

DEP SPECIFICATION

DESIGN AND FABRICATION OF LV SWITCHGEAR FOR NORTH AMERICAN APPLICATIONS (AMENDMENTS/SUPPLEMENTS TO IEEE C37.10.1)

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DESIGN AND ENGINEERING PRACTICE



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PART I INTRODUCTION

1.1 SCOPE

This DEP specifies requirements and gives recommendations for the design and fabrication of metal enclosed low voltage switchgear rated up to and including 1000V, including instruments and control, for use in North American applications.

Parts I and II include introductory and general information.

Part III of this DEP is based on IEEE C37.20.1:2015. Part III of this DEP amends, supplements and deletes various clauses of IEEE C37.20.1:2015. Part III follows the clause numbering of IEEE Std C37.20.1:2015 for easy reference.

All clauses of IEEE C37.20.1:2015 not modified by this DEP remain valid as written.

Part IV covers documentation requirements for all LV switchgear.

Part V covers supplemental non-technical requirements for all LV switchgear.

This is a revision of the DEP of the same number dated September 2011; see (1.5) regarding the changes.

1.2 DISTRIBUTION, INTENDED USE AND REGULATORY CONSIDERATIONS

Unless otherwise authorised by Shell GSI, the distribution of this DEP is confined to Shell companies and, where necessary, to Contractors and Manufacturers/Suppliers nominated by them. Any authorised access to DEPs does not for that reason constitute an authorisation to any documents, data or information to which the DEPs may refer.

This DEP is intended for use in facilities related to oil and gas production, gas handling, oil refining, chemical processing, gasification, distribution and supply/marketing. This DEP may also be applied in other similar facilities.

When DEPs are applied, a Management of Change (MOC) process shall be implemented; this is of particular importance when existing facilities are to be modified.

If national and/or local regulations exist in which some of the requirements could be more stringent than in this DEP, the Contractor shall determine by careful scrutiny which of the requirements are the more stringent and which combination of requirements will be acceptable with regard to the safety, environmental, economic and legal aspects. In all cases the Contractor shall inform the Principal of any deviation from the requirements of this DEP which is considered to be necessary in order to comply with national and/or local regulations. The Principal may then negotiate with the Authorities concerned, the objective being to obtain agreement to follow this DEP as closely as possible.

1.3 DEFINITIONS

1.3.1 General definitions

The **Contractor** is the party that carries out all or part of the design, engineering, procurement, construction, commissioning or management of a project or operation of a facility. The Principal may undertake all or part of the duties of the Contractor. The Contractor is sometimes referred to as Purchaser.

The **Manufacturer/Supplier** is the party that manufactures or supplies equipment and services to perform the duties specified by the Contractor.

The **Principal** is the party that initiates the project and ultimately pays for it. The Principal may also include an agent or consultant authorised to act for, and on behalf of, the Principal.

The word **shall** indicates a requirement.

The word **should** indicates a recommendation.

1.3.2 Specific definitions

Term	Definition
Arc resistant accessibility Type 1:	Equipment with arc-resistant designs or features at the freely accessible front of the equipment only.
Arc resistant accessibility Type 2:	Equipment with arc-resistant designs or features at the freely accessible exterior (front, back, and sides) of the equipment only.
Arc resistant accessibility Type 2B:	Equipment with arc-resistant designs or features at the freely accessible exterior (front, back, and sides) of the equipment only, plus the additional requirements of IEEE C37.20.7. The equipment is arc resistant even with the instrument or control compartment doors open.
Arc resistant equipment	Equipment designed to withstand the effects of an internal arcing fault, as indicated by meeting test requirements of IEEE C37.20.7.
Internal arcing fault:	An unintentional discharge of electrical energy in air within the confines of an electrical equipment enclosure.
Observed	An Observed inspection or test means that the Principal and Contractor are notified of the timing of the inspection or test; however, the inspection or test is performed as scheduled, and if the Principal or Contractor is not present, the Manufacturer/Supplier proceeds to the next step.
Principal's Electrical Technical Authority	The Principal's Electrical Technical Authority is the discipline engineer appointed by the Principal and is responsible for all technical decisions associated with the work. The Principal's Electrical Technical Authority is responsible for technical integrity.
Witnessed	A Witnessed inspection or test means that a hold is applied to the production schedule and that the inspection or test is carried out with the Principal or Contractor in attendance.

1.3.3 Abbreviations

Term	Definition
ACO	Accredited Certification Organization
AWG	American Wire Gauge
IEEE	The Institute of Electrical and Electronics Engineers, Inc.
LV	Low Voltage (less than or equal to 1000V)
NEMA	National Electrical Manufacturers Association
UL	Underwriters Laboratory

1.4 CROSS-REFERENCES

Where cross-references to other parts of this DEP are made, the referenced section or clause number is shown in brackets (). Other documents referenced by this DEP are listed in (Part VI).

1.5 SUMMARY OF MAIN CHANGES

This DEP is a full revision of the DEP of the same number dated September 2011. The following are the main, non-editorial changes.

Section/Clause	Change
1.9	Relocated requisitions/data sheets to Part II sec 1.5. Data sheet DEP 33.67.01.91-Gen. was withdrawn and combined with data sheet DEP 33.67.01.90-Gen. for all North American applications
5.4.4	Added minimum bus short circuit rating (42kA).
7.1	Item 3 - Revised switchgear depth to 1.83 m (72 in) industry standard.
7.3	Item 4 - Added " <i>barriers between vertical sections are not required if the main bus is insulated.</i> "
7.7.1.2	Added "Switchgear shall be arc resistant rated, unless otherwise specified on the data sheet."
7.23	Item 4 - Added the option to install receptacle on the instrument compartment door.
7.24	Item 12 - Revised wording in accordance with Manufacturer/Supplier agreement.
Part III	Part IV from the previous revision, titled "Requirements for Canadian Installations", has been harmonized into Part III.
9.2	Deleted section 9.2 as it is covered in Part V section 1.13.

1.6 COMMENTS ON THIS DEP

Comments on this DEP may be submitted to the Administrator using one of the following options:

Shell DEPs Online (Users with access to Shell DEPs Online)	Enter the Shell DEPs Online system at https://www.shelldeps.com Select a DEP and then go to the details screen for that DEP. Click on the "Give feedback" link, fill in the online form and submit.
DEP Feedback System (Users with access to Shell Wide Web)	Enter comments directly in the DEP Feedback System which is accessible from the Technical Standards Portal http://www.shell.com/standards . Select "Submit DEP Feedback", fill in the online form and submit.
DEP Standard Form (Other users)	Use DEP Standard Form 00.00.05.80-Gen. to record feedback and email the form to the Administrator at standards@shell.com .

Feedback that has been registered in the DEP Feedback System by using one of the above options will be reviewed by the DEP Custodian for potential improvements to the DEP.

1.7 DUAL UNITS

This DEP contains both the International System (SI) units, as well as the corresponding US Customary (USC) units, which are given following the SI units in brackets. When agreed by the Principal, the indicated USC values/units may be used.

1.8 NON NORMATIVE TEXT (COMMENTARY)

Text shown in italic style in this DEP indicates text that is non-normative and is provided as explanation or background information only.

Non-normative text is normally indented slightly to the right of the relevant DEP clause.

PART II GENERAL REQUIREMENTS

1.1 GENERAL

1. Part III of this DEP is written as amendments and supplements to IEEE C37.20.1:2015. Wherever reference is made to IEEE C37.20.1, it shall be understood to mean IEEE C37.20.1:2015 as amended by this DEP.
2. For ease of reference, the clause numbering of IEEE C37.20.1 has been used throughout Part III of this DEP.
3. Clauses of IEEE C37.20.1 which are not mentioned in this DEP shall remain valid as written.
4. Switchgear assemblies shall be provided in accordance with the one line diagram and data sheet.
5. LV Switchgear for Canadian facilities shall, in addition to Part III, comply with CAN/CSA C22.2 No. 31-14:2014.
6. In the event of conflicts between and/or among documents, the Manufacturer/Supplier shall contact the Contractor for resolution.
7. Where conflicting requirements exist between the above-mentioned CSA standards and the IEEE standard to which this DEP is amended, the CSA standards shall prevail for Canadian applications.

1.2 STATEMENT OF COMPLIANCE

1. The Manufacturer/Supplier of the switchgear and its ancillary equipment shall confirm that the equipment fully complies with the quotation and the whole system is properly designed, constructed and suitable for the specified duty.
2. All performance values established in the pre-ordering meeting or quotation (whichever is the later) shall be regarded as limiting values (maximum or minimum as applicable).
3. These values shall be guaranteed by the Manufacturer/Supplier under the most arduous conditions specified in this DEP and the requisition.
4. Tolerances shall be in accordance with this DEP and the relevant reference publications.
5. All the equipment forming part of the order shall be tested individually and in combination at the Manufacturer/Supplier's works to prove their capability and compliance with this DEP and the performance data.
6. The Manufacturer/Supplier shall comply with regulatory requirements applicable to the equipment for the location in which it will be installed; see also (Part I, 1.2).
7. Whenever equipment proposed by the Manufacturer/Supplier cannot fully meet the requirements of this DEP, such exceptions shall be clearly stated in Manufacturer/Supplier's proposal with cross-references to the specific sections and subsections to which exceptions are taken.
8. No exceptions shall be allowed, unless approved by the Principal's Electrical Technical Authority in writing.
9. If no exceptions are taken to these specifications or drawings, a specific statement to that effect shall be included.
10. If any one of the components or the whole system does not comply with the specification and any agreed amendments, the Manufacturer/Supplier shall rectify and re-test the switchgear within a mutually agreed time.