

SECTION 9 - SYSTEM PARALLELS

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9.1 MANAGEMENT OF FAULT LEVELS

Fault Level Management in Electricity North West is detailed in EPD220.

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In assessing compliance of fault levels against the fault capabilities of circuit breakers and substations, the following conditions apply:

- The equipment can only be operated when the prospective short circuit current is less than or equal to the rating of the equipment.
- When it is necessary to retain apparatus potentially operating in excess of fault level ratings on the network, it shall not be operated on any occasion without the written agreement of the Engineering Services Manager except in the situations stated in EPD220.
- Information on where additional action is required to ensure either adequate containment of fault levels or to prevent excessive circulating currents is provided in Appendix A and the individual 11/6.6kV Paralleling Matrices
- The 11/6.6kV Paralleling Matrices in Appendix A shall be managed by the Control and System Management Manager without requiring formal approval by the Technical Policy Panel; however any changes to these matrices shall be submitted to the Technical Policy Panel for noting.

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9.2 GENERAL

9.2.1 Switchgear

Electricity North West shall inform the relevant parties of any permanent or temporary permission to operate switchgear in excess of its specified normal or enhanced capability rating as appropriate.

They will also inform the relevant parties of any restrictions or safety bulletins that shall be applied when operating High Voltage switchgear in excess of its specified normal or enhanced capability rating.

The nameplate ratings provided on many older type of switchgear do not provide accurate information on Fault Making and Fault Breaking ratings. Current assigned switchgear ratings are recorded in Master Asset Management System (MAMS). These will be used as the definitive source for switchgear rating information.

9.2.2 System Design Fault Levels

The system design fault levels are designed to comply with EPD220.

The Electricity North West web site allows access to the Long Term Development information on Electricity North West's 132kV, 33kV and 11/6.6kV systems, including fault levels.

The information provided is substation group, substation name, voltage, system impedance (% on 100MVA base), calculated system fault currents, (peak make, r.m.s. break) and switchgear rating information (make (kA) and break (kA)).

9.3 REAL TIME MANAGEMENT OF FAULT LEVELS

Appendix A details those individual parallels where additional action is required to ensure either adequate containment of fault level or to prevent excessive circulating currents.

Where circumstances have changed a risk assessment will be used to indicate whether normal security arrangements or the practice of pre-switching shall be used to ensure safety.

On the HV system where it is known that the fault level exceeds the installed switchgear rating, the Control Engineer should confirm that the sites are clear of staff before making the parallel. This will normally be done by telephoning the site and making contact separately with all personnel known to be operating in the vicinity.

Once it has been confirmed that all staff are clear of the affected sites the Control Engineer shall proceed with the paralleling operations without delay. Where affected sites include equipment owned or controlled by third parties, including customer operated equipment covered by COMA or IDNO, it is impractical for the Control Engineer to identify all persons who may be in the vicinity. In all such cases suitable switching to reduce the system fault level shall take place before the paralleling can occur.

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When the need arises to undertake unplanned network reconfiguration - for example, in reaction to equipment and network faults, as a result of emergency measures to secure safety of people, equipment, or security of supplies to customers - it is sometimes impractical for Control Engineers and others to conduct system studies to assess prospective short-circuit currents. The Control Engineer will manage the system fault level, taking into account the current operational instructions and procedures.

9.4 CIRCUIT BREAKER OPERATIONS

System parallels can be made provided that the requirements specified in this document are followed.

In order to ensure that a protection operation does not occur within interconnected high voltage systems the parallel shall be broken within the shortest time possible, either by use of remote control or manual operation. This could require the use of multiple operators.

Circulating current can occur between Primary Substations due to voltage differences and/or phase differences between sources. The impact of small scale generation must also be considered.

Operational Instructions are issued at sites where it is known that the installed switchgear is being operated in excess of the certified peak making or r.m.s. break duty. The operational instruction states the necessary operational procedure to be used when operating the switchgear. The instructions shall be posted on site and CRMS.

9.5 VOLTAGE CONTROL

Control Engineers shall follow the requirements for making tap change schemes non-automatic in Appendix A, when system parallels are being undertaken.