WESTERN POWER DISTRIBUTION

Serving the Midlands, South West and Wales

Company Directive

STANDARD TECHNIQUE: SD1C

Selection and Application of WPD Assessed Switchgear for Use on the Distribution Network

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Implementation Date: **March 2013**

Approved by:

Policy Manager

Date: 20 March 2013

Document Revision & Review Table		
Date	**Comments**	**Author**
11/08/2015	• Additional text in 6.1 to provide commentary on the considerations of GIS for customer connections	Stephen Hennell
17/04/2013	• Additional text in 6.2 to provide clarity as regards the use of AIS / GIS switchgear.	Stephen Hennell
18/02/2013	• Initial issue	Stephen Hennell

IMPLEMENTATION PLAN

Introduction

This document details the requirements for essential aspects of the selection and application of switchgear

Main Changes

Section 6 has been updated to include details of the considerations made by WPD on the use and application of GIS switchgear

Impact of Changes

The details support the existing policy, so there is no impact or change.

Implementation Actions

Team Managers responsible for Planners who design HV and EHV schemes should make them aware of this document.

Implementation Timetable

This document can be implemented with immediate effect.

1. INTRODUCTION

This document details the requirements for essential aspects of the selection and application of switchgear for Western Power Distribution (WPD) Engineering Design and Network Services, Independent Connections Providers and other external provider contracted to WPD.

The appropriate selection and application of switchgear for use on the WPD distribution network is fundamental to ensuring reliability in operation and aspects of continuity of supply

2. REQUIREMENTS

Switchgear shall be selected from the Schedule contained within Engineering Equipment Specification 122 "WPD Assessed Switchgear and Associated Plant for Use on the Distribution Network". The specific selection criteria contained within the Engineering Equipment Specification 122 (EE SPEC 122) shall be followed at all times.

3. ENSURING DIVERSITY OF MAKE AND TYPE

In order that parts of the distribution network do not become reliant on a specific make/type of switchgear which might result in adverse customer effects and operational difficulty in the event of an Operating Restriction or equipment defect, it is recommended that the following criteria are considered when selecting equipment.

- 11kV secondary network – "strings" of the same make/type of switchgear should not exceed more than 4 substations;

- 11kV & 33kV network – primary substation switchboards providing the majority alternative source of supply to an adjoining substation should where practicable utilise a different make/type of switchgear;

- 66kV and 132kV network – design should take into account the interdependence of circuits and plant such that a type defect with a single make/type is unlikely to generate significant inoperability of the network.

For the 11kV secondary distribution network the responsibility for ensuring diversity of switchgear make/type rests with the local Team Manager (TM).

For 11kV and 33kV switchgear located at Primary or Grid substations the need for specific selection of make/type of equipment shall be determined by the Primary System Design and Engineering Design Teams and communicated in writing to the Major Projects Team in the project documentation. The Major Projects TM shall ensure that any specific requirement is met when ordering equipment.

For 66kV and 132kV the Primary System Design and Engineering Design Teams shall ensure that the need for diversity in equipment make type between adjoining substations is considered and any specific requirements shall be communicated to the relevant Major Projects TM. The Major Projects TM shall ensure that any specific requirement is met when ordering equipment.

For 11kV Primary, 33kV, 66kV and 132kV condition based replacement or replacement after failure then in order to determine the most suitable choice of equipment, taking into account the criteria above, the Major Projects TM may seek the guidance and support of the Engineering Design Team.

4. EXTENSIONS TO EXISTING INDOOR SWITCHBOARDS

Where switchgear is required to extend an existing indoor extensible type switchboard then the hierarchy below should provide the optimum solution taking into account factors such as compatibility, reliability, etc:-

a) Using the same make & type. [This may be new equipment obtained from the manufacturer, or recovered, refurbished and relocated WPD equipment.]

b) Utilising directly compatible gear from the original equipment manufacturer (OEM) or the successor company.

c) Using a busbar adaptor chamber and new equipment from the OEM.

d) Using a busbar adaptor chamber and new equipment from the new equipment supplier.

Also

- Third party non-OEM companies shall not be used for the supply of busbar adaptor chambers.
- Extensions to existing double busbar switchboards using busbar adaptor chambers shall be single busbar only.
- Compound filled busbars shall not be extended by the use of busbar adaptor chambers.
- New equipment shall be non-oil and of a fixed-pattern design.

Suppliers of busbar adaptor chambers will be required to provide evidence that the unit is capable of carrying the maximum continuous busbar load current; have a short circuit current withstand rating (assigned or by testing) that is a least as good as the lowest rated unit being connected by the chamber; and have a BIL that is at least as good as the lowest rated unit being connected. [Ideally the unit shall achieve 1250A, 2000A or 2500A load current, 25kA for 3sec short time withstand current, and 95kV BIL.]

5. RETROFIT CIRCUIT BREAKERS

Retrofit circuit breakers will only be considered for use where there is both a robust business and technical justification for doing so.

Any retrofit circuit breakers will have to have obtained an ENA Switchgear Assessment Panel Notice of Conformity Certificate before being considered for use within WPD. A WPD Policy team assessment of the unit will be carried out prior to any agreement being given to purchase a unit.

Modifications to existing circuit breaker trucks that change the interrupting medium are considered as being as retrofit circuit breakers and are to be considered/treated accordingly.

6. USE OF AIS SUBSTATIONS AT 132KV, 66KV AND 33KV

6.1 132kV and 66kV

There is a presumption that air insulated substation (AIS) designs will be used for 66kV and 132kV substations within WPD.

Gas insulated substations (GIS) or hybrid switchgear would only normally be considered where there is a pressing need due to a physical space limitation that prevents the application of AIS technology, or where there are significant adverse environmental conditions.

AIS offers the benefits of:-

- Reduced cost compared with GIS
- Increased flexibility in the restoration of supplies in the event of switchgear failure
- Protection against obsolescence and sourcing of replacement parts
- Reduced dependence on manufacturer staff for maintenance and repairs
- Operational familiarity of WPD staff with AIS equipment
- Smaller volumes of SF6 used
- Easier to define ownership and operational boundaries on shared sites

Gas-insulated metal-clad substations (GIS) or hybrid switchgear are not considered appropriate and in the best interest of a customer for single metered point customer connections at 66kV and 132kV due to likely prolonged outage in the event of failure or repair being required. Sourcing of spare parts and availability of specialist engineers from the OEM required to make a repair for the lifetime of the equipment is seen as critical in this regard. Also due to the configuration and reduced physical size of the substation compound there is highly likely to be no opportunity for redeployment of other WPD equipment or application of a temporary connection solution.

Page amended 11.08.15

6.2 33kV

Whilst the normal expectation would be to install new substations or replacement 33kV switchboards as indoor switchgear, there are occasions where this is not possible or desirable. Examples are:-

- Where ratings of 36kV equipment are not available that would allow an indoor GIS solution.

- Where part replacement of substation plant is cost beneficial because other AIS equipment on site has significant remaining life.

Where additions or alterations are required to an existing AIS substation then the changes should be AIS. Where a condition assessment carried out in accordance with POL:SP3, ST:SP3A and ST:SP3B indicates significant work is required to replace or refurbish the existing equipment to an acceptable standard, then consideration may be given to accommodating the addition or alterations into a condition based replacement of the existing equipment, subject to the normal financial approval process.

Page amendment 17/04/2013

APPENDIX A

SUPERSEDED DOCUMENTATION

No document is superseded by the issue of this Standard Technique.

APPENDIX B

ASSOCIATED DOCUMENTATION

Current version of EE SPEC 122 "WPD Assessed Switchgear and Associated Plant for Use on the Distribution Network".

APPENDIX C

POLICY IMPLEMENTATION

This Standard Technique is implemented on issue. There is no retrospective action required as a result of the issue of this document.

APPENDIX D

POLICY IMPACT

This document is relevant to all staff involved with the specification, purchase, design, and installation of new switchgear and associated plant.

APPENDIX E

KEY WORDS

Retrofit; circuit breaker; busbar adaptor chamber; diversity; switchgear; assessed