

## LICENSEE EVENT REPORT (LER)

Form Rev. 2.0

Facility Name (1) Quad Cities Unit Two										Docket Number (2) 0   5   0   0   0   2   6   5					Page (3) 1   of   0   5													
(4) Drywell Equipment Drain Sump and the Drywell Floor Drain Sump covers were constructed not in accordance with design drawings, which affected the accurate measurement of the Technical Specification for primary containment leakage, due to an original construction error.																												
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	9	9	7	9	7	--	0	0	4	--	0	0	0	5	2	9	9	7	0	5	0	0	0			
OPERATING MODE (9)			0			THIS REPORT IS SUBMITTED PURSUANT TO THE REQUIREMENTS OF 10CFR (Check one or more of the following) (11)																						
POWER LEVEL (10)			0			<input type="checkbox"/> 20.402(b)			<input type="checkbox"/> 20.405(c)			<input type="checkbox"/> 50.73(a)(2)(iv)			<input type="checkbox"/> 73.71(b)													
						<input type="checkbox"/> 20.405(a)(1)(i)			<input type="checkbox"/> 50.36(c)(1)			<input type="checkbox"/> 50.73(a)(2)(v)			<input type="checkbox"/> 73.71(c)													
						<input type="checkbox"/> 20.405(a)(1)(ii)			<input type="checkbox"/> 50.36(c)(2)			<input type="checkbox"/> 50.73(a)(2)(vii)			<input type="checkbox"/> Other (Specify													
						<input type="checkbox"/> 20.405(a)(1)(iii)			<input type="checkbox"/> 50.73(a)(2)(i)			<input type="checkbox"/> 50.73(a)(2)(viii)(A)			in Abstract													
						<input type="checkbox"/> 20.405(a)(1)(iv)			<input checked="" type="checkbox"/> 50.73(a)(2)(ii)			<input type="checkbox"/> 50.73(a)(2)(viii)(B)			below and in													
<input type="checkbox"/> 20.405(a)(1)(v)			<input type="checkbox"/> 50.73(a)(2)(iii)			<input type="checkbox"/> 50.73(a)(2)(x)			<input type="checkbox"/> Text)																			
LICENSEE CONTACT FOR THIS LER (12)																												
NAME Charles Peterson, Regulatory Affairs Manager, ext. 3609										TELEPHONE NUMBER AREA CODE 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																			
SUPPLEMENTAL REPORT EXPECTED (14)										Expected Submission Date (15)			Month Day Year															
<input type="checkbox"/> YES (If yes, complete EXPECTED SUBMISSION DATE)										<input checked="" type="checkbox"/> NO																		
ABSTRACT (Limit to 1400 spaces, i.e., approximately fifteen single-space typewritten lines) (16)																												

## ABSTRACT:

Quad Cities Nuclear Station Unit Two was shutdown for refueling with no fuel in the reactor at the time of discovery for this event. Chemistry personnel were sampling the drywell sumps when they noticed that the sump covers appeared to be opposite to what they were expecting. Investigation proved that the Drywell Equipment Drain Sump and the Drywell Floor Drain Sump cover were not constructed per design drawings. This sump cover problem affects the accurate measurement of the Technical Specification for primary containment leakage. The plant was shutdown at the time of this event and there was no immediate consequences. The drywell sump covers construction error had no impact on the current operation of this or any other system. The apparent cause of this event was an error during plant construction. The actual root cause is unknown. The short term response to this event was to modify the Unit Two sump covers so that they now can meet Technical Specifications and to verify Unit One's sump covers by viewing them on video tape. The long term response is to visually verify the Unit One sump covers are installed as per design during the next refueling outage. There was no impact on health/safety of on-site personnel or to the public. The effect of wrong sump covers on identification of reactor coolant leakage was minimal.

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## LICENSEE EVENT REPORT (LER) TEXT CONTINUATION

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

**PLANT AND SYSTEM IDENTIFICATION:**

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

**EVENT IDENTIFICATION:**

The Drywell Equipment Drain Sump and the Drywell Floor Drain Sump covers were constructed not in accordance with design drawings, which affected the accurate measurement of the Technical Specification for primary containment leakage, due to an original construction error.

**A. CONDITIONS PRIOR TO EVENT**

Unit: 2                      Event Date: 050997              Event Time: 1830  
 Reactor Mode: 0              Mode Name: Refueling              Power Level: 000%

This report was initiated by Licensee Event Report 265\97-004.

No fuel in the reactor.

**B. DESCRIPTION OF EVENT:**

The Unit Two reactor was shutdown for refueling with no fuel in the reactor and Chemistry Department personnel were taking routine samples from the Drywell Equipment Drain Sump (DWEDS)[WK] and the Drywell Floor Drain Sump (DWFDS)[WK]. During the event personnel questioned which sump they were sampling since the sump covers appeared to be reversed from that which they were expecting. Chemistry requested that Operations investigate whether the correct sump covers were on the sumps. An operator was sent into the drywell and he concurred that the covers were on the wrong sumps. On 042497 at 1700 the operator then initiated Problem Investigation Form (PIF) 97-1980 and submitted it to the Shift Engineer (SE). During the discovery of this event and afterwards the plant was in a stable condition.

The PIF was sent to Mechanical Maintenance who then examined the sump covers to determine if they were installed on the wrong sumps during cleaning. During this inspection they discovered that this was not the case. Due to the construction of the sumps, the grating would only fit on the DWEDS and the deck plate will only fit on the DWFDS. Therefore this problem has existed since the plant was initially constructed. Since the sump covers could not simply be switched, Mechanical Maintenance wrote a Site Engineering Service Request (SESR) on 050197 to have Design Engineering provide a design change to make the sump covers as per the design drawings. When Design Engineering received the SESR, they questioned the reportability screening because the DWFDS would not collect unidentified leakage occurring directly below the reactor. This concern is based on Technical Specification (TS) 3.6/4.6.H which states that reactor coolant system leakage shall be limited to:

1. No pressure boundary leakage
2. Less than or equal to 25 Gallons per Minute (GPM) averaged over any 24 hour surveillance period
3. Less than or equal to 5 GPM unidentified leakage
4. Less than or equal to 2 GPM increase in unidentified leakage with any period of 24 hours or less (Applicable in operational mode 1 only)

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With any pressure boundary leakage the unit must be in hot shutdown within 12 hours and in cold shutdown within the next 24 hours. With the reactor coolant system unidentified leakage or total leakage rate(s) greater than the above limit(s) the unit would be required to reduce the leakage to within the limits within four hours or be in at least hot shutdown within the next 12 hours and in cold shutdown within the following 24 hours.

On 050697 at 1830 the Shift Engineer requested that System Engineering provide an Operability/Concern screening on the issue of the reduced ability of the DWFDS to detect unidentified leakage. On 050997 System Engineering concluded that the DWFDS sump was unable to function as per design due to the DWFDS cover construction error preventing operations from properly monitoring unidentified leakage in the drywell in modes 1,2 or 3. An LER was initiated. This event applies to Unit Two only; video tape footage has been reviewed to visually verify that the Unit One sump covers are installed as per design.

### C. CAUSE OF THE EVENT:

The covers installed in Unit 2 on the DWEDS and DWFDS do not agree with the configurations identified on design drawings. These applicable design drawings call for the DWEDS to have one quarter inch checkered deck plate installed over the opening while the DWFDS is identified as utilizing one and one half inch grating over the opening. The actual installed conditions are reversed. During original construction, a concrete frame recessed one and one half inch in the concrete floor was built around the DWEDS. This was intended to allow installation of a one and one half inch grating flush with the finished concrete. The DWFDS was constructed with a concrete frame recessed one fourth inch in the concrete floor. Additionally, steel bracing members were installed in the sump. This installation sequence was intended provide adequate support and a flush installation of one fourth inch thick deck plating. This construction sequence is reversed from that shown on the design drawings. The as found construction of the sump covers therefore do not allow for the sump covers to be interchanged.

The apparent cause of this event is a error during the construction phase of Quad Cities Unit Two. The actual root cause is unknown. The effect of the construction error is a reduction in the capability to accurately measure unidentified leakage directly under the Reactor Pressure Vessel (RPV) as described in the Quad Cities Updated Final Safety Analysis Report (UFSAR). Unidentified leakage inside the bioshield would have been previously mischaracterized as identified leakage. Unidentified leakage collected in the floor drains outside of the bioshield wall is still directed to the DWFDS. The actual leakage would still have been collected and pumped to the radwaste system as per design intent. Additionally, the Unit One DWFDS and DWEDS covers have been visually verified on videotape to be in the correct orientation. This issue therefore pertains only to Unit Two. No other plant system or component would have been affected by this event.



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#### D. SAFETY ANALYSIS OF THE EVENT:

There was no impact on health/safety of on-site personnel or to the public.

The DWEDS is used to collect "identified" leakage from the recirc pumps, relief valves, and other equipment via hard piped drain lines. The DWFDS is used to collect "unidentified" leakage, or all other leakage other than the known possible inputs that go into the DWEDS. TS 3.6/4.6H and UFSAR section 5.2.5.5 requires shutdown of the reactor when unidentified leakage exceeds 5 GPM and/or when the total of identified and unidentified leakage exceeds 25 GPM. Also since 092396, the TS require that the reactor must be shutdown if unidentified leakage increases by more than 2 GPM from the previous 24 hour period. With the DWEDS and DWFDS covers switched on Unit 2, operations could not accurately determine unidentified leakage directly under the reactor vessel. If the leakage is inside the bioshield (i.e. Control Rod Drives (CRD), Low Power Reactivity Monitors (LPRM), or other leakage) then the water on the floor is supposed to go to the DWFDS and be counted as unidentified leakage. But with the grating covering the DWEDS, the unidentified leakage would have been mis-identified as "known" leakage. Leakage outside of the bioshield would have been collected by the floor drains and directed to the correct sumps for unidentified leakage detection.

A small break Loss of Coolant Accident (LOCA) may be discovered by other methods. A large increase in DWEDS leakage rate would cause immediate concern by Operations and System Engineering. Chemistry would take samples to determine the source of the leakage (i.e. reactor coolant, Reactor Building Closed Cooling Water (RBCCW)...etc.). Also an increase in drywell temperature and pressure might be noticed. In fact, a large leak inside the drywell would probably occur outside of the bioshield since this is where the majority of the valves, pumps, piping, and other equipment exists and would be correctly identified as "unidentified" leakage.

System Engineering has analyzed available drywell sump leakage data for the period of 1987 - 1997. In this analysis, both the DWEDS and DWFDS leakage was combined and counted as a single leakage amount minus the "identified" recirc pump seal leakage. The recirc pump seal leakage is a known quantity of approximately one and one half GPM. All leakage other than the recirc pump was considered unidentified leakage. Also, hydrostatic testing of the reactor coolant system pressure boundary after every refueling outage has shown no unidentified leakage inside of the bioshield that would have affected leakage calculations. Based on this analysis System Engineering has determined that the TS for reactor coolant pressure boundary leakage has not been violated during this period. Data from years previous to 1987 was also sampled and not TS violations were identified.

#### E. CORRECTIVE ACTIONS:

##### Corrective Actions Completed:

1. Design Change Package (DCP) 9700171 has been completed to drill holes in the DWFDS deck plates and to install new deck plates on top of the DWEDS grating so that they now meet their original design functions and Technical Specifications.
2. Video tape footage of the Unit One DWEDS and DWFDS was reviewed to determine that the sump covers were of the correct type.

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Corrective Actions to be Completed:

The Unit One DWEDS and DWFDS will be examined to verify the video tape determination during the next refueling shutdown to ensure the covers on that unit are installed per the applicable design drawings (System Engineering, NTS 265-180-97-004-01). This will be completed during refueling outage Q1R15.

**F. PREVIOUS EVENTS:**

Previous LERs related to plant construction errors are:

LER 1-96-015 HPCI whip restraint J1HP-3 improperly installed due to inadequate supervisory oversight, documentation provisions and QA/QC programs.

**G. COMPONENT FAILURE DATA:**

There is no component failure associated with this event.