



**Adam Tas Corridor Energy**

# **500kV Substation Relay Protection Regulations**





## 500kV Substation Relay Protection Regulations

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### Substation Primary Design Standard

Mechanical protection requirements shall be as per AS-2067 and AS-3000. The primary warning on top of installed cable circuits and pits shall be achieved using appropriately designed polymeric cable

### Substation Protection Overview

Provide current differential protection for up to five windings with an adaptive-slope percentage restraint for transformers at power plants, transmission substations, distribution substations, and industrial

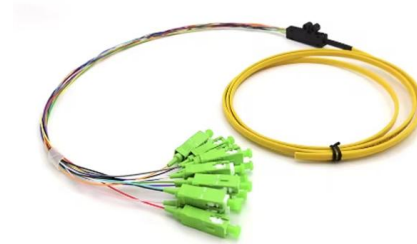


### 6 different types of relaying schemes to protect the EHV

Six different types of relaying schemes to protect the EHV and UHV substation equipment

### Protection Relaying Basics

Other Types of Protection Coordination of Relays  
Protect Personnel  
Protect Equipment  
Isolate Fault to Smallest



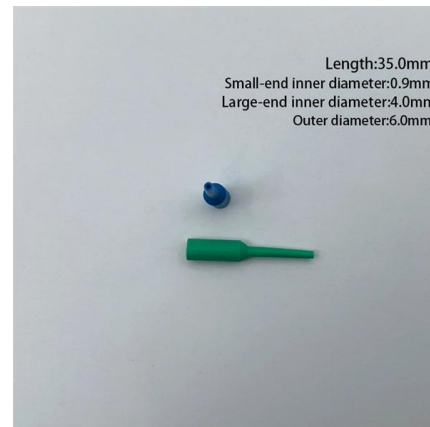
## ELECTRICITY DISTRIBUTION NETWORK PLANNING CRITERIA

In order to provide a uniform framework and guidelines to distribution utilities/DISCOMs and to evolve integrated approach for strengthening of Distribution System in the country, a document on



## PROCEDURE FOR ISSUING SCADA PAS

To ensure that all proposed installations are handled uniformly and to minimize the possibility of misinterpreting PPL EU requirements, this document outlines the protection and control requirements



## CN106877299A

A 500kV substation relay protection system of the present invention includes several SDH systems; each of the SDH systems includes a relay protection device and intelligent optical transmission





## Chapter 12: Protection Schemes and Substation Design Diagrams

Previous chapters have detailed the make up and operating characteristics of various types of protection relays. This chapter considers the combination of relays required to protect various items of power



### High Voltage 220kV/230kV Step-Down Power Transformer for Substations

220/230kV Substation Step-Down Transformer  
MVA Ratings (50 MVA to 500 MVA) 220kV/230kV  
Power transformers are available in a wide

### Section G2: Protection and Control Requirements for Transmission

Purpose This section specifies the requirements for protective relays and control devices for Generation Entities interconnecting to the PG& E Power System.



### WO2015081849A1

A relay protection control method for a serial connection between a reactor and a 35 kV transformer at a 500kV substation, comprising the following control steps: step 1, adding a 35 kV impedance



## PG& E 500 kV Protection Standard Design and Development

A. Investigation of the Control Buildings and Wiring Situations for All PG& E 500 kV Substations The project team visited a sample of substations to assess the condition of the wiring,



## PG& E 500 kV Protection Standard Design and Development

I. INTRODUCTION This paper details the scope of a Pacific Gas and Electric Company (PG& E) 500 kV transmission line protection design created to address the replacement of relays

### 1. SCOPE

Application of Ancillary Electrical Equipment  
Standard Numbering for Small Wiring  
Instantaneous high-impedance differential protection DC relays associated with a tripping function in protections systems





## Substation Equipment Arrangement Application

For 500kV substation development, expansion capability shall also consider the future need for 500/230kV transformation and a 230kV substation, shunt-reactive devices located outboard to main

## Protection relays

Scope Modern protection relays Multifunctional protection Product benefits Provide continuity of power to consumers Protection of network assets Protection

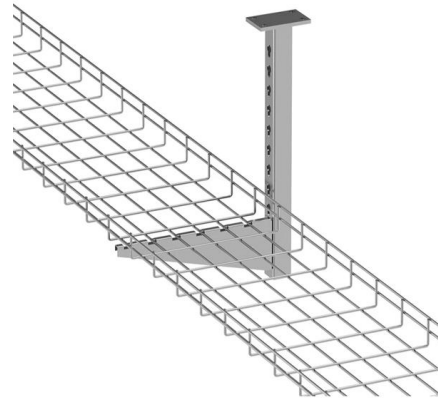


## PRC-005-6

Misoperations due to product design errors, software errors, relay settings different from specified settings, Protection System Component, Automatic Reclosing, or Sudden Pressure Relaying

## PG& E 500 kV Protection Standard Design and Development

E redesigned the protection system from the ground up. I. INTRODUCTION This paper details the scope of a Pacific Gas and Electric Company (PG& E) 500 kV transmission line protection



## Substation Protection Schemes , Delgado Relay Protection Reference

Substation protection schemes are crucial for maintaining the reliability and safety of power systems. They prevent catastrophic failures, reduce downtime, and protect valuable



## 500kV Relay Replacement Design Guide

This document discusses relay replacement and testing for a 500kV transmission line at PG& E. It describes designing relay settings using steady-state fault studies and validating them through RTDS



## CN106877299A

On the basis of this system, a test system is built, and the transmission characteristics of mainstream relay protection devices are tested by using test methods, and the effectiveness and





## Substation Protection And Control Training

The traditional emphasis on electromechanical relays and basic protection schemes needs to be supplemented with in-depth knowledge of digital technologies, communication protocols, and



### Slide 1

Double-bus double-bus-tie-breaker method addition - Jim O'Brien/received Define "double-bus double-bus-tie-breaker: A substation configuration having two bus-tie circuit breakers connected in series

## Section G2: Protection and Control Requirements for Transmission

Interconnection to the 500kV system requires dual vendor relays for all protection systems that are protecting PG& E owned 500kV system equipment (includes the 500kV lines, 500kV buses,



## PG& E 500 kV Protection Standard Design and Development

PG& E identified the need to replace aging solid-state relay systems with modern, more reliable microprocessor-based relay systems to improve the 500 kV transmission network reliability



## Transmission Owner Guidelines\_11142017

The relay/control house must be constructed for long life and minimum maintenance. The local transmission owner must be contacted for specific design requirements, including the need for

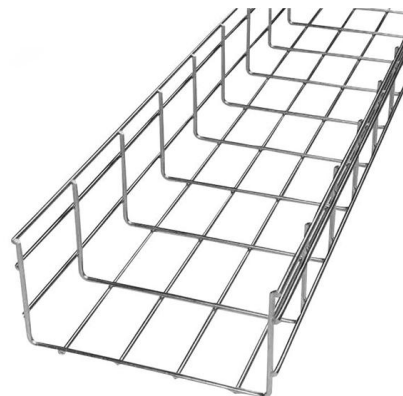


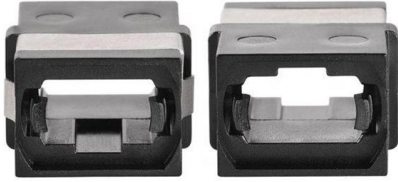
## Power System Protective Relays: Principles & Practices

Protective relays and devices have been developed over 100 years ago to provide "lastline" of defense for the electrical systems. They are intended to quickly identify a fault and isolate it so the balance of

## Collection\_vuSpec

This powerful collection contains over 184 IEEE Standards, Guides, and Recommended Practices, including Errata & Interpretations on Power Switchgear, Circuit Breaker, Fuse, Substation, and





## PRC-005-6

Identify which maintenance method (time-based, performance-based per PRC-005 Attachment A, or a combination) is used to address each Protection System, Automatic Reclosing, and Sudden

## Protection and Substation Control

Fig. 1: The digital substation control system SICAM implements all of the control, measurement and automation functions of a substation. Protection relays are connected serially Fig. 3: For the user,



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