

Appendix D - Required Protection Outage Request Form and Examples

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Table 1 - Protection and Communication Outage Work Scope Description (All Yes / No / NA Questions Must Be Answered)	
1. Describe the scope of work for the protection/communication outage and include equipment impacted. Answer all questions below:	
2. CROW #:	
3. Duration of job:	
4. Will a pilot line protection scheme remain in-service for the equipment in question?	<input type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A
5. Will a breaker failure function remain in-service for local breakers?	<input type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A
6. Will breaker failure – transfer trip remain in-service?	<input type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A
7. Will bus, transformer, shunt protection remain in-service?	<input type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A
8. Has the information in this form been reviewed by the protection staff of all entities operating at least one terminal of the transmission facility?	<input type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A
IF , the response to questions 4, 5, 6, 7 and 8 are either “Yes” or “N/A”, proceed to questions 10 and 11. OTHERWISE , describe how the fault clearing times for the compromised system(s) or transmission or generation element(s) change, including clearing times at all stations (including remote stations).	
9. Description of impact on clearing times:	
10. If the response to question 5 is “No” list all elements tripped to clear a fault with stuck breaker for the out-of-service breaker failure relay: See the notes (9) below for more information.	
11. Protection technical staff contact information (individual who understands impact of this work scope)	
Name/Phone/E-mail	
12. LCC Outage Coordinator contact information	
Name/Phone/E-mail	

Examples of Completing Table 1

1. Use OP-24C to determine if relay outages must be reported for the transmission element.
2. After determining that relay outages must be reported, consider the scheme. For example, Figure 1 has System A and System B, each with its own communication channel.

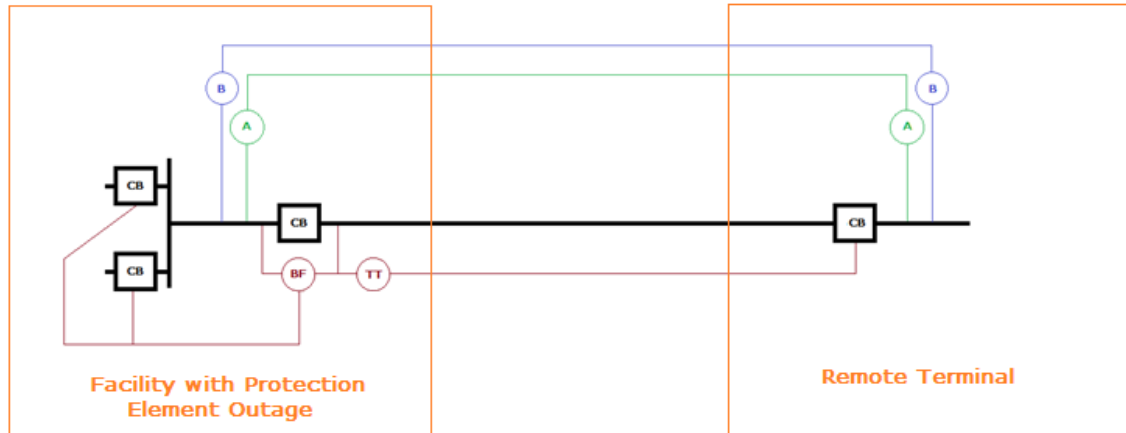


Figure 1 - Two Redundant Pilot Line Protection Schemes

3. In Figure 1, two separate pilot line protection schemes (e.g. POTT, DCB, DUTT, Line Differential) are used along with a separate communication channel for breaker failure transfer trip (BF TT). If one of the pilot line protection schemes, either System A or System B is taken out-of-service, then the answer to Question 4 should be "Yes", the answer to Question 5 should also be "Yes" and the answer to Question 6 should be "Yes" as long as BF TT remains in-service. If non-redundant breaker failure relay (BF) is removed from service, then the answer to Question 5 should be "No." If BF TT were removed from service, then the answer to Question 6 should be "No."

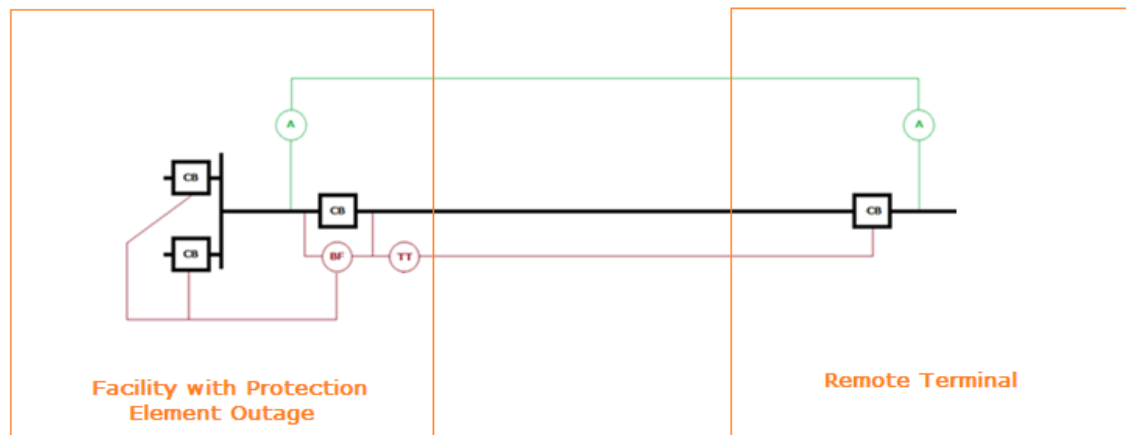


Figure 2 - Single Pilot Line Protection Scheme (Separate Transfer Trip Channel)

4. In Figure 2, a single pilot line protection scheme is used along with a separate communication channel for BF TT. If the pilot line protection scheme is taken out-of-service, then the answer to Question 4 should be “No,” the answer to Question 5 should also be “Yes” and the answer to Question 6 should be “Yes” as long as BF TT remains in-service.

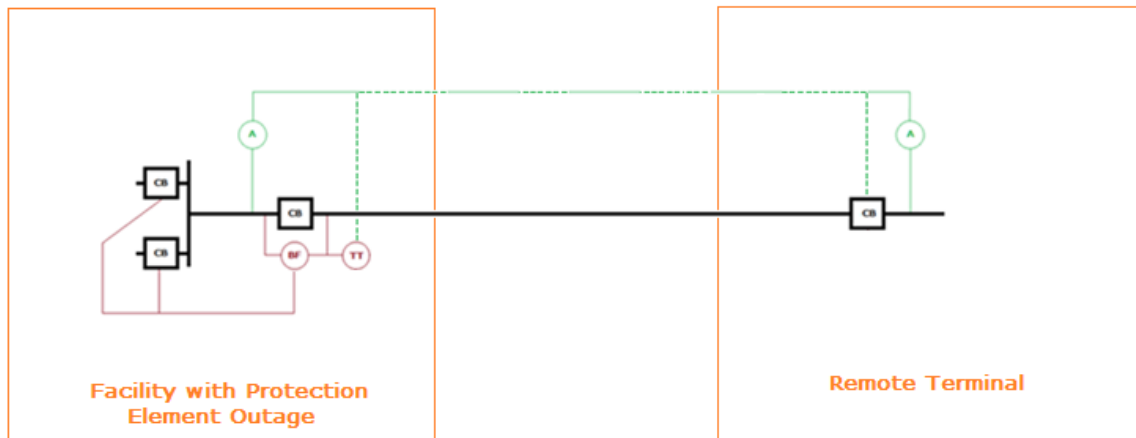


Figure 3 - Single Pilot Line Protection Scheme with Shared Transfer Trip Channel

5. In Figure 3, a single pilot line protection scheme is applied with shared communications to transfer the trip signal to a remote breaker (BF TT). To complete Table 1 for this scheme with the communication removed from service, the answers to both Questions 4 and 6 should be “No.” The answer to Question 5 should be “Yes.”
6. In Figure 3, a non-redundant BF relay is taken out-of-service. The pilot line protection scheme and the BF TT will not be impacted by that outage, so the answers to Questions 4 and 6 should be “Yes”. The answer to Question 5 should be “No”. Note that a single BF relay out-of-service does not make the whole BF TT scheme unavailable. Other local and remote breakers will key in the trip signal to BF TT if needed. Hence, the answer to Question 6 should be “Yes.”.



Figure 4 - Step Distance Relay

7. In Figure 4, a step distance relay is employed with no BF TT. If the step distance relay is removed from service, then the answers to Questions 4, 5 and 6 should all be "N/A."
8. For bus or transformer differential relays taken out-of-service the answers to Questions 4, 5 and 6 should all be "N/A."
9. The answer to Question 10 provides information to perform the steady-state analysis. In order to properly simulate the stuck breaker contingency with BF relay out-of-service, all elements tripped in this contingency must be listed. A single line-to-ground fault on either side of the stuck breaker with its BF relay out-of-service should be considered; such a fault will most likely require remote tripping of all transmission elements emanating from the substation.
10. The answer to Question 8 confirms that the entity submitting the outage application has appropriately coordinated scope of protection work with other entities operating other terminals of the same transmission facility. If the transmission facility is owned by one entity, then no such coordination is required and the answer to Question 8 should be 'N/A'.

OP-24, Appendix D Revision History

Rev. No.	Date	Reason
Rev 0	02/01/19	Initial version
Rev 1	12/07/20	Periodic review by document owner: corrected title in header and clarified language.
Rev 2	08/11/21	Refine instructions for timely review of outage applications and update Table 1.
Rev 3	12/05/22	Biennial review completed by procedure owner; Added question 7 to Table 1; Renumbered questions in Table 1; Minor grammar and renumbering edits.