# Workflow for your IEC61850 project

### Physics

1.) Check the existing cabling infrastructure
2.) Choose one of the designs which fit your needs at its best
3.) Choose the fiber optical ports of the Ruggedcom switches to the one you need (singlemode or multimode, which connectors are in use)

### Network

1.) Design your IP-address scheme. Typically it is not necessary to have public IP-addresses in your substation, so you can use the private IP-address range
2.) Even if you have less than 250 devices in your network, we recommend choosing a class B network, because of more flexibility in your IP-address scheme

Choose your network address number:      172.16.0.0
Choose your subnet mask:      255.255.0.0

(e.g. Class B address range 172.16.0.1 - 172.16.255.254)

### IP-address Scheme

Think about a logical structure within your substation, e.g. every device in substation 1 has IP-address 172.16.1.x, reserve an IP-address range for the Ruggedcom switches, e.g. 1-10, so the 1st switch in every substation has address 172.16.x.1, for the 1st Siprotec ring reserve 11-40, for a second 41-70, etc.; so you know that 172.16.3.16 is the IP-address of the 6th Siprotec device in the 3rd substation.

Also reserve an IP-address range for your devices in the control center room, etc.
Such kind of logical scheme makes your life much easier in case of maintenance or fault clearance.

### Commissioning

1.) Download the basic settings (IP-addresses, RSTP-parameter) of the Siprotec devices with DIGSI via front interface
2.) Set the IP-addresses of the Ruggedcom switches
3.) Build up your network like described in the design and power up
4.) Update the firmware of the SIPROTEC Ethernet modules and Ruggedcom switches (recommended version is 3.4.6, stand Oct. 2008) to the designated one
5.) Upload the preconfigured Ruggedcom configuration files to the switches. You can use RC-TFTP tool for fast and convenient upload
6.) Check the basic Ethernet Communication of the network via Siemens Netview tool
7.) Check the basic redundancy of your network and correct function of RSTP algorithm by means of the commissioning protocol
8.) Now your network is working. Download the relays with the IEC61850 relevant parameters and check the IEC61850 communication, e.g. with IEC-Browser for client-server communication or GOOSE-Monitoring tool (available Q1 2009)
9.) Check all other relevant parameters for your substation, e.g. station unit, NTP-server, serial hubs, etc.
10.) Create the documentation (logs, protocols, network sketches, screenshots)