

FINAL REPORT
ON
4 kV SWITCHGEAR
CIRCUIT BREAKER AUXILIARY SWITCH
CRANK ASSEMBLY DEFECT
AT
LIMERICK GENERATING STATION
UNITS 1 AND 2

Philadelphia Electric Company
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1.0 INTRODUCTION

The Limerick Generating Station uses 4 kV metal-clad switchgear as safeguard switchgear in safety related systems.

A manufacturing deficiency in the crank assemblies that operate the compartment-mounted, circuit breaker auxiliary switches has been identified. It has been determined that plant safety could have been compromised had these manufacturing deficiencies gone unidentified.

In compliance with 10CFR50.55(e), this Final Report is issued to describe the deficiency, analyze the safety implication of the deficiency, and describe the action taken to correct the deficiency.

This significant deficiency was reported via telecon to the USNRC, Region 1 on May 22, 1980.

2.0 Description of Problem

A defective circuit breaker auxiliary switch linkage on ITE Type 5HK350, Stored-Energy Metal-Clad Switchgear has been discovered by the Limerick Generating Station Bechtel QC personnel. Following the discovery of a 10/32 nut on the floor of a switchgear compartment, an inspection determined that the captive nut had fallen off the stud that holds the operating link to the auxiliary switch crank. The nut loosened because the brass lock washer in the assembly had flattened when the nut was tightened and did not provide sufficient opposing torque to secure the nut.

Further inspection found some assemblies in other compartments in which the locking nut on a similar stud was loose. In some cases, locking nuts were loosened by simulating breaker operation by manually operating the link.

There are a total of 72 circuit breaker compartments in the eight 4 kV safeguard switchgear line-ups; each nuclear unit has four 4 kV safeguard buses equipped with 8 to 10 circuit breaker compartments each. Each compartment has either 2 or 3 auxiliary switches ganged together. All compartments have been placed in their final location.

3.0 Analysis of Safety Implications

An auxiliary switch or group of auxiliary switches that is not operated by the closing or opening of the circuit breaker because the operating link has become disconnected from the auxiliary switch crank will not initiate the proper control action since the auxiliary switch contacts are used in interlocking controls of equipment required to operate during an accident condition.

Failure of the auxiliary switches to operate could result in impairment of the proper operation of safety related equipment in the event of an accident requiring safe shutdown.

4.0 Corrective Action Taken

A representative of the ITE Switchgear Division of Gould-Prown Boveri has visited the Limerick site and inspected a representative number of the switchgear compartments.

The manufacturer has determined that the brass internal lock washers are an improper application. The brass lock washer flattens when tightened and does not adequately restrain the nut from loosening when the linkage is operated.

A 100% inspection of the subject switchgear will be made and the nuts will be secured on the studs in a manner that will prevent them from loosening during operation. It is anticipated that all corrective actions will be completed by December 31, 1980.

5.0 Conclusions

It is concluded that the corrective action described above will correct and preclude recurrence of the defects in the ITE Type SHK350, metal clad switchgear auxiliary switch assembly at Limerick Generating Station.