



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

TITLE:- ROLLING & LOAD RAISING PROCEDURES

Doc. ID: NTPL/OPRN/SOP-23

Revision :02

Date:25/10/2022

PURPOSE: To roll, synchronize and raise load to full

SCOPE: This SOP is applicable at NTPL

RESPONSIBILITY: Shift Engineer / Operation Engineer

PERFORMANCE CRITERIA:

ACTIVITIES:

CHECK LIST FOR ROLLING THE TG:

Initial Checks:

- Select the rolling parameters w.r.t. MMT (Cold/Warm/Hot).
Refer Annexure-1 for MMT Vs Rolling parameters.
- Confirm all line (MS/CRH/HRH), MAL & HPBP atmospheric drains for open condition. CLOSED DRAINS WILL LEAD TO SLOW WARMING UP.
- Lube oil TCV is in auto and set point is at 45 °C.
- Check seal steam temp is above 300 °C (Don't allow < 280°C) and condenser back pressure should be below 0.13 bar.
- All the 4 nos of Test valves for HP/IP stop valves are in open condition.
- EHC cut-out and CRH pilot valve are open in the governing/protection racks.
- Check Trimming device SOV is in energised condition.
- Record TSE and all the supervisory readings, viz. AS/DE/Brg.Vib/Brg Temp etc.
- Check power supply for Both Trip SOVs are available. Ensure that all protections are available after checking the "Simulations Register".
- Check for any abnormal alarms persisting in the annunciation panel.

Rolling through EHC:

- Speeder gear should be in the maximum position.
- No fault in EHC.
- TSE Influence ON.
- Check the EHC control desk for the following:
 - ❖ LP mode selection
 - ❖ Load controller ON
 - ❖ Speed control active display
 - ❖ Tracking device off
 - ❖ Speed set point Zero
 - ❖ Healthiness of starting device and speeder gear motor
 - ❖ ΔP Zero (Pressure), preferably slightly positive.



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- ❖ Load set point approximately 60 MW in P_R set.
- ❖ Load gradient ON (set at 10 MW/min)

- On reaching warmup parameters bring starting device to zero & check start up oil pressure.
- Inform generator board to reset the protection relays in GRP.
- Ensure Trip Oil pressure and resetting of Turbine Tripped alarm.
- Raise starting device slowly and open stop valves one by one, allowing enough time for the Trip Oil to regain its full pressure, after opening of each SV. Note down Start-Up oil pressure for opening of each SV, for a reference later.
- Allow some time for warm-up process and observe temp stabilization of SVs & CVs in TSE & Metal Temperature pages. Record if any CV passing is present by observing the speed rise from STG speed.
- Withdraw Starting Device slowly to maximum position, Observing for any speed rise. If speed is rising, STOP and check and confirm if EHC is in control.
- Raise speed set point to 360 rpm.
- Observe speed rising and ensure closing of GVG @ 240 rpm.
- Hold at 360 rpm for the required soaking time depending on MMT.
- Observe any abnormalities at local.
- HPC and HPS (θ_i and θ_m) temperatures to be stabilised.
- Raise the speed set point to 3000 rpm (without any interruption).
- Ensure tripping of JOP-A @ 540 rpm. and record bearing metal temperatures.
- Observe for any interruption in speed and if "power set point block" indication appears it should be reset immediately (TSE Off).
- Record the speed at which maximum shaft and pedestal vibrations occur.
- Observe takeover of MOP at around 2650 rpm (press rise in MOP dis, Trip oil)
- Record speed at which AOP stops (@ 2800 rpm).
- After reaching 3000 rpm inform generator board for synchronizing.
- @ 3000 rpm, if the holding time is more than 30 mins, HPT exhaust temperature is to be monitored.
- Unit is to be synchronised preferably through auto synchronizer, in the forward direction.
- Immediately on closing of generator breaker raise set point by further 15 rpm and observe for block load. Be vigilant against delay in load raising due to slow



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response, rising trend in grid frequency etc. which may lead to tripping on low forward power protection.

- Observe Load Control takeover above 50 MW.

Rolling through MHG

- Close EHC cut out valves.
- Bring down the speeder gear to minimum position.
- Open stop valves as mentioned earlier.
- Slowly raise the starting device (CVs start to open at approximately 55% to 60%)
- Wait for the speed to settle at approximately 360 rpm.
- After observing Bearing metal temp/SIP readings slowly raise starting device. Observe for speed rise and vibration. Speed settles at 2400 rpm due to the action of primary oil. Raise starting device to max.
- Then raise the speed through Speeder Gear and at approximately at 50% position of speeder gear, 3000 rpm will be reached.
- Synchronise the unit and block load to be raised in speeder gear manually.
- Early during load rising, take over control to starting device and withdraw speeder gear to eliminate load variations due to grid frequency.

Load rising:

- Slowly raise the load and temperature adhering to ABT schedule and TSE.
- Refer the attached load raising sheet for guidance regarding Load, pressure and temperature rising, allowing enough time for the turbine to get warmed up in a normal way.
- Always stress margin has to be chased while raising the load. But at no time negative margin should be allowed.
- WISH YOU ALL A HAPPY ROLLING.

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