1 References

- NFPA 70 National Electric Code
- IEEE C37.46 Standard Specifications for Power Fuses and Fuse Disconnecting Switches

2 General Information

2.1 Power fuses shall be utilized to provide primarily short circuit protection for cables and transformers. The fuse rating shall be selected to appropriately provide 125 percent of the transformers full-load rating continuously, sustain no damage from magnetizing in-rush currents, and provide protection against thermal damage from internal or secondary faults. The interrupting rating shall be sufficient to quickly and safely interrupt fault currents and prevent extensive damage to equipment.

3 Expulsion Type Power Fuses

3.1 The quality of components is to be that represented by

- S & C Electric type SM-5S or SM-5SS

3.2 Fuses shall be of the solid-material type and shall utilize refill-unit-and-holder or fuse-unit-and-end-fitting construction with readily replaceable refill unit or fuse unit.

3.3 Disconnect style mountings shall be used for switchgear rated up through 600 MVA at 13.8 kV. Non-disconnect style mountings for power fuses shall be used only where higher ratings are required.

3.4 Fusible elements shall be non-aging and non-damageable construction.

3.5 Melting time-current characteristics shall be permanently accurate with a maximum total tolerance of 10% in terms of current.

3.6 Power fuses shall be capable of detecting and interrupting down to minimum melting current, under all realistic conditions of line-to-line or line-to-ground voltage, and shall be capable of handling the full range of transient recovery voltage severity associated with these faults.

3.7 All arcing accompanying power fuse operation shall be contained within the fuse, and any arc products and gases evolved during fuse operation shall be vented through exhaust control devices that shall effectively control fuse exhaust.

3.8 Blown-fuse indicators shall provide visible evidence of fuse operation while installed in the fuse mounting.

3.9 Expulsion-type power fuses shall be 13.8kV, E-rated, with an Interrupting Rating (kA sym) of 34.6kA

4 Electronic Power Fuses

4.1 The quality of components is to be that represented by

- S & C Electric

4.2 Electronic power fuses shall utilize an expendable interrupting module and a reusable control module.

4.3 The interrupting module shall consist of a main-current section and a fault-interrupting section. These sections shall be arranged coaxially and contained within the same housing. The main-current section shall carry current under normal operating conditions while the fault-interrupting section shall operate only under fault conditions. It shall not carry current continuously and shall not determine the timecurrent characteristic (TCC) minimum operating curve shape.

4.4 The fusible-element section shall not be subject to damage due to current surges.

4.5 All arcing accompanying operation of the electronic power fuse shall be contained within the interrupting module and fuse operation shall be silent, without any exhaust.

4.6 The control module shall continuously monitor the line current through an electronic sensing circuit, be self-powered with the capability to supply power for operating the sensing logic circuits, and to actuate the interrupting module during a fault.

4.7 Blown-fuse indicators shall provide visible evidence of fuse operation while installed in the fuse mounting. Fuse mounting shall be disconnect style.

4.8 Electronic power fuses shall have time-current characteristics that are permanently accurate.
4.9 Electronic power fuses shall be 13.8KV, Continuous rated for 600A, with an Interrupting Rating (kA sym) of 40kA.

5 Current-Limiting Power Fuses

5.1 The quality of components is to be that represented by:

- Cutler Hammer type HLE
- GE type EJO-1
- Cooper type NX

5.2 Current-Limiting type power fuses shall be constructed with pure silver fuse elements, high purity silica sand filler, and a glass resin outer casing.

5.3 Disconnect style mountings shall be used for switchgear rated up through 600 MVA at 13.8 kV. Non-disconnect style mountings for power fuses shall be used only where higher ratings are required.

5.4 Fusible elements shall operate in such a manner as to substantially limit the peak let-through current by interrupting the fault before the first current peak is attained.

5.5 Melting time-current characteristics shall be permanently accurate with a maximum total tolerance of 10% in terms of current.

5.6 Current-limiting fuses shall be capable interrupting all currents from the rated interrupting current down to the minimum continuous melting current in no less than one hour.

5.7 All arcing accompanying operation of the current-limiting power fuse shall be contained within the fuse and operation shall be silent, without any exhaust.

5.8 Blown-fuse indicators shall provide visible evidence of fuse operation while installed in the fuse mounting.

5.9 Current-limiting fuses shall be 15.5KV, E-Rated, with an Interrupting Rating (kA sym) of not less than 38kA.