

UNIT SHUTDOWN REPORT

UNIT No: 1&2

STATION: NTPL, TUTICORIN.

REPORT NO: 82

OUTAGE: NO. 82

1.Date of Shutdown : 18.12.2023

2.Time of Shutdown : Unit-I at 08:09hrs & Unit-II at 07:25hrs

3.Status before Shutdown :

Unit-I

- a) Unit Load : 280 MW
- b) Mills in service : A, B, C, D, F & G (6 mills in service)
- c) Oil guns in service : Nil
- d) Boiler feed pumps in service : TDBFP A & B
- e) CEPs in Service : A & B
- f) ID fans in service : A & B
- g) FD fans in service : A & B
- h) PA fans in service : A & B
- i) CWP in service : A & B

Unit-II

- a) Unit Load : 280 MW
- b) Mills in service : B, C, D, E, G & H (6 mills in service)
- c) Oil guns in service : Nil
- d) Boiler feed pumps in service : TDBFP A & B
- e) CEPs in Service : A & C
- f) ID fans in service : A & B
- g) FD fans in service : A & B
- h) PA fans in service : A & B
- i) CWP in service : A & B

4. Analysis of Shutdown:

On 17.12.2023 early morning the rain started at Tuticorin. The Turbidity of the sea water was monitored in the Main Lab/NTPL. In the first shift it was within normal limits ($<10\text{NTU}$). At 15:30 hrs the Turbidity suddenly increased to 51.6 NTU & it was informed to the Desalination control room. The sea water Intake pump and RO skid stopped at 16:15 hrs. The turbidity was continuously monitored and it was on the increasing trend. Since there is no improvement, it was decided to stop the service water pump and it was stopped at 19:00 hrs. Through out the II & III shift of 17.12.2023 the rain was heavy and the turbidity was on the increasing trend and went up to 125NTU at 23:00hrs.

Till 18.12.2023 7:25 hrs unit was running at 280 MW, Service water from service water storage tank was utilized for CW pump thrust bearing cooling. As there was no possibility of improvement on turbidity in the near future and service water tank came down to 40%, unit was planned for shut down and unit 2 was hand tripped at 07:25 hrs and unit 1 was hand tripped at 08:09 hrs. Unit-1 CW pumps stopped at 9:15 hrs, Unit-II 8:43 hrs

5.Root cause:

Due to heavy rainfall and flood on 17/12/2023 and 18/12/2023 the turbidity of intake water raised above limits. To prevent the RO system getting affected due to high turbidity of intake water the sea water intake pump and RO plant was stopped. Unavailability of service water for CW pump thrust bearing cooling resulted in stoppage of unit.

6.Remedial measures taken/to be taken:

The Service water for CW thrust bearing cooling is an open loop system, if its modified as Closed Loop system, Service water requirement will be reduced and pump stoppage due to service water unavailability can be avoided.

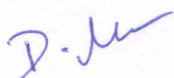
7.Time / Date of boiler light up and synchronization:

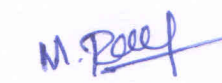
On 20.12.2023, the turbidity was checked and found to be normal and Intake pump started at 2:00 hrs and service water production started at 2:25 hrs. The service water pump started at 10:00 hrs. After Fire water tank and Service water tank filled, on 21.12.2023 the U1 Boiler was lighted up at 12:00 hrs and synchronized at 19:27 hrs.


On 22.12.2023 the U2 Boiler was lighted up at 13:49 hrs and synchronized at 19:37 hrs.

8. Recommendation / Action plan

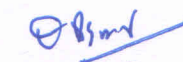
Sl.No.	Recommendations/Action plan	Responsibility	Time line
1	Feasibility study of modification of CW thrust bearing cooling system as closed loop.	TMD	3 months
2	Reduction of service water requirement can be studied	OS	Regularly


EE / OS


EE/EEMG


DCE/C & I


ACM/OS


CM/ OS

Copy submitted to CEO / NTPL
Copy submitted to GM/O&M

Report on Plant shut down due to Heavy rain on 17.12.2023

On 17.12.2023 early morning the rain started at Tuticorin. The Turbidity of the sea water was monitored in the Main Lab /NTPL. In the first shift it was within normal limits. (Normally the turbidity value will be within 10 NTU) At 15.30 hrs the Turbidity suddenly increased to 51.6 NTU and it was informed to the Desalination control room. The sea water Intake pump and R.O skid stopped at 16.15 hrs. The turbidity was continuously monitored and it was on the increasing trend. Since there is no improvement, it was decided to stop the service water pump and it was stopped at 19.00 hrs. Through out the II & III shift of 17.12.23 the rain was heavy and the turbidity was on the increasing trend and went up to 125 NTU at 23.00 hrs

On 18.12.2023 Service water pump was operated intermittently 3 times (each time 1hr) as it was requested by user Division. The service pump was stopped at 10.00 hrs as there was no possibility of improvement on turbidity in the near future and service water tank came down to 40%

On 20.12.2023, the turbidity was checked to be normal and Intake pump started at 2.00 hrs and soft water production started. started at 2.25 hrs. The service water pump started at 10.00 hrs

S.S.D
6.01.24
DGM/Chemical

17/12/2023 A. Shift

*Turbidity:-

Time Seawater Clarifier GSF in GSF out UF in UF Rej

06.30 12.5 10.7 9.37 0.40 0.10 1.09

10.30 9.87 9.53 8.72 0.37 0.10 0.93

13.15 16.3 15.7 13.5 0.89 0.11 1.45

*FRC Analysis in Ro plant using chlorobex

Time:- 06.30 07.30 08.30 09.30 10.30 11.30 12.30 13.30

GSFOL:- Nil Nil Nil Nil Nil Nil Nil Nil

* CT(F/B) FRC:- 0.88 ppm, Turbidity:- 18.7 NTU @ 06.30

*MB₁ Regen Tank concn:- Lye:- 42.8%

Acid:- 31.64%

* GSF Turbidity @ Backwash Turbidity:-

Initial → 612 NTU

Final → 78 NTU

*MB₁ Regen injection Sample Lye concn → 3.76%

* All Sample reports informed to Ro UR.

G. Mungasankar

17/12/23 B-Shift. S. Vijaya Rupa / R. Vijaya Ragupathi

Turbidity: CT(FB) = 23.2 NTU

Time In Clarifier GSF in GSF out UF in UF Rej

14.25 15.6 14.7 16.9 0.76 0.12 1.0

15.30 51.6 45.4 41.3 0.93 0.14 2.3

17.20 53.7 - - - - -

18.45 82.4 - - - - -

19.15 79.7 89.6 - - - -

20.00 72.3 78.6 - - - -

21.00 78.9 77.7 - - - -

FRC: CT(FIR) =>

Time	S.W	Clarifier	CT-IN	CT-OUT	UFOOT	I. Feed.
14.30	NR	NRL	NRL	NRL	NRL	NRL

Fe ²⁺	CEP	BFW	CBP	S.S	M3
U.E	3.78	3.66	8.71	3.57	3.49
U.D	4.42	4.17	9.39	3.92	3.84

PTP Stopped at 16.00 Hrs.

I.R₂, D.R₂, Potable Stopped at 16.10 Hrs.

Time	Samples	EC	Cl (ppm)	COC
	Seawater	49800	19594	1.15
	CT(FIR)	54800	22599	

Seawater and Clarifier lineup at 19.00 Hrs.

All Sample Results informed to R. CR

By R/S

2/2023 C-SHIFT P. Pralamurugan / R. Ramesh.

> Turbidity (NTU) :-

Time	Seawater	Clarifier
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22.00	81.5	78.0
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23.00	125.0	98.0
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01.45	98.5	→ (Sample collected in makeup water pump house)
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> DM transfer to CT Consumption:- 550 m³/day.

> All Sample results informed to R. CR.

By R/S

20/12/23

"C" Shift M. Esakimuthu

* Turbidity :- (NTU)

Time	Seawater	Clarifier	Cosin	Cosfot	Ufot	Ufref
02:30	15.8	15.2	14.6	0.65	0.10	0.11
00:30	—	—	—	—	—	—
02:30	15.1	14.5	14.2	0.62	0.10	1.05

* All sample reports informed to Ro ch.

M. Esak

21/12/2023

Day Shift

(Ganapathi)

P. Balamurugan / Thangamavipras / Sena
B. Mathukumar (Out) / C. Ramesh

> FRe :- (ppm) :-

Time	Seawater	clarifier	Cosin	Cosfot	Ufot	Ufref
09:30	NIL	0.42	0.35	NIL	NIL	NIL
11:30	NIL	0.48	0.41	NIL	NIL	NIL
14:30	NIL	NIL	NIL	NIL	NIL	NIL
17:00	NIL	NIL	NIL	NIL	NIL	NIL

> Turbidity (NTU) :-

Time	Seawater	clarifier	Cosin	Cosfot	Ufot	Ufref
09:30	6.89	5.56	5.18	0.21	0.08	0.75
11:30	6.52	5.49	5.03	0.20	0.08	0.71
14:30	5.86	5.41	8.52	0.32	0.08	0.86
17:00	5.65	5.29	4.95	0.19	0.08	0.68

> 8th pass RO, started @ 17:15 hr.

> All sample results informed to RoR.

P. Balamurugan