

METHOD STATEMENT FOR INSTALLATION OF AUTOMATIC TRANSFER SWITCH(ATS)

RED LINE NORTH ELEVATED AND AT GRADE

Revision and Issue Records

Review History

Document No.	Revision	Title
M002-RLR-ELE-MES-00012	1	MS for Installation of Automatic Transfer Switch (ATS)

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Rev. No	Date	Description	Prepared	Reviewed	Approved

Document Review and Approval

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1 Definitions and Abbreviations:

Table 1: Definitions and Abbreviations

Abbreviation	Definition
BS	British Standard
HS	Health, and Safety
ITP	Inspection and Test Plan
MSDS	Material Safety Data Sheet
PMC	Project Management Consultant
QA/QC	Quality Assurance / Quality Control
QCS	Qatar Construction Specification
SONO	Statement of No Objection
PPE	Personal Protective Equipment

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Abbreviation	Definition
RLN-EAG	Red Line North Elevated and At Grade
RLR JV	Rizzani de Eccher, Lotte and Redco - Joint Venture
DB	Distribution Board
ATS	Automatic Transfer Switch
MCB	Motorized Circuit Breaker
SMDB	Sub Main Distribution board
MDB	Main Distribution Board
ITP	Inspection Test Plan
FAT	Factory Acceptance Test
MS	Method Statement
QR	Qatar Rail
QCS-2014	Qatar Construction Specification

2 Purpose:

The purpose of the method statement is to describe the procedure for material delivery inspection, installation and inspection of the Automatic Transfer Switch (ATS) at Stations. The Intent of this report is to explain, the methods to be adopted to ensure works conducted on site are in compliance with approved design & material approvals as per Project specifications.

3 Scope of Method Statement:

The scope of application of this method statement is the Installation and inspection of Automatic Transfer Switch (ATS) for RedLine North Elevated & At Grade. (Chainage: 25+285 to Chainage: 31+950, Section of the RLN-EAG Project.

4 Work Execution:

4.1 General Supplied Items:

4.1.1 Personnel:

Ref.	Trade & Despines	Responsibility

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1	MEP Construction Manager	<ul style="list-style-type: none"> Delivering the overall works in a safe and timely manner, ensuring conformance with the approved design. Leading the team of engineers and surveyors, guiding them in the delivery of the works. Verifying that work done is in accordance with requirements of contract. Ensuring the quality standards set for the work are achieved and the work team adhere to the QA/QC and HS requirements of the contract.
2	Systems Assurance Engineer	<ul style="list-style-type: none"> Establish the system assurance process. Manage the RAMS team and EMC team in delivering the system assurance submissions. <p>Liaise with the System Assurance Manager for all safety and RAM related activities respectively.</p>
3	Project/Site Engineer	<ul style="list-style-type: none"> Ensuring that the works are being carried out in accordance with contract requirements and this Method Statement. Management onsite to ensure that the team carries out the works in time with the delivery schedule. Implementation of and adherence of the team to the QA/QC and H&S policies and procedure.
3	QA/QC Manager	<ul style="list-style-type: none"> The preparation of the company's QA manual control and supervision of all amendments and revisions Monitor all quality related activities on the project Perform all internal and external audits on behalf of the company's management Preparation, monitoring, training of project staff on method statements, and control of material on site.
4	QA/QC Engineer	<ul style="list-style-type: none"> The QA/QC Engineer is the overall responsible for the implementations of this procedure and will carry out the material inspection to ensure that materials received on site are approved materials. He will be conducting surveillance and inspection duties at various stages of the project delivery to ensure compliance to contract requirements and to QA / QC requirements. He will monitor the installation works according to the approved drawing & method statement. He will coordinate with the Supervisory Consultant to carry out inspection/testing of the completed works. The QA/QC Engineer is responsible for the detail application of this procedure for the inspection and testing, to coordinate with the Construction Manager and Site Engineer for the inspection of on-going work.

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5	Surveyor	<ul style="list-style-type: none"> • Setting out all planned works. • Monitoring the works being carried out to ensure they are at the correct levels and measurements. • Maintaining documents relevant to alignment and height control.
6	Document Controller	<ul style="list-style-type: none"> • Documenting, distributing and maintaining data in the prescribed format. • Making the necessary data available as requested by the team or the client.
7	HS Inspector	<ul style="list-style-type: none"> • Identify HS requirements, non-compliance or otherwise by conducting both formal and informal audits and communicate said to relevant site management • Advise site management on HS substandard acts and HS substandard conditions on a continuous basis and record said. • Coordinate and record action by site management as identified and advised. • Verify actions taken by site management , record and report accordingly • Conduct relevant HS administrative functions and additional tasks as directed by HS Management.
8	Supervision Engineer	<ul style="list-style-type: none"> • Checking the compliance of works to the design. • Carrying out comprehensive supervision of all construction works. • Confirming that the work executed complies with the approved design and be responsible for checking the construction works.

All of the above will individually be responsible for a safe and healthy operational environment consideration of all the workers in their team related to the execution of their duties and any other personnel. Furthermore one group of workers is planned for execution of installation of Automatic Transfer Switches (ATS) This group will perform all activities. The group will have following labour profile.

Labours/Workers

No.	Description	No.	Description
1	Electrical Supervisor	3	Electrician
2	Electrical Forman	4	Labours

4.1.2 Equipment and tools :

The typical construction equipment requirements is as listed below, and will be used for Installation activities at site.

General Tools used for this activity

- PPE for all staff and labour
- Measuring tapes and setting out markers
- Electrician Tool Box with all tools
- Spirit Level
- Screwdriver set
- Maker/Whitener and Line Marker

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- Mechanical Winches
- Cable Lugs Punch
- Cable Glands
- Cable Lugs
- Heat Shrink Sleeve
- Identification Tags
- Insulation Tape
- Hammer
- Barrier Warning Tape & Portable Emergency Lamp
- Heat Gun
- Multimeter
- Mobile Scaffolding (if Required)
- Man Lift (if Required)
- Ladders (if Required)
- Drilling Machine

Note: All the powered tools shall be suitable for use of 220V - 240V power Supply. The above tools and equipment shall be checked for operational suitability before each shift of commencement of works including, but not limited, to safety and operational compliance. The same shall be executed for all small tools and miscellaneous items. Equipment may be substituted subject to availability and actual requirements on the day. The type and quantities of equipment are subject to change to suit the site requirements and to meet the construction program.

4.1.3 Material

- a) The Automatic Transfer Switch (ATS) shall be as per approved Material Submittal.
- b) Automatic Transfer Switch (ATS) to be installed as per verified Shop drawing and load Schedule.
- c) Selector switch, Sensing relay, Visual indicator lamps, Time delay relay and all internal components shall be as per required rating.
- d) Glanding of incoming and outgoing cable shall be as per typical details.
- e) All wiring materials and installations shall confirm to the requirements of NFPA 70 and NFPA 130.



Sample figure 1: Automatic Transfer Switch

4.1.4 Handling and Storing of Materials

On receipt of Automatic Transfer Switch & fittings, the equipment shall be handled & stored in line with the following procedure:

1. When materials arrives at site shall be inspected randomly and ensure that the materials are as per approved material submittals.
2. Any discrepancies, damage, and etc. found to the materials shall be notified and reported to QA/QC Engineer and Site Engineer for further action.

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3. Materials found not suitable for site use shall be removed from site immediately.
4. While unloading, shifting and storage, it should be ensured that there are no damages.
5. Manufacturer's packing should be retained during Transporting, Handling and hauling of ATS Panels inside its Storage area.



Sample figure 2: Storage of materials

6. Material Inspection need to be carried out while material delivered at site.
7. Storage will be performed in compliance with manufacturer recommendation and all Precautions to prevent any damage on Equipment and respective accessories will be taken.
8. Delivered materials shall be covered with polyethylene sheets while storage to ensure free from dirt and dust.
9. When off-loading with crane/boom truck materials shall be lowered and not dropped to the ground.
10. Materials shall be stored in an elevated ground with manufacturer's packing.
11. QA/QC Engineer will be responsible on checking and receiving all the materials delivered at site prior to stock on storage area.
12. All Materials delivered on site must have relevant supporting documents complying on the specification of the project. Upon inspection approval it can be deliver to storage area, fabrication area or installation area.
13. Rejected and damaged materials shall be stored at a suitable quarantine area with proper identification label to prevent unintended use and to be returned for replacement.

4.2 Site Execution

4.2.1 Program

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Installation of Sub Main Automatic Transfer Switch (ATS) is expected to be performed starting **MAY**-2017. Detail schedule of Installation activity will be provided in the weekly update of the 3-weeks look ahead construction schedule.

4.2.2 Automatic Transfer Switches

1. It shall be Supplied and install automatic transfer switch (ATS) units to provide local Transfer of life safety loads between the normal mains and alternative services, as shown on the LV schematic drawings.
2. It shall ensure ATS units are of the open-transition 4-pole type, complete with overlapping neutral. Select current ratings and sizes in line with the design and the specification requirements to suit the upstream protective device from either source, whichever is the greater (the device frame rating and not the protection setting).
3. A maintenance bypass facility as required by BS 8519, such that the ATS can be Maintained safely without compromising the life safety systems.
4. It shall ensure the normal default supply for all ATS units is not the alternative supply.
5. It shall ensure that the selected ATS are sized larger than the Feed MCCB in final Installation.

4.2.3 Transportation and Storage on Site

1. Manufacturer's packing should be retained during Transporting, Handling and hauling of ATS Panel inside plant room.
2. ATS panels shall be lifted by mobile / tower crane to the roof and placed on pallet trucks. Then the ATS panels shall be hauled to the respective plant room by pulling them with the pallet truck.
3. Ensure that the mobile / tower crane should be used safely.
4. Materials shall be shifted / hauled carefully from storage area to work area by forklift/portable pallet truck on the ground floor.
5. Only specialist, trained, competent and well-experienced electrical personal shall be involved in this activity.
6. Personal involved in this task should wear site mandatory PPE always on site.
7. Specific job training shall be given to all prior to start the work.

4.2.4 Pre-Installation Procedure

1. Approved Builders work drawing for concreting and latest verified shop drawing to be checked in co-ordination with MEP co-ordinator for the installation Automatic Transfer Switch.
2. Ensure Automatic Transfer Switch shall be installed as per the verified shop drawings and manufacturer's recommendation.
3. Ensure mounting, location and clearances are per plan and specified on civil openings for properly coordination as per the requirement before installing the Automatic Transfer Switch.
4. Safe start procedure shall be prepared before commencing the work.

4.2.5 Installation Procedure

1. All works shall be undertaken in a neat and workmanlike manner to ensure quality installation.
2. Ensure that the area is clear and barricaded off from other construction activities and that are overhead installations are completed.
3. Verify the ATS panel is tagged correctly before they are prepared for site installation as per project specification.
4. Verify the name plate with single line diagram that the equipment is in accordance with project approved drawings.

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5. Verify the type/rating of Automatic Transfer Switch panel accessories are correct and as per approved shop drawings.
6. Ensure to removal of wooden wedges, blocks fixed by the manufacturer for the purpose of transportation.
7. Check the horizontal and vertical alignment by spirit level.
8. Check the final alignment and verify that all panels are in line.
9. After final alignment the panel shall be securely bolted by expansion anchors on concrete plinths
10. Installation shall be done at correct location as per drawing for Wall mounted ATS panel.
11. Proper support and bolts shall be provided for fixing wall mounted installation.
12. Clearance space shall be provided for termination of cable and for maintenance works.
13. Panel installation shall not clash with other services.
14. Ensure enough space for opening and closing of door and not blocked by other services.
15. Ensure the cable insulation resistance test have been done and approved by QA/QC Engineer.
16. Ensure all terminal blocks are correct type and fixed securely and marked with identification labels.
17. Rectify all loose wiring of the panels and connect them to the respective terminal blocks.
18. All circuits shall be correctly identified, labelled and core identification ferrules are used for individual core.
19. All protection and control devices shall be correctly set and operational.
20. All unused cable entries and openings shall be sealed properly with dummy plugs of suitable IP rating.
21. All feeder/bus-bar compartments of panel shall be free from moisture, debris/foreign materials after final installation completed.
22. Ensure test equipment's shall have valid calibration certificates.
23. Bus-bar, components, feeders and control circuits shall be done for continuity and insulation resistance test.
24. Earthing shall be done properly.
25. Ensure final touch of paint of same colour of the panel if required.

4.2.6 Glanding & Termination

1. Cable entries of ATS panel shall be either bottom/top/both as per the requirement of site condition.
2. Cable bending radius should be as large as possible and shall not to bend to a radius less than as specified in relevant IFC specifications, manufacturer instruction and KAHRAMAA standards.
3. Cable shall be supported in accordance of the IFC Specifications and KAHRAMAA regulations.
4. Approved cable glands shall be used for terminating to ATS panels.
5. Cable gland shall be brass compression type.
6. Suitable brass or copper clamp or wires strip not less than 2.5mm² shall be provided for armour or metallic sheath earthing.
7. Cable termination shall be done by approved skilled cable joiner.
8. The number strands of cable core shall not be reduced at the termination point.
9. Approved cable lugs shall be used for termination.
10. Lugs shall be insulated with an approved type of insulation tape or heat shrinkable sleeve after crimping the lugs before termination.
11. The insulation tape or heat shrinkable tube shall have equal or better electrical and mechanical properties than those of the original insulation removed.
12. The insulation tape or heat shrinkable sleeve shall be adhered to the core securely and permanently.
13. Sufficient spare cable shall be allowed to remake the termination.
14. Cable terminations are accessible.

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15. Cable identification tags shall be provided at both ends of the cable.
16. Cables shall be tested for continuity and insulation resistance test before and after cable termination.

4.2.7 Testing

1. Testing shall be as set out in the Inspection & Test Plan (ITP).
2. Test voltage as per manufacturer recommendation.
3. Testing and Commissioning for Installed ATS shall be done by the specialist.
4. Testing mechanical linkage or tie connection and operate switch manually, exercised auto mode without line voltage or load applied.(normal, emergency, automatic and off)
5. Insulation Resistance test need to be done for Incoming and Outgoing cables with calibrated Tester. The Test Report for this work is attached in Appendix C
6. Torque test to be done for Cables terminated and bolted joints. The Test Report for this work is attached in Appendix C

4.2.8 IDENTIFICATION OF ELECTRICAL SERVICES

1. All identification labels and notices in accordance with BS 7671 and Kahra-maa shall be provided.
2. Warning, caution and instruction notices where indicated in the engineering system sections of this Specification or on the drawings shall be provided.
3. It shall be ensured that all identification labels and notices shall be installed in a visible position, without interference to the operation and maintenance of equipment.
4. It shall be ensure that labels and notices are sized in proportion to the equipment on which they are mounted and that they are securely fixed.
5. When conductor fixing and termination is completed then Permanent label and notices shall be provided according to the Approved method statement of "TAG and Marking(M008-RLR-ELE-MES-00018)"

REDLINE MARK-UP & AS-BUILT

If any changes occur in the location of ATS Panel (Non Adherence to the approved Shop drawings) then such information shall be detailed in the AS —Built Drawings with Red Lines.

5 Quality

The Inspection and Test Plan (ITP) for this Method Statement summarizes various characteristics to be checked. The concerned Site Engineer or Site Supervisor will be responsible to ensure compliance for these operations and the site QA/QC Engineer will carry out quality control checks and report the inspection results.

5.1 Quality Records:

ITP reference No: M002-RLR-ELE-ITP-00012.

Quality records shall be provided as identified in the ITP and maintained as per ISO 9001/QCS 2014 section 2 part 5 QR Quality Guidelines.

Required form of records and reports are defined in the Inspection and Test Plans. Refer to Doc. No: M002-RLR-ELE-ITP-00012.

6 Health and Safety Plan:

- a) The Health and Safety Plan: M002-RLR-HMS-PLN-00001 will be strictly adhered to at all times.
- b) Compulsory RLR HSE induction is required before access to workplace is permitted. PPE relevant to the scope of work risks as identified must be utilized.

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- c) Compliance with the HS Summer working plan is compulsory Ref: M002-RLR-HMS-00003.
- d) Expose to direct sunlight; including Installation of Automatic Transfer Switch (ATS) shall be avoided 11.30 AM to 3.00PM hours during Hot seasons. Precaution shall be taken on heat strokes, dusty winds and other unsuitable weather conditions.
- e) Workplace HS communication ie Toolbox talks, task briefings and HS non compliant notices / closeouts are compulsory.
- f) The health and safety Department shall create and approve tool box talks which the safety office shall conduct such meetings shall cover, at various times and before use of equipment, the respective matters consisting of, but not limited, to:
 - i. Use of tools including specialised equipment;
 - ii. Personal protective equipment;
 - iii. Smoking;
 - iv. Handling of waste material;
 - v. Use of ablution facilities;
 - vi. Barricades, signs and warning tape;

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RLR EMERGENCY CONTACT NUMBERS In case of emergency, accident, sickness	
QATARI EMERGENCY CALL – FIRST AID, FIREFIGHTING BRIGADE, POLICE	999
RLR Emergency Number	74783299
QATAR RAIL DUTY MANAGER	44331777
KAHRAMAA CALL CENTER ELECTRICITY & WATER	991
FIRST AIDER	74798190
DEPUTY RESCUE MANAGER: Mr. Joseph Linehan	30481706
HS Manager: Mr.Johann Brink	30461333
HS Deputy Manager : Mr.Varghese Chattukulam	30986153
Water Team	74798184
Environmental Assistant: Mr.Chaitanya Veruva	74795948
Management Office: _____	44719853

Contacts for Traffic issues:

Security Manager	Mr. Arif Khan	74795950
Traffic Manager	Mr. Eur Ing Miguel	50050399

6.1 Specific Measures:

Specific measures related to span erection are as follow:

1. Working at height: all measures described in M002-RLR-HMS-PRO-00005 shall be in place during erection activities.

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2. Load shifting Machinery

- i. Do not operate any load shifting machinery without training and approval.
- ii. Operators of forklift trucks, bulldozers, loaders, excavators, trucks should possess appropriate certificates/ Passes.

3. Manual Handling

Avoid manual handling operations as far as possible to minimize the risk of injury. Estimate the weight of the load. Lift an object with a correct posture. Wear suitable protective equipment. Put on gloves as far as possible to protect your hands from any cut, scratch or puncture, and wear safety boots or shoes to prevent injury to toes by heavy falling objects .Seek assistance from someone in lifting a load if necessary.

4. Portable Power Tool

- i. Do not use a portable power tool (such as saw, grinder and drill) unless its dangerous parts have been effectively guarded.
- ii. Place the electric cable and hose of a tool at an appropriate position to avoid tripping hazards.
- iii. Do not operate a cartridge operated fixing tool unless you have possessed a valid
- iv. certificate.
- v. Wear suitable eye and ear protectors while operating a cartridge-operated fixing tool.
- vi. Use a cartridge-operated fixing tool with great care.

5. Scaffold (Mobile)

- i. Do not use scaffolds unless they have been erected by trained workmen and under the supervision of a Supervisor.
- ii. Do not use a scaffold unless it has been inspected and certified safe (A Green Tag to visibly hoist on the scaffolds) by a Certified Supervisor before use.
- iii. Strictly follow the instructions of a Supervisor. Do not alter the scaffold unless authorized to do so.
- iv. Do not work on an unfinished scaffold.
- v. When it is necessary to work on a mobile scaffold, lock the wheels of the scaffold before you start working.
- vi. Do not work on a scaffold unless it has been provided with a suitable working platform.
- vii. Ladders shall be used where no other means of access is possible.

6. Safety Requirements.

- i. First Aid Kit to be provided at Station working areas in consultation with HSE officer.
- ii. Clean up work area immediately after each task; never leave an area that is cluttered
- iii. with tools or supplies that could present tripping hazard.
- iv. Barriers as required shall be in place wherever necessary.
- v. Visible "Safety sign" shall be provided where necessary as per HSE requirements.
- vi. Good quality gloves are to be worn to protect your hands when using the equipment or handling materials.
- vii. The basic Personal Protective Equipment for this particular job are:
 - a. Hard Hats (Hat Colours as specified by HSE Department)
 - b. Gloves (Must Be Task Specific)

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- c. Goggles (Clear Glass for underground areas and Black Glass for work in Sun Light)
- d. Reflective Vest
- e. Safety Boots (High Ankle as Qatar Rail)

Note: Always wear safety spectacles when using the equipment.

Other specific risks & measures are addressed in the Risk assessment attached in Appendix B.

7 Environmental:

The site team including subcontractors shall implement the following environmental controls measures:

- a) The waste material from the installation of Automatic Transfer Switch (ATS) are to be placed in waste skips provided at site.
- b) Unused materials shall be returned to the stores for appropriate storage according to manufactures' instructions for potential reuse;
- c) Colour coded skips with signage shall be provided for waste segregation (general waste, metals, and plastics). Separate colour coded storage skips to be used for hazardous material.
- d) Good housekeeping shall be maintained regularly at job site.

8 Interfaces and Permits

8.1 Interfaces

- Not Applicable

8.2 Permits

- Qatar Rail Permit 2

9 Appendices / References:

9.1 Appendices:

- Appendix A –Inspection and Test plan;
- Appendix B– Risk Assessment;
- Appendix C- Test Report

9.2 References:

This Method Statement shall be read in conjunction with the following documents:

Material Submittal:

Material submittal for Cable Glands.

Material Submittal for Fir Resistant Multicore Armoured Cables.

Material Submittal for Low Voltage LSOH Cables & Wires.

Material Submittal for Distribution Boards.

Material Submittal for Cable Accessories.

Material Submittal for Wiring Devices and Accessories.

Material Submittal for Identification and Labelling

Material Submittal for ATS Panels.

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Method Statement For:

Document No.	Document Title
M002-RLR-ELE-MES-00001	Installation of Cable Containment System
M002-RLR-ELE-MES-00002	Installation of GI Conduits, Flexible Metallic Conduits & Accessories
M002-RLR-FRS-MES-00009	Installation of Fire Alarm Control Panel & Repeater Panels
M002-RLR-ELE-MES-00010	Installation of Wiring Accessories & General Power
M002-RLR-ELE-MES-00011	Installation of LV Cables & Wires

Specifications:

Document No.	Document Title
M002-RLR-MEP-TEN-00007	Volume 6 – Employer’s Requirements – Design Specifications
M002-RLR-MEP-TEN-00008	Material and Workshop Specifications Volume 7
M002-RLR-MEP-SPE-27005	DD2 –Qatar University Station-WP11.2 MEP Specifications
M002-RLR-MEP-SPE-36303	DD2 – Lusail Station-WP18.2 MEP Specifications
QCS 2014	QCS 2014 Section 21 Part 17.2.3
M002-RLR-ELE-SPE-36013	Lusail Station - WP18.2 - DD2 - Earthing and Bonding Specifications
KAHRAMAA	Section 10
Volume 6 –Contract’s Requirements Design Speciation’s	13.3 Electrical Works Description,(13.3.2 General Design Criteria) 13.3.3 Station
BS EN 60947	Automatic Transfer Switching Equipment Installation
BS EN 7671	Standards for Electrical Installation
NFPA 70	National Electrical Code ®
NFPA 130	Standard for Fixed Guide way Transit and Passenger Rail System

Reports & Calculation:

Document No.	Document Title
M002-RLR-MEP-RPT-27003	DD2- Qatar University Station Earthling & Bonding Report
M002-RLR-ELE-RPT-26000	DD2- Qatar University Station WP11.2 – MEP Design Report
M002-RLR-ELE-CLN-26004	DD2- Qatar University Station Electrical Calculation Notes
M002-RLR-MEP-RPT-27701	DD2- Qatar University Station BACS Sequence of Operations
M002-RLR-MEP-RPT-27702	DD2- Qatar University Station BACS Input/output Schedule
M002-RLR-MEP-RPT-27703	DD2- Qatar University Station BACS Design Report

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