

Exelon Generation Company, LLC
Quad Cities Nuclear Power Station
22710 206th Avenue North
Cordova, IL 61242-9740

www.exeloncorp.com

June 11, 2010

10 CFR 50.73

SVP-10-042

U. S. Nuclear Regulatory Commission
ATTN: Document Control Desk
Washington, D.C. 20555

Quad Cities Nuclear Power Station, Unit 2
Renewed Facility Operating License No. DPR-30
NRC Docket No. 50-265

Subject: Licensee Event Report 265/2010-001-00, "Main Condenser Low Vacuum Scram RPS Switch Inoperable Exceeded Technical Specifications"

Enclosed is Licensee Event Report (LER) 265/2010-001-00, "Main Condenser Low Vacuum Scram RPS Switch Inoperable Exceeded Technical Specifications," for Quad Cities Nuclear Power Station, Unit 2.

This report is submitted in accordance with the requirements of the Code of Federal Regulations, Title 10, Part 50.73(a)(2)(i)(B), which requires the reporting of any operation or condition which was prohibited by the plant's Technical Specifications.

There are no regulatory commitments contained in this letter.

Should you have any questions concerning this report, please contact Mr. W. J. Beck at (309) 227-2800.

Respectfully,



William R. Gideon
Site Vice President
Quad Cities Nuclear Power Station

cc: Regional Administrator – NRC Region III
NRC Senior Resident Inspector – Quad Cities Nuclear Power Station

JE22
NRR

LICENSEE EVENT REPORT (LER)

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

Estimated burden per response to comply with this mandatory collection request: 80 hours. Reported lessons learned are incorporated into the licensing process and fed back to industry. Send comments regarding burden estimate to the Records and FOIA/Privacy Service Branch (T-5 F52), U.S. Nuclear Regulatory Commission, Washington, DC 20555-0001, or by internet e-mail to infocollects@nrc.gov, and to the Desk Officer, Office of Information and Regulatory Affairs, NEOB-10202, (3150-0104), Office of Management and Budget, Washington, DC 20503. If a means used to impose 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.

1. FACILITY NAME Quad Cities Nuclear Power Station Unit 2	2. DOCKET NUMBER 05000265	3. PAGE 1 OF 6
--	------------------------------	-------------------

4. TITLE Main Condenser Low Vacuum Scram RPS Switch Inoperable and Exceeded Technical Specifications

5. EVENT DATE			6. LER NUMBER			7. REPORT DATE			8. OTHER FACILITIES INVOLVED	
MONTH	DAY	YEAR	YEAR	SEQUENTIAL NUMBER	REV NO.	MONTH	DAY	YEAR	FACILITY NAME	DOCKET NUMBER
04	14	10	2010	- 001	- 00	06	11	2010	N/A	N/A
									FACILITY NAME	DOCKET NUMBER
									N/A	N/A

9. OPERATING MODE 1	11. THIS REPORT IS SUBMITTED PURSUANT TO THE REQUIREMENTS OF 10 CFR §: (Check all that apply)									
10. POWER LEVEL 10%	<input type="checkbox"/> 20.2201(b)	<input type="checkbox"/> 20.2203(a)(3)(i)	<input type="checkbox"/> 50.73(a)(2)(i)(C)	<input type="checkbox"/> 50.73(a)(2)(vii)						
	<input type="checkbox"/> 20.2201(d)	<input type="checkbox"/> 20.2203(a)(3)(ii)	<input type="checkbox"/> 50.73(a)(2)(ii)(A)	<input type="checkbox"/> 50.73(a)(2)(viii)(A)						
	<input type="checkbox"/> 20.2203(a)(1)	<input type="checkbox"/> 20.2203(a)(4)	<input type="checkbox"/> 50.73(a)(2)(ii)(B)	<input type="checkbox"/> 50.73(a)(2)(viii)(B)						
	<input type="checkbox"/> 20.2203(a)(2)(i)	<input type="checkbox"/> 50.36(c)(1)(i)(A)	<input type="checkbox"/> 50.73(a)(2)(iii)	<input type="checkbox"/> 50.73(a)(2)(ix)(A)						
	<input type="checkbox"/> 20.2203(a)(2)(ii)	<input type="checkbox"/> 50.36(c)(1)(ii)(A)	<input type="checkbox"/> 50.73(a)(2)(iv)(A)	<input type="checkbox"/> 50.73(a)(2)(x)						
	<input type="checkbox"/> 20.2203(a)(2)(iii)	<input type="checkbox"/> 50.36(c)(2)	<input type="checkbox"/> 50.73(a)(2)(v)(A)	<input type="checkbox"/> 73.71(a)(4)						
	<input type="checkbox"/> 20.2203(a)(2)(iv)	<input type="checkbox"/> 50.46(a)(3)(ii)	<input type="checkbox"/> 50.73(a)(2)(v)(B)	<input type="checkbox"/> 73.71(a)(5)						
	<input type="checkbox"/> 20.2203(a)(2)(v)	<input type="checkbox"/> 50.73(a)(2)(i)(A)	<input type="checkbox"/> 50.73(a)(2)(v)(C)	<input type="checkbox"/> OTHER						
<input type="checkbox"/> 20.2203(a)(2)(vi)	<input checked="" type="checkbox"/> 50.73(a)(2)(i)(B)	<input type="checkbox"/> 50.73(a)(2)(v)(D)	Specify in Abstract below or in NRC Form 366A							

12. LICENSEE CONTACT FOR THIS LER	
FACILITY NAME Tom Petersen – Regulatory Assurance	TELEPHONE NUMBER (Include Area Code) (309) 227-2825

13. COMPLETE ONE LINE FOR EACH COMPONENT FAILURE DESCRIBED IN THIS REPORT									
CAUSE	SYSTEM	COMPONENT	MANU-FACTURER	REPORTABLE TO EPIX	CAUSE	SYSTEM	COMPONENT	MANU-FACTURER	REPORTABLE TO EPIX
N/A	N/A	N/A	N/A	N/A					

14. SUPPLEMENTAL REPORT EXPECTED		15. EXPECTED SUBMISSION DATE		MONTH	DAY	YEAR
<input type="checkbox"/> YES (If yes, complete 15. EXPECTED SUBMISSION DATE)	<input checked="" type="checkbox"/> NO			N/A	N/A	N/A

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

During Startup of Unit 2 from refueling outage Q2R20, anomalous condenser [CDU] backpressure indications were noted by the control room staff. While investigation into the indication issue was in progress the operators placed the Unit into Mode 1. Approximately 12 hours later the anomalous indication was determined to be caused by a partially closed isolation valve [ISV] which isolates the turbine [TRB] condenser low vacuum pressure switch [PS] which inputs into the Reactor Protection System (RPS) [JD]. The valve was subsequently re-opened. This pressure switch is required to be operable in Mode 1 by plant Technical Specifications (TS). Since the pressure switch was determined to be inoperable, the Unit had entered Mode 1 without meeting TS 3.0.4 for the required minimum number of operable channels per TS 3.3.1.1, Function 10.

The apparent cause of this event was failure of the Station to place sufficient importance on the anomalous Control Room indications. Contributing to the cause was the improperly positioned isolation valve that was potentially caused by personnel inadvertently bumping the isolation valve during outage activities. Condenser pressure plots during shutdown prior to the outage indicated pressure channels were tracking uniformly, however upon outage completion, the startup condenser pressure plots indicated anomalous readings, therefore the isolation valve had been inadvertently repositioned during the outage. Corrective actions include procedure changes to require investigations into abnormal plant indications to verify there are no impacts on TS required equipment prior to entering Modes 1 and 2, and reviews of work practices and configuration controls associated with instrument isolation valves in high traffic areas.

The safety significance of this event was minimal. Although the required instrument was not operable for a short period of time, sufficient redundant condenser backpressure instrumentation was operable to maintain scram capability. This event is therefore, a past operation or condition which was prohibited by the plant Technical Specifications, and is therefore reportable per 10 CFR 50.73(a)(2)(i)(B).

LICENSEE EVENT REPORT (LER)
CONTINUATION SHEET

1. FACILITY NAME	2. DOCKET	6. LER NUMBER			3. PAGE
Quad Cities Nuclear Power Station Unit 2	05000265	YEAR	SEQUENTIAL NUMBER	REV NO.	2 OF 6
		2010	- 001	- 00	

NARRATIVE

PLANT AND SYSTEM IDENTIFICATION

General Electric - Boiling Water Reactor, 2957 Megawatts Thermal Rated Core Power

Energy Industry Identification System (EIIIS) codes are identified in the text as [XX].

EVENT IDENTIFICATION

Main Condenser Low Vacuum Scram RPS Switch Inoperable and Exceeded Technical Specifications 3.0.4.

A. CONDITION PRIOR TO EVENT

Unit: 2

Event Date: April 14, 2010

Event Time: 1111 hours

Reactor Mode: 1

Mode Name: Power Operation

Power Level: 10%

B. DESCRIPTION OF EVENT

On April 14, 2010, during startup of Unit 2 from refueling outage Q2R20, at approximately 0800, while establishing vacuum in the Unit 2 Main Condenser, Operations determined the 2C Condenser Backpressure PT 2-3141-5C LP Turbine Exhaust 2C to Condenser was reading higher than the other main condenser sections (i.e., a degraded condition) based on the computer points and Control room recorder. Communications between the Outage Control Center and the Operating Shift determined the indication of 2C Main Condenser backpressure was coming down slower (lagging) than the other two condenser sections. A troubleshooting plan was initiated on the anomalous indication.

At 1111, Unit 2 was taken to Mode 1. At 1754, Instrument Maintenance (IMD) started troubleshooting on the 2C condenser backpressure sensing line, the Technical Specification impact was communicated to the Operations shift (Technical Specification 3.3.1.1, Action A entered). At approximately 1830, it was determined by IMD that there was insufficient flow to the indicator. IMD technicians then attempted to backflow the line to clear the assumed obstruction with no success. The controlled drawings were reviewed with Operations and Engineering personnel and it was determined that isolation valve 2-3199-75C "C" Condenser Pressure Transmitter root valve was not correctly positioned; it was partially closed when expected to be full open.

At 2351, an Equipment Operator having Operations Management concurrence repositioned the valve to fully open which restored indication consistent with the other main condenser backpressure indicators. The backpressure indication for the "C" instruments quickly returned to normal. The partially closed isolation valve was causing a delay in how quickly the condenser backpressure was being sensed by the instrumentation connected to the sensing line. On April 15, 2010 at 0032, Technical Specification 3.3.1.1, Action A was exited.

In reviewing recent work history on the 2C Main Condenser backpressure sensing line, work was performed on 4/9/2010 to backblow main condenser backpressure sensing lines prior to start-up. The work isolates the main condenser vacuum pressure transmitters and scram pressure switch at the instrument rack and connects an air line to the common sensing line. Air is then opened for 5 minutes to backblow the sensing line back to the main condenser. There is no requirement in the work package to verify air flow during the 5 minutes that air is opened to the main condenser. Each of the three main condenser backpressure sensing sections is performed separately. This work

LICENSEE EVENT REPORT (LER)
CONTINUATION SHEET

1. FACILITY NAME	2. DOCKET	6. LER NUMBER			3. PAGE
Quad Cities Nuclear Power Station Unit 2	05000265	YEAR	SEQUENTIAL NUMBER	REV NO.	3 OF 6
		2010	- 001	- 00	

NARRATIVE

activity could have identified the blockage in the line before the reactor startup was performed and is being considered a failed barrier.

Condenser backpressure plots during shutdown prior to the outage indicated pressure channels were tracking uniformly, however upon outage completion, the startup condenser pressure plots indicated anomalous readings (2C reading higher and lagging other readings), therefore the isolation valve had been inadvertently repositioned during the outage.

Since the 2C Main condenser low vacuum scram switch was inadvertently isolated during the Q2R20 outage, and the Unit entered Mode 1 on 4/14/10 at 1111 with the scram switch isolated, the 2C turbine condenser low vacuum RPS channel was inoperable and TS LCO 3.0.4 (Mode change preconditions) was not met since the minimum number of required channels operable per TS 3.3.1.1, Function 10 was not met prior to entering Mode 1. Hence this event is a past operation or condition which was prohibited by the plant Technical Specifications, and is therefore reportable per 10 CFR 50.73(a)(2)(i)(B).

C. CAUSE OF EVENT

During reactor start-up, the Station determined that the 2C Condenser Backpressure reading was higher than the other main condenser sections based on the computer points and Control Room recorder. The lagging pressure indications and the completed Instrument Maintenance surveillances led Operations department and the Station to respond in a manner that they would for a degraded plant indicator, not an inoperable Tech Spec required RPS trip channel instrument. Even though the actions were rigorous for what they thought was an indication problem, in that a troubleshooting guide was developed and Instrument Maintenance was investigating within nine hours of the issue being identified, the improper evaluation of the relationship between the indication and the input to the Tech Spec RPS function, resulted in a reduced priority of corrective actions that allowed the plant to move to Mode 1 without first meeting the requirements of TS LCO 3.0.4.

The apparent cause of this event is the Station did not place sufficient importance on the improperly indicating Control Room indicators. This resulted in a reduced priority of investigating and correcting the improper indication. The contributing cause of the event is outage activities in the area of the Main Condenser hatches were determined to be the most likely cause for the inadvertent closing of the 2-3199-75C isolation valve (potentially due to lack of awareness of surroundings, lack of flagging and robust operational barriers, and lack of use of pertinent work briefings).

The inadvertent isolation valve closure resulted in the improper entering of Mode 1 with an inoperable turbine condenser low vacuum RPS channel since the Mode change did not meet TS 3.0.4 since the minimum number of required channels operable per TS 3.3.1.1, Function 10 was not met prior to entering Mode 1.

D. SAFETY ANALYSIS

System Operation

The Turbine Condenser Vacuum—Low Function is provided to shut down the reactor and reduce the energy input to the main condenser to help prevent over-pressurization of the main condenser in the event of a loss of the main condenser vacuum. Loss of condenser vacuum occurs when the condenser can no longer handle the heat input (e.g., loss of heat transfer capability or excessive in-leakage). This condition initiates a closure of the turbine stop valves and turbine bypass valves, which eliminates the reactor heat input to the condenser. Closure of the turbine stop and

LICENSEE EVENT REPORT (LER)
CONTINUATION SHEET

1. FACILITY NAME	2. DOCKET	6. LER NUMBER			3. PAGE
Quad Cities Nuclear Power Station Unit 2	05000265	YEAR	SEQUENTIAL NUMBER	REV NO.	4 OF 6
		2010	- 001	- 00	

NARRATIVE

bypass valves causes a pressure transient, neutron flux rise and an increase in fuel surface heat flux. To prevent the fuel cladding integrity Safety Limit from being exceeded if this occurs, a reactor scram occurs on turbine stop valve closure. The turbine stop valve closure scram function alone is adequate to prevent the fuel cladding integrity Safety Limit from being exceeded, in the event of a turbine trip transient with bypass closure. The condenser low vacuum scram is anticipatory to the turbine stop valve closure scram. Turbine condenser vacuum pressure signals are derived from four pressure switches that sense the pressure in the condenser. The Allowable Value is consistent with the main turbine trip on low main condenser vacuum set-point, and provides main condenser overpressure protection by shutting down the reactor; thereby, reducing energy into the main condenser. Four channels of Turbine Condenser Vacuum—Low Function, with two channels in each trip system arranged in a one-out-of-two logic, are required to be OPERABLE to ensure that no single instrument failure will preclude a scram from this Function on a valid signal. The Function is required in MODE 1 since in this MODE there is a significant amount of core energy that can be rejected to the main condenser. During MODES 2, 3, 4, and 5, the core energy is significantly lower. This Function is automatically bypassed with the reactor mode switch in any position other than run.

Safety Impact

This instrument inputs into RPS as one of the four channels of Turbine Condenser Vacuum-low function, with two channels in each trip system arranged in a one-out-of-two logic. The function is designed with all instruments required to be operable to ensure that no single instrument failure will preclude a scram from this function on a valid signal. With the "C" Main Condenser switch inoperable, a "B" RPS channel trip would have occurred from the Pressure switch 2-0503-D to allow a scram to occur on loss of vacuum. Although the pressure switch would have tripped at the proper set-point, the "C" pressure switch would have very likely taken slightly longer to trip than the other three unaffected RPS condenser backpressure pressure switches. There was no impact to the "A" RPS channel due to this event. Scram capability was maintained during this event.

The Main Condenser low vacuum pressure switches are required operable in Mode 1. Unit 2 entered Mode 1 at 11:11 on 4/14/10, the isolation valve was reopened at 23:51, and Technical Specification 3.3.1.1, Action A was exited at 00:32 on 4/15/2010. Although the required instrument was not operable for a short period of time, this did not create any actual plant or safety consequences since the Unit was not in an accident or transient condition requiring use of the RPS during this period of time.

In conclusion, this event resulted in a minimal impact on plant risk, and the overall safety significance of this event was minimal.

E. CORRECTIVE ACTIONS

Immediate:

- Valve 2-3199-75C was placed in the open position and verified in the correct position.
- Initiated a prompt investigation on the event.

Follow-up:

- Revise QCGP 1-1 to add requirements to review abnormal plant indications to verify there is no impact to Technical specification required equipment or proper resolution prior to entering Mode 1 or 2.
- Install robust barrier to protect the Unit 1 Main Condenser vacuum sensing isolation valves during Q1R21.

**LICENSEE EVENT REPORT (LER)
CONTINUATION SHEET**

1. FACILITY NAME	2. DOCKET	6. LER NUMBER			3. PAGE
Quad Cities Nuclear Power Station Unit 2	05000265	YEAR	SEQUENTIAL NUMBER	REV NO.	5 OF 6
		2010	- 001 -	00	

NARRATIVE

- Review high traffic work areas each outage and determine vital components that need to have valve or component line -ups performed.
- Review high traffic work areas each outage and determine vital components that should be protected.
- Revise model work orders and any existing work orders to verify air flow during backblow of these sensing lines.
- Review this event with Operations Shift Managers and under Operations training emphasizing the importance of challenging the operability of improper responses of equipment and the impact of making decisions without fully verifying the data.

F. PREVIOUS OCCURRENCES

The Station Events Database, EPIX, NPRDS, and LERs were reviewed for similar events. This event was caused by the Station not placing sufficient importance on the improperly indicating Control Room indicators, which resulted in a reduced priority of investigating and correcting the improper indication.

- Station Event Database – Quad Cities IR 761287 (4/9/08) - On April 20, 2008, while preparing to perform a work order, the 2B Reactor Building [VA] Supply Fan failed to stop running after the Control Room attempted to open the breaker. When the 2B Reactor Building Supply Fan failed to trip, Operations entered QGA 300 and Technical Specification 3.6.4.1 Condition A on loss of negative differential pressure. Troubleshooting identified that the breaker (S058) had failed to open because a wire that supplies control power to the trip coil [94RLY] had broken free from a butt splice connecting it to the trip coil. The red light is in the trip circuit for the breaker, and the lack of light indication was a symptom of the broken wire. With the broken wire to the trip coil, the breaker trip function was lost. Corrective actions included revising Station 480V and 4KV breaker racking-in procedures to add a statement that lack of red light indication during breaker closure could be symptom of an inoperable breaker trip function, and communications and training for Operations concerning the red light function. Although this event is similar to the subject of this LER since a wrong disposition for the initial indication problem resulted in the operation of the plant with compromised equipment, the scope of corrective actions for the event was targeted at 480V and 4KV breaker closure light indication issues, and did not focus on the general topic of this LER being, Station personnel not placing sufficient importance on the improperly indicating Control Room indicators, which resulted in a reduced priority of investigating and correcting the improper indication.
- Station Event Database – Quad Cities IR 933472 (6/5/09) - During pre-turnover panel monitoring checks, the U1 Admin NSO checked for "Normal" status of all SPING channels, and discovered that channels 11-01 and 11-02 indicated "Uninitialized." The Chemistry technician was contacted and it was determined that the Service Water Effluent Rad Monitor was inoperable. The U1 SW Effluent Rad Monitor was inoperable for 15 days without samples being taken, in violation of the ODCM. Although the recorder was functional, the alarms were not. The Operations Department did not utilize a sufficient questioning attitude in addressing the Sping Instrument, "uninitialized" reading. The NSO should have reviewed the indication in sufficient detail to take the actions necessary to have the condition addressed or to determine that the instrument was inoperable. Corrective actions included Operations training related to the SPING "uninitialized" indication, procedure revisions to address the initialize indication, and reinforcement of Operations standards on addressing off normal conditions during turnovers. Although the SPING event is similar to the subject of this

**LICENSEE EVENT REPORT (LER)
CONTINUATION SHEET**

1. FACILITY NAME	2. DOCKET	6. LER NUMBER			3. PAGE
Quad Cities Nuclear Power Station Unit 2	05000265	YEAR	SEQUENTIAL NUMBER	REV NO.	6 OF 6
		2010	- 001	- 00	

NARRATIVE

LER since a wrong disposition for the initial indication problem resulted in the operation of the plant with compromised equipment, the scope of corrective actions for the SPING event was targeted at a sufficient questioning attitude in addressing the in-plant SPING Instrument, "uninitialized" condition, and did not focus on the general topic of this LER being, Station personnel not placing sufficient importance on the improperly indicating control room indicators, which resulted in a reduced priority of investigating and correcting the improper indication. The Operations Department was responsible for a questioning attitude concerning the SPING "uninitialized" condition, whereas for this LER, the Operations Department was responsible for determining the priority for the identification and correction of the main condenser backpressure issue.

- EPIX/ NPRDS – No similar events identified for Quad Cities.
- LER 05000265/2009-001-00, Failure of Common Unit EDG Auxiliaries to Transfer Power Sources to Support Unit 2 (06/09/09) - A loss of indication of power to the 1/2 EDG auxiliaries on March 25, 2009 was misunderstood to be a problem with the in-plant light bulb when in fact the circuit had lost power. Operations shift personnel did not challenge the conclusion that the loss of the light bulb was only an "indication." The cause of the 1/2 EDG event was that key Operations shift personnel did not adequately question and challenge critical information provided by subject matter experts. Corrective actions included developing procedural guidance expectations related to ensuring a questioning attitude of abnormal plant conditions when critical information is provided by subject matter experts. Although the 1/2 EDG event is similar to the subject of this LER since a wrong disposition for the initial indication problem resulted in the operation of the plant with compromised equipment, the scope of corrective actions for the 1/2 EDG event was targeted at a questioning attitude of abnormal plant conditions when critical information is provided by subject matter experts, and did not focus on the general topic of this LER being, Station personnel not placing sufficient importance on the improperly indicating control room indicators, which resulted in a reduced priority of investigating and correcting the improper indication. The Operations Shift was responsible for determining the priority for the identification and correction of the main condenser backpressure issue, as opposed to determining the validity of the subject matter expert inputs as identified in the 1/2 EDG event.

G. COMPONENT FAILURE DATA

This event does not involve the failure of any equipment. An EPIX report has not been generated.