# PHARMA DEVILS

ENGINEERING DEPARTMENT

| STANDARD OPERATING PROCEDURE | |
|---|---|
| **Department:** Engineering | **SOP No.:** |
| **Title:** Operation of Steam Boiler | **Effective Date:** |
| **Supersedes:** Nil | **Review Date:** |
| **Issue Date:** | **Page No.:** |

## 1.0 OBJECTIVE

To lay down the procedure for operation of Steam Boiler

## 2.0 SCOPE

This standard operating procedure (SOP) is applicable for the operation of steam boiler.

| MACHINE DETAILS | |
|---|---|
| Model | M: 1000 |
| Type | Double coil |
| Steam output | 850Kg/hr per Boiler |
| Load | 6.75Kw per Boiler |

## 3.0 RESPONSIBILITY.

Engineering Supervisor/technician will operate the Steam boiler and maintained the daily log Sheet.
Executive Engineering will check the daily log sheet
Manager Engineering will verify the daily log sheet

## 4.0 PROCEDURE

### 4.1 STARTING OF STEAM BOILER

4.1.1 Switch ON main power supply from electrical panel.
4.1.2 Ensure that RYB indicator glow from boiler control panel.
4.1.3 Ensure that heaters in FO. Tank & Day tank are always on.
4.1.4 Ensure the fuel oil level from sight glass of day tank is upto sufficient level.
4.1.5 Ensure water level from sight glass of water day tank is upto sufficient level.
4.1.6 Ensure that the hardness of feed water is less than 5PPM.Check the hardness according to Annexure no 1.
4.1.7 Open fuel oil outlet valve FOV10 of fuel service day tank.
4.1.8 Open feed water tank inlet valve SWV12 and condensate return valve SWV43.
4.1.9 Open the inlet valve SWV14 for Boiler no1and SWV15 for Boiler no2.
4.1.10 Ensure those economizer drain valves SWV16 for boiler NO.1and SWV17 for boiler NO.2 are in closed position.
4.1.11 Open the inlet oil valve FOV11 for boiler NO.1 and FOV12 for boiler NO.2.
4.1.12 Ensure that main steam valve of boiler no1/2 that is SV3/SV4 and common steam supply valve SV5 are always open. Ensure that steam bypass valve SV32for boiler NO.1 and SV33 for boiler NO.2 are in open position.
4.1.13 Ensure that main steam line valve SV1 for boiler NO.1and SV2 for boiler NO.2 are in closed position.

4.1.14 Ensure that blow down valve SV34 for Boiler no1 and SV35 for boiler NO2 are in closed position.

4.1.15 Switch ON the heater by turning the knob K1 and K2 for boiler NO1 and boiler NO2.

4.1.16 Switch ON the feed water pump manually by turning the knob K3 and K4 for boiler NO1 and boiler NO2.

4.1.17 Start the Boiler by turning the knob K3 and K4 in auto position for boiler NO1 and for boiler NO2.

4.1.18 When temp. of steam reaches to 150ºC in temperature indication meter then open the main steam Isolation valve SV1 for boilerNO.1and SV2 for boiler NO.2, then close the bypass valve SV32 for boiler NO.1 and SV33 for boilerNO.2

4.1.19 Observe loading and unloading of steam Boiler at set pressure

4.1.20 Ensure the system is running satisfactory and record the data in logbook as per annexure –I

## 4.2 STOPPING OF STEAM BOILER

4.2.1 When the boiler is at high pressure then turn the knob K3 and K4 for boiler NO.1 and NO.2 to off position.

4.2.2 After that close the main steam valve SV1 for boilerNO.1and SV2 for boiler NO.2.

4.2.3 Switch OFF the heater by turning the knob K1 and K2 for boiler NO1 and boiler NO2.

4.2.4 Open the blow down valve SV34 & SV35 for boiler No. 1 & No.2 & check the pressure from the pressure Gauge SPG7 for boiler No. 1 & SPG8 for boiler No.2.When steam press. Reaches at 2Kg./cm² then close the valve.

4.2.5 Open the bypass valve SV32 for boiler No.1 & SV33 for boiler No. 2.

4.2.6 Switch ON feed water pump manually by turning knob K3 & K4 for boiler No.1& 2 for cooling boiler coil.

4.2.7 Ensure feed water temperature from feed water temperature indicator mounted on control panel is below 50°C then switch OFF the knob K3 & K4 for boiler No. 1 & 2.

4.2.8 Close fuel oil valve FOV10 of fuel service day tank.

4.2.9 Close feed water tank inlet valve SWV12 and condensate return valve SW43.

4.2.10 Close the inlet valveSWV14 for Boiler no1and SWV15 for Boiler no2.

4.2.11 Close the inlet oil valve FOV11 for boiler NO.1 and FOV12 for boiler NO.2.

## 5.0 SAFETY AND PRECAUTIONS:

5.1 Do not bypass safety controls. Switches.

5.2 All hoses inside the unit are in good condition.

5.3 All electrical leads are secure and in good order

## 6.0 REVISION HISTORY

| Revision No. | Reason for Revision | Superseded from & date |
|---|---|---|
| 00 | New | ---- |

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## 7.0 REFERENCES

Manufacturer Manual of steam boiler.

## 8.0 ABBREVIATIONS

SOP: Standard Operating Procedure.
PPM: Parts Per Millions.

## 9.0 ANNEXURE

Annexure I: Valves, pressure gauge and Push button details
Annexure II: Daily log sheet of Steam Boiler

**Annexure I**

**Valves, pressure gauge and Push button details**

FOV10: Outlet of FO service tank
FOV11: Fuel inlet of Boiler no1
FOV12: Fuel inlet of Boiler no2
SWV12: Feed water inlet of day tank
SWV43: condensate return
SWV14: Feed water inlet of Boiler no1
SWV15: Feed water inlet of Boiler no2
SWV16: Economizer Feed water inlet of Boiler no1
SWV17: Economizer Feed water inlet of Boiler no2
SV01 : Steam isolation valve for boiler no1
SV02 : Steam isolation valve for boiler no2
SV03 : Steam supply valve for boiler no1
SV04 : Steam supply valve for boiler no2
SV05 : Common Steam supply
SV32 : Steam bypass supply for boiler no1
SV33 : Steam bypass supply for boiler no2
SV34 : Blow down for boiler no1
SV35 : Blow down for boiler no2
SPG7 : Pressure gauge Boiler no1
SPG8 : Pressure gauge Boiler no2

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**Annexure II**

**Daily log sheet of Steam Boiler**

**BOILER NO.-1**

| | STEAM | | STACK | | FUEL | | | FEED WATER | | STEAM | | STACK | FUEL | FEED WATER | REMARKS |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| TIME | PRESS | TEMP | TEMP | PRESS. | TEMP. | PRESS. | TEMP. | PRESS | TEMP | TEM | PRESS. | TEMP. | PRESS. | TEMP. | |
| 07:00 | | | | | | | | | | | | | | | |
| 08:00 | | | | | | | | | | | | | | | |
| 09:00 | | | | | | | | | | | | | | | |
| 10:00 | | | | | | | | | | | | | | | |
| 11:00 | | | | | | | | | | | | | | | |
| 12:00 | | | | | | | | | | | | | | | |
| 13:00 | | | | | | | | | | | | | | | |
| 14:00 | | | | | | | | | | | | | | | |
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| 18:00 | | | | | | | | | | | | | | | |
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| 22:00 | | | | | | | | | | | | | | | |
| 23:00 | | | | | | | | | | | | | | | |
| 00:00 | | | | | | | | | | | | | | | |
| 01:00 | | | | | | | | | | | | | | | |

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|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 02:00 | | | | | | | | | | | | | | | |
| 03:00 | | | | | | | | | | | | | | | |
| 04:00 | | | | | | | | | | | | | | | |
| 05:00 | | | | | | | | | | | | | | | |
| 06:00 | | | | | | | | | | | | | | | |
| 07:00 | | | | | | | | | | | | | | | |

| **SHIFT** | **OPERATOR** | **SIGN** | **FUEL CONS.LTR** | **FEED WATER CONS.LTR** | **FUEL RECEIVED** | **BLOW DOWN TIME** | | **WATER ANALYSIS** | |
|---|---|---|---|---|---|---|---|---|---|
| | | | | | | **NO-1** | **NO-2** | **PH** | **HARDNESS** |
| **A** | | | | | | | | | |
| B | | | | | | | | | |
| C | | | | | | | | | |

| **BOILER NO-1** | | **BOILER NO-1** | **BOILER NO-2** | **KWH** | **BOILER NO-1** | **BOILER NO-2** | **FUEL LTR** | **FEED WATER KL** | |
|---|---|---|---|---|---|---|---|---|---|
| **RUNNING HOURS:** | | | | **FINAL** | | | | | |
| **PREVIOUS RUNNING HOURS** | | | | **INTIAL** | | | | | |

# PHARMA DEVILS

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**STANDARD OPERATING PROCEDURE**

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| | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| **:** | | | | | | | | | | |
| **TOTAL RUNNING HOURS :** | | | | | **CONS.** | | | | | |

**EXECUTIVE ENGINEER**

**MANAGER ENGINEERING**

N/EN/0