

DESIGN REVIEW PROCEDURE

Document Number: 1-16-FR-01

VERSION 0.1 July 2018

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1. Definitions

In this document the following words and expressions will have the following meanings:

Term/Acronym	Definition
ADM	Asset Design Manual
CDR	Critical Design Review (40%)
DFDR	Detailed Functional Design Review (15%)
DM	Design Manager
DR	Design Review
DRR	Design Review Record
DRT	Design Review Team
FDR	Final Design Review (80%)
IDR	Inter-Disciplinary Review
N/A	Not Applicable
PDR	Preliminary Design Review
SME	Subject Matter Expert
TA	Technical Authority

2. Purpose

The process described in this document covers the review of all design documentation which could be drawings, reports and other investigative documentation, and will form part of the ultimate design package.

3. Scope

The procedure will apply to all Design Managers (DM) who are responsible for the management of design activities and all engineering Subject Matter Experts (SMEs) reviewing the design.

4. Procedure Details

3.1 Design Reviews (DR)

The goal when conducting a Design Review is to determine whether the technical specification associated with the design has been adequately addressed to move into the subsequent design phase. This is broadly achieved by assessing how well the overall design is maturing toward meeting the specified functional and performance requirements. The requirements will be reviewed and tracked at each DR meeting.

Each DR meeting may require differing numbers of resources based on the technical standards highlighted during the project Optioneering and Definition Phases. For a DR meeting the Connection Applicant responsible for the design will make claims of compliance to the requirements and the maturity of the design. The DM, in consultation with SMEs, reviews the technical and design issues and then focuses the review to better understand the identified issues. To achieve this objective, the DM assigns individuals to review design documents that address the identified design issues.

The type of document that are to be reviewed at the Detailed Functional Design Review (DFDR), Critical Design Review (CDR) and Final Design Review (FDR) are listed in Appendix A Design Review Drawings

3.2 Design Review Record (DRR)

The DRR shall be used to capture, track and manage outcomes of the various stages of design review: PDR, DFDR, CDR, FDR and Interdisciplinary Review.

3.3 Design Review Team (DRT) Protocol

DR is a multidisciplinary function. It involves a number of discipline areas and covers a wide variety of design data and in some instances hardware and/or software. In order to fulfil its objective expeditiously (i.e. review the design to ensure that all system requirements are met in an optimum manner), the DR must be well organised and firmly controlled by the DM.

DR meetings should be brief, to the point, and only on the topics stated in the agenda, which is captured in the DRR. Attendance is to be limited to those who have a direct interest and can contribute to the subject matter presented. SMEs who participate should be authorised to speak and make decisions concerning their area of speciality and Technical Authority (TA).

Desk-top review of all documents declaring the maturity of the design must be completed by appropriate SMEs prior to attending the formal DR meeting. Formal design review records of the desk-top review and any identified deficiencies are to be captured in the DRR; and are to be accessible to the DRT members.

The DR must make provisions for the identification, recording, scheduling, and monitoring of corrective actions. The DM must designate specific responsibility for follow-up action. These details are captured in the DRR.

The Designer must submit a list of deliverables (applicable drawings, surveys, data analysis, reports etc.) for the DR DM. The drawing list, numbers and title must be captured in the DRR.

The DR has the greatest chance of success (i.e. meeting the goal of assessing how well the design package meets the customer requirements) with thorough preparation prior to the DR, and how well the DR is conducted. The following preparation and conduct activities will aid in achieving a successful DR:

- Identification of items to be reviewed. Basic design functions, reliability, maintainability, human factors, quality control, manufacturing, Safety in Design and logistic support areas shall be included;
- The DM requests the SME, who was selected for the DR Team, to review the design submissions and insert the comments on the DRR;
- The DM schedules a Design Review Meeting and the comments listed in DRR will serve as an agenda. The DRR shall also capture the date, time and place of the meeting, and the attendees;
- The delivery (with sufficient period for desk-top review before the scheduled DR) of formal design documentation by the Connection Applicants nominated representative that demonstrates the maturity of the design prior to the scheduled DR;
- The desk-top based review of delivered documents by ElectraNet SMEs referring back to the relevant ADM;
- Providing the Connection Applicant with focused issues/questions or drawing mark-ups arising from the desk-top review for clarification during the formal DR. The outcome and actions to be taken will be listed on the DRR, for access for the Designer and DRT to update the actions taken and to verify if the changes made are acceptable to the SME;
- If the SME is not satisfied with the actions taken by the Designer, the Customer's feedback is logged on the DRR and the Designer's project manager is advised of the outstanding issue, which has to be resolved; and
- Once the ElectraNet SME has accepted the Designer's corrective actions as satisfactory, through each items' sign off on the DRR, the drawings can then be signed off. This gives the Designer the authority to continue with subsequent design review(s) until all designs reach a For Construction status.

The Chairperson shall minute the attendees and the purpose of the DRT meeting and ensure the meeting minutes (comments/issues raised/actions/decisions) are captured on the DRR as the meeting progresses through the DR items.

The DRR minutes shall provide sufficient background information pertaining to design issues and risks being raised and on which discussions were held. Where decisions of a technical nature have been made, a risk assessment shall be conducted at the end of the DR to identify the person/persons responsible to resolve the technical matters raised and agree an assigned target date for the resolution.

A register of all action-items are recorded in the DRR record. The DM shall follow-up on the closeout of these actions as required, but in any event prior to overall Design Acceptance being granted.

3.4 DR Maturity Considerations

The DM should consider a broad range of issues in preparation for setting the focus of ElectraNet's DR priorities, including:

- Developmental or higher technical/safety risk elements;
- Prior technical performance and areas of technical strengths/weaknesses;
- Performance at preceding DR(s) and identified design issues;
- Quality of previous deliverables;
- Connection Applicant DR verification to the quality of deliverables, including:
 - Verification by Connection Applicant authorised delegate;
 - Any limiting conditions, etc.;
 - Evidence of documentation control, version control, appropriate signatories, quality review, etc.;
 - Completeness and thoroughness of delivered items; and
 - Outcomes of ElectraNet SME review.

3.5 Preliminary Design Review (PDR)

The objective of the PDR is to confirm that the developed option addresses the user requirements and interfaces are adequately developed and defined and that drawings are reflecting the requirements accurately. The PDR is a separate design review that shall also be captured in the DRR.

The PDR has the system requirements as its main focus and is generally conducted in the design phases. The operational requirements and maintenance concepts for the system need to have been defined prior to the PDR.

It is essential that the Project Brief plus approved scope changes (as documented through Change Requests) is used as the basis of the project scope.

3.6 Detailed Functional Design Review (DFDR)

The DFDR is essentially a detailed review of the drawings and design documentation (stated as requirements of the design manuals) to ensure that the specification is correctly interpreted. The DFDR is to be focused on any identified critical areas contained in the Customer Specification or Technical Standards.

As such, the Connection Applicant needs to demonstrate that they have designed to the technical specification and have highlighted areas of risk, including those requirements that cannot be met.

As the major systems and subsystems are defined throughout the preliminary system design stage, one or more formal DRs may be scheduled to verify that the overall requirements are being met. The design approach selected (and the justification for it), drawings, reports, etc. are reviewed for compliance with the technical specification. Waivers and/or Deviations are noted, and the necessary corrective action initiated.

It is likely that there will be multiple design activities for a system or design discipline occurring for the one project. As such, DFDRs for each system will be required. These unique DFDRs will follow their own schedule as appropriate.

It is critical that the DFDR is fully completed before the detail designer commences the design development drawings for the CDR. Failure to comply with this requirement could lead to significant rework, project delays and expenditure overruns.

3.7 Critical Design Review (CDR)

The CDR will be scheduled after the DFDR has been completed. The CDR is conducted to verify the adequacy and the safety and practicality of the design, i.e. determining if the design can actually be built. The design is essentially 'frozen' at this point. From this point onward only minor changes that do not make a significant impact shall be made to the design.

Whilst no construction activities may commence once the CDR has been completed for the specific discipline, upon successful completion of the CDR procurement of equipment and materials may commence.

3.8 Final Design Review (FDR)

The FDR will occur at the point where the design is 80% complete. It is not expected that any major modifications will be made to the design from this point, with only minor changes occurring in incorporating feedback provided to the designer by ElectraNet. Any significant/major changes made to the design will need to adhere to the waiver/deviation process and may require a detailed DR to reconsider the impact of such major changes late in the design life of the project.

No construction activities may commence until the appropriate FDR has been completed for the specific discipline. At the completion of the FDR and subsequent completion of design documentation preparation, drawings can be issued as and marked clearly "Issue for Construction". The "Issue for Construction" status of drawings signifies the conclusion of the DR process for the specific discipline under review.

3.9 Inter-Disciplinary Review (IDR)

It is considered critical to a successful design to carry out an Inter-Disciplinary Review across engineering disciplines. The intent is that all plant specifications, design and construct specifications and preliminary drawings are aligned across disciplines and meets the specified requirements.

The SMEs, together with the DM, shall determine the key elements to be compared and disciplines required to participate in the IDR. The outcomes of the Design Acceptance

During the DR process the Connection Applicant shall present evidence to ElectraNet which will be used to support Design Acceptance. The DRs will review and discuss this evidence. Areas of non-conformance and/or non-compliance will be identified and will be required to be addressed via appropriate design action by the Connection Applicant.

Appendices

Appendix A Design Review Drawings

DRAWING NUMBER	DRAWING TITLE	Discipline	DFDR 15%	CDR 40%	FDR 80%
310 SSD/102	SIMPLIFIED SINGLE LINE DIAGRAM	Substation	YES	NO	NO
310 SSD/103	METERING SINGLE LINE DIAGRAM	Protection	YES	NO	NO
310 SSD/106	400 V SINGLE LINE DIAGRAM	Substation	YES	NO	NO
310 SSD/107	D.C. AUX SINGLE LINE	Protection	YES	NO	NO
310 SSD/111	500 kV PROTECTION SINGLE LINE DIAGRAM	Protection	YES	NO	NO
310 SSD/112	275 kV PROTECTION SINGLE LINE DIAGRAM	Protection	YES	NO	NO
310 SSD/113	132 kV PROTECTION SINGLE LINE DIAGRAM	Protection	YES	NO	NO
310 SSD/114	66 kV PROTECTION SINGLE LINE DIAGRAM	Protection	YES	NO	NO
310 SSD/115	33 kV PROTECTION SINGLE LINE DIAGRAM	Protection	YES	NO	NO
310 SSD/116	XX kV PROTECTION SINGLE LINE DIAGRAM (UP TO 22kV)	Protection	YES	NO	NO
310 SSD/117-	MISC PROTECTION SINGLE LINE	Protection	YES	NO	NO
310 SSD/119-	IEC61850 SYSTEM TOPOLOGY DIAGRAM	Protection	YES	NO	NO
310 SSD/120-	AUTOMATION BLOCK LOGIC DIAGRAM	Automation	YES	NO	NO
310 SSD/121-	500 kV SCHEMATIC	Protection	NO	YES	NO
310 SSD/122-	275 kV SCHEMATIC	Protection	NO	YES	NO
310 SSD/123-	132 kV SCHEMATIC	Protection	NO	YES	NO
310 SSD/124-	66 kV SCHEMATIC	Protection	NO	YES	NO
310 SSD/125-	33 kV SCHEMATIC	Protection	NO	YES	NO
310 SSD/126-	XX kV SCHEMATIC (UP TO 22kV)	Protection	NO	YES	NO
310 SSD/127-	AC AUXILIARIES SCHEMATIC	Substation	NO	YES	NO
310 SSD/128-	DC AUXILIARIES SCHEMATIC	Protection	NO	YES	NO
310 SSD/129-	LIGHTING AND POWER DIAGRAM	Substation	YES	NO	NO
310 SSD/130-	SUMP PUMP (OR) AIR CONDITIONER SCHEMATIC	Substation	NO	YES	NO
310 SSD/132-	POWER SYSTEM DIAGRAM SCHEMATIC	Protection	NO	YES	NO
310 SSD/133-	OIL SEPARATOR SCHEMATIC	Substation	NO	YES	NO
310 SSD/134-	FIRE SYSTEM SCHEMATIC	Protection	NO	YES	NO
310 SSD/135-	SCADA DIGITAL INPUT	Automation	NO	YES	NO
310 SSD/138-	RECORDER SCHEMATIC	Protection	NO	YES	NO
310 SSD/139-	6.6KV SCHEMATIC	Protection	NO	YES	NO
310 SSD/140-	VOLTAGE RESTORATION SCHEMATIC	Protection	NO	YES	NO
310 SSD/141-	INDICATING SCHEMATIC	Automation	NO	YES	NO
310 SSD/142-	EMERGENCY CONTROL & SPECIAL PROTECTION SCHEME SCHEMATIC	Protection	NO	YES	NO

DRAWING NUMBER	DRAWING TITLE	Discipline	DFDR 15%	CDR 40%	FDR 80%
310 SSD/143-	SIGNALLING INTERCONNECTION DIAGRAM	Protection	NO	YES	NO
310 SSD/144-	STATION PANEL SCHEMATIC	Protection	NO	YES	NO
310 SSD/145-	OLTC SCHEMATIC	Automation	NO	YES	NO
310 SSD/146-	SYNCHRONISING SCHEMATIC	Protection	NO	YES	NO
310 SSD/147-	CONTROL SYSTEM BLOCK DIAGRAM	Automation	NO	YES	NO
310 SSD/148-	PROTECTION BLOCK LOGIC DIAGRAM	Protection	YES	NO	NO
310 SSD/150-	RELAY CONTACT LISTING	Protection	NO	YES	NO
310 SSD/161-	NATIONAL GRID METERING SCHEMATIC	Protection	NO	YES	NO
310 SSD/162-	SECURITY SYSTEM SCHEMATIC	Security	NO	YES	NO
310 SSD/201-	500 kV EQUIPMENT WIRING	Protection	NO	NO	YES
310 SSD/202-	275 kV EQUIPMENT WIRING	Protection	NO	NO	YES
310 SSD/203-	132 kV EQUIPMENT WIRING	Protection	NO	NO	YES
310 SSD/204-	66 kV EQUIPMENT WIRING	Protection	NO	NO	YES
310 SSD/205-	33 kV EQUIPMENT WIRING	Protection	NO	NO	YES
310 SSD/206-	XX kV EQUIPMENT WIRING (UP TO 22kV)	Protection	NO	NO	YES
310 SSD/207-	AC EQUIPMENT WIRING	Substation	NO	NO	YES
310 SSD/208-	DC EQUIPMENT WIRING	Protection	NO	NO	YES
310 SSD/209-	6.6KV EXTERNAL CONNECTIONS	Protection	NO	NO	YES
310 SSD/210-	SECURITY SYSTEM EQUIPMENT WIRING	Security	NO	NO	YES
310 SSD/211-	500 kV EQUIPMENT EXTERNAL CONNECTIONS	Protection	NO	NO	YES
310 SSD/212-	275 kV EQUIPMENT EXTERNAL CONNECTIONS	Protection	NO	NO	YES
310 SSD/213-	132 kV EQUIPMENT EXTERNAL CONNECTIONS	Protection	NO	NO	YES
310 SSD/214-	66 kV EQUIPMENT EXTERNAL CONNECTIONS	Protection	NO	NO	YES
310 SSD/215-	33 kV EQUIPMENT EXTERNAL CONNECTIONS	Protection	NO	NO	YES
310 SSD/216-	XX kV EQUIPMENT EXTERNAL CONNECTIONS (UP TO 22kV)	Protection	NO	NO	YES
310 SSD/217-	AC AUXILIARIES EXTERNAL CONNECTIONS	Protection	NO	NO	YES
310 SSD/218-	DC AUXILIARIES EXTERNAL CONNECTIONS	Protection	NO	NO	YES
310 SSD/219-	LEAKAGE AUXILIARIES EXTERNAL CONNECTIONS	Protection	NO	NO	YES
310 SSD/220-	SECURITY SYSTEM EQUIPMENT EXTERNAL CONNECTIONS	Security	NO	NO	YES
310 SSD/232-	275KV TERMINAL BOARD WIRING	Protection	NO	NO	YES
310 SSD/233-	132KV TERMINAL BOARD WIRING	Protection	NO	NO	YES

DRAWING NUMBER	DRAWING TITLE	Discipline	DFDR 15%	CDR 40%	FDR 80%
310 SSD/234-	66KV TERMINAL BOARD WIRING	Protection	NO	NO	YES
310 SSD/235-	33KV TERMINAL BOARD WIRING	Protection	NO	NO	YES
310 SSD/236-	XX kV TERMINAL BOARD WIRING (UP TO 22kV)	Protection	NO	NO	YES
310 SSD/237-	INTERPOSING TERMINAL BOARD	Protection	NO	NO	YES
310 SSD/239-	FAULT LOCATOR PANEL WIRING	Protection	NO	NO	YES
310 SSD/240-	DISTURBANCE RECORDER PANEL WIRING	Protection	NO	NO	YES
310 SSD/241-	500 kV PANEL WIRING	Protection	NO	NO	YES
310 SSD/242-	275 kV PANEL WIRING	Protection	NO	NO	YES
310 SSD/243-	132 kV PANEL WIRING	Protection	NO	NO	YES
310 SSD/244-	66 kV PANEL WIRING	Protection	NO	NO	YES
310 SSD/245-	33 kV PANEL WIRING	Protection	NO	NO	YES
310 SSD/246-	XX kV PANEL WIRING (UP TO 22kV)	Protection	NO	NO	YES
310 SSD/247-	AC PANEL WIRING	Substation	NO	YES	NO
310 SSD/248-	DC PANEL WIRING	Protection	NO	NO	YES
310 SSD/249-	STATION PANEL WIRING	Automation	NO	YES	NO
310 SSD/250-	OLTC PANEL WIRING	Automation	NO	YES	NO
310 SSD/251-	METERING PANEL WIRING	Protection	NO	NO	YES
310 SSD/252-	EMERGENCY CONTROL & SPECIAL PROTECTION SCHEME PANEL WIRING	Protection	NO	NO	YES
310 SSD/253-	CONTROL PANEL WIRING	Automation	NO	YES	NO
310 SSD/254-	NUMERICAL CABLE SCHEDULE (refer appendix D.3)	Protection	NO	NO	YES
310 SSD/256-	CONNECTION DIAGRAM	Protection	NO	NO	YES
310 SSD/257-	CABLE DETAILS	Prot & Sub	NO	NO	YES
310 SSD/258-	RECORDER PANEL WIRING	Protection	NO	NO	YES
310 SSD/259-	ENGINEERING COMMUNICATIONS DIAGRAM (OPSWAN)	Automation	NO	YES	NO
310 SSD/260-	WIRING SCHEDULE	Protection	NO	NO	YES
310 SSD/261-	500 kV PANEL EXTERNAL CONNECTIONS	Protection	NO	NO	YES
310 SSD/262-	275 kV PANEL EXTERNAL CONNECTIONS	Protection	NO	NO	YES
310 SSD/263-	132 kV PANEL EXTERNAL CONNECTIONS	Protection	NO	NO	YES
310 SSD/264-	66 kV PANEL EXTERNAL CONNECTIONS	Protection	NO	NO	YES
310 SSD/265-	33 kV PANEL EXTERNAL CONNECTIONS	Protection	NO	NO	YES
310 SSD/266-	XX kV PANEL EXTERNAL CONNECTIONS (UP TO 22kV)	Protection	NO	NO	YES
310 SSD/267-	AC PANEL EXTERNAL CONNECTIONS	Substation	NO	NO	YES

DRAWING NUMBER	DRAWING TITLE	Discipline	DFDR 15%	CDR 40%	FDR 80%
310 SSD/268-	DC PANEL EXTERNAL CONNECTIONS	Protection	NO	NO	YES
310 SSD/269-	STATION PANEL EXTERNAL CONNECTIONS	Automation	NO	NO	YES
310 SSD/270-	OLTC PANEL EXTERNAL CONNECTIONS	Substation	NO	NO	YES
310 SSD/271-	METERING PANEL EXTERNAL CONNECTIONS	Protection	NO	NO	YES
310 SSD/272-	EMERGENCY CONTROL & SPECIAL PROTECTION SCHEME PANEL EXTERNAL CONNECTIONS	Protection	NO	NO	YES
310 SSD/273-	CONTROL PANEL EXTERNAL CONNECTIONS	Automation	NO	NO	YES
310 SSD/274-	SUPERVISORY PANEL EXTERNAL CONNECTIONS	Automation	NO	NO	YES
310 SSD/275-	SECURITY PANEL WIRING	Security	NO	NO	YES
310 SSD/276-	SECURITY PANEL EXTERNAL CONNECTIONS	Security	NO	NO	YES
310 SSD/277-	SVC PANEL EXTERNAL CONNECTION	Protection	NO	NO	YES
310 SSD/278-	VOLTAGE RESTORATION EXTERNAL CONNECTION	Protection	NO	NO	YES
310 SSD/279-	6.6KV PANEL EXTERNAL CONNECTION	Protection	NO	NO	YES
310 SSD/280-	FIELD MARSHALLING KIOSK EXTERNAL CONNECTION	Prot & Sub	NO	NO	YES
310 SSD/286-	MARSHALLING PANEL WIRING	Prot & Sub	NO	NO	YES
310 SSD/288-	RECORDER PANEL EXTERNAL CONNECTIONS	Protection	NO	NO	YES
310 SSD/290-	AC BUS ROUTING DIAGRAM	Prot & Sub	NO	NO	YES
310 SSD/291-	DC BUS ROUTING DIAGRAM	Prot & Sub	NO	NO	YES
310 SSD/292-	FIBRE OPTIC BUS ROUTING DIAGRAM	Protection	NO	NO	YES
310 SSD/293-	CABLE BLOCK DIAGRAM	Prot & Sub	NO	NO	YES
311 SSD/294-	TIME SYNCHRONISATION BUS DIAGRAM	Automation	NO	YES	NO
310 SSD/301-	CONTROL BUILDING LAYOUT	Protection	YES	NO	NO
310 SSD/302-	TUNNEL BOARD LAYOUT	Protection	NO	YES	NO
310 SSD/303-	CONTROL BUILDING LIGHTING AND POWER LAYOUT	Substation	NO	YES	NO
310 SSD/304-	OUTDOOR LIGHTING AND POWER LAYOUT	Substation	YES	NO	NO
310 SSD/306-	CONTROL BUILDING CABLE TRUNKING LAYOUT	Protection	YES	NO	NO
310 SSD/309-	FIRE PUMP LAYOUT	Protection	NO	YES	NO
310 SSD/311-	500 kV EQUIPMENT TERMINAL LAYOUT	Substation	NO	YES	NO
310 SSD/312-	275 kV EQUIPMENT TERMINAL	Substation	NO	YES	NO

DRAWING NUMBER	DRAWING TITLE	Discipline	DFDR 15%	CDR 40%	FDR 80%
	LAYOUT				
310 SSD/313-	132 kV EQUIPMENT TERMINAL LAYOUT	Substation	NO	YES	NO
310 SSD/314-	66 kV EQUIPMENT TERMINAL LAYOUT	Substation	NO	YES	NO
310 SSD/315-	33 kV EQUIPMENT TERMINAL LAYOUT	Substation	NO	YES	NO
310 SSD/316-	XX kV EQUIPMENT TERMINAL LAYOUT (UP TO 22kV)	Substation	NO	YES	NO
310 SSD/321-	500 kV PANEL TERMINAL LAYOUT	Protection	NO	YES	NO
310 SSD/322-	275 kV PANEL TERMINAL LAYOUT	Protection	NO	YES	NO
310 SSD/323-	132 kV PANEL TERMINAL LAYOUT	Protection	NO	YES	NO
310 SSD/324-	66 kV PANEL TERMINAL LAYOUT	Protection	NO	YES	NO
310 SSD/325-	33 kV PANEL TERMINAL LAYOUT	Protection	NO	YES	NO
310 SSD/326-	XX kV PANEL TERMINAL LAYOUT (UP TO 22kV)	Protection	NO	YES	NO
310 SSD/327-	AC PANEL TERMINAL LAYOUT	Protection	NO	YES	NO
310 SSD/328-	DC PANEL TERMINAL LAYOUT	Protection	NO	YES	NO
310 SSD/329-	STATION PANEL TERMINAL LAYOUT	Automation	NO	YES	NO
310 SSD/330-	OLTC PANEL TERMINAL LAYOUT	Automation	NO	YES	NO
310 SSD/331-	METERING PANEL TERMINAL LAYOUT	Protection	NO	YES	NO
310 SSD/332-	EMERGENCY CONTROL & SPECIAL PROTECTION SCHEME PANEL TERMINAL LAYOUT	Protection	NO	YES	NO
310 SSD/333-	CONTROL PANEL TERMINAL LAYOUT	Protection	NO	YES	NO
310 SSD/340-	REACTOR CONTROL PANEL LAYOUT	Protection	NO	YES	NO
310 SSD/351-	500 kV PANEL LAYOUT	Protection	NO	YES	NO
310 SSD/352-	275 kV PANEL LAYOUT	Protection	NO	YES	NO
310 SSD/353-	132 kV PANEL LAYOUT	Protection	NO	YES	NO
310 SSD/354-	66 kV PANEL LAYOUT	Protection	NO	YES	NO
310 SSD/355-	33 kV PANEL LAYOUT	Protection	NO	YES	NO
310 SSD/356-	XX kV PANEL LAYOUT (UP TO 22kV)	Protection	NO	YES	NO
310 SSD/357-	AC PANEL LAYOUT	Prot & Sub	NO	YES	NO
310 SSD/358-	DC PANEL LAYOUT	Protection	NO	YES	NO
310 SSD/359-	STATION PANEL LAYOUT	Automation	NO	YES	NO
310 SSD/360-	OLTC PANEL LAYOUT	Automation	NO	YES	NO
310 SSD/361-	METERING PANEL LAYOUT	Protection	NO	YES	NO
310 SSD/362-	EMERGENCY CONTROL & SPECIAL PROTECTION SCHEME PANEL LAYOUT	Protection	NO	YES	NO
310 SSD/363-	CONTROL PANEL LAYOUT	Protection	NO	YES	NO

DRAWING NUMBER	DRAWING TITLE	Discipline	DFDR 15%	CDR 40%	FDR 80%
310 SSD/365-	FIRE PUMP CONTROL CUBICLE	Substation	NO	YES	NO
310 SSD/366-	MARSHALLING PANEL LAYOUTS	Prot & Sub	NO	YES	NO
310 SSD/367-	RELAY SCHEDULE	Protection	NO	YES	NO
310 SSD/368-	RECORDER PANEL LAYOUTS	Protection	NO	YES	NO
310 SSD/369-	SECURITY PANEL LAYOUTS	Security	NO	YES	NO
310 SSD/371-	500 kV PANEL MATERIALS	Protection	NO	YES	NO
310 SSD/372-	275 kV PANEL MATERIALS	Protection	NO	YES	NO
310 SSD/373-	132 kV PANEL MATERIALS	Protection	NO	YES	NO
310 SSD/374-	66 kV PANEL MATERIALS	Protection	NO	YES	NO
310 SSD/375-	33 kV PANEL MATERIALS	Protection	NO	YES	NO
310 SSD/376-	XX kV PANEL MATERIALS (UP TO 22kV)	Protection	NO	YES	NO
310 SSD/377-	AC PANEL MATERIALS	Substation	NO	YES	NO
310 SSD/378-	DC PANEL MATERIALS	Protection	NO	YES	NO
310 SSD/379-	STATION PANEL MATERIALS	Automation	NO	YES	NO
310 SSD/380-	OLTC PANEL MATERIALS	Automation	NO	YES	NO
310 SSD/381-	METERING PANEL MATERIALS	Protection	NO	YES	NO
310 SSD/382-	EMERGENCY CONTROL & SPECIAL PROTECTION SCHEME PANEL MATERIALS	Protection	NO	YES	NO
310 SSD/383-	CONTROL PANEL MATERIALS	Protection	NO	YES	NO
310 SSD/384-	PANEL MATERIAL LIST	Protection	NO	YES	NO
310 SSD/385-	SECURITY PANEL MATERIALS	Security	NO	YES	NO
310 SSD/552-	275KV EQUIPMENT SCHEDULE	Substation	NO	YES	NO
310 SSD/553-	132KV EQUIPMENT SCHEDULE	Substation	NO	YES	NO
310 SSD/554-	66KV EQUIPMENT SCHEDULE	Substation	NO	YES	NO
310 SSD/555-	33KV EQUIPMENT SCHEDULE	Substation	NO	YES	NO
310 SSD/556-	XX kV EQUIPMENT SCHEDULE (UP TO 22kV)	Substation	NO	YES	NO
310 SSD/601-	ULTIMATE SITE LAYOUT	Substation	YES	NO	NO
310 SSD/602-	SITE PLAN	Substation	NO	YES	NO
310 SSD/603-	PLAN LEVELS AND CONTOURS	Substation	YES	NO	NO
310 SSD/604-	LANDSCAPE PROPOSAL	Substation	NO	YES	NO
310 SSD/606-	SERVICES LAYOUT	Substation	NO	YES	NO
310 SSD/610-	ELECTRICAL FIELD CONTOURS	Substation	NO	NO	YES
310 SSD/611-	MAGNETIC FIELD CONTOURS	Substation	NO	NO	YES
310 SSD/621-	EQUIPMENT 500 KV AREA	Substation	YES	NO	NO
310 SSD/622-	EQUIPMENT 275 KV AREA	Substation	YES	NO	NO
310 SSD/623-	EQUIPMENT 132 KV AREA	Substation	YES	NO	NO
310 SSD/624-	EQUIPMENT 66 KV AREA	Substation	YES	NO	NO
310 SSD/625-	EQUIPMENT 33 KV AREA	Substation	YES	NO	NO
310 SSD/626-	EQUIPMENT XX kV AREA (UP TO 22kV)	Substation	YES	NO	NO

DRAWING NUMBER	DRAWING TITLE	Discipline	DFDR 15%	CDR 40%	FDR 80%
310 SSD/627	EQUIPMENT (OTHER VOLTAGE AREAS)	Substation	YES	NO	NO
310 SSD/631-	STRINGING DETAILS	Substation	NO	YES	NO
310 SSD/632-	EQUIPMENT DETAILS / AIRLINES	Substation	NO	NO	YES
310 SSD/633-	EQUIPMENT DETAILS	Substation	NO	YES	NO
310 SSD/691-	CONTROL BUILDING – ARCHITECTURAL	Substation	NO	YES	NO
310 SSD/692-	DUCTS, TRENCHES & BUILDINGS CABLE LAYING DETAILS	Substation	NO	YES	NO
310 SSD/701-	FOOTINGS AND DUCTS 500kV AREA	Substation	NO	YES	NO
310 SSD/702-	FOOTINGS AND DUCTS 275kV AREA	Substation	NO	YES	NO
310 SSD/703-	FOOTINGS AND DUCTS 132kV AREA	Substation	NO	YES	NO
310 SSD/704-	FOOTINGS AND DUCTS 66kV AREA	Substation	NO	YES	NO
310 SSD/705-	FOOTINGS AND DUCTS 33kV AREA	Substation	NO	YES	NO
310 SSD/706-	FOOTINGS AND DUCTS XX kV AREA (UP TO 22kV)	Substation	NO	YES	NO
310 SSD/707-	FOOTINGS AND DUCTS (OTHER VOLTAGE AREAS)	Substation	NO	YES	NO
310 SSD/711	LINE AND LEVEL PEGS	Substation	NO	YES	NO
310 SSD/790	EARTHWORKS PAVING AND FENCES	Substation & Security	NO	YES	NO
310 SSD/791	CONTROL BUILDING - FOOTINGS	Substation	NO	YES	NO
310 SSD/792	FLOOR AND DUCT DETAILS	Substation	NO	YES	NO
310 SSD/793-	SEPTIC TANK ARRANGEMENT	Substation	NO	YES	NO
310 SSD/794-	CIVIL WORKS CODES AND PRACTICES	Substation	NO	YES	NO
310 SSD/795-	SITE DRAINAGE - CLEAN AND OILY WATER DRAINAGE FLOWS	Substation	NO	YES	NO
310 SSD/801-	EARTHING 500 kV AREA	Substation	NO	YES	NO
310 SSD/802-	EARTHING 275 kV AREA	Substation	NO	YES	NO
310 SSD/803-	EARTHING 132 kV AREA	Substation	NO	YES	NO
310 SSD/804-	EARTHING 66 kV AREA	Substation	NO	YES	NO
310 SSD/805-	EARTHING 33 kV AREA	Substation	NO	YES	NO
310 SSD/806-	EARTHING XX kV AREA (UP TO 22kV)	Substation	NO	YES	NO
310 SSD/807	EARTHING (OTHER VOLTAGE AREAS)	Substation	NO	YES	NO
310 SSD/811-	EARTH GRID AND RISERS	Substation	YES	NO	NO
310 SSD/891-	EARTHING CONTROL BUILDING OR SWITCH HOUSE	Substation	NO	YES	NO
310 SSD/892-	STEP AND TOUCH POTENTIAL	Substation	YES	NO	NO
310 SSD/893-	VOLTAGE CONTOUR 430V, 1000V AND 1500V	Substation	YES	NO	NO

DRAWING NUMBER	DRAWING TITLE	Discipline	DFDR 15%	CDR 40%	FDR 80%
310 SSD/901-	OUTDOOR LABELS	Substation	NO	YES	NO
310 SSD/902-	BUSBAR DETAILS	Substation	NO	YES	NO
310 SSD/904-	MOBILE TELEPHONE	Substation	NO	YES	NO
310 SSD/905-	FLOODLIGHT CONTOUR PLAN	Substation	NO	YES	NO
310 SSD/906-	LIGHTNING PROTECTION COVERAGE PLAN	Substation	YES	NO	NO
311 SSD/907-	SOUND PRESSURE LEVELS CONTOURS	Substation	YES	NO	NO
310 SSD/921-	SUBSTATION STEEL WORK 500kV AREA	Substation	NO	YES	NO
310 SSD/922-	SUBSTATION STEEL WORK 275kV AREA	Substation	NO	YES	NO
310 SSD/923-	SUBSTATION STEEL WORK 132kV AREA	Substation	NO	YES	NO
310 SSD/924-	SUBSTATION STEEL WORK 66kV AREA	Substation	NO	YES	NO
310 SSD/925-	SUBSTATION STEEL WORK 33kV AREA	Substation	NO	YES	NO
310 SSD/926-	SUBSTATION STEEL WORK XX kV AREA (UP TO 22kV)	Substation	NO	YES	NO
310 SSD/927-	SUBSTATION STEEL WORK (OTHER VOLTAGE AREAS)	Substation	NO	YES	NO



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