

Date: Wed, 01 Apr 1998 13:19:16 -0600
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Subject: Red Alert: Breaker Flash Fire

TITLE: Breaker Flash Fire
IDENTIFIER: 1998-SR-WSRC-LL-0001
DATE: April 1, 1998

LESSONS LEARNED STATEMENT:

An electrical fault and possible injury can occur when using the manual mechanical trip buttons on ITE breakers (e.g. KA, KB, KC).

DISCUSSION OF ACTIVITIES:

On 03/28/98, a Site Utility Department (SUD) associate received second degree burns to his arms and face from a 480 volt fault in a bus tie breaker in Building 184-K. He reported to Site Medical and was transported to Augusta. He was released that evening with a follow-up visit scheduled for the next day. After being checked by an offsite physician, the SUD associate reported to Site Medical on 03/29/98 and completed his shift rotation. The employee is on restricted duty and is recovering.

The breaker was an ITE/Nelson frame type 'KC' breaker with a solid state trip unit. Information available to date indicates that a failure of the mechanical trip button initiated the fault. The failure (cracking) of the button allowed the mechanical linkage, behind the button, to swing down and contact energized electrical parts.

To prevent a similar incident, all 480V power in the facility was deenergized and an inspection performed. The inspection of other similar breakers in Building 184-K revealed that at least one other push button was damaged and broke during the inspection.

ADDITIONAL BACKGROUND:

On 03/27/98, several facilities were requested to reconfigure power feeds to allow the number two, 13.8 kV, bus in Building 151-2K to be deenergized for corrective maintenance. The maintenance was performed and the facilities were notified. On 03/28/98, personnel were going to open the bus tie breaker and close the transformer secondary breaker (return to normal configuration) in Building 184-K. With safety glasses and high voltage switching gloves, the SUD associate opened the bus tie breaker by pushing the "trip" button and the bus tie breaker opened. The SUD associate closed the 480V secondary breaker and normal power was restored.

Before the associate left, he noticed that the "trip" button on the 480V bus tie breaker was stuck. The "trip" button had lodged behind the panel it normally sticks through and was located just below the hole, pushing against the inside of its panel. The associate had seen this happen quite a few times in the past; thus he opened the cubicle door, squatted down and attempted to realign the button with the hole. The button came apart and the linkage swung/dropped down into the energized bus bar initiating the electrical arcing and flash.

SRS RECOMMENDED ACTIONS:

On 03/29/98, all SRS owners of ITE breakers (e.g. KA, KB, KC) equipped with manual trip buttons were advised not to use the mechanical trip button on these breakers. This advisory is still in effect.

It is recommended that owners of ITE 'KA', 'KC' and 'KB' breakers walk their system down and visually identify those breakers with mechanical trip buttons. This walkdown should be visual only; it is recommended that these breakers not be manipulated since manipulation could precipitate another failure. Breakers with solid state trip devices and mechanical push buttons should be barricaded and not manipulated until guidance from the Site Breaker Committee is provided and if necessary, appropriate corrective actions are performed.

Breakers which have not been retrofitted with the solid state trip device (e.g. SS-3, SS-4 or SS-5) have a different configuration. Although the information available indicated that the same type of event is not likely to occur, identification of the units with mechanical push buttons will allow proper and consistent corrective actions when the investigation is complete.

RECOMMENDED COMPLEX ACTIONS:

Consider inspecting breakers with manual trip buttons to ensure linkage and push buttons are not susceptible to this type of failure.

ITEM OF NOTE:

In 1994 these breakers had a flaw which allowed the push button to be pushed through its sleeve and fall inside the enclosure; this allowed the metal push rod to contact the energized bus bar. This flaw had been corrected.

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CLASSIFIER: Ralph E. Painter REVIEWING OFFICIAL: Ralph E. Painter

PRIORITY DESCRIPTOR: RED/URGENT

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REFERENCES: Savannah River Site Daily Activity Log (3-31-98) Occurrence Report, SR--
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