



NLC TAMILNADU POWER LIMITED
DEPARTMENTAL PROCEDURE MANUAL
(Incorporating ISO 9001:2015, ISO 14001: 2015 & ISO 45001: 2018)
STANDARD OPERATING PROCEDURE

TITLE:- SOP for Wet Preservation of Boiler

Doc. ID: NTPL/OPRN/SOP-20

PURPOSE: To define Wet Preservation of Boiler

SCOPE: This SOP is applicable at NTPL

RESPONSIBILITY: Shift Engineer / Operation Engineer

During long shutdown of Boiler, unit should be kept under preservation for protecting the internal surface of pressure parts from oxidation. Generally wet preservation method is used for preserving pressure parts of a boiler. In this method the boiler water recirculation (Drum, Water walls, and BCW) system, Economizer, Super-Heaters and Re-Heaters are filled with DM water containing Hydrazine >200ppm and pH of 9.5-10 through filling lines connected to the Boiler drain header.

ACTIVITIES:

Prechecks: the following are the valves to be operated as mentioned for the scheme line-up:

| S.N. | LIST OF ISOLATIONS | REQUIREMENT | REMARKS |
|------|---|-------------|--------------------------------------|
| 1 | ECO DRAIN E-20 AND E-22 AND ISO. | CLOSE | TO BE OPEN WHILE FILLING ECO COILS |
| 2 | RING HDR DRAIN B-99 AND ISO. | CLOSE | TO BE OPEN WHILE FILLING WATER WALLS |
| 3 | W/W DRAIN HDR TO IBD ISOLATION | CLOSE | - |
| 4 | BOILER FILL LINE VALVE @ OML | OPEN 30% | - |
| 5 | ECO- INLET E-2 AND E-3 | CLOSE | - |
| 6 | DRUM DRAIN B-81 AND B-82 | CLOSE | - |
| 7 | CBD DRAIN B-88, B-85 AND COMMON ISO. | CLOSE | - |
| 8 | SH DRAIN HDR TO IBD COMMON ISOLATION | CLOSE | - |
| 9 | SH FILLING VALVE (NEAR DRN HDR) | CLOSE | TO BE OPEN WHILE FILLING SH COILS |
| 10 | ALL SH DRAIN | OPEN | - |
| 11 | ALL RH DRAIN TO IBD | CLOSE | - |
| 12 | BOTH RH FILLING VALVE (NEAR DRAIN VALVE) | CLOSE | TO BE OPEN WHILE FILLING RH COILS |
| 13 | MSV-1 AND MSV-2 AND ITS BYPASS AND DRAIN BEFORE MSV | CLOSE | - |
| 14 | ALL DRUM VENTS | OPEN | - |
| 15 | ALL SH VENTS | OPEN | - |



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| | | | |
|----|---|----------|---|
| 16 | ALL RH VENTS | OPEN | - |
| 18 | S-148 AND ISOLATION | CLOSE | - |
| 19 | CBD SAMPLE LINE ROOT VALVE | OPEN | - |
| 20 | W/W DRAIN HDR DRAIN TO ATM | OPEN 30% | - |
| 21 | Other unit Filling fully isolated | | - |
| | TURBINE SIDE | | |
| 1 | ALL MAL DRAINS | OPEN | - |
| 2 | MS AND HRH STRAINER DRAIN | OPEN | - |
| 3 | RH ATM DRAIN | OPEN | - |
| 4 | ALL DOSING TO CEP AND DEA. OUTLET AND DRUM | CLOSE | - |
| 5 | DOSING TO FILL LINE | OPEN | - |
| 6 | BOTH DEA INITIAL FILL VALVE | CLOSE | - |
| 7 | HPBP LINE DRAIN | OPEN | - |
| 8 | LPBP LINE DRAIN | OPEN | - |
| 9 | CHECK HEALTHINESS OF AMMONIA AND HYDRAZINE DOSING PUMP | | - |
| 10 | @17.5ML, FILLING LINE 1 ST ISOLATION 30% OPEN AND 2 ND ISO FULL CLOSE | | - |

Procedure:

Stage I (Drum-Eco-WW-SH)

1. Keeping Boiler fill pump RC full open and discharge valve crack open, start Fill pump.
2. Slowly open discharge valve to 40 %.
3. Now slowly open fill valve @17.5ML, to charge the line, keeping W/W drain hdr drain to atm open.
4. Start both ammonia and both Hydrazine dosing pump.
5. Take sample near drain hdr. When high concentration of Hydrazine and ammonia is achieved, slowly open B-99 and its isolation.
6. Regulate fill valve @17.5ML to keep the flow 100 TPH (Flow should be enough to keep Hydrazine>200ppm and pH>9.5).
7. Observe pressure rise in Drain hdr gauge.
8. Every 30 mins take sample to check Hydrazine >200ppm and pH>9.5.
9. As level rises, accordingly adjust the flow to keep 100 TPH.
10. Once drum level starts rising, slowly open E-20 and E-22 and its isolation.
11. Adjust the flow to maintain Hydrazine >200ppm and pH>9.5.



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12. Along with E-22 and E-20, open SH filling valve, keeping fill water flow around 100 TPH, maintaining Hydrazine >200ppm and pH>9.5.
13. When water starts coming out of vents, take sample and close all vents one by one.
14. Pressurize the Drum upto 5 ksc and once vent sample reading is within the limits, Stop Fill Pump-Close 17.5ML Isolations-Stop all dosing pumps.
15. Close SH Filling valve, B-99, E-22, E-20 and their isolations.

Stage II (RH Filling)

1. B-99, E-22, E-20, SH filling valves and isolations Fully closed.
2. W/w drain header drain IBD isolation closed.
3. Fill valve at 0ML Full open.
4. 17ML both isolation closed.
5. Fill Pump, RC full open, Dish. 5% open. Start Boiler fill pump. Slowly Full Open Discharge valve.
6. Start Both Ammonia Dosing Pump and One Hydrazine Pump.
7. Slowly Full open 17ML both isolations.
8. Take sample near drain header. With High concentration start filling RH coils by opening RH filling valves.
9. *Accordingly adjust dosing concentration to get Hydrazine >200 and pH >10
10. When water start coming out of CRH/HRH line drains (near 70ML), take sample and Stop fill pump and dosing pumps and close RH Fill valve.
11. Keep open RH vents and CRH/HRH line drains (near 70ML).

** RH filling will take around 10-11 hours due to restricted flow.

*In case of RH filling, Flow cannot be raised due to restriction in flow. Therefore, dosing concentration to be changed to match desired values.

1. Fill water flow of 100 TPH is based on Hydrazine and pH value, which may come at lower or higher value.
2. No welding shall be carried out on pressure parts when the system is filled for preservation.
3. Every 15 days take sample to check Hydrazine concentration and pH value.

CONTOUR WATER VOLUME DETAILS

| VOLUME IN M ³ | |
|--------------------------------------|-----|
| ECONOMISER | 135 |
| DRUM | 60 |
| GENERATING SURFACE | 160 |
| SUPER HEATER (DRUM TO SHO HEADER) | 145 |
| REHEATER | 220 |
| TOTAL | 720 |