Criteria for Installing Sectionalizing Switches for Tapping of Transmission Lines

Summary
This bulletin replaces Guideline G0104 and provides criteria for when and where to install sectionalizing switches on transmission lines. Sectionalizing switches provide operational flexibility in maintaining service to customers on the tap line and the main line, for planned maintenance and unplanned interruption.

Line sectionalizing (see Figure 1) provides for effective reduction in outage duration and minimizes planned clearances for customers. Sectionalizing switches do not reduce the number of outages nor the frequency of maintenance on the tap line to the customers.

Affected Document
Utility Standard TD-1006S “Transmission Line Air Switches”

Target Audience
Transmission line engineers, asset strategy, transmission planning and operation employees.

What you need to know

I. When Sectionalizing Switches are required:

500 kV
For 500 kV, no sectionalizing switches are allowed.

60-230 kV
Note for 230 kV, sectionalizing switch designs are limited to de-energized operation only; no interrupting devices can be mounted.

1. Non-Radial Transmission Line
For non-PG&E single tap connections, sectionalizing switches are always required (based upon lack of back-up capability for loss of the transmission source).

For PG&E tapped connections, or non-PG&E connections with more than one transmission line source, sectionalizing switches are required as follows:

a) Length -- Long transmission lines have more exposure and have a greater frequency of being forced out of service for maintenance. Long lines are also at greater risk of experiencing sustained faults due to increased exposure to adverse elements.

A sectionalizing switch is required on the PG&E transmission line for all when the tap point is more than one mile to the end of the transmission line or another tap point.
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b) Location and Route (Exposure to Outage) – Geographic, traffic and environmental conditions affect the total exposure of the line to adverse elements. For example, transmission lines that traverse mountainous areas are subject to greater number of outages due to exposure to trees and inclement weather.

A sectionalizing switch is required when the exposure is more than minimal. Examples of minimal exposure are: no adjacent trees, elevations below snow level, non-corrosive environment, lower maximum wind speeds, and no car pole activity.

2. Radial Transmission Line
   PG&E may require only one sectionalizing switch on the non-source side of the tap point (location B in Figure 1).

3. Multiple Customers on Transmission Line
   As a means of maintaining service availability, regardless of radial configuration, length or exposure, PG&E requires sectionalizing switches on a transmission line at each tap where multiple customers are tapped.

II. Locating the sectionalizing switch:
   Sectionalizing switches must be located in close proximity (preferably within one pole or tower structure) of the tap point of the transmission line. All structures used for mounting the sectionalizing switches will be determined and designed by PG&E; see TD-1006S.

III. Is line dropping or loop splitting required:
   Determined by operations, based upon length, topology and associated connections of the transmission line; see TD-1006S.

IV. Is a motor operator or SCADA required:
   Determined by operations, based upon remoteness, access, or reliability needs of the transmission line.

V. Ownership
   PG&E shall own, operate and maintain all sectionalizing switches in the system to serve customer-owned substations, customer load or generation. A customer-owned switch on the tap line shall not be mounted on a PG&E structure.

VI. Accessibility
   PG&E personnel must be able to access all sectionalizing switches 24 hours a day.
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Figure 1 -- Example Single-Tap Configuration with Sectionalizing Switches

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Inclusion Plan
This bulletin supersedes Utility Guideline G0104, and will be incorporated into Standard TD-1006S at a future date.