



**Bangladesh Power Development Board**  
**INTEGRATED MANAGEMENT SYSTEM**  
**(BASED ON ISO 9001:2015, ISO 14001:2015 & ISO**  
**45001:2018 STANDARDS)**

**PROCEDURE FOR INSTRUMENT & CONTROL**  
**MAINTENANCE – COAL POWER PLANT**



## INTEGRATED MANAGEMENT SYSTEM

Document No.:  
BPDB-IMS-PR-033

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### PROCEDURE FOR INSTRUMENT & CONTROL MAINTENANCE – COAL POWER PLANT

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#### 1.0 Purpose

- To establish effective instrument & control maintenance system for the plant and machinery to ensure continuing process capability
- To plan and implement instrument control maintenance
- To ensure Occupational Health & Safety management system in the gas turbine power generation
- To assess environmental management system for the gas turbine power generation.

#### 2.0 Scope

Applies to whole of Integrated Management System of Bangladesh Power Development Board (BPDB).

#### 3.0 Terms & Definition

##### Definition

None

##### Abbreviations

BPDB – Bangladesh Power Development Board  
MR – Management Representative

#### 4.0 Roles and Responsibility

Tasks in Reference Clause nos.	Responsibility
5.1, 5.2, 5.3, 5.4	Head of instrument & control maintenance, SDE/AE/SAE,
5.5	MR/ Head of the plant

#### 5.0 Procedure

##### Plan of the maintenance procedures

Following 3 types of maintenance is carried out

- Breakdown maintenance
- Schedule maintenance
- Preventive maintenance

##### 5.1 Breakdown Maintenance

On-Load  
Off-Load

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- Concerned operation unit report breakdown or abnormality
- Job allocated to concerned official
- Concerned technician/ official/ engineer check the facility and assess the maintenance task
- Maintenance task is approved
- If the maintenance can be done on-load, then it is carried out
- If the maintenance of repair requires to be carried out off load, permission of the concerned authority is taken
- Maintenance work is carried out accordingly
- On completion of Maintenance work, required checking is carried out.
- Maintenance work is recorded

#### 5.2 Schedule Maintenance

- Seek permit from operation department on schedule issue
- Operation gives permit after isolation
- Respective maintenance work is one accordingly
  - Cleaning of all Operator Work Station(OWS) and Engineering Work Station(EWS) so that computer systems work properly without any unwanted breakdown or interruption of the machine
  - Cleaning environmental area o DCS room where DCS panels are placed
  - All sensitive places are maintained equipment friendly ambient temperature (16DC to 25°C). These places are DCS cabinet room main control room, engineering workstation room, switch room etc. To maintain required temperature HVAC is used
  - Field equipment are cleaned time to time as the plant is coal based so dusts in field equipment may cause damage or malfunctioning of equipment.
  - Internal batteries of motorized actuators are changed time to time as it needed
  - Calibration of coal measurement scale
  - Procedure goods every year as per requirement
- Planned maintenance
  - Planned maintenance is classified into 4(four) categories: Class A Maintenance, Class B Maintenance, Class C Maintenance and Class D Maintenance
  - Class A Maintenance
    - Prepare a tentative maintenance schedule
    - Approve permission from top level management
    - A complete overhauling of all the control system and instruments by thorough check up and inspecting the physical and working condition of those and necessary action accordingly taken in every 4 to 5 years to restore performance of the plant efficiently and effectively
  - Class B Maintenance

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- Class B maintenance is made Between two class A maintenance events
- Class B maintenance is normally not followed but if major overhauling like class A maintenance is execute for long intervals (6 to 7 years) then this type maintenance is taken into consideration Approve permission from top level management
- Class B maintenance is carried out accordingly
- Class C Maintenance
  - Class C maintenance is strictly maintained as normally class A and class B type maintenance cannot be done as per schedule time.
  - Elimination of minor defects
  - Replacement of faulty parts
  - Calibration of some equipment such as coal belt scale, coal feeders etc.
- Class D Maintenance
  - Daily maintenance of equipment as and when required if there are any abnormalities found
- Recommended Sequence of Planned Maintenance
  - If class A maintenance is carried out once every 4 years, the following maintenance sequence is as followed-

A → C → C → C → A

If class A maintenance is carried out once every 6 years, the following maintenance sequence is as followed

A → C → C → B → C → C → A

### 5.3 Preventive maintenance

- Prepare long-term preventive maintenance plan, at least for 3 years for major facilities
- Concerned authority approves preventive maintenance plan
- Resources and spares are mobilized to carryout preventive maintenance
- Where applicable, plant shutdown s solicited
- Plan Scheduled maintenance is modified to adjust with the approval of shut down
- Maintenance work is carried out following approved plan
- Necessary checks are performed after maintenance work

### 5.4 Maintenance Records

- All maintenance jobs are recorded in maintenance log book
- Machine history cards are maintained and maintenance records, especially breakdown reports, are recorded.
- Equipment check list are prepared and carrying out routine checks

### 5.5 Implementation and Review

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- Procedure for Maintenance and its effectiveness after implementation will be checked and reviewed during internal audits.
- Actions are taken on the basis of review.

### 5.6 Environmental Aspect, Impact & Controls

Any activity at the plant, whether it is carried out for ensuring quality of service or meeting requirement of the interested parties, there will be some environmental aspects associated with it. It is a requirement of the IMS of BPDB to identify those environmental aspects, evaluate their impact and determine necessary controls.

While carrying out the activities and operation, the employees of BPDB need to exercise appropriate and predetermined controls so as to prevent or mitigate any adverse impact that may be associated with the activity or the process.

Some examples of environmental aspects associated with the Procedure for Instrument & Control Maintenance-Coal Power Plant are as below:

SI Nos.	Aspect	Impact	Controls
1.	Solid Waste (wires, plastics)	Soil / Water Pollution	1. Follow the waste management plan
2.	Discarding of Rare Earth Metals	Depletion of Resource	1. Follow the waste management plan
3.	Chemical Cleaning Agent	Soil / Water Pollution	1. Work and dispose as per the chemical disposal plan 2. Provide Necessary Training
4.	Rejection of Refrigerant	Depletes Ozone layer	1. Use the latest eco-friendly air-conditioner
5.	Paper Use	Natural Resource Depletion	Avoid printing e-mail and drafts (display documents on screen rather than printing out a paper copy) § Archive electronically
6.	Lighting	Natural Resource Depletion	Using day lightings § Unnecessary lights should be switched off
7.	Empty Packs	Waste Generation	Segregate properly and deliver to the central admin department

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<b>8.</b>	Effluent from toilet use	Water Pollution	Dispose to Municipal discharge connection for adequate disposal
<b>9.</b>	Battery Disposal	Soil / Water Pollution	1. Follow the waste management plan
<b>10.</b>	Capacitors Disposal	Soil / Water Pollution	1. Follow the waste management plan

The table above provides examples only. The IMS team of each site needs to identify the aspect impact and controls related to specific activities and ensures that the environmental performance of the organization is effectively maintained. For this purpose, the procedure “Environmental Aspect Impact Assessment Procedure” is to be followed and forms “Environmental Aspect Impact Register” is to be filled up by the IMS team.

#### 5.7 OHS Hazard, Risk & Controls

Any activity at the plant, whether it is carried out for ensuring quality of service or meeting requirement of the interested parties, there will be some occupational hazards with it related to the occupational health and safety (OHS) to the workers and employees. It is a requirement of the IMS of BPDB to identify those OHS hazards and determine necessary controls.

While carrying out the activities and operation, the employees of BPDB need to exercise appropriate and predetermined controls so as to prevent or mitigate any adverse consequence that may be associated with the activity or the process.

Some examples of OHS hazards and with the Procedure for Instrument & Control Maintenance-Coal Power Plant are as below:

SI Nos.	OHS Hazard	Controls
1.	Soldering	1. Provide Necessary training 2. Maintain adequate PPE whilst at worksite 3. Ensure a Permit to Work is issued as per guidance before personnel is sent for work
2.	Energized Components	1. Completely de-energizing equipment, conductors or circuits before an employee begins work 2. Maintain adequate PPE whilst at worksite 3. Ensure a Permit to Work is issued as per guidance before personnel is sent for work
3.	Control Room Fire Hazard	1. Use of fire extinguisher 2. Follow the 'Prevention of Fire and

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		Explosion' Procedure
4.	Failure of PTW Process	1. Provide Necessary Training 2. Active Supervision of activity
5.	Wrong Use of tools	1. Provide Necessary Training 2. Active Supervision of activity
6.	Wrong use of Lifting equipment	1. Provide Necessary Training 2. Active Supervision of activity. 3. Maintain adequate PPE whilst at worksite
7.	Dropped object	1. Provide Necessary Training 2. Maintain adequate PPE whilst at worksite
8.	Fall	1. Provide Necessary Training 2. Maintain adequate PPE whilst at worksite
9.	Expose to Chemicals	1. Provide Necessary Training 2. Maintain adequate PPE whilst at worksite
10.	Cold Burn	1. Provide Necessary Training 2. Maintain adequate PPE whilst at worksite
11.	Chemical Burn	1. Provide Necessary Training 2. Maintain adequate PPE whilst at worksite 3. Maintain adequate housekeeping
12.	Electric Shock	1. Ensure a Permit to Work is issued as per guidance before personnel is sent for work 2. Maintain LOTO Procedure 3. Maintain adequate PPE whilst at worksite
13.	Wrong Startup	1. Alarm 2. Ensure a Permit to Work is issued as per guidance before personnel is sent for work
14.	Improper re-assembly of equipment	1. Provide Necessary Training 2. Active Supervision of activity

The table above provides examples only. The IMS team of each site needs to identify the OHS hazards and necessary controls related to specific activities and ensures that the environmental performance of the organization is effectively maintained. For this, the procedure Hazard Identification and Risk Assessment Procedure is to be followed and Hazard Identification and Risk Assessment Register is to be filled up by the IMS team.

### 6.0 References

- a) Audit Report

### 7.0 Appendix

None

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#### 8.0 Revision History

SI No.	Revision Number	Section	Change Made	Date of Revision

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