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## ***PACSafe*** Arc-Resistant Specifications Guide

rev5

Definition: Arc-Fault flames, pressure, burned particles, etc., collectively referred to as Arc-Fault By-products.

- 1.0) The intent of this Specification Guide is to specify drawout metalclad Switchgear which includes the safety provisions of Arc Resistant Switchgear, to the relevant Standards. The further intent of this document is that it be inserted into a general specification for switchgear ,which describes the design and operating parameters of that switchgear.
- 1.2) Metalclad Switchgear shall be manufactured in accordance with IEEE C37.20.2. The Arc-Resistant design shall be manufactured to the Standards of IEEE C37.20.7-2007.
- 1.3) Arc Resistant design shall conform to Accessibility (Type 1—Type 2—Suffix 1B--Suffix 1C—Suffix 2C).
- 1.4) The Voltage Class of the Switchgear shall be (13.8 KV...etc). Frequency shall be (50—60Hz).
- 1.5) The Short Circuit design shall be (25KA—31.5KA—40KA—50KA—63KA).
- 1.6) The manufacturer/ assembler of the Arc-Resistant Switchgear shall have performed these Type Tests under their own name, and not that of another manufacturer.
- 2.0) Switchgear shall be of (one high—two high) design. Two high is capable of a breaker top and bottom (or accessories such as PT's, etc.) in the same vertical cubicle.
  - 2.1) Front doors shall require only one handle to open and close, with no bolting hardware. Rear doors shall be provided, and shall require only one handle to open or close, and will be provided with bolting hardware.
  - 2.3) Front doors shall include as required, Arc-Blast resistant ( viewing window ) & ( ventilation flaps). Racking of circuit breaker, PT's, etc., accomplished though closed front door. Manual breaker trip shall be accomplished through closed front door.
  - 2.4) Front and rear doors shall be manufactured of "Slot-Lock" steel tabs that interlock with frame mounted steel tabs when closed. Front & rear doors shall not include gaskets or mechanical, geared locking devices.
  - 2.5) Each vertical switchgear section shall directly vent all Arc-Fault by-products vertically, away from the faulted cubicle, through thru roof mounted pressure relief flaps, into the top Collector Plenum.
  - 2.6) Interior "Tunnel Type" Plenums that pass horizontally through adjacent vertical switchgear cubicles to vent Arc-Fault by-products shall be prohibited to prevent damage to adjacent vertical cubicles.
  - 2.7) All Arc-Fault By-products shall be safely vented through the top of the Switchgear into a steel Collector Plenum to preclude these Arc-Fault By-products from contaminating the Switchgear room. The top Collector Plenum shall include a minimum of two throats for connection (by Others) to a steel pressure tight duct system, that shall duct the Arc-Fault By-products into a safe area. The Collector Plenum shall have been Type Tested as part of the Switchgear, per paragraph 1.5 & 1.6, above.
  - 2.8) Complete Switchgear and top Collector Plenum shall be fabricated of 11 gauge steel, minimum.
  - 2.9) A separate 11 gauge control cabinet shall be provided at the front of each vertical switchgear cubicle. This control cabinet shall be sealed from, and shall withstand the Arc-Fault By-products blast. Where required the front of the vertical Isolation Panel can be used for controls.
  - 2.10) Control cables shall include pressure glands when passing in and out of Arc-Fault areas.
  - 2.11) Control cables shall enter from bottom or top, at the front of the cabinets.
  - 2.12) Power cables entering cubicles must be sealed by the installing contractor against the Arc-Fault blast. Cables normally enter from bottom; cubicles with cables entering from the top must be identified.
  - 2.13) Bus duct entries must be so identified, and shall enter from top . Bus ducts entering Switchgear must be sealed to withstand the Arc-Fault blast.
  - 2.14) Neither the front doors or the rear doors may be opened or closed, unless the breaker (or PT's, etc.) have been moved to the disconnect position. These interlocks may be defeated (in two deliberate steps) as part of a maintenance program.
  - 2.15) Switchgear shall include live, continuous Partial Discharge monitoring, as well as an Arc Detection & Mitigation monitoring system.
  - 2.16) Vertical cubicles shall be separated from each other by 2 sheets of 11 gauge steel, to prevent burnthrough. Switchgear shall have been so type tested.
- 3.0) Power & Control Centers (PCC) buildings.
  - 3.1) Building arrangement shall be as designed by Consultant.
  - 3.2) Arc-Resistant rear doors shall be provided, that are weatherproof without the requirement for a second door.
  - 3.3) The top Collector Plenum shall be integrated into the PCC building design.
  - 3.4) The top Collector Plenum shall include required designs to discharge the Arc-Fault by-products toward the rear of the Switchgear. As site specific, duct work may be installed (by Others) to vent the Arc-Fault By-products into a remote safe area. Vents opening to the atmosphere must be sealed against the ingress of birds, insect, vermin, weather, etc.
  - 3.5) The Arc-Fault By-products discharge areas shall be kept off-limits to personnel as long as switchgear is live.