DOCUMENT CONTROL

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Title of Document	**SCADA ENGINEERING, INTEGRATION AND TESTING**	
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Amendment Details:

Sr.	Issue No.	Rev. No.	Date	Amendment Details	Reviewed by	Approved by
1	1	0	01.12.2021	First Issue	Shilajit Ray Satish Shah	Snehal Shah Abdulrashid Shaikh
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1. PURPOSE

1.1. SCADA engineering, integration & testing

2. SCOPE OF DOCUMENT

2.1. The scope of this document is to define a procedure for SCADA engineering, integration & testing.

(1) SCADA engineering & testing related to new updates
(2) SCADA engineering & testing related to maintenance
(3) Testing of C&R Relays for Inter-tripping scheme
(4) Testing of C&R Relays for SCADA
(5) Testing of 11Kv & 22Kv Relays for SCADA
(6) Testing of Pilot Relay scheme

2.2. The process document aims to define the guidelines to ensure the process efficiency and effectiveness as required by the Integrated Management System.

3. FIELD OF APPLICATION

3.1. This procedure is used for SCADA engineering, integration & testing in TPL-D's Franchisee areas of Bhiwandi & SMK.

4. FREQUENCY

4.1. As and when required

5. AUTHORITIES AND RESPONSIBILITY

5.1. The Head of Department is responsible for implementation of this procedure for effectiveness

5.2. The Head of Section at respective location is responsible for execution of this procedure

5.3. The authorized person of EHV department is responsible for execution of the work in accordance with this procedure

6. REFERENCES

6.1. OEM Manual for SCADA Software

7. SPECIFIC COMPETANCY REQUIREMENTS

7.1. Tech/Jr. Exe/Exe/AM/M should have Knowledge of

(1) SCADA Software

(2) Relay configuration

(3) Protection & Interlocking scheme

(4) Automation equipment's and related safety aspects

(5) Use of PPEs

7.2. Tech/Jr. Exe/Exe/AM/M shall have authority for electrical isolation and issue of LCP/PTW.

8. INTERFACE WITH OTHER DEPARTMENTS/SECTIONS, IF ANY

8.1. EHV Control Room

8.2. EHS Department

8.3. Safety Department

8.4. Store Department

8.5. HR and Security Department

9. TOOLS AND TACKLES

9.1. Equipment's

(1) Testing kit

(2) Laptop with all required accessories and software

9.2. The team shall carry following tools & tackles.

(1) Tool kit

(2) Extension Board with ELCB

(3) Crimpers & connectors

(4) Multi Meter

(5) Live Line Detector (if Isolation is required)

(6) Earthing Device (if Isolation is required)

(7) LOTO (if Isolation is required)

(8) Barricading tape

9.3. Stationery and Documents

(1) All forms enlisted as attachments

10. PERSONAL PROTECTIVE EQUIPMENTS / SAFETY TOOLS

Following PPEs shall be used to carry out work at site.

10.1. Safety shoes

10.2. Safety helmet

10.3. Cotton Gloves

10.4. Insulating Gloves – 11KV/22KV as applicable

10.5. Gum boot

11. SIGNIFICANT RISK PARAMETRS

11.1. Quality Management System: High

11.2. Impact on Environment: Medium

11.3. Health and Safety Risk: High

11.4. Energy Management: Low

11.5. Asset Management Risk: High

12. PROCEDURE

12.1. Work procedure

(1) SCADA engineering & testing related to new updates

(a) Take backup of running SCADA project from Server
(b) Make list of items related to new updates
(c) Prepare document related to new updates like nos. of panels, nos. of equipment's, communication details etc.
(d) Restore SCADA project in engineering PC & offline prepare SCADA configuration files related to tagging, MIMIC diagrams, Alarm Configuration, Trend configuration, unit configuration based on predefined protocol connectivity
(e) Compile SCADA project for any error and take backup of project
(f) Deployed modified project in SCADA servers.

(g) First check communication established between new panels with SCADA
(h) Verify panel name, feeders name and panel layout with SCADA MIMIC pages as per field arrangement
(i) For other new updates, simulate BI/BO & verify measurement parameters with site.
(j) After completion, inform control Room about new updates in SCADA

(2) SCADA engineering & testing related to maintenance

(a) Taken backup of running SCADA project from Server
(b) Prepare document related to SCADA engineering maintenance activity
(c) Check whether it is possible to online changes with running SCADA system
(d) If possible, do modification in SCADA engineering files in running project
(e) Compile project for any error then restart related application of SCADA
(f) If online modification is not possible then restore running SCADA backup project in engineering PC & offline prepare SCADA configuration files
(g) Deployed modified project in SCADA servers.
(h) Verify SCADA engineering modification with respect to actual field condition
(i) Inform control Room about SCADA engineering maintenance completion

(3) Testing of C&R Relays for Inter-tripping scheme

(a) Plan testing jointly with Project / maintenance team.
(b) If feeder isolation is required than carry out the necessary switching and Isolation activities as per operation OCP: TPDF02-DIS01-OCP-005
(c) Ensure SCADA signal configuration for related Inter tripping scheme.
(d) Same activity has been carried out from the other end relay & check for the same.
(e) If feeder isolation is required than carry out the necessary switching and Isolation activities as per operation OCP: TPDF02-DIS01-OCP-005.

(4) Testing of C&R Relays for SCADA

(a) Plan testing jointly with Project / maintenance team.

(b) Ensure SCADA signal configuration is ready for related testing.
(c) If feeder isolation is required than carry out the necessary switching and Isolation activities as per operation OCP: TPDF02-DIS01-OCP-005
(d) Check all possible operations from SCADA.
(e) Simulate all possible status signals from C&R panel & verify on SCADA.
(f) If feeder isolation is required than carry out the necessary switching and Isolation activities as per operation OCP: TPDF02-DIS01-OCP-005

(5) Testing of 11Kv & 22Kv Relays for SCADA

(a) Plan testing jointly with Project / maintenance team.
(b) Ensure SCADA signal configuration is ready for related testing.
(c) If feeder isolation is required than carry out the necessary switching and Isolation activities as per operation OCP: TPDF02-DIS01-OCP-005
(d) Check all possible operations from SCADA.
(e) Simulate all possible status signals from 11kv & 22kv panel & verify on SCADA.
(f) If feeder isolation is required than carry out the necessary switching and Isolation activities as per operation OCP: TPDF02-DIS01-OCP-005

(6) Testing of Pilot Relay scheme

(a) Plan testing jointly with Project / maintenance team
(b) Ensure SCADA configuration is ready for testing.
(c) Ensure end to end FO connectivity between source & destination Pilot Relays.
(d) Simulate all possible signals for pilot wire protection scheme & verify on SCADA.
(e) If feeder isolation is required than carry out the necessary switching and Isolation activities as per operation OCP: TPDF02-DIS01-OCP-005.

12.2. Housekeeping

(1) The team shall at all the times keep the site free from the accumulation of waste materials and debris and upon completion of work shall clear away and dispose all the surplus materials, rubbish and temporary works of whatsoever nature and kind. The team shall ensure clean and tidy site.

(2) The team shall ensure that the hazardous waste & non-hazardous

waste are handled as per OCP # TPDF02-STO01-OCP-006 & 007.

13. IMPACT ANALYSIS OF SIGNIFICANT RISKS

13.1. Quality Management System

(1) Details of Quality Issues involved

(a) Incompetent manpower (Wrong configuration)

(b) Incompetent manpower (Wrong testing)

(c) Incompetent manpower (Wrong testing approach)

(2) Details of Quality Assurance plan

(a) Ensure work to be carried out as per OEM Manual

13.2. Health and Safety

(1) Details of Health and Safety Hazard involved

(a) Exposure to screen radiation

(b) Excessive workload

(c) Continuous Sitting

(d) Flash over during isolation or energization or wrong isolation

(e) Fire hazard due to electric flash over during switching operation of VCB locally

(f) Negligence of use of safety PPEs / Non usage of PPEs/ Use of faulty PPEs

(g) Flashover due to equipment failure

(h) Flash over due to earthing on live part (Local Earthing through earth lead)

(i) Use of faulty Tools

(j) Contact with sharp edges

(k) Animal/ insect bite

(l) Contact with Live terminal/ cable/ wire/ busbar

(2) Health and Safety Precautions required

(a) Use all required PPEs during execution of the job

(b) Keep the First aid box ready within reachable limit for any exigency during work

(a) Use extension board with ELCB for LT supply and Provision of Body earthing

(c) Tools and PPE Checking

(d) Conduct Toolbox talk in presence of all crew members about health & safety precautions

(e) Training on PPE

(f) Training on Road safety policy & guideline

13.3. Environment

(1) Details of Environmental impact

(a) Resource depletion

(b) Land contamination

(2) Precautions to minimize Environmental impact

(a) Ensure that Material consumption monitored during and after work.

(b) Ensure that all waste including hazardous waste collected & segregated and submitted to stores.

(c) Ensure that all plastic waste, metal waste, wooden waste Collected and submitted to the store/scrap yard for proper disposal as per relevant Waste Management

13.4. Energy Management

(1) Details of energy use involved

(a) Consumption of auxiliary power by testing equipment & tools during work

(b) Fuel consumption during material handling

(2) Precautions to minimize energy use

(a) Switch off supply when not in use during work.

(b) Ensure energy efficient tools and equipments

13.5. Asset Management

(1) Details of Asset related risks

(a) Asset damaged due to mishandling

(2) Mitigation plan for asset related risks

(a) Work to be carried out under authorized person supervision

14. LIST OF ATTACHMENTS

Sr.	Document /Record Description	Reference No.
1	SCADA engineering, integration & testing Checklist	TPDF02-DIS01-OCP-027-F01

***** End of Procedure *****