



Commonwealth Edison

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DMB

May 7, 1984

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

Subject: Byron Generating Station Units 1 and 2
10 CFR 50.55(e) Final Report
DC Cable Failure
NRC Docket Nos. 50-454 and 50-455

- References: (a) December 6, 1983 letter from T.R. Tramm
to J.G. Keppler.
- (b) June 1, 1983 letter from T.R. Tramm
to J.G. Keppler.
- (c) September 8, 1983 letter from T.R. Tramm
to J.G. Keppler.

Dear Mr. Keppler:

References (a), (b) and (c) provided interim reports on a deficiency reportable pursuant to 10 CFR 50.55(e) regarding the failure of several DC cables in an underground duct at Byron Station. This is the final report on that deficiency. For NRC tracking purposes this deficiency is numbered 82-07.

Description of Deficiency

Several 1/C #2 awg. cables have failed to ground in an underground duct which runs from the Byron Auxiliary Building to the Essential Service Water Cooling Towers. These cables were used to supply DC control power for the 480V switchgear in the cooling towers. The failures occurred after the cables had been tested and placed in service. The failures occurred at times when there was a high moisture level in the ducts. Adjacent cables in the ducts have apparently not been damaged.

Analysis of Safety Implications

The cables which failed in the underground ducts were used to provide DC control power to the 480V switchgear in the ESW Cooling Tower. In general, loss of DC control power could result in loss of remote control for electrical equipment located in the cooling tower. In order to experience a loss of DC control power, it would be necessary

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to experience two ground faults in the DC control circuit (specifically one fault in the positive lead and another in the negative lead). In each case of a failed DC cable experienced at Byron, the failure occurred on only one of the leads in the circuit. A failure of this type would cause a ground indication alarm at the DC control center, but would not cause a loss of DC control power at the 480V switchgear.

Corrective Action Taken

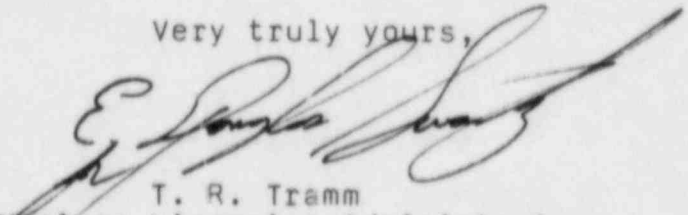
In order to determine the cause of failure for the 1/C #2 awg. cable, a sampling of the failed cables was pulled out of the underground ducts and returned to the manufacturer for testing. The manufacturer indicated that the sample cables failed production tests (e.g., a 13.5kV spark test) which the same cable had previously passed prior to shipment to the jobsite. These unsatisfactory results were most likely caused by an elongation of the cable insulation. The conditions which are significant factors in cable damage of this type are conditions which are unique to a cable which is pulled into a lengthy duct run with other cables of larger diameters or weights, such as these DC cables.

The DC circuits utilizing the faulted 1/C #2 awg. cables were redesigned. The failed cables have been abandoned and new cables were rerouted. The new circuits were designed with multi-conductor cables in order to prevent reoccurrence of the same cable damage.

A review was made of installations elsewhere in the plant and it was determined that the conditions which could cause a failure similar to that in the DC cable do not exist elsewhere.

Please direct further 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

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