



NPCC Request for Criteria Clarification

Note: A Clarification cannot be used to revise the Criteria within a Directory.

Request for a Clarification of Criteria
Date submitted: 11/9/2023
Date revised version submitted:
Contact information for person requesting the clarification:
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Identify the Directory that contains the Criteria requiring clarification:
Directory Number: Directory #4 TFSP
Directory Title: Bulk Power System Protection Criteria
Identify specifically what portion of the Criteria needs clarification:
Text of Requirement: <p>5.2.2 Except as identified otherwise in these criteria, the two protection groups shall not share the same component. If the two protection groups share a redundant component in order to achieve improved reliability, the galvanic isolation and physical separation of the two protection groups shall not be compromised. This is to ensure that a single component failure or malfunction will not prevent both protection groups from performing their protective functions.</p>



Identify the material impact associated with the lack of clarity:

Identify the material impact to your organization or others caused by the lack of clarity or an incorrect interpretation of this Directory:

Clarification of Directory #4, Section 5.2.2, is required to complete the new standard protection and control design to be implemented at Rhode Island Energy.

Task Force Response to Request for Criteria Clarification:

Directory 4 for Rhode Island Energy

The following clarification of the criteria in Directory #4 was developed by the Task Force on System Protection (TFSP).

Directory Number and Text of Requirement

Directory #4, Section 5.2.2: Except as identified otherwise in these criteria, the two protection groups shall not share the same component. If the two protection groups share a redundant component in order to achieve improved reliability, the galvanic isolation and physical separation of the two protection groups shall not be compromised. This is to ensure that a single component failure or malfunction will not prevent both protection groups from performing their protective functions.

Question 1

PPL Corporation is currently working on developing a new protection and control design standard for Rhode Island Energy operating company. A protection and control design philosophy that PPL Corp. has implemented at our PA company (PPL Electric Utilities) to help field personnel with circuit breaker maintenance is the use of a circuit breaker maintenance switch. The purpose of this switch is to provide a convenient means of isolating any remote TRIP/CLOSE operations either from local or SCADA controls, including any TRIP/CLOSE operation from the substation protective relaying. This practice is implemented for field personnel to ensure no outside device can operate the breaker while maintenance is being performed for safety reasons.

Upon reviewing, the requirement mentions that the two protection groups shall not share the same component. Reviewing the NPCC glossary of terms, component refers to the components of equipment or protection systems. Our question to the requirement is: Is this intended to address using a single protective relay/device only (where a failure of the IED device prevents operation) or does this also include mechanical devices such as control switches, lockout relay's, etc.?

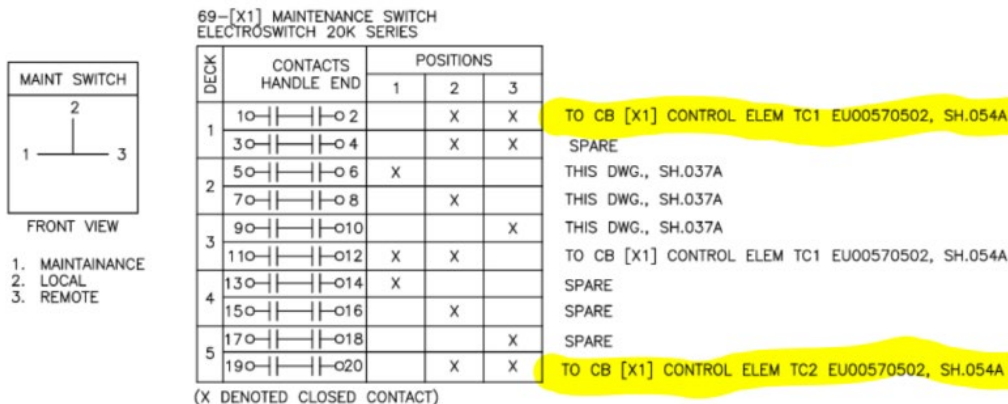
With the requirement and definition in mind, our interpretation is that this requirement is addressing the normal (in service) functionality of the protection system such that a failure of a relay or device does not impact both protection groups. Our thoughts are that this would not include mechanical devices that



are operated for specific purposes (such as maintenance activities), but PPL is seeking additional clarification on this interpretation.

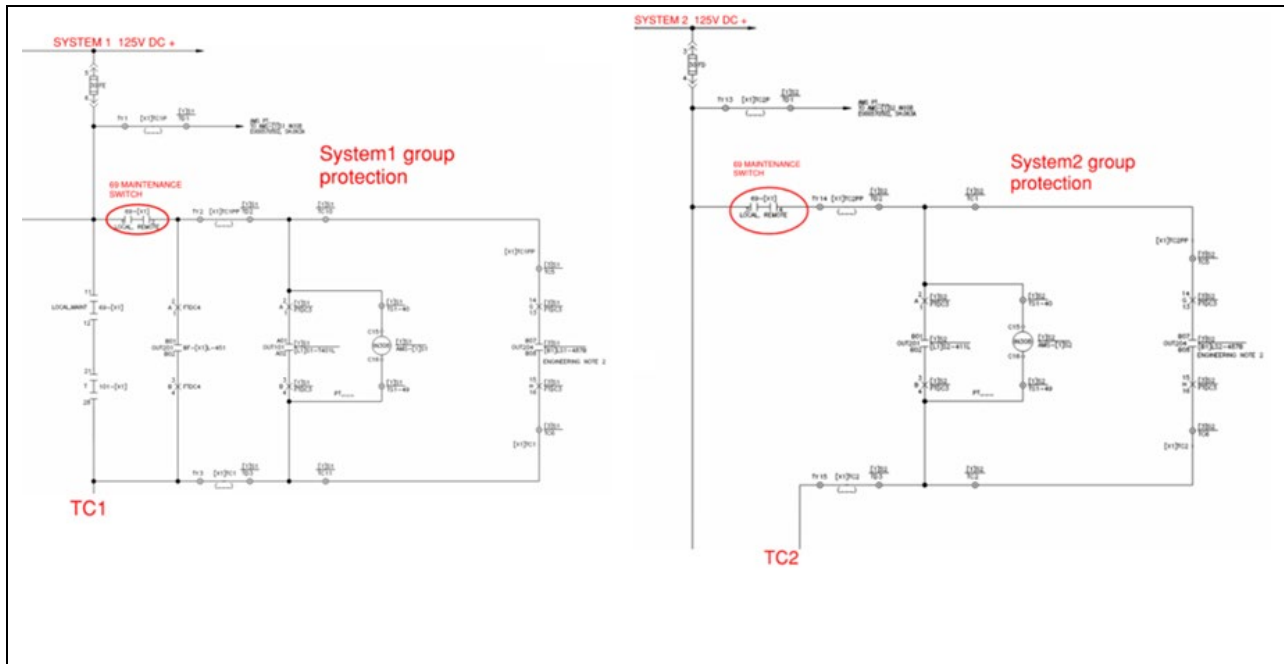
Additional Details:

PPL practice is to use a common maintenance switch to block external TRIP/CLOSE to the circuit breaker during maintenance activities only (when the circuit breaker is out of service with disconnects open). The use of a single maintenance switch is for human performance, where this switch would be mounted near the circuit breaker control switch (101 switch). The blocking of external TRIP/CLOSE operation to the circuit breaker would include blocking trips from protective relays to the breaker trip coil #1 (from system 1 relaying) and to trip coil #2 (from system #2 relaying). **These switch contacts are physically on different stacks of the maintenance switch, providing physical separation between the contacts as shown below (contact 1 & 2 on DECK 1 is for the TC1 block, whereas contact 19 & 20 on DECK 5 is for the TC2 block).**



Attached is another snapshot of the breaker trip coil circuits for trip coil #1 and trip coil #2 showing how these contacts are wired to the DC positive of the trip circuits to achieve the blocking.

These circuits are separately fused on their respective system 1 and system 2 protection panels. The switch contacts shown are dry contacts that interrupt system 1 and system 2 DC positive to the trip circuit to block relay trips during maintenance. Under normal operation, this switch would be in the 'Remote' or 'Local' position which would enable the trip circuits. This switch would only be operated for maintenance activities or switching locally.



Response to Question 1

System 1 and System 2 trip circuits shall not be connected to the same device, such as a maintenance switch, to prevent the failure of both protection systems. This requirement is applicable to maintenance switches that are located outside the breaker control cabinet.

Question 2

Response to Question 2