



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

PROCEDURE FOR INSTRUMENT & CONTROL
MAINTENANCE – HIGH SPEED FURNACE OIL



INTEGRATED MANAGEMENT SYSTEM

Document No.:
BPDB-IMS-PR-031

Revision No.: 00

PROCEDURE FOR INSTRUMENT AND CONTROL MAINTENANCE – HIGH SPEED FURNACE OIL

Effective Date: 01-11-2021

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1.0 Purpose

- a. To establish effective instrument & control maintenance system for the plant and machinery to ensure continuing process capability
- b. To plan and implement instrument & control maintenance

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
5.0 ,	Maintenance EXEN
5.1, 5.2, 5.3	Shift engineer, Maintenance engineer
5.4	Head of instrument & control maintenance, Concerned technical staff
5.5	MR/ Head of the plant

5.0 Procedure

Plan of the Maintenance Procedure

As the maintenance intervals often depend on the operating conditions, the stated intervals are to be considered as guidelines of supplier of the plant. Take note of these guidelines when creating overall maintenance plan for the plant. The maintenance intervals are given either as running hours for the device or as calendar based intervals (Hours, Days, weeks, months or years). If none of these are applicable, the best estimation must be applied. The calendar-based intervals are counted as total elapsed time. If not otherwise stated, this interval applies regardless of the running hours of the device. It is left to the discretion of the maintenance planner to apply the stated interval correctly

Following 3 types of maintenance is carried out

- Schedule maintenance

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- Breakdown Maintenance
- Preventive maintenance

5.1 Schedule Maintenance

- Schedule Maintenance of D.C.S. & Diamo System
 - Pre Maintenance Activities & Isolation
 - • To inform control room
 - • Ensure De-energized Condition where it is required. Close the earth switch (generator side)
 - • Inform network control room so that they can open the isolator to isolate the system from the grid
 - Maintenance Activities
 - Maintenance work is carried out accordingly following Service manual of engine
 - Post Maintenance Activity
 - Providing clearance to Control Room after work completion
- Schedule Maintenance of Burner System
 - Pre Maintenance Activities & Isolation
 - To inform control room
 - Ensure De-energized Condition where it is required. Close the earth switch (generator side)
 - Inform network control room so that they can open the isolator to isolate the system from the grid
 - Maintenance Activities
 - Maintenance work is carried out accordingly following Service manual of engine
 - Post Maintenance Activity
 - Providing clearance to Control Room after work completion
- **Schedule Maintenance of Exciter and TRV System**
 - Pre Maintenance Activities & Isolation
 - To inform control room
 - Ensure De-energized Condition where it is required. Close the earth switch (generator side)
 - Inform network control room so that they can open the isolator to isolate the system from the grid
 - Maintenance Activities
 - Maintenance work is carried out accordingly following Service manual of engine
 - Post Maintenance Activity
 - Providing clearance to Control Room after work completion
- Schedule Maintenance UPS Battery
 - Pre Maintenance Activities & Isolation
 - To inform control room
 - Ensure De-energized Condition where it is required. Close the earth switch (generator side)

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- Inform network control room so that they can open the isolator to isolate the system from the grid
- Maintenance Activities
 - Maintenance work is carried out accordingly following Service manual of engine
- Post Maintenance Activity
 - Providing clearance to Control Room after work completion
- Schedule Maintenance of Protection and Signal System
 - Pre Maintenance Activities & Isolation
 - To inform control room
 - Ensure De-energized Condition where it is required. Close the earth switch (generator side)
 - Inform network control room so that they can open the isolator to isolate the system from the grid
 - Maintenance Activities
 - Maintenance work is carried out accordingly following Service manual of engine
 - Post Maintenance Activity
 - Providing clearance to Control Room after work completion
- Schedule Maintenance Magnetic Relays
 - Pre Maintenance Activities & Isolation
 - To inform control room
 - Ensure De-energized Condition where it is required. Close the earth switch (generator side)
 - Inform network control room so that they can open the isolator to isolate the system from the grid
 - Maintenance Activities
 - Maintenance work is carried out accordingly following Service manual of engine
 - Post Maintenance Activity
 - Providing clearance to Control Room after work completion
- Schedule Maintenance of Control Desk and Switches
 - Pre Maintenance Activities & Isolation
 - To inform control room
 - Ensure De-energized Condition where it is required. Close the earth switch (generator side)
 - Inform network control room so that they can open the isolator to isolate the system from the grid
 - Maintenance Activities
 - Maintenance work is carried out accordingly following Service manual of engine
 - Post Maintenance Activity
 - Providing clearance to Control Room after work completion
- Schedule Maintenance of Transmitter, Indicator and Recorder
 - Pre Maintenance Activities & Isolation
 - To inform control room

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- Ensure De-energized Condition where it is required. Close the earth switch (generator side)
- Inform network control room so that they can open the isolator to isolate the system from the grid
- Maintenance Activities
 - Maintenance work is carried out accordingly following Service manual of engine
- Post Maintenance Activity
 - Providing clearance to Control Room after work completion
- Schedule Maintenance of at Control System with Thermocouple and Thermo Resistance
 - Pre Maintenance Activities & Isolation
 - To inform control room
 - Ensure De-energized Condition where it is required. Close the earth switch (generator side)
 - Inform network control room so that they can open the isolator to isolate the system from the grid
 - Maintenance Activities
 - Maintenance work is carried out accordingly following Service manual of engine
 - Post Maintenance Activity
 - Providing clearance to Control Room after work completion
- Schedule Maintenance of Servomotor, Servo Driver and Conductivity Meter
 - Pre Maintenance Activities & Isolation
 - To inform control room
 - Ensure De-energized Condition where it is required. Close the earth switch (generator side)
 - Inform network control room so that they can open the isolator to isolate the system from the grid
 - Maintenance Activities
 - Maintenance work is carried out accordingly following Service manual of engine
 - Post Maintenance Activity
 - Providing clearance to Control Room after work completion
- Schedule Maintenance of Turbine Protection System
 - Pre Maintenance Activities & Isolation
 - To inform control room
 - Ensure De-energized Condition where it is required. Close the earth switch (generator side)
 - Inform network control room so that they can open the isolator to isolate the system from the grid
 - Maintenance Activities
 - Maintenance work is carried out accordingly following Service manual of engine
 - Post Maintenance Activity
 - Providing clearance to Control Room after work completion

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- Schedule Maintenance of Different Cards and Relays of H₂ Plant
 - Pre Maintenance Activities & Isolation
 - • To inform control room
 - • Ensure De-energized Condition where it is required. Close the earth switch (generator side)
 - • Inform network control room so that they can open the isolator to isolate the system from the grid
 - Maintenance Activities
 - Maintenance work is carried out accordingly following Service manual of engine
 - Post Maintenance Activity
 - Providing clearance to Control Room after work completion.
- Schedule Maintenance of Pressure Gage, Conductivity Meter and Selector Switches
 - Pre Maintenance Activities & Isolation
 - • To inform control room
 - • Ensure De-energized Condition where it is required. Close the earth switch (generator side)
 - • Inform network control room so that they can open the isolator to isolate the system from the grid
 - Maintenance Activities
 - Maintenance work is carried out accordingly following Service manual of engine
 - Post Maintenance Activity
 - Providing clearance to Control Room after work completion
- Schedule Maintenance of All Instrument Valves
 - Pre Maintenance Activities & Isolation
 - To inform control room
 - Ensure De-energized Condition where it is required. Close the earth switch (generator side)
 - Inform network control room so that they can open the isolator to isolate the system from the grid
 - Maintenance Activities
 - Maintenance work is carried out accordingly following Service manual of engine
 - Post Maintenance Activity
 - • Providing clearance to Control Room after work completion

5.2 Breakdown Maintenance

On-Load

Off-Load

- Concerned operation unit report breakdown or abnormality
- Job allocated to concerned official
- Concerned technician/ official/ engineer check the facility and assess the maintenance task

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- 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

5.3 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 is 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 Internal Audit

- 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-High Speed Diesel are as below:

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

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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-High Speed Diesel 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 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

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		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

- Service manual of engine
- Service manual
- Audit Report

7.0 Appendix

None

8.0 Revision History

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SI No.	Revision Number	Section	Change Made	Date of Revision

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