

**ILLINOIS
POWER**

Post-It® Fax Note	7671	Date	# of pages
To	NRC Operations Center	From	Mat Storken
Co./Dept.		Co.	Illinois Power
Phone #		Phone #	(217) 935-8801 ext 3479
Fax #	301-816-5151	Fax #	(217) 935-5864

Illinois Power Company
Clinton Power Station
P.O. Box 678
Clinton, IL 61727
Tel 217 935-5623
Fax 217 935-4632

Wilfred Connell
Vice President

U-602673

2C.220

4F.140

WC-377-96

December 17, 1996

Docket No. 50-461

10CFR50.73

10CFR21

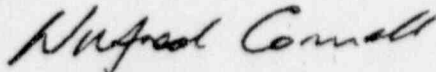
Document Control Desk
Nuclear Regulatory Commission
Washington, D.C. 20555

Subject: Clinton Power Station - Unit 1
Licensee Event Report No. 96-018-00

Dear Madam or Sir:

Enclosed is Licensee Event Report No. 96-018-00: Incorrect Torque Value for Control Rod Drive Hydraulic Control Units Was Specified by Supplier Causing Inoperability of the Control Rod Drive System. This report is being submitted in accordance with the requirements of 10CFR50.73 and 10CFR21.

Sincerely yours,



Wilfred Connell
Vice President

MRS/csm

Enclosure

cc: NRC Clinton Licensing Project Manager
NRC Resident Office, V-690
Regional Administrator, Region III, USNRC
Illinois Department of Nuclear Safety
INPO Records Center

9612270138 961217
PDR ADDCK 05000461
S PDR

NRC FORM 366
(4-95)

U.S. NUCLEAR REGULATORY COMMISSION

APPROVED BY OMB NO. 3150-0104

EXPIRES 04/30/98

LICENSEE EVENT REPORT (LER)

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

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 20555-0001, AND TO THE PAPERWORK REDUCTION PROJECT (3150-0104), OFFICE OF MANAGEMENT AND BUDGET, WASHINGTON, DC 20503.

FACILITY NAME (1)

Clinton Power Station

DOCKET NUMBER (2)

05000461

PAGE (3)

1 OF 5

TITLE (4)

Incorrect Torque Value for Control Rod Drive Hydraulic Control Units Was Specified by Supplier Causing Inoperability of Control Rod Drive System

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
10	14	81	96	018	00	12	17	96	None	05000
OPERATING MODE (9)			THIS REPORT IS SUBMITTED PURSUANT TO THE REQUIREMENTS OF 10 CFR 6: (Check one or more) (11)							
5										
POWER LEVEL (10)			20.2201(b)							
000			20.2203(a)(1)							
			20.2203(a)(2)(i)							
			20.2203(a)(2)(ii)							
			20.2203(a)(2)(iii)							
			20.2203(a)(2)(iv)							
			20.2203(a)(3)(i)							
			20.2203(a)(3)(ii)							
			20.2203(a)(3)(iii)							
			20.2203(a)(3)(iv)							
			20.2203(a)(4)							
			50.36(a)(1)							
			50.36(a)(2)							
			50.73(a)(2)(i)							
			50.73(a)(2)(ii)							
			50.73(a)(2)(iii)							
			50.73(a)(2)(iv)							
			50.73(a)(2)(v)							
			50.73(a)(2)(vi)							
			50.73(a)(2)(vii)							
			50.73(a)(2)(viii)							
			50.73(a)(2)(ix)							
			73.71							
			X OTHER							
			Specify in Abstract below or in NRC Form 366A							

NAME

Nguyen Le, Engineer

LICENSEE CONTACT FOR THIS LER (12)

TELEPHONE NUMBER (Include Area Code)

(217) 935-8881, Extension 4066

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

CAUSE	SYSTEM	COMPONENT	MANUFACTURER	REPORTABLE TO NRC	CAUSE	SYSTEM	COMPONENT	MANUFACTURER	REPORTABLE TO NRC

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 November 19, 1996, the plant was in Mode 5 (Refueling), engineering determined that the wrong torque value was used on the 3/8 inch bolts that connect the 145 Control Rod Drive (CRD) Hydraulic Control Units (HCU) to structural supports in the containment building. This torque value exceeded the minimum yield strength for these bolts causing the CRD HCUs to not meet seismic qualifications, and therefore, they were not operable. The CRD HCU operation would only be affected if a seismic event occurred during plant operation. This condition has existed since initial licensing of the plant. The cause of this event is a failure of Sargent and Lundy Engineering to provide the proper torque values due to a lack of attention to detail and a questioning attitude on the part of their engineers. Also, Illinois Power and General Electric failed to recognize this error during their review of this information. Corrective action for this event is to replace all of the 3/8 inch hold down bolts on the CRD HCUs and torque them to the proper value. This event is also reportable under 10CFR, Part 21.

NRC FORM 366A
(4-85)

U.S. NUCLEAR REGULATORY COMMISSION

LICENSEE EVENT REPORT (LER)
TEXT CONTINUATION

FACILITY NAME (1)	DOCKET	LER NUMBER (2)			PAGE (3)
		YEAR	SEQUENTIAL NUMBER	REVISION NUMBER	
Clinton Power Station	05000461	96	018	00	2 OF 5

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

DESCRIPTION OF EVENT

On November 19, 1996, the plant was in Mode 5 (Refueling) with the reactor pressure vessel [RCT] head removed and the pool over the reactor pressure vessel being maintained at greater than 23 feet above the reactor pressure vessel flange, reactor coolant temperature was being maintained in a range from 80 to 90 degrees Fahrenheit. Utility mechanical maintenance personnel were performing maintenance on the control rod drive [AA] (CRD) hydraulic control units [HCU] (HCU) using Clinton Power Station procedure 8221.01, "CRD Hydraulic Control Unit Maintenance." Part of the maintenance work was to retorque the hold down bolts for the CRD HCUs. These hold down bolts attach the General Electric (GE) supplied CRD HCUs to structural steel supports designed by Sargent and Lundy Engineering, the architect engineer for the construction of the power station. During performance of section 8.15 of the procedure maintenance personnel questioned the use of the same torque value for both the 1/2 inch and 3/8 inch diameter bolts. Engineering determined that the torque value that was given in the procedure was correct for the 1/2 inch bolts but the torque value for the 3/8 inch bolt exceeded the bolts minimum yield strength and therefore, was unacceptable.

Engineering reviewed the records for the original installation of the bolts and determined that when the 3/8 inch bolts were originally installed the incorrect torque value, which exceeded the bolts minimum yield strength, was used to install the CRD HCUs. Engineering concluded that because the bolts minimum yield strength had been exceeded for the bolts when the CRD HCUs were initially installed, that all 145 CRD HCUs were inoperable. This determination was made because the improper torque value used for torquing the 3/8 inch bolts would cause the bolts to be overstressed and therefore, not able to fulfill the seismic qualification requirements for restraining the CRD HCUs during a design basis earthquake. There are seven 3/8 inch bolts in each of the 145 CRD HCUs for a total of 1015 total bolts that are improperly torqued.

The history of the determination of the torque values for the 3/8 inch bolts was reviewed by engineering personnel. The results of that review showed that on October 5, 1981, Field Change Request (FCR) 11732 was submitted to request torque values for the 3/8 inch and 1/2 inch bolts on the CRD HCUs. The request for a torque value for the 3/8 inch bolts was reviewed, and dispositioned by Sargent and Lundy Engineering based on GE's recommendation for 1/2 inch bolts used on the CRD HCUs. Illinois Power (IP) concurred with this disposition. On October 14, 1981, FCR 11732 was completed and Sargent and Lundy Engineering concluded that the same torque value should be used for the 3/8 inch bolts and the 1/2 inch bolts because they were made of the same material. This assumption was incorrect since a different torque value should have been specified because the bolts were not the same diameter. On November 4, 1981, a request was made, using Nonconformance Report (NCR) 5720, to allow a lower torque value to be used for 3/8 inch bolts that were not readily accessible to be retorqued to the higher torque value specified in FCR 11732. The request to use a lower torque value was approved by IP and concurred with by GE. However, this lower torque value specified for the inaccessible bolts was still higher than the minimum yield strength for the 3/8 inch bolts. Also, GE did not recognize that the 3/8 inch CRD HCU hold down bolts were not within the scope of GE design and therefore, Sargent and Lundy Engineering was responsible for providing the input.

NRC FORM 366A

(4-95)

U.S. NUCLEAR REGULATORY COMMISSION

LICENSEE EVENT REPORT (LER)

TEXT CONTINUATION

FACILITY NAME (1)	DOCKET	LER NUMBER (6)			PAGE (3)
		YEAR	SEQUENTIAL NUMBER	REVISION NUMBER	
Clinton Power Station	05000461	96	018	00	3 OF 5

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

On September 1, 1982, FCR 17063 was dispositioned by IP with GE concurrence to allow a range of the higher and lower values specified in FCR 11732 and NCR 5720 to alleviate any confusion caused by specifying two different torque values for the bolts on FCR 11732 and NCR 5720.

No automatic or manually initiated safety system responses were necessary to place the plant in a safe and stable condition. No other equipment or components were inoperable at the start of this event to the extent that their inoperable condition contributed to this event.

CAUSE OF THE EVENT

The cause of this event is attributed to a lack of a questioning attitude and attention to detail by Sargent and Lundy when determining the proper bolt torque for the HCU hold down bolts. Also, IP and GE failed to recognize this error during their review of this information. On three separate occasions either Sargent and Lundy or GE reviewed the torque values for the 3/8 inch CRD HCU hold down bolts and the error contained in the disposition of the first document requesting proper torque values was not corrected during subsequent reviews.

CORRECTIVE ACTION

All of the 3/8 inch CRD HCU hold down bolts have been replaced with new bolts and retorqued to the proper value. Also, a sample of the 3/8 inch bolts that were removed from the CRD HCUs will be tested to determine whether or not they would have been able to withstand a design basis earthquake when installed on the CRD HCUs. The results of these test results will be used to determine past operability of the CRD HCUs.

ANALYSIS OF EVENT

This event is reportable under the provisions of 10CFR50.73(a)(2)(ii) and 10CFR50.73(a)(2)(v). This event is reportable under 10CFR50.73(a)(2)(ii) because the inoperability of the CRD HCUs since initial plant licensing places the plant in a condition where it is degraded. This event is reportable under 10CFR50.73(a)(2)(v) because the inoperability of the CRD HCUs places the plant in a condition that alone could have prevented the CRD system from fulfilling its safety function to shutdown the reactor and maintain it in a safe shutdown condition.

If the results of the tests on the CRD HCU hold down bolts determine that they would have been unable to withstand a design basis earthquake, the safety consequences and implications of this event would be considered to have low safety significance. Although the ability of the control rod drives to safely shutdown the reactor may have been affected during a design basis earthquake, the reactor could have been shutdown using the standby liquid control system (BR) from rated power at any time during core life as stated in section 9.3.5.1 of the Updated Safety Analysis Report.

NRC FORM 366A
(4-95)

U.S. NUCLEAR REGULATORY COMMISSION

LICENSEE EVENT REPORT (LER)
TEXT CONTINUATION

FACILITY NAME (1)	DOCKET	LER NUMBER (6)			PAGE (3)
		YEAR	SEQUENTIAL NUMBER	REVISION NUMBER	
Clinton Power Station	05000461	96	018	00	4 OF 5

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

Therefore, the function of the control rod drive system to shutdown the reactor would have been accomplished through the use of the standby liquid control system when it was operable. During periods when both trains of the standby liquid control system were unavailable and a design basis earthquake occurred and the CRD HCUs failed to operate this condition would have safety significance. Because the unavailability time for the standby liquid control system is low, particularly since only one of the two trains of the system would be required to function to shutdown the reactor, and the probability of a design basis earthquake occurring during that unavailability time is low, the overall safety significance for this event is low.

The control rod drive system may have been inoperable since initial plant licensing.

ADDITIONAL INFORMATION

Clinton Power Station has not reported other failures by outside engineering groups to provide correct information which affected the operability of systems in recent history.

For further information on this event contact Nguyen Le, Engineer, at (217) 935-8881 at extension 4066.

10CFR21 Report No. 21-96-033: Incorrect Bolt Torque Specified By Sargent and Lundy For CRD HCUs

On November 19, 1996, IP identified that the torque value specified by GE for the 3/8 inch hold down bolts for the CRD HCUs exceeded the minimum yield strength of the bolt material causing the CRD HCUs to be inoperable because the torque value did not meet seismic qualification requirements. The concern was determined to be potentially reportable under the provisions of 10CFR21. Based on an evaluation of this matter, IP is providing the following information in accordance with the requirements of 10CFR, Part 21.21(b)(3).

- (i) Wilfred Connell, Vice President of Illinois Power Company, Clinton Power Station, P. O. Box 678, Clinton, Illinois, 61727, is informing the Commission by means of this report.
- (ii) The basic component involved are the torque requirements for the 3/8 inch hold down bolts for the CRD HCUs.
- (iii) Sargent and Lundy Engineering provided the incorrect torque specification for the 3/8 inch hold down bolts used in the CRD HCUs.
- (iv) The torque value specified exceeded the 3/8 inch hold down bolts minimum yield strength and made the CRD HCUs inoperable. Because the hold down bolts were overstressed the bolts could potentially fail in a design basis earthquake causing the control rods to fail to insert into the reactor core when required.

NRC FORM 366A
(4-95)

U.S. NUCLEAR REGULATORY COMMISSION

LICENSEE EVENT REPORT (LER)
TEXT CONTINUATION

FACILITY NAME (1)	DOCKET	LER NUMBER (8)			PAGE (3)
		YEAR	SEQUENTIAL NUMBER	REVISION NUMBER	
Clinton Power Station	05000461	96	018	00	5 OF 1

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

- (v) IP identified the condition as a potential defect on November 20, 1996.
- (vi) This condition involves 7 hold down bolts on each of the 145 CRD HCUs for a total of 1015 bolts installed at Clinton Power Station.
- (vii) Corrective actions for this matter are discussed in the CORRECTIVE ACTION section of this report.
- (viii) IP does not have any advice to other purchasers or licensees related to this report.

POWER REACTOR

EVENT NUMBER: 31477

FACILITY: CLINTON
UNIT: [1] [] []
RX TYPE: [1] GE-6

REGION: 3
STATE: IL

NOTIFICATION DATE: 12/18/96
NOTIFICATION TIME: 15:15 [ET]
EVENT DATE: 12/17/96
EVENT TIME: 14:30 [CST]
LAST UPDATE DATE: 12/18/96

NRC NOTIFIED BY: MATT STOOKEY
HQ OPS OFFICER: DICK JOLLIFFE

NOTIFICATIONS

EMERGENCY CLASS: NOT APPLICABLE
10 CFR SECTION:
CCCC 21.21

UNSPECIFIED PARAGRAPH

VERN HODGE

NRR

UNIT	SCRAM CODE	RX CRIT	INIT PWR	INIT RX MODE	CURR PWR	CURR RX MODE
1	N	N	0	REFUELING	0	REFUELING

EVENT TEXT

-INOP CRD SYSTEM DUE TO INCORRECT TORQUE VALUE OF CRD HCU HOLD DOWN BOLTS-

ON 11/19/96, WITH THE PLANT IN A REFUELING OUTAGE, THE LICENSEE IDENTIFIED THAT THE TORQUE VALUES SPECIFIED BY GENERAL ELECTRIC FOR THE 3/8 INCH HOLD DOWN BOLTS FOR THE CONTROL ROD DRIVE (CRD) HYDRAULIC CONTROL UNITS (HCU_s) EXCEEDED THE MINIMUM YIELD STRENGTH OF THE BOLT MATERIAL. THIS CAUSED THE CRD HCU_s TO BE INOPERABLE BECAUSE THE TORQUE VALUE DID NOT MEET SEISMIC QUALIFICATION REQUIREMENTS FOR RESTRAINING THE THE CRD HCU_s DURING A DESIGN BASIS EARTHQUAKE. THE CRD HCU OPERATION WOULD ONLY BE AFFECTED IF A SEISMIC EVENT WERE TO OCCUR DURING PLANT OPERATION.

THERE ARE SEVEN 3/8 INCH BOLTS IN EACH OF THE 145 CRD HCU_s FOR A TOTAL OF 1015 BOLTS. THESE BOLTS ATTACH THE GENERAL ELECTRIC SUPPLIED CRD HCU_s TO STRUCTURAL STEEL SUPPORTS IN THE CONTAINMENT BUILDING WHICH WERE DESIGNED BY SARGENT AND LUNDY ENGINEERING, THE ARCHITECT ENGINEER FOR THE CONSTRUCTION OF THE POWER STATION. THIS CONDITION HAS EXISTED SINCE INITIAL LICENSING OF THE PLANT IN 1987.

ALL OF THE 3/8 INCH CRD HCU HOLD DOWN BOLTS HAVE BEEN REPLACED WITH NEW BOLTS AND RETORQUED TO THE PROPER VALUE. ALSO, A SAMPLE OF THE 3/8 INCH BOLTS THAT WERE REMOVED FROM THE CRD HCU_s WILL BE TESTED TO DETERMINE WHETHER OR NOT THEY WOULD HAVE BEEN ABLE TO WITHSTAND A DESIGN BASIS EARTHQUAKE WHILE INSTALLED ON THE CRD HCU_s.

THIS 10CFR21 REPORT ONLY APPLIES TO THE CLINTON POWER STATION.

THE LICENSEE ALSO HAS SUBMITTED LER #96-018 ON THIS EVENT TO THE NRC AND HAS INFORMED THE NRC RESIDENT INSPECTOR.

260048

IE28/1