Book 7
Technical Specification and Requirements of Protection System

Technical Specification and Requirements of Protection System for Microgrid Development Project at Betong District, Yala Province Provincial Electricity Authority (PEA)

1. Introduction

This Technical Specification presents the protection system in the bidding document of Microgrid Development Project at Betong District, Yala. The protection system is one critical part of microgrid project. This document specifies the necessary details of protection system of MGBT.

2. Principal Requirement

Protection setting in microgrid is usually different from that in traditional radial distribution system. The looped or meshed network of microgrids will affect fault current magnitude and direction, in both grid-connected microgrid and islanding microgrid, the protection setting should be modified to adapt to their specific topology. Integration of microgrid shall not interfere with the safe, secure and reliable operation of the distribution system. When the protection for microgrid connection to distribution system is being designed, the envisioned protection schemes should be coordinated with the existing protections in distribution system. Connected microgrid can either act as load or energy resource, so when microgrid is connected through dedicated line to distribution system, protection of the dedicated connection line should be set according to the principle of bilateral power protection configuration.

Grid-connected and isolated microgrids shall have the corresponding protective relaying functions to prevent equipment damage and guarantee safe operation. Optimization of protective relay setting (substation circuit breaker and recloser) shall be considered (if needed) in case of relay group setting cannot be available. PEA will do setting the protective relay, the contractor shall working with PEA.

Therefore, the requirement of protection system as following:

1) The contractor shall provide power system study for both 33kV and 115kV power source such as short circuit study, power flow study, dynamic study of FLISR function. 3 operation modes compose of.
    a. Grid connected mode with 115kV.
    b. Grid connected mode with 33kV.
    c. Islanding mode.
2) The contractor shall supply all necessary devices or materials and perform all necessary fabrication, testing, wiring, and interconnection work during the process of assembling and connecting to microgrid controller.

    The contractor shall provide site acceptance testing (SAT) for every modes of operation of protection system for microgrid system. SAT shall include the test sets in order to demonstrate the readiness of the protection system.