



Commonwealth Edison

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DMB

March 28, 1984

Mr. James G. Keppler
Regional Administrator
U.S. Nuclear Regulatory Commission
799 Roosevelt Road
Glen Ellyn, IL 60137

Subject: Byron Generating Station Units 1 and 2
Braidwood Generating Station Units 1 and 2
Pacific Air Products Linear Torque Converters
NRC Docket Nos. 50-454, 50-455, 50-456 & 50-457

Dear Mr. Keppler:

On February 28, 1984 Commonwealth Edison Company notified Mr. Robert Lerch of your office of a deficiency reportable pursuant to 10 CFR 50.55(e) regarding the failure of linear torque converters in HVAC damper actuators at Byron Station during flow testing. This deficiency pertains to equipment being installed at both the Byron and Braidwood Stations. For NRC tracking purposes this report is numbered 84-01 for Byron and 84-03 for Braidwood. This letter provides an interim report to satisfy the 30-day reporting requirement of the regulations.

Description of Deficiency

During flow testing at Byron Station, linear torque converters failed on safety related dampers OVC04Y, OVC94Y, and OVC199Y. The failure occurred because of excessive wear of the brass shaft guides on the input and output shafts. The linear torque converter is a mechanical device that converts the linear (push-pull) motion of an ITT electro-hydraulic actuator into rotary motion for damper operation. The three linear torque converters sent back to Pacific Air Products Company (PAPCo) for analysis. Three replacements were also furnished by PAPCo.

Preliminary analysis by PAPCo indicates that side loading of the linear torque converter by the rack portion of the rack-and-pinion gear is responsible for the bushing wear. Preliminary evaluation by PAPCo indicates that lubrication of the brass shaft guide bushings corrects bushing wear.

Analysis of Safety Implications

The linear torque converter failure occurred prior to pre-operational testing of the control room ventilation system. Bushing wear appears to be a generic problem as it has happened elsewhere in the utility industry (Edgewater Project, fossil plant, Wisconsin Power and Light). Byron Station has 165 damper-actuator units (138 safety-related units) and Braidwood Station has 157 damper-actuator units (138 safety-related units) supplied by PAPCo. Failure of a linear torque converter during plant operation would cause the damper to fail-as-is. Presently, all safety-related dampers are designed to fail-open or fail-close (fail-safe position).

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Dampers that fail-as-is would not allow proper isolation or modulation operation. This may be important in certain applications such as:

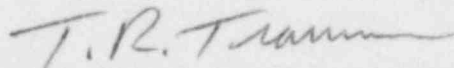
- (1) Switching from control room ventilation train A to train B because of a problem with train A.
- (2) Isolating portions of the non-accessible exhaust areas of the auxiliary building.
- (3) Maintaining temperature control in control room boundary.

Corrective Action

Pacific Air Products Company has submitted a preliminary report of their findings along with an interim lubrication procedure. PAPCo will publish the final report by April 17, 1984. Based on PAPCo's preliminary recommendations, Commonwealth Edison is returning linear torque converters to PAPCo for refurbishment on a weekly basis. Refurbishment includes lubrication of moving parts, shaft polishing, and replacing brass shaft guide bushings with an alternate material that PAPCo has shown by analysis to meet IEEE 382-1980 standards for cyclic wear. CECO anticipates that this program of refurbishment will be completed before fuel loading at Byron Station. Based on the above information, and the fact that PAPCo's final report is not complete, a final response will be forthcoming in sixty days.

Please address any questions regarding this matter to this office.

Very truly yours,



T. R. Tramm
Nuclear Licensing Administrator

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cc: Director of Inspection and Enforcement
Byron Resident Inspector
Braidwood Resident Inspector