Electrical Passive Fire Protection for Power Distribution Networks

Substations · Cable Galleries · Control Rooms · Safety-Critical Circuits

Section A | Electrical Zone-Wise Fire Risk Map

A1. Substations, MCC Rooms & Cable Galleries

Indoor and outdoor distribution substations, HT / LT panel rooms, RMU / UIS enclosures, SCADA / dispatch centres, and DT workshops.

Area	Fire Scenario	Stanvac PFP Product Application	Rating / Priority
Indoor 33/11 kV substation	Cable + transformer fire	Cable coatings, firestops, panel FP	**Critical**
Outdoor 33/11 kV substation	Transformer oil fire	Fire walls, cable wraps	**Critical**
HT / LT panel rooms (every DSS)	Cable + arc flash fire	Panel FP, cable coatings, firestops	**Critical**
Ring main unit (RMU) enclosures	Cable / switchgear fire	Firestops at cable entries, panel FP	**High**
Compact / packaged substation	Transformer + cable fire	Panel FP, firestops	**High**
Unit substation (UIS) in customer premises	Cable + transformer fire	Cable coatings, firestops, panel FP	**High**
SCADA / dispatch centre	Panel + cable fire	Panel FP, firestops, FR doors	**Critical**
Communication / metering room	Cable + panel fire	Panel FP, cable coatings	**High**
DT maintenance workshop	Transformer oil fire	Panel FP, firestops	**High**
Server / SCADA IT room	Cable + UPS fire	Firestops, cable coatings	**Critical**

A2. Safety-Critical Electrical Systems

Area	Fire Scenario	Stanvac PFP Product Application	Rating / Priority
Fire water pump power (at major control centre)	Switchgear to motor	Fire-survival cable	**Critical**
SCADA communication cables	Substation-to-dispatch continuity	Fire-survival cable	**Critical**
Protection relay DC supply	Battery to relay panel	Fire-survival cable	**Critical**
RTU / IED communication	Control centre connectivity	Fire-survival cable	**Critical**

Section B | Product-to-Application Matrix

This section maps each of the four priority Stanvac product lines to the specific power distribution networks locations and circuits where they must be specified. Use these tables to build the bill of quantities (BOQ) for any power distribution networks opportunity.

B1. Cable Coatings — Fire Propagation Prevention

Minimum 240 minutes protection, thickness ≤ 1.6 mm DFT.

Purpose: prevent the spread of fire along cable trays, risers and bunches. The "Browns Ferry" scenario — one cable igniting an entire cable gallery — is the design basis.

Applicable standards: IEC 60332-3 (FM 3971 has limited use — it provides only short-duration protection against arcs and sparks)

Zone	Specific Application	Priority
DSS cable galleries	Incoming and outgoing HT/LT	**Critical**
RMU cable entries	HT cable bunches	**High**
Cable trenches (street to DSS)	Underground feeder cables	**High**
SCADA / dispatch centre cable routes	Marshalling cables	**Critical**
IT / server room cable routes	All IT cabling	**Critical**
DT maintenance workshop cables	Test + process	**High**
UIS cable entry routes	HT + LT cables	**High**

Zone	Specific Application	Priority
Feeder pillar cable routes	Street lighting feeders	**Medium**
Cable joint pit cables	Jointed cable stretches	**High**
DG room cable entries	Start, alternator, control	**High**

B2. Cable Coatings — Fire Survivability

240-minute circuit integrity, thickness ≤ 1.6 mm DFT.

Purpose: keep the cable electrically functional while burning, so the safety circuit continues to operate through the fire event. Fire-survival coatings are specified where loss of the circuit would defeat the fire-fighting or shutdown system itself.

Applicable standards: IEC 60331-21 and IS 17505-1

Circuit Type	Where Applied	Priority
SCADA communication cables	Sub-to-dispatch continuity	**Critical**
Emergency lighting (DSS + control centre)	Safety lighting	**Critical**
Fire water pump power (at major control centre)	Switchgear to motor	**Critical**
DG start & transfer (dispatch centre)	Battery to engine panel	**Critical**
Substation fire alarm circuits	Detector + AV alarm	**Critical**
Protection relay DC supply	Battery to relay panel	**Critical**
UPS feeders to SCADA	UPS to marshalling	**Critical**
RTU / IED communication	Control centre connectivity	**Critical**
Fire pump controller signalling	Auto-start circuit	**Critical**
Evacuation alarm (multi-storey control centre)	AV alarm	**Critical**

B3. Electrical Panel Fireproofing

Purpose: protect field control panels, junction boxes, MCC panels and logic cabinets from external fire and internal electrical fire. Stanvac offers three complementary solutions under this product line.

Option	Stanvac Solution	Description & Typical Use
A	Two-hour rated firestop sealant	For sealing cable gland openings, panel cut-outs, conduit entries and small penetrations at the panel boundary. Silicone / acrylic intumescent sealant certified to UL 1479 / IS 12458 at 2-hour rating.
B	Non-combustible intumescent paint	For external coating of panel enclosures, cable glands and junction boxes exposed to radiant heat or hydrocarbon fire. Non-combustible base with intumescent top-coat.
C	Two-hour rated intumescent translucent coating for small-dia. cables (aerosol spray)	Aerosol-delivered translucent intumescent coating for small-diameter instrumentation, control and signal cables entering panels. Clean application in congested panel interiors; 2-hour rated.

B4. Two-Hour Rated Firestop Barriers

Hybrid combination of mineral wool and firestop mortar.

Purpose: seal every penetration through a fire-rated wall, floor or cable tunnel so compartmentation is maintained. Stanvac's hybrid system combines high-density mineral wool (for bulk void filling and thermal insulation) with firestop mortar (for load-bearing, smoke-tight surface seal). This dual-material approach delivers superior 2-hour rating performance across a wider range of penetration sizes than single-material systems.

Applicable standards: UL 1479 · ASTM E814 · IS 12458

Location	Specific Application	Priority
DSS cable trench to building entry	Sand-seal + firestop pillows + mortar	**Critical**
Wall between MCC and switchgear rooms	Cable + tray penetrations	**Critical**
SCADA centre external wall cable entries	Marshalling bundles	**Critical**
Server / IT room boundary	Cable and HVAC penetrations	**Critical**
Battery / UPS room boundary	Cable and ventilation duct penetrations	**High**
RMU cable compartment penetrations	Cable entry seals	**High**
Cable joint pit cover seal	Pit perimeter seal	**High**
UIS to consumer premises boundary	Cable entry seal	**High**
DG room boundary	Fuel and cable penetrations	**High**
DT workshop compartment walls	Cable and oil pipe penetrations	**High**

Detailed product data sheets, certifications, specimen specifications and project BOQ support are available on request.

For more information, please connect with us.

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