

**ATER SUPPLIES DEPARTMENT**  
**STANDARD SPECIFICATION E-90-21**  
**MANUAL FOR**  
**SWITCHBOARD AND CONTROL BOARD**

1. GENERAL

This Specification is supplementary to WSD Standard Specification E-90-02 (Manual for Electrical and Instrumentation Equipment) with additional requirements stated below.

2. REQUIREMENTS OF MANUAL CONTENT

2.1 Handling, Installation, Storage and Transit Information

Any transit clamps or guards on switchboard and control board, protective relays or instrument against vibration for transport and storage shall be detailed. Recommended details on grouting of foundation bolts shall be provided. Mounting skirt / rails at panel fixing points shall be indicated.

2.2 Design, Operating and Technical Information

System design information of control, monitoring and alarm for switchboard and control board shall be provided. It shall include a detailed description of each mode of control, monitoring and alarm and the calculation of protection settings for switchboard and control board. For motor starter circuits of the switchboard, it shall specify their starting frequency limitation. Operational data and settings of protective devices and timers shall be tabulated. For auto-transformer motor starter, the thermal withstand capability, utilisation category and percentage tapping of the auto-transformer shall be specified.

2.3 Maintenance Information

It shall include:

- (a) A schedule of maintenance tools supplied with the contract e.g. test plug, circuit-breaker slow closing handle, circuit-breaker drawout handle, earthing gear, torque wrenches etc.;
- (b) A dismantling and re-assembly instruction with '*warning*' or '*caution*' information for the safe maintenance of the switchboard and control board;
- (c) A components maintenance instruction on the contacts for circuit-breakers, contactors and relays, moving mechanism of circuit-breakers and busbars; and

- (d) A panel repair information e.g. details of primer, undercoat and top coat of paint, method of application and curing.

#### 2.4 Reports and Certificates

Type test certificates or reports called for in the contract shall form part of the manual with the following information:

- (a) Particulars of test including the name and address of testing station, profile of the testing authority, date and time of test, witnessing authority.
- (b) Particulars of equipment tested including the manufacturer and model, rating, test objective and relevant IEC, BSEN Standards and other international standards.
- (c) Certified copy of full size drawing showing the equipment assembly, insulating barriers, busbars / cable sizes and type, clearance and creepage.
- (d) Description of testing details and conditions as specified in relevant IEC, BSEN Standards and other international standards to conform test conditions are in compliance with these standards.
- (e) For short-circuit testing, the current transformer mounting details, switchgear connection, partition type and thickness and ventilation arrangement shall be detailed.