Southern California Edison
2023-WMPs – 2023-WMPs

DATA REQUEST SET M G R A - S C E - 0 0 3

To: MGRA
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Response Date: 5/8/2023

Question 01 :
REFCL – Appendix F
Australian sources have found that REFCL is 90% effective in eliminating ignitions from phase-to-ground faults. Mitigation Effectiveness Values on p. 825 and following pages show much lower values for REFCL. Please justify how the values were obtained for:
a. Vegetation contact – 50%
b. Vehicle contact – 20%
c. Unknown contact – 50%
d. Conductor damage or failure – 50%
e. Crossarm damage or failure – 30%
f. Pole damage or failure – 40%
g. Splice damage or failure – 50%
h. Transformer damage or failure – 85%
i. Tie wire damage or failure – 50%
Provide data and calculation leading to these values.

Response to Question 01 :

SCE agrees with the results of the Australian testing program that identified the 90% effectiveness for REFCL related to single phase to ground faults, and SCE expects similar performance for SCE with regard to this specific type of fault.

However, drivers can result in different fault types, such as phase-to-phase, where REFCL has limited effectiveness. Fault events can also evolve as arcing occurs and related energy is expelled or alternately where facilities are damaged such as a conductor clash that causes downed wire. Accordingly, just because REFCL is 90% effective for single phase to ground faults, does not mean that it is 90% effective against all faults.

The mitigation effectiveness of REFCL for each driver is based on the expectation of the frequency of single line ground faults as the fault or ignition initiator, and an effectiveness of 90% relative to that fault, since that is the type of fault REFCL is effective at mitigating. Thus, for example, if 50% of all of the faults resulting from a specific driver were single line ground faults, REFCL would have a 45% mitigation effectiveness for that driver (.5*.9).

We expect to continue to refine our ME estimates over the coming years. Please see the table below for the detailed ME values for the drivers and the rationale for those values.

Sub-driver/ Consequence Type	**Mitigation Effectiveness**	**Rationale/Data source**
Veg. contact - Distribution	50%	Estimating 90% effectiveness for phase to ground vegetation contact. However, based on expert judgment, effectiveness for phase-to-phase contact will be much lower.
Vehicle contact - Distribution	20%	Estimating 90% effectiveness for phase to ground vehicle contact. However, based on expert judgment, it is common that vehicle strikes result in wire slap where effectiveness will be low. It can be effective in other scenarios such as when a down wire occurs.
Unknown contact - Distribution	50%	Aligned with vegetation and balloon contact values.
Conductor damage or failure - Distribution	50%	Estimating 90% effectiveness for single phase down wire incidents. However, based on expert judgment, there is potential for the initial failure to result in dropped incandescent particles.
Crossarm damage or failure - Distribution	30%	Estimating 90% effectiveness for single phase down wire incidents. However, based on expert judgment, phase to phase contact can be likely with a failed crossarm.
Pole damage or failure - Distribution	40%	Estimating 90% effectiveness for failures which involve a ground fault. However, based on expert judgment, pole damage can result in multi-phase faults.
Splice damage or failure - Distribution	50%	Estimating 90% effectiveness for failures which involve a ground fault. However, based on expert judgment, it is much less effective at other failure mechanisms, such as high resistance connections which drop incandescent particles.
Transformer damage or failure - Distribution	85%	Estimating 90% effectiveness for failures which involve a ground fault. However, based on expert judgment, it is much less effective at other failure mechanisms, such as high resistance connections which drop incandescent particles.
Tie wire damage or failure - Distribution	50%	Estimating 90% effectiveness for single phase down wire incidents. However, based on expert judgment, it is possible for incandescent particles to drop upon initial failure.