incorporate the recommended minimum core flow limit into any procedures.

Contributing causes to this event have been determined to be:
- Work Practices associated with the implementation of the 'Heightened Level of Awareness' (HLA) Program were inadequate; and
- Work Practices did not allow for effective monitoring of the panels for abnormal indications.

HLA
Although SLO is considered a HLA activity, the oncoming (day) shift did not conduct a briefing prior to assuming the shift. The briefing should have included a review of the 'Limitations and Actions' of the procedures being used in the HLA evolution. A review of the procedures would have reinforced the 50 degree F temperature limit between loops.

Panel Monitoring
Monitoring of the loop temperatures during the event was too infrequent. A post-event review of the RR Loop Discharge Temperature recorder [TR] indicated that an observable deviation of the loop temperatures was existent from approximately 0600 hours until the time of discovery (0915 hours).

D. SAFETY ANALYSIS OF EVENT:

The safety significance of this event was minimal. The event was reviewed to historical thermal analyses for the RR System during Quad Cities SLO. It was determined that the resultant loadings for this event were within FSAR limits. It should be noted that for this evaluation, seismic loadings were not considered.

During this event the '1A' RR pump was not restarted. Restart of the pump occurred following completion of the engineering evaluation and associated walkdown (see Corrective Actions).

E. CORRECTIVE ACTIONS:

As a result of the engineering evaluation for this event, a VT examination was performed on two variable support (spring can) hangers [H] located on the loop 'A' ring header to verify their integrity and cold load settings. It was determined that the hangers had sustained no damage and that their cold settings were within the acceptance range. In addition, a general walkdown of both RR loops identified no obvious support or structure damage.

Procedures associated with SLO will be revised to incorporate a minimum core flow limit as recommended by GE SIL 517. Additionally, the adequacy of the current frequency for monitoring loop temperatures during SLO, which is once per shift, will be evaluated. (Operations; Action Item No. 2541809401501).

The Training Department will review the Technical Specification amendment package for SLO (Unit 1/2 - amendment 147/143) to determine the additional training for the licensed operators. The training will include the details of this event. (Training; Action Item No. 2541809401502).

The Regulatory Assurance Department will review QCAP 2300-13, "Processing Operating License Amendments," to verify that sufficient procedural guidance exists for providing the appropriate operating license amendment information to the cognizant station departments. (Regulatory Assurance; Action Item No. 2541809401503). In addition, Technical Specification amendments from the past three years will be reviewed to determine if any procedural or training concerns exist. (Operations and Training; Action Item No. 2541809401504).

Regulatory Assurance personnel will be trained on QCAP 2300-8, "Station Operating Experience Review and Response," to ensure all Operating Experience information is sent to the Training Department for evaluation. (Regulatory Assurance; Action Item No. 2541809401505). In addition, Service Information Letters from the past three years pertaining to systems considered 'Important to Safety' will be reviewed for inclusion into the Training Program. (Training; Action Item No. 2541809401506).

All Operating Department shift personnel will be trained on QCAP 200-11, "Heightened Level of Awareness Program." This training will emphasize when HLA briefings are required, and the prominent items that these briefings should address. (Operations; Action Item No. 2541809401507).

For Operating Department shift personnel, the expectations for panel monitoring for the purpose of identifying abnormal indications will be clarified. (Operations; Action Item No. 2541809401508).

F. PREVIOUS EVENTS:

A search was performed to identify previous instances of implementation concerns associated with Technical Specification amendments or Operating Experience information (e.g., GE SILs). In response to an NOV in Quad Cities Inspection Report 93-017, Quad Cities has implemented a review of SIL responses in order to identify instances of inadequate evaluation and/or implementation of corrective actions. SILs which warrant further evaluation are being reissued. This effort is currently on-going.

G. COMPONENT FAILURE DATA:

There was no component failure associated with this event.