TESTING AND COMMISIONING OF GIS SWITCHGEAR FOR HIGH VOLTAGE SUBSTATION

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ABSTRACT

This project presents a testing and commissioning of high voltage substation. The project focus on Gas Insulated Switchgear (GIS) is come out and the result of testing obtained are compared with Air Insulated Switchgear (AIS).

The study and testing is carried out at Bukit Raja substation for GIS and Tanah Merah for AIS. The testing focus at primary side includes busbar, switchgear and Transformer. The testing includes busbar, switchgear and transformer. The testing to make sure all equipment can be operate and safe for used. In this project, we can see protection of GIS substation comparison with AIS substation.

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CHAPTER 1

INTRODUCTION

1.1 Introduction

High-voltage substations form an important link in the power transmission chain between generation source and consumer. Two basic designs are Air-insulated outdoor switchgear of open design (AIS) and Gas-insulated indoor or outdoor switchgear (GIS). AIS are favorably priced high-voltage substations for rated voltages up to 800 kV which are popular wherever space restrictions and environmental circumstances do not have to be considered. The individual electrical and mechanical components of an AIS installation are assembled on site. Air-insulated outdoor substations of open design are not completely safe to touch and are directly exposed to the effects of weather and the environment GIS compact dimensions and design make it possible to install substations up to 550 kV right in the middle of load centers of urban or industrial areas. Each circuit breaker bay is factory assembled and includes the full complement of isolator switches, grounding switches (regular or make-proof), instrument transformers, control and protection equipment, interlocking and monitoring facilities commonly used for this type of installation.

This project present the testing result of the two types of switchgear GIS and AIS. The testing of GIS is carried out at Bukit Raja Substation and the testing of AIS is carried out at Tanah Merah Substation. The Bukit Raja substation is one of the biggest GIS substations in Malaysia. This substation is 275/132/33/11kV. This substation has 6 feeders for 275kV and 11feeders for 132kV. 275kV side is incoming or transmission and 132kV, 33kV and 11kV is distribution. The 275kV side used ABB switchgear and 132kV side used Hyundai switchgear.