Overview of Technical Requirements

Transfer Trip Communications

- Required to mitigate anti-islanding conditions that may arise when generation exceeds feeder load.

- Islanding occurs when a DG source continues to power a portion of the grid even after the main utility source has disconnected.

Transfer Trip Communications

- Minimum load of Kingston Hydro 4.16kV distribution feeders greatly influences anti-islanding conditions.

- A single Small DER project on a feeder could prevent the connection of other generators.

- One remedy is remote Transfer Trip communications.

- Transfer Trip requirements will be indicated through the CIA.

Monitoring & Control

- All DERs above 10kW are required to have SCADA monitor and control to manage thermal issues that may arise due to distribution maintenance activities and/or abnormal distribution system conditions.

FIT Generator SCADA and Transfer Trip Communication Concept

Generator Site

Substation

Solar Inverter#1

MODBUS over RS485

SEL-3505 Mini RTAC

Transfer Trip Protection over Ethernet (UK Fibre)

SEL-3505 Mini RTAC

Feeder Protection Relay

Solar Inverter#2
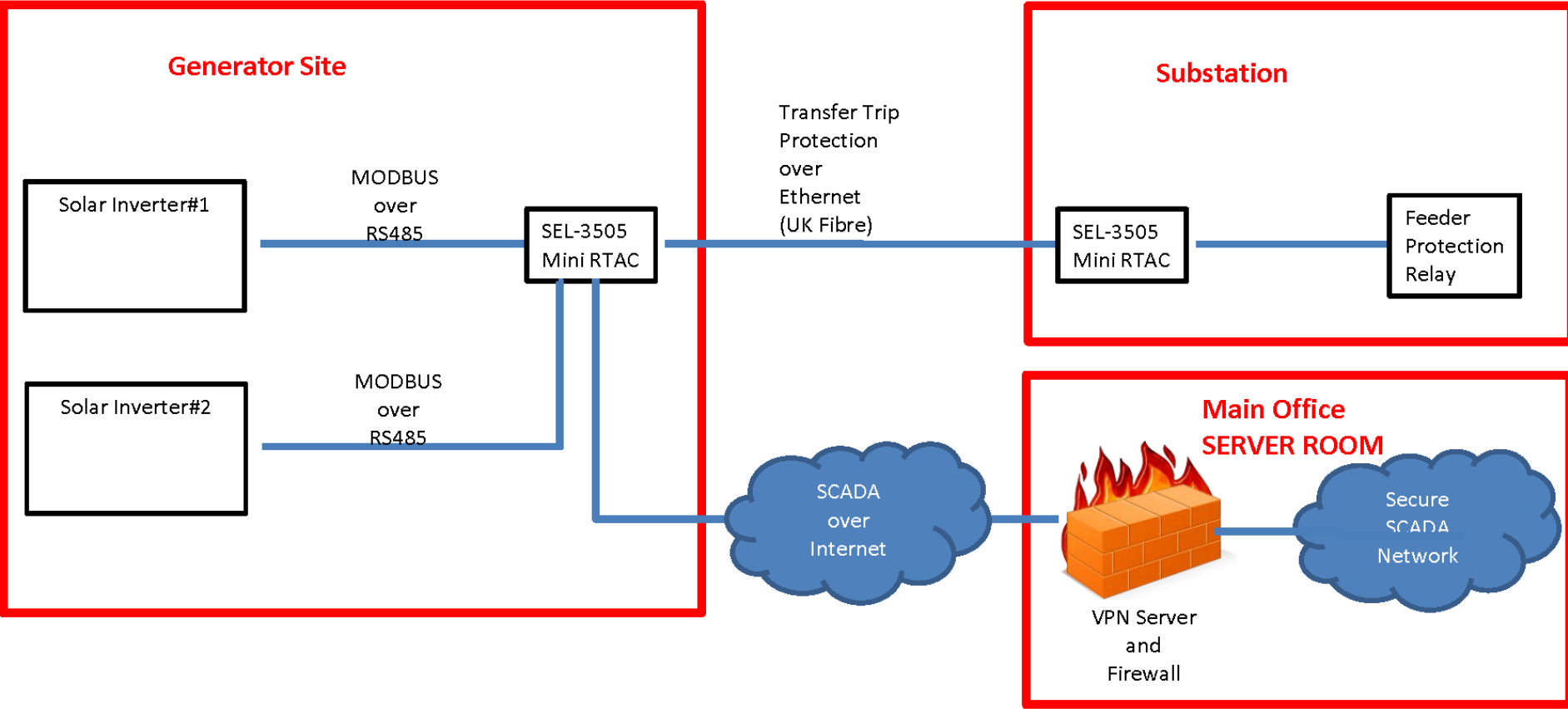
MODBUS over RS485

SCADA over Internet

Main Office SERVER ROOM
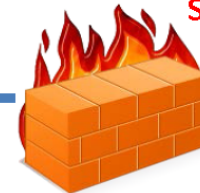
VPN Server and Firewall

Secure SCADA Network

Transfer Trip Communications

Managed Ethernet Connection over UK Fibre (VLAN):

- High Availability Network - 99.6%
- Low Latency Network - Maximum 18ms *based on Electric Protection Calculation*
- Connection speed - Minimum 1.5Mbps
- Usage approximately 2 GB/Month   (1 GB Up, 1 GB Down)

Monitoring & Control

Ethernet Connection via Internet Service Provider (ISP):

- RJ-45 Ethernet Port 10/100 Mbps with DHCP enabled

- Fibre, Cable, DSL, or Cellular (HSPA+ or above) medium

- Usage to be approximately 1.5 GB/Month (850MB Up, 650MB Down)

- Kingston Hydro provides and maintains security device for encryption to SCADA network

Operational Flexibility

- Ability to temporarily override the transfer trip function via SCADA for scenarios such as:
  - Paralleling activities;
  - Feeder maintenance;
  - Temporary switching activities, etc.

- Ability to temporarily shutdown the generator via SCADA;

- Ability to override the connection availability shutdown function (via RTAC) for scenarios like:
  - Planned network maintenance;
  - Planned SCADA system maintenance;
  - Unplanned reactive maintenance.