March 24, 1994

Docket No. 50-461

Illinois Power Company
ATTN: Mr. J. S. Perry
Senior Vice President
Clinton Power Station
Mail Code V-275
P.O. Box 678
Clinton, IL 61727

Dear Mr. Perry:

SUBJECT: NOTICE OF VIOLATION (NRC INSPECTION REPORT NO. 50-461/93026-01(DRS) AND 50-461/93026-02(DRS))

This will acknowledge receipt of your letter dated March 7, 1994, in response to our letter dated February 4, 1994, transmitting a Notice of Violation and an unresolved item associated with Inspection Report No. 50-461/93026(DRS). We have reviewed your corrective actions and have no further questions at this time. These corrective actions will be examined during future inspections.

Sincerely,

Geoffrey C. Wright, Chief
Engineering Branch

See Attached Distribution

RIII	RIII	RIII	RIII
Replogle/kjc	Walker	Shafer	Wright
03/21/94	03/22/94	03/22/94	03/24/94

IE-01

Distribution

cc: J. Cook, Vice President & Manager
Clinton Power Station
R. Phares, Director, Licensing

cc w/ltr dtd 03/07/94:
OC/LFDCB
Resident Inspectors, Clinton,
Dresden, LaSalle, Quad Cities
Project Manager, NRR
Nathan Schloss, Economist, Public
Utilities Division
K. K. Berry, Licensing Services Manager
General Electric Company
Chairman, DeWitt County Board
State Liaison Officer
Chairman, Illinois Commerce Commission

bcc: IE-01

Illinois Power Company
Clinton Power Station
P.O. Box 678
Clinton, IL 61727
Tel 217 935-6226
Fax 217 935-4632

J. Stephen Perry
Senior Vice President

ILLINOIS POWER

U-602258
L42-94(03-07)LP
1A.120

Docket No. 50-461

10CFR2.201
JSP-108-94
March 7, 1994

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

Subject: Response to Notice of Violation
50-461/93026-01(DRS) and Unresolved Item
50-461/93026-02(DRS)

Dear Sir:

This letter provides the Illinois Power Company (IP) response to the Notice of Violation (NOV) documented in Inspection Report 50-461/93026(DRS). The NOV discusses a violation of 10CFR50, Appendix B, Criterion XVI, "Corrective Action," related to IP actions taken to resolve conditions adverse to quality associated with an excessive number of trips of the High Pressure Core Spray (HPCS) system water leg pump. Attachment 1 to this letter provides the IP response to this NOV.

IP concurs that actions taken to correct HPCS system water leg pump trips caused by pump runout when the HPCS pump discharge check valve did not fully shut were not timely. During the period between pre-plant startup and the third refueling outage, numerous maintenance work requests were initiated to correct HPCS system water leg pump trips caused by the HPCS system pump discharge check valve not fully closing; however, this condition was not corrected until March 1992, during Clinton Power Station's third refueling outage. Since that outage, though, IP has made many improvements to its corrective action program.

Improvements to the CPS corrective action program include strengthened management oversight, lowering the threshold for initiating condition reports; improvements in performing and documenting root cause determinations, and in thoroughness and documentation of corrective actions. The initiation of condition report (CR) 1-92-10-035 on October 19, 1992, documenting an adverse trend related to continued tripping of the HPCS system water leg pump, is an example of the lowered threshold for initiating condition reports.

IP does not fully agree that actions taken to correct HPCS system water leg pump tripping due to undersized pump motor thermal overloads, as documented in CR 1-92-10-035, were untimely. At all times during these occurrences, the HPCS system was capable

of performing its design basis function. Pump motor overloads were replaced during the next available HPCS system outage following identification of the need to replace them and approval of the design change required to perform this action.

Attachment 2 to this letter discusses the closed safety function of the HPCS system pump discharge check valve in response to Unresolved Item 50-461/93026-02(DRS). IP has determined that this valve has a safety function in the closed position and is taking action to include the closed position safety function in the Clinton Power Station Inservice Testing Program as noted in Attachment 2.

As discussed during a telecon on March 3, 1994, between Mr. G. D. Replogle of Region III staff and Mr. J. V. Sipek, CPS Supervisor-Regional Regulatory Interface, IP would appreciate the opportunity to discuss this issue further if necessary.

Aside from the Notice of Violation, the inspection report noted improvement in the root cause investigation and corrective action program at CPS. The report attributes this improvement to engineering involvement and management emphasis. IP appreciates this recognition of improvement. IP has worked diligently to improve the CPS corrective action program and continues to emphasize the need for improvement.

Sincerely yours,

J. A. Miller for

J. S. Perry
Senior Vice President

MAR/csm

Attachments

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

The Notice of Violation states:

"Criterion XVI of 10 CFR 50, Appendix B, requires that measures be established to assure that conditions adverse to quality, such as failures and deficiency, be promptly identified and corrected. In the case of significant conditions adverse to quality, the measures shall assure that the cause of the condition is determined and corrective action taken to preclude repetition.

Contrary to the above, as of December 22, 1993, corrective actions taken to resolve conditions adverse to quality associated with an excessive number of trips of the high pressure core spray water leg pump were not prompt and did not prevent recurrence."

1. Background and Reason for the Violation

During the period from pre-plant startup until the third refueling outage, numerous Maintenance Work Requests (MWRs) were initiated to correct repetitive trips of the High Pressure Core Spray (HPCS) system water leg pump. The cause of the pump trips was attributed to water leg pump runout which caused the pump to trip on thermal overload. Water leg pump runout occurred following filling and venting of the HPCS system, cycling of HPCS system test valves during in service testing (IST) stroke time testing, and after failure of the HPCS pump discharge check valve (1E22F024) to fully close during and after HPCS system surveillances.

On December 5, 1990, MWR D04538 was initiated due to the HPCS system water leg pump tripping twice within an approximate four-hour time period. On March 24-25, 1992, in accordance with instructions contained in MWR D04538, the HPCS pump discharge check valve was disassembled to determine the cause of the valve not fully closing. It was discovered that the valve disc key was worn. This condition prevented the disc from fully closing onto the valve seat. A new disc key was installed and the valve was reassembled and tested satisfactorily.

On June 28, 1992, and on October 17, 1992, MWRs D31143 and D32215, respectively, were initiated as a result of repetitive HPCS water leg pump tripping. The pump tripping occurred while restoring the pump to service following HPCS valve operability testing performed in accordance with plant surveillance procedures. On October 19, 1992, condition report (CR) 1-92-10-035 was initiated to document repetitive tripping of the HPCS water leg pump.

As specified by the CR 1-92-10-035 action plan, on December 3, 1992, during the performance of quarterly HPCS system surveillance testing, the HPCS water leg pump was monitored for runout and trips. During HPCS system restoration following operability checks of water leg pump discharge check valves 1E22F006 and 1E22F007, the water leg pump tripped while operating at approximately 83 gallons per minute (gpm) discharge flow rate. The water leg pump motor motor control center was supplied with General Electric overload relay heaters C778A. These heaters meet the sizing criteria as specified in Clinton Power Station (CPS) maintenance procedure 8410.03, "Motor Overload Relay Testing," for motors with up to a full load amperage (FLA) of 7.2 amps (ambient compensated)(the HPCS water leg pump motor is rated at five horsepower, 6.8 FLA). These overload heaters are designed to trip at 7.2 amps after 1000 seconds. This will provide

approximately 106% (approximately 92 gpm pump discharge flow rate) of motor FLA overload protection which will fulfill HPCS system water leg pump design basis requirements.

Review of HPCS surveillance procedures found that limiting HPCS water leg pump flows to less than 92 gpm discharge flow rates are unavoidable without possible deadheading of the pump. These flow rates occur following operability checks of water leg pump discharge check valves, during stroking of 1E22F010 and 1E22F011 (HPCS First and Second Test Valves to Storage Tank), and during filling and venting of the HPCS pump discharge header.

General Electric Purchase Specification 21A9301AA for the HPCS water leg pump allows motor thermal overloads one size larger than the normal motor thermal overloads to be installed. Corrective action for CR 1-92-10-035 specified that overload heaters C867A be installed for the HPCS water leg pump. This action is considered an enhancement which will allow performance of quarterly HPCS system surveillance testing without water leg pump tripping. These overload heaters will provide approximately 121% (approximately 110 gpm pump discharge flow rate) of motor FLA overload protection. Fifty gpm discharge flow rates are adequate to encompass design basis requirements for the HPCS water leg pump in a tight system, while 110 gpm discharge flow rates are adequate for post-surveillance testing HPCS system filling and venting. The HPCS system water leg pump/motor/overload heater combination as specified by CR 1-92-10-035 is adequate to protect the water leg pump. No further corrective actions are necessary.

On December 29, 1993, the HPCS system water leg pump thermal overloads were replaced with overload heaters C867A during a scheduled HPCS system outage. This action was accomplished in accordance with Engineering Change Notice (ECN) 27978, which was approved on June 23, 1993. ECN 27978 was implemented as specified by MWR D50012. Post-maintenance testing (PMT) for MWR D50012 was accomplished by performing CPS surveillance procedures 9051.01, "HPCS System Pump Operability," and 9051.02, "High Pressure Core Spray (HPCS) Valve Operability Test." PMT results were acceptable. CPS surveillance procedures 9051.02 and 9051.01 were also performed satisfactorily per the normal surveillance schedule on January 21, 1994, and January 24, 1994, respectively, without the HPCS water leg pump tripping on thermal overload.

The violation noted that the requirements of 10CFR50, Appendix B, Criterion XVI, were violated because corrective actions taken to resolve conditions adverse to quality associated with an excessive number of trips of the HPCS system water leg pump were not prompt and did not prevent recurrence. The HPCS system is designed to rapidly provide cooling water to the reactor following receipt of an initiation signal. The lag between the signal to start the pump and the initiation of flow into the reactor pressure vessel is kept minimized by keeping the HPCS system full of water downstream of the HPCS pump discharge check valve. The function of the HPCS system water leg pump is to keep this piping full of water. As stated earlier, 50 gpm water leg pump discharge flow rates are adequate to encompass design basis requirements for a tight HPCS system.

The cause of recurrent HPCS system water leg pump tripping was twofold. First, the failure of the HPCS pump discharge check valve to fully close caused the water leg pump to runout and subsequently trip on thermal overload. IP concurs that actions taken to correct this condition were not timely.

Second, tripping of the water leg pump occurred during restoration of the HPCS system following HPCS system surveillance testing. This condition was documented by CR 1-92-10-035 initiated on October 17, 1992. Corrective actions as specified by CR 1-92-10-035 and the implementation schedule for these actions were appropriate to correct water leg pump tripping during HPCS system surveillance testing. As specified by the CR 1-92-10-035 corrective action plan, the HPCS water leg pump was monitored for runout and trips during HPCS system surveillance testing on December 3, 1992. This monitoring also included measurement of the pump discharge flow rate during the performance of the surveillance test. Monitoring indicated that during normal HPCS system lineups (HPCS system in standby), water leg pump discharge flow rates were approximately 35 gpm, well within the 50 gpm discharge flow rates necessary to perform design basis functions. These results indicated that corrective actions taken during the CPS third refueling outage in March 1992 to ensure the HPCS pump discharge check valve would fully close were effective. Since the HPCS water leg pump tripping only occurred during performance of HPCS system surveillances, and this condition was always corrected prior to returning the HPCS system to standby status following surveillance testing, the ability of the HPCS water leg pump to perform its design function was not challenged. Since the water leg pump was always able to perform its design basis function, a special HPCS system outage was not necessary to replace water leg pump thermal overloads. Therefore, the replacement of water leg pump thermal overloads on December 29, 1993, during a scheduled HPCS system outage, is considered to be adequate.

II. Immediate Corrective Action

As specified above, HPCS water leg pump motor thermal overloads were replaced on December 29, 1993, in accordance with MWR D50012. The installed thermal overloads ensure that the HPCS water leg pump is capable of performing its design basis function and allow filling and venting of the HPCS system without water leg pump tripping.

III. Corrective Steps Taken to Avoid Further Violation

Illinois Power (IP) recognizes that corrective actions taken to address recurrent tripping of the HPCS water leg pump caused by the HPCS pump discharge check valve not fully closing prior to the CPS third refueling outage were not timely. However, since that time, IP has made many improvements to its corrective action program. These improvements include strengthened management oversight; lowering the threshold for initiating condition reports; improvements in performing and documenting root cause determinations, and in thoroughness and documentation of corrective actions. The CR initiated to address recurrent HPCS water leg pump tripping in October 1992 (CR 1-92-10-035) is an example of the increased emphasis placed on identifying recurring conditions adverse to quality and bringing these conditions to management's attention.

No further corrective actions are warranted. IP remains in compliance.

Unresolved Item (URI) 93026-02 was initiated to track the Clinton Power Station (CPS) analysis of whether the High Pressure Core Spray (HPCS) pump discharge check valve (1E22F024) has a closing safety function. To address this issue, a review of the CPS design basis was performed. The CPS USAR specifies that a requirement of the emergency core cooling systems (ECCS) is that cooling water flow to the reactor be initiated rapidly when called upon to perform its function. This requirement involves keeping the ECCS systems piping full of water when not in use. The CPS Updated Safety Analysis Report (USAR) and the General Electric design specification for the HPCS system explain that the HPCS pump discharge check valve is provided so that the HPCS piping downstream of the check valve can be maintained full of water. Because leakage through the HPCS pump discharge check valve is assumed, the discharge line fill system was included in the system. In the case of the HPCS system, should the HPCS pump discharge check valve fail open or not be in the closed position when the HPCS pump is not running, the potential exists to drain the HPCS pump discharge piping beyond the capability of the HPCS water leg pump to keep this system full of water. If this were to occur, a pressure indicator located on the HPCS water leg pump discharge line would detect this condition and alert operators via an annunciator located in the Main Control Room (MCR).

If the HPCS system did not have a water leg pump, IP agrees that the HPCS pump discharge check valve would have an active safety function to close. Since the HPCS pump discharge check valve and water leg pump are provided, CPS has determined that the HPCS system pump discharge check valve has a safety function to be in the closed position. This safety function is not the active closing action of the valve, rather it is the passive safety function of the valve being closed.

Although testing the closed safety function for the HPCS pump discharge check valve has not previously been required by the CPS IST Program, the overall safety function of maintaining the HPCS system discharge piping full has been maintained. The low pressure alarm on the HPCS water leg pump discharge line will alert operators in the MCR if the piping is not full. The quarterly HPCS system pump operability surveillance also includes a step to ensure this alarm is cleared after surveillance testing is completed, thereby ensuring that the HPCS system discharge piping is filled and vented. If the HPCS pump discharge check valve does not fully close following HPCS system surveillance testing and this condition causes the water leg pump to trip, appropriate actions will be taken to correct this condition. These actions include an assessment of HPCS system operability.

While the HPCS system discharge check valve accomplishes a safety function when closed, the concern discussed in Inspection Report 50-461/93026(DRS) regarding starting the HPCS pump, stopping the HPCS pump, then restarting the pump is not a design basis accident scenario. The HPCS system is designed to initiate following a loss-of-coolant accident in conjunction with a reactor vessel low water level signal or a high drywell pressure signal. The system is capable of delivering rated flow into the reactor vessel within 27 seconds following receipt of an automatic initiation signal. When a high water level in the reactor vessel is signaled, the HPCS flow into the vessel is stopped by a signal to the HPCS injection valve (1E22F004) to close. When this occurs, the HPCS pump will continue to run with the minimum flow valve (1E22F012) open providing sufficient system flow to prevent HPCS pump damage due to pump overheating. The system will continue to operate in this manner until the pump is manually stopped by operator action.

At this point, positive operator action is required to restart the HPCS pump for injection into the reactor vessel or to return the HPCS system to standby. Operators would not restart the HPCS pump without first ensuring that the HPCS system is filled. If operator action is required to stop the HPCS pump, then operator action to ensure the HPCS system is filled prior to restarting the HPCS pump would be taken.

The event postulated in Inspection Report 50-461/93026(DRS) that would impact the safety function of the HPCS system is based on emergency operating procedure (EOP)-type scenarios, not design basis accidents. Since EOP-type scenarios involve multiple operator actions and in some cases the use of non-safety-related equipment, they are not used to determine a component's design safety function or test requirements.

The CPS Inservice Testing (IST) Program will be revised to incorporate the verification of HPCS pump discharge check valve closure. This action will be completed by March 31, 1994.