

# **QCD-QATAR CIVIL DEFENCE AND KAHRAMAA LOSS PREVENTION SYSTEM: SUBSTATIONS - ELECTRICITY AND DISTRIBUTION NETWORKS**



FLS	QCD-QATAR CIVIL DEFENCE AND KAHRAMAA LOSS PREVENTION SYSTEM: SUBSTATIONS - ELECTRICITY AND DISTRIBUTION NETWORKS						
A8	Fire and Life Safety (FLS) Requirements Annex_8					Revisions_2021	
Item	Type of Sub-station and Equipment	Location on Site or Property	Room / Space	Fire and Loss Prevention (LP) Requirements			
				Fire Protection System	Wall Enclosures (hrs/ mins)	Opening Protec-tives (hrs/mins)	Other Loss Prevention Requirements
1.0	PUBLIC Distribution Substation						
1.1	INDOOR Distribution Substation:  VCB-OCB + TX (Oil Type + Dry Type for future use) + FP	Located in Open Area; Separated or Attached with Neighbors, subject to Site condition	MV/HV SWITCHGEAR / PANEL ROOMS	PFE-Portable Fire Extinguishers: 2-nos Clean Agent or CO, 10lbs	2-hrs (120mins) FRR fire rated enclosures and separation (wall) from adjacent rooms or spaces.  No requirement, if external walls are fronting a public open space or street.  No requirement, if located 15 m away from any building or structures.	1.5-hrs (90mins) FPR (Doors, Windows and Penetrations)  No requirement if openings are fronting a public open space or street and separated by not less than 6 m from other buildings. G.I. Steel Door, with Sand Trap Ventilator shall be provided.  No requirement, if located 15 m away from any building or structures.	(1) Exit/Safety Signs (Arabic & English format);  (2) Penetrations of FRR fire rated enclosure & separation walls shall be sealed with fire resistant materials.  (3) Mechanical sleeves (fire-rated, gas sealed & water-proof) provided at all cables entries and exits of wall. Not applicable (N/A) in areas where cable entry in substation by sand backfill and underground excavated.  Above Point 2 & 3 shall not be applicable in case the substation is located 15 m away from any building or structure as there is no requirement of fire rated enclosure and separation wall.



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	PUBLIC Distribution Substation						
1.1	INDOOR Distribution Substation:  VCB-OCB + TX (Oil Type + Dry Type for future use) + FP	Located in Open Area; Separated or Attached with Neighbors, subject to Site condition	TRANSFORMER (TX) ROOM	PFE-Portable Fire Extinguishers: 2-nos Dry Chemical, 10lbs	2-hrs (120mins) FRR fire rated & blast proof enclosures and separation (wall) from adjacent rooms or spaces.  No requirement, if external walls are fronting a public open space or street.  No requirement, if located 15 m away from any building or structures.	1.5-hrs (90mins) FPR fire rated & blast proof Doors, Windows and fire rated penetrations.  No requirement if openings are fronting a public open space or street and separated by not less than 6 m from other buildings. G.I. Steel Door, with Sand Trap Ventilator shall be provided.  No requirement, if located 15 m away from any building or structures.	(1) Exit/Safety Signs (Arabic & English format);  (2) Penetrations of FRR fire rated enclosure & separation walls shall be sealed with fire resistant materials.  (3) Mechanical sleeves (fire-rated, gas sealed & water-proof) provided at all cables entries and exits of wall. Not applicable (N/A) in areas where cable entry in substation by sand backfill and underground excavated.  Above Point 2 & 3 shall not be applicable in case the substation is located 15 m away from any building or structure as there is no requirement of fire rated enclosure and separation wall.



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	PUBLIC Distribution Substation						
1.2	OUTDOOR Distribution Substation:  Outdoor Switchgears (RMU [Oil or SF6] - F Swt - TX Swt.] + TX [Oil Type + Dry Type for future use) + FP	Located in Open Area; Separated or Attached with Neighbors, subject to Site condition	MV/HV SWITCHGEAR / PANEL ROOMS	PFE-Portable Fire Extinguishers: 2-nos Clean Agent or CO <sub>2</sub> , 10lbs	2-hrs (120mins) FRR fire rated enclosures and separation (wall) from adjacent rooms or spaces.  No requirement, if external walls are fronting a public open space or street.  No requirement, if located 15 m away from any building or structures.	1.5-hrs (90mins) FPR (Doors, Windows and Penetrations)  No requirement if openings are fronting a public open space or street and separated by not less than 6 m from other buildings. G.I. Steel Door, with Sand Trap Ventilator shall be provided.  No requirement, if located 15 m away from any building or structures.	(1) Exit/Safety Signs (Arabic & English format);  (2) Penetrations of FRR fire rated enclosure & separation walls shall be sealed with fire resistant materials.  (3) Mechanical sleeves (fire-rated, gas sealed & water-proof) provided at all cables entries and exits of wall. Not applicable (N/A) in areas where cable entry in substation by sand backfill and underground excavated.  Above Point 2 & 3 shall not be applicable in case the substation is located 15 m away from any building or structure as there is no requirement of fire rated enclosure and separation wall.



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	PUBLIC Distribution Substation						
1.3	PACKAGE Substation:  RMU (Oil or SF6) + TX (Oil Type) + FSFP	No Civil Building (Steel Enclosures only)	N/A - Not applicable	N/A - Not applicable	N/A - Not applicable	N/A - Not applicable	N/A - Not applicable



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	PUBLIC Distribution Substation						
1.4	SWITCHING Stations:  Indoor Switchgears (VCB-OCB) or Outdoor Switchgears (RMU) (Oil or SF6)	Located in Open Area; Separated or Attached with Neighbors, subject to Site condition	MV/HV SWITCHGEAR / PANEL ROOMS	PFE-Portable Fire Extinguishers: 2-nos Clean Agent or CO <sub>2</sub> , 10lbs	2-hrs (120mins) FRR fire rated enclosures and separation (wall) from adjacent rooms or spaces.  No requirement, if external walls are fronting a public open space or street.  No requirement, if located 15 m away from any building or structures.	1.5-hrs (90mins) FPR Doors, Windows and Penetrations.  No requirement if openingsare fronting a public open space or street and separated by not less than 6 m from other buildings. G.I. Steel Door, with Sand Trap Ventilator shall be provided.  No requirement, if located 15 m away from any building or structures.	(1) Exit/Safety Signs (Arabic & English format);  (2) Penetrations of FRR fire rated enclosure & separation walls shall be sealed with fire resistant materials.  (3) Mechanical sleeves (fire-rated, gas sealed & water-proof) provided at all cables entries and exits of wall. Not applicable (N/A) in areas where cable entry in substation by sand backfill and underground excavated.  Above Point 2 & 3 shall not be applicable in case the substation is located 15 m away from any building or structure as there is no requirement of fire rated enclosure and separation wall.



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	PUBLIC Distribution Substation						
1.5	REMOTE Stations (GMT):  Ground Mounted TX (Oil Type + Dry Type for future use) + FP	Located in Open Area; Separated or Attached with Neighbors, subject to Site condition	TRANSFORMER (TX) ROOM	PFE-Portable Fire Extinguishers: 1-no. Dry Chemical, 10lbs	2-hrs (120mins) FRR fire rated & blast proof enclosures and separation (wall) from adjacent rooms or spaces.  No requirement, if external walls are fronting a public open space or street.  No requirement, if located 15 m away from any building or structures.	1.5-hrs (90mins) FPR fire rated & blast proof Doors, Windows and fire rated penetrations.  No requirement if openings are fronting a public open space or street and separated by not less than 6 m from other buildings. G.I. Steel Door, with Sand Trap Ventilator shall be provided.  No requirement, if located 15 m away from any building or structures.	(1) Exit/Safety Signs (Arabic & English format);  (2) Penetrations of FRR fire rated enclosure & separation walls shall be sealed with fire resistant materials.  (3) Mechanical sleeves (fire-rated, gas sealed & water-proof) provided at all cables entries and exits of wall. Not applicable (N/A) in areas where cable entry in substation by sand backfill and underground excavated.  Above Point 2 & 3 shall not be applicable in case the substation is located 15 m away from any building or structure as there is no requirement of fire rated enclosure and separation wall.





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	PUBLIC Distribution Substation						
1.6	REMOTE Stations (PMT):  Pole Mounted Tx. (Oil Type) 200 KV <sub>a</sub>	No Civil Building (Steel Enclosures only)	N/A - Not applicable	N/A - Not applicable	N/A - Not applicable	N/A - Not applicable	N/A - Not applicable



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				Fire Protection System	Wall Enclo- sures (hrs/ mins)	Opening Protec- tives (hrs/mins)	Other Loss Prevention Requirements
2.0	CONSUMER DISTRIBUTION SUBSTATION						
2.1	INDOOR Distribution Substation:  VCB-OCB + TX (Oil Type + Dry Type) + FP + MV Panel	Located outside (detached) or within or attached to consumer building, in either Ground (GF) or Basement Level, subject to the Project type	A/G (Aboveground) MV/HV SWITCHGEAR / PANEL ROOMS	PFE-Portable Fire Extinguishers, 1-no. Clean Agent or CO <sub>2</sub> , 10lbs	3-hrs (180mins) FRR fire rated enclosures.  No requirement, if located 15 m away from any building or structures.	3-hrs (180mins) FPR: Doors, Windows & Penetrations.  No requirement, if located 15 m away from any building or structures.	(1) Exit/Safety Signs (Arabic & English format);  (2) Penetrations of FRR fire rated enclosure & separation walls shall be sealed with fire resistant materials.  (3) Mechanical sleeves (fire-rated, gas sealed & water-proof) provided at all cables entries and exits of wall. Not applicable (N/A) in areas where cable entry in substation by sand backfill and underground excavated.  Above Point 2 & 3 shall not be applicable in case the substation is located 15 m away from any building or structure as there is no requirement of fire rated enclosure and separation wall.



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2.1	INDOOR Distribution Substation:  VCB-OCB + TX (Oil Type + Dry Type) + FP + MV Panel	Located outside (detached) or within or attached to consumer building, in either Ground (GF) or Basement Level, subject to the Project type	A/G (Aboveground) TRANSFORMER (TX) ROOM	PFE-Portable Fire Extinguishers, 2-nos Dry Chemical, 10lbs	3-hrs (180mins) FRR fire rated & blast proof enclosures and separation (wall) from adjacent rooms or spaces.  No requirement, if external walls are fronting a public open space or street.  No requirement, if located 15 m away from any building or structures.	3-hrs (180mins) FPR fire rated & blast proof Doors, Windows and fire rated Penetrations.  No requirement if openings are fronting a public open space or street and separated by not less than 6 m from other buildings. G.I. Steel Door, with Sand Trap Ventilator shall be provided.  No requirement, if located 15 m away from any building or structures.	(1) Exit/Safety Signs (Arabic & English format);  (2) Penetrations of FRR fire rated enclosure & separation walls shall be sealed with fire resistant materials.  (3) Mechanical sleeves (fire-rated, gas sealed & water-proof) provided at all cables entries and exits of wall. Not applicable (N/A) in areas where cable entry in substation by sand backfill and underground excavated.  Above Point 2 & 3 shall not be applicable in case the substation is located 15 m away from any building or structure as there is no requirement of fire rated enclosure and separation wall.



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	CONSUMER Distribution Substation						
2.1	INDOOR Distribution Substation:  VCB-OCB + TX (Oil Type + Dry Type) + FP + MV Panel	Located outside (detached) or within or attached to consumer building, in either Ground (GF) or Basement Level, subject to the Project type	U/G (Underground) MV/HV SWITCHGEAR / PANEL ROOMS	FM200 or Inert Gas Fire Suppression System  PFE-Portable Fire Extinguishers, 1-no. Clean Agent or CO <sub>2</sub> , 10lbs	2-hrs (120mins) FRR fire rated enclosures.	1.5-hrs (90mins) FPR: Doors, Windows & Penetrations.	(1) Exit/Safety Signs (Arabic & English format);  (2) Penetrations of FRR fire rated enclosure & separation walls shall be sealed with fire resistant materials.  (3) Mechanical sleeves (fire-rated, gas sealed & water-proof) provided at all cables entries and exits of wall. Not applicable (N/A) in areas where cable entry in substation by sand backfill and underground excavated.
	CONSUMER Distribution Substation						
2.1	INDOOR Distribution Substation:  VCB-OCB + TX (Oil Type + Dry Type) + FP + MV Panel		U/G (Underground) TRANSFORMER (TX) ROOM	FM200 or Inert Gas Fire Suppression System  PFE-Portable Fire Extinguishers, 1-no. Clean Agent or CO <sub>2</sub> , 10lbs	2-hrs (120mins) FRR fire rated enclosures.	1.5-hrs (90mins) FPR: Doors, Windows & Penetrations.	(1) Exit/Safety Signs (Arabic & English format);  (2) Penetrations of FRR fire rated enclosure & separation walls shall be sealed with fire resistant materials.  (3) Mechanical sleeves (fire-rated, gas sealed & water-proof) provided at all cables entries and exits of wall. Not applicable (N/A) in areas where cable entry in substation by sand backfill and underground excavated.



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	CONSUMER Distribution Substation						
2.2	OUTDOOR Distribution Substation:  Outdoor Switchgears (RMU [Oil or SF6) - F Swt - TX Swt.] + TX [Oil Type + Dry Type) + FP + MV Panel	Located outside (detached) or within or attached to consumer building, at Ground Level (GF),	A/G (Aboveground) MV/HV SWITCHGEAR / PANEL ROOMS	PFE-Portable Fire Extinguishers, 1-no. Clean Agent or CO <sub>2</sub> , 10lbs	3-hrs (180mins) FRR fire rated enclosures.  No requirement, if located 15 m away from any building or structures.	3-hrs (180mins) FPR: Doors, Windows & Penetrations.  No requirement, if located 15 m away from any building or structures.	(1) Exit/Safety Signs (Arabic & English format);  (2) Penetrations of FRR fire rated enclosure & separation walls shall be sealed with fire resistant materials.  (3) Mechanical sleeves (fire-rated, gas sealed & water-proof) provided at all cables entries and exits of wall. Not applicable (N/A) in areas where cable entry in substation by sand backfill and underground excavated.  Above Point 2 & 3 shall not be applicable in case the substation is located 15 m away from any building or structure as there is no requirement of fire rated enclosure and separation wall.



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	CONSUMER Distribution Substation						
2.2	OUTDOOR Distribution Substation:  Outdoor Switchgears (RMU [Oil or SF6] - F Swt - TX Swt.] + TX [Oil Type + Dry Type) + FP + MV Panel	Located outside (detached) or within or attached to consumer building, at Ground Level (GF),	A/G (Aboveground) TRANSFORMER (TX) ROOM	PFE-Portable Fire Extinguishers, 2-nos Dry Chemical, 10lbs	3-hrs (180mins) FRR fire rated & blast proof enclosures and separation (wall) from adjacent rooms or spaces.  No requirement, if external walls are fronting a public open space or street.  No requirement, if located 15 m away from any building or structures.	3-hrs (180mins) FPR fire rated & blast proof Doors, Windows and fire rated Penetrations.  No requirement if openings are fronting a public open space or street and separated by not less than 6 m from other buildings. G.I. Steel Door, with Sand Trap Ventilator shall be provided.  No requirement, if located 15 m away from any building or structures.	(1) Exit/Safety Signs (Arabic & English format);  (2) Penetrations of FRR fire rated enclosure & separation walls shall be sealed with fire resistant materials.  (3) Mechanical sleeves (fire-rated, gas sealed & water-proof) provided at all cables entries and exits of wall. Not applicable (N/A) in areas where cable entry in substation by sand backfill and underground excavated.  Above Point 2 & 3 shall not be applicable in case the substation is located 15 m away from any building or structure as there is no requirement of fire rated enclosure and separation wall.



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	CONSUMER Distribution Substation						
2.3	PACKAGE Substation:  RMU (Oil or SF6) + TX (Oil Type) + FSFP	Steel Enclosures only. Located outside, sometimes within consumer building (GF) in very limited cases where suitable height available 5-6 m.	N/A - Not applicable	N/A - Not applicable	N/A - Not applicable	N/A - Not applicable	N/A - Not applicable



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	CONSUMER Distribution Substation						
2.4	SWITCHING Stations:  Indoor Switchgears (VCB-OCB) or Outdoor Switchgears (RMU) (Oil or SF6)	Located outside (detached) or within or attached to consumer building, at Ground Level (GF), subject to the Project type	MV/HV SWITCHGEAR / PANEL ROOMS	PFE-Portable Fire Extinguishers: 2-nos Clean Agent or CO2, 10lbs	3-hrs (180mins) FRR fire rated enclosures and separation (wall) from adjacent rooms or spaces.  No requirement, if located 15 m away from any building or structures.	3-hrs (180mins) FPR Doors, Windows and Penetrations.  No requirement, if located 15 m away from any building or structures.	(1) Exit/Safety Signs (Arabic & English format);  (2) Penetrations of FRR fire rated enclosure & separation walls shall be sealed with fire resistant materials.  (3) Mechanical sleeves (fire-rated, gas sealed & water-proof) provided at all cables entries and exits of wall. Not applicable (N/A) in areas where cable entry in substation by sand backfill and underground excavated.  Above Point 2 & 3 shall not be applicable in case the substation is located 15 m away from any building or structure as there is no requirement of fire rated enclosure and separation wall.





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	CONSUMER Distribution Substation						
2.5	REMOTE Stations (GMT):  Ground Mounted TX (Oil Type + Dry Type) + FP + MV Panel  TX capacity: 500-800-1000-1250-1600 Kva	Located outside (detached) or within or attached consumer building, at Ground Level (GF) or Basement or High Floor, subject to the project type.	A/G (Aboveground) TRANSFORMER (TX) ROOM	Fire Alarm System +  PFE, 2-nos Dry Chemical, 10lbs	3-hrs (180mins) FRR fire rated & blast proof enclosures and separation (wall) from adjacent rooms or spaces.  No requirement, if external walls are fronting a public open space or street.  No requirement, if located 15 m away from any building or structures.	3-hrs (180mins) FPR fire rated & blast proof Doors, Windows and fire rated Penetrations.  No requirements if openings are fronting a public open space or street and separated by not less than 6 m from other buildings. G.I. Steel Door, with Sand Trap Ventilator shall be provided.  No requirement, if located 15 m away from any building or structures.	(1) Exit/Safety Signs (Arabic & English format);  (2) Penetrations of FRR fire rated enclosure & separation walls shall be sealed with fire resistant materials.  (3) Mechanical sleeves (fire-rated, gas sealed & water-proof) provided at all cables entries and exits of wall. Not applicable (N/A) in areas where cable entry in substation by sand backfill and underground excavated.  Above Point 2 & 3 shall not be applicable in case the substation is located 15 m away from any building or structure as there is no requirement of fire rated enclosure and separation wall.



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	CONSUMER Distribution Substation						
2.5	REMOTE Stations (GMT):  Ground Mounted TX (Oil Type + Dry Type) + FP + MV Panel  TX capacity: 500-800- 1000-1250- 1600 Kva		U/G (Underground) TRANSFORMER (TX) ROOM	FM200 or Inert Gas Fire Suppression System  PFE-Portable Fire Extinguishers, 1-no. Clean Agent or CO <sub>2</sub> , 10lbs	2-hrs (120mins) FRR fire rated enclosures.	1.5-hrs (90mins) FPR: Doors, Windows & Penetrations.	(1) Exit/Safety Signs (Arabic & English format);  (2) Penetrations of FRR fire rated enclosure & separation walls shall be sealed with fire resistant materials.  (3) Mechanical sleeves (fire-rated, gas sealed & water-proof) provided at all cables entries and exits of wall. Not applicable (N/A) in areas where cable entry in substation by sand backfill and underground excavated.
	CONSUMER Distribution Substation						
2.6	REMOTE Stations (PMT):  Pole Mounted Tx. (Oil Type) 200 Kva	No Civil Building (On Pole only)	N/A - Not applicable	N/A - Not applicable	N/A - Not applicable	N/A - Not applicable	N/A - Not applicable



<b>NOTES.</b>	
1)	Fire safety signs shall be provided in both Arabic and English text.
2)	Stand alone substations or those not part, within or attached to the building or structure and is 15.0 m away from any building or structure in the same or adjacent property, shall as a minimum, be provided the appropriate type and quantity of portable fire extinguishers in accordance with NFPA 10 for its fire suppression requirement.
3)	Fire fighting, fire detection and fire alarm provisions of the substation shall be in accordance with QCDD requirements.
4)	Fixed-or permanently opened wall openings (such as louvers, unprotected doors and unprotected windows, etc.) shall NOT be permitted. All penetrations on fire rated walls shall be sealed by fire resistant materials.
5)	The Consultant/contractor shall comply with all the Fire and Loss Prevention requirements stated here in this document when applying for Substation approvals at QCD. The review and evaluation of Fire and Life Safety Plans and the conduct of inspection for the issuance of Fire Safety Certificate for Substations, shall be based on the Fire and Loss Prevention requirements stated in this document. The requirements stipulated in this document shall not be construed as KAHRAMAA (KM) requirement/s. Any additional Loss Prevention requirements not stated in this document will solely be under KM jurisdiction. QCDD and KAHRAMAA approvals shall be separate.

<b>LEGENDS.</b>			
<b>A/G</b>	Above Ground	<b>FSFP</b>	Free Standing Feeder Pillar
<b>U/G</b>	Under Ground	<b>BOFP</b>	Bolt On Feeder Pillar
<b>B/W</b>	Between	<b>MV</b>	Medium Voltage
<b>N/A</b>	Not Applicable	<b>HV</b>	High Voltage
<b>VCB</b>	Vacuun Circuit Breaker	<b>FRR</b>	Fire Resistance rating
<b>OCB</b>	Oil Circuit Breaker	<b>FPR</b>	Fire Protection Rating
<b>RMU</b>	Ring Main Unit	<b>GF</b>	Ground Floor
<b>F SWT</b>	Feeder Switch	<b>PFE</b>	Portable Fire Extingusihers
<b>TX SWT</b>	Transformer Switch	<b>CO</b>	Carbon Dioxide
<b>TX</b>	Transformer	<b>AFSS</b>	Automatic Fire Suppression System
<b>FP</b>	Feeder Pillar		

