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

Subject: Notification of Close-out – GE CR2940 Key-Lock Switch Spring Return

The attachment to this letter provides close-out information about the subject concern which was previously identified to the NRC in the reference letter. GE Nuclear Energy has determined that a potential CR2940 switch problem does not represent a safety concern.

Very truly yours,

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Reference: Letter (MFN-179-93) E. L. Schock to NRC Document Control Desk,
"Notification of In-Process 10 CFR Part 21 Evaluation," dated November
1, 1993

Attachment

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Attachment

SUBJECT: Notification of Close-out – CR2940 Key-Lock Switch Spring Return

Background

A previous notification (Reference) on this subject informed the NRC that GE-NE was evaluating a condition identified in 1981 by GE General Purpose Controls (GPC).

GPC did some factory testing which confirmed a problem can exist with the CR2940 switch's key lock operator, namely the spring return feature. This two position key lock switch operator, when rotated clockwise from the left (normal) position to the right position and then released, might fail to return completely to the left position. The internal spring force of the switch operator might not be sufficient to return the switch (counterclockwise) to the left position. The angle between the two positions is 90°, with the left one at the 10:30 position and the right at the 1:30 position.

Switch contact blocks controlled by this key lock switch when turned and then released might retain the right position contact state when prematurely stopped before completely reaching the left position. The switch contact block would achieve the correct contact state when returned completely to the left position where the key can be removed.

GPC stopped supplying the GE CR2940 key lock switch operator (GE-NE drawing # 145C3040P024, catalog # CR2940UN200AJ) for use in nuclear plants. GPC designed and supplied a replacement key lock switch operator (catalog # CR2940UN200HY). However, GPC continued to sell key lock switch operator CR2940UN200AJ to industrial customers and neither a Service Advice Letter nor a Service Information Letter was issued to identify this replacement switch.

Safety Basis

GE-NE supplied CR2940 key lock switch assemblies (i.e., operator CR2940UN200AJ) with either single or double contact blocks (CR2940U310 or 203). These switch assemblies have been in operation in nuclear applications for over twelve (12) years. To the best of GE-NE's knowledge there have not been any reports of this switch operator failing to spring return to its left (original) position or the related contacts failing to operate properly.

To verify GPC's findings, GE-NE conducted additional tests. The test results identified that there is the potential for the switch's key lock operator to not fully spring return to the left position unless the key lock operator is manually returned to the left position where the key can be removed. By returning the key lock operator to the left position, the cam inside the operator will return to the left position and the contact block contacts will change state.

Attachment

For GE's Nuclear Steam Supply System scope, the only applications that would require the switch contacts, upon release, to change state to meet system design requirements are those for the Main Steam Isolation Valves Leakage Control System. For this application, three BWRs inside the US and one BWR outside the US are potentially affected by this condition. GE contacted the US BWR utilities and found that they all remove the key from the lock. This action is controlled either administratively or through normal plant policy. Therefore, GE-NE concludes that for these plants and applications the spring not returning by its own force is not a safety concern.

Corrective Actions

Since 1984, GE-NE has not supplied key lock switch operator CR2940UN200AJ (GE-NE part # 145C3040P024) as part of any CR2940 switch assembly. GE-NE does supply replacement CR2940 switch assemblies with a similar key lock switch operator (i.e., key lock switch operator CR2940YN203HY1). However, switches with this replacement key lock operator are not fully interchangeable, necessitating minor wiring changes to different terminals on the contact block.

A replacement for the GE-NE supplied CR2940 switch assembly evaluated above, is GE-NE drawing # 169C9490P101. This assembly has a double contact block. The earlier GE-GPC department is now identified as GE Electrical Distribution & Control (ED&C) and ED&C will stop supplying the earlier model operator to all customers.

Reference: Letter (MFN-179-93) E. L. Schock to NRC Document Control Desk, "Notification of In-Process 10 CFR Part 21 Evaluation," dated November 1, 1993.