Session Six:

Types of Technology for MV Switchgear (10k - 40.5 KV)

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Abstract

The MV distribution switching system involve heavy use of Load Break Switch, Load Break Switch + fuse & Circuit Breaker; the modern technology of Load Break Switch for Arc extinguishing are air puffer, SF6 gas & Vacuum Interrupter each has its advantages and limitation, while for circuit breaker, the technology of arc extinguishing are vacuum interrupter for or SF6 gas; each has its own advantages & limitation as well.

To understand the different between Load Break Switch & Circuit Breakers for making a switchboard with all the essential accessories taking into their advantages and disadvantages & technical data mainly rate voltage KV, rated current ampere, short circuit current KA, impulse voltages, transfer current rating etc in order to form a proper RMU system for different KVA transformers rating is very important for design & selection of most appropriate switchgear and switchboard for a project in term of cost and technology.

Case Study 1

A 50MW power plant with 5 units of 11KV, 12MW generator and 4 units of additional 8 MW generator 11KV supply to 2 section of bus bar with a coupler.

Each section of bus bar connected to a step up power transformer 30/35MW ΔY 11K/132KV then connected to the 132KV over head grid.

See SLD # 1/3

Question:

1. Any improvement can be made on the power of generators and transformers management? Where? How? Why?
2. Proper selection of the ALBS & circuit breakers for each junction? The reason for making that selection.
3. What kind of coupler to be used and the rated current? Can we do without this coupler? Why?
4. How to make output power improvement of this plant? Why?

Case Study 2

See SLD #2/3

A 10KV switchboard with 2 units of 132KV/10KV, 50/70 MW transformer to 2 bus bar with coupler each section, bus bar have 7 out-going feeder with CL & MD indicated show in drawing # 2.

Question:

1. The transformer 50/70 MW is the proper selection? Why?
2. Are all the VCB rated current and KA rating for each VCB is proper? If not why not?
3. What breaker you select for A_1, A_2, & A_3, B_1, B_2, B_3, C_1, C_2 & C_3, D_1, D_2 & D_3. Why?