



A PECO Energy/British Energy Company

**Clinton Power Station**

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U-603341  
4F.140

March 8, 2000

Docket No. 50-461

10CFR21.21

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

Subject: 10CFR21 Final Report 21-99-027/028: Hydramotors Fail to Meet  
Fail Safe Return Time Test Acceptance Criteria and Recycle Criteria  
Due to Malfunction of ITT Barton Hydramotor Pump Assemblies

Dear Madam or Sir:

This letter is notification that Clinton Power Station (CPS) has completed the evaluations of two deviations under the provisions of 10CFR, Part 21, that were discussed in letter U-603314 dated January 14, 2000. The deviations are failures of two hydramotor pump assemblies manufactured and supplied to CPS by ITT Barton. The evaluations conclude that these issues should be reported under the provisions of 10CFR, Part 21.

CPS is providing the following information in accordance with 10CFR21.21(d)(4). Initial notification of this matter will be provided by facsimile of this letter to the NRC Operations Center in accordance with 10CFR21.21(d)(3) within two days of the date the responsible officer signs this letter.

- (i) Michael T. Coyle, Vice President, Clinton Power Station, Highway 54, 6 Miles East, Clinton, Illinois, 61727, is informing the Nuclear Regulatory Commission (NRC) of a condition reportable under the provisions of 10CFR, Part 21.
- (ii) The basic components involved in this condition are pump assemblies for hydramotors (electro-hydraulic push-type linear actuators). The affected pump assemblies were being installed in hydramotors for the B Train Control Room Supply Air Damper and the B Train Standby Gas Treatment System Fuel Building Isolation Damper during separate hydramotor refurbishment activities.

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- (iii) The hydramotor for the B Train Control Room Supply Air Damper is model number NH91G2073L33, manufactured and supplied by ITT Barton. The new pump assembly is part number NS109761AQ, manufactured and supplied by ITT Barton. CPS purchased the pump assembly in March of 1995. The ITT Barton hydramotor product line has been sold to Automatic Switch Company (ASCO) and ASCO now has responsibility under 10CFR, Part 21, for this ITT Barton material.

The hydramotor for the B Train Standby Gas Treatment System Fuel Building Isolation Damper is model number NH95G4673P203, manufactured by ITT Barton. The new pump assembly is part number NS109761EQX07, purchased through ASCO in February 1999, and manufactured and supplied by ITT Barton. As stated above, ASCO has responsibility under 10CFR, Part 21, for this ITT Barton material.

- (iv) On November 19, 1999, during refurbishment, CPS Electrical Maintenance personnel installed a new pump assembly from stores into a hydramotor for the B Train Control Room Supply Air Damper. During bench testing of the hydramotor, the redundant relief valve did not meet the fail safe spring return time test acceptance criteria provided in the hydramotor actuator maintenance procedure. The new pump assembly was suspected to be the cause of the test failure. The old pump assembly was reinstalled in the hydramotor and the unit was tested with satisfactory results. The new pump assembly was shipped to a vendor for failure analysis to determine the cause for the test failure. CPS issued Condition Report 1-99-11-134 to track the investigation and resolution of this issue.

The failure analysis determined that the pump assembly failure during testing was caused by the pump assembly high-pressure solenoid being out-of-adjustment, preventing the solenoid from opening, and resulting in a return time of greater than five seconds. The reason for the out-of-adjustment condition is unknown.

The CPS program of testing hydramotors prior to installation identified this unacceptable pump assembly and prevented it from being installed in the plant. If the unacceptable unit had gone uncorrected and been installed in the plant, the redundant relief valve would not have met the 5 second fail safe spring return time which would have caused hydramotor failure.

On December 1, 1999, during a separate hydramotor refurbishment activity, CPS Electrical Maintenance personnel installed a new pump assembly from stores into a hydramotor for the B Train Standby Gas Treatment System Fuel Building Isolation Damper. During in-shop functional testing of the hydramotor, the hydramotor recycle rate was not consistent with the criteria provided in the hydramotor actuator maintenance procedure. Recycle occurs when sufficient hydraulic fluid is internally bypassed in the hydramotor for the shaft to move 0.10 inch off the fully stroked position. At that point, the hydramotor restarts to drive the shaft back to the full stroke position. The new pump was suspected to be the cause of the functional test failure. The old pump assembly was reinstalled in the hydramotor and the recycle times were satisfactory. The new pump assembly was shipped to a vendor for analysis

to determine the cause for the test failure. CPS issued Condition Report 1-99-12-004 to track the investigation and resolution of this issue.

The failure analysis determined that the pump assembly failed during testing due to a pitted needle seal point in the amplifier of the pump assembly. The pitted condition occurs when particulate becomes lodged between the orifice and the seal. The origin of the particle is unknown.

The CPS program of testing hydramotors prior to installation identified this unacceptable pump assembly and prevented it from being installed in the plant. If the unacceptable unit had gone uncorrected and been installed in the plant, the pump would have continued to cycle until failure, causing hydramotor failure.

- (v) The failure of new pump assembly part number NS109761AQ was identified on November 19, 1999, during refurbishment of the B Train Control Room Supply Air Damper hydramotor and was determined to be potentially reportable under the provisions of 10CFR, Part 21, at that time.

The failure of new pump assembly part number NS109761EQX07 was identified on December 1, 1999, during refurbishment of the B Train Standby Gas Treatment System Fuel Building Isolation Damper hydramotor and was determined to be potentially reportable under the provisions of 10CFR, Part 21, on December 20, 1999.

CPS notified the NRC in letter U-603314 dated January 14, 2000, that the evaluations of these issues under 10CFR, Part 21, would not be completed within the 60-day evaluation requirement of the rule, but were expected to be complete by March 10, 2000.

- (vi) The new pump assemblies that failed were the only remaining units of those part numbers supplied by ITT Barton to CPS that had not been installed. All previously purchased ITT Barton pump assemblies of these part numbers were tested and verified to be acceptable prior to installation. CPS has no knowledge about potentially deficient pump assemblies supplied to other facilities.
- (vii) A vendor will repair the two pump assemblies that failed. Other cases of poor quality ITT Barton parts have been documented in previous condition reports at CPS. However, increased CPS receipt inspection of ITT Barton parts due to previous concerns about the quality of ITT Barton parts, and the CPS pre-installation testing program that identified the two deficient pump assemblies will identify deficient parts prior to returning the hydramotors to service. Currently, hydramotor parts for CPS are being manufactured and supplied by ASCO. The CPS history with ASCO indicates ASCO has a high quality manufacturing program.

- (viii) Additional information about this issue may be obtained by contacting J. W. Blount, Nuclear Station Engineering, at (217) 935-8881, extension 3638.

Sincerely yours,

A handwritten signature in black ink, appearing to read "Michael T. Coyle", with a stylized flourish at the end.

Michael T. Coyle  
Vice President

RSF/mlh

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