

PETITION NO...../GT/2026

**PETITION FOR DETERMINATION OF
TARIFF OF SUBANSIRI LOWER HYDRO
ELECTRIC PROJECT (2000 MW) FOR THE
PERIOD 23.12.2025 TO 31.03.2029.**

एन एच पी सी लिमिटेड
(भारत सरकार का एक नवरत्न उद्यम)
NHPC Limited
(A Government of India Navratna Enterprise)



Commercial Division

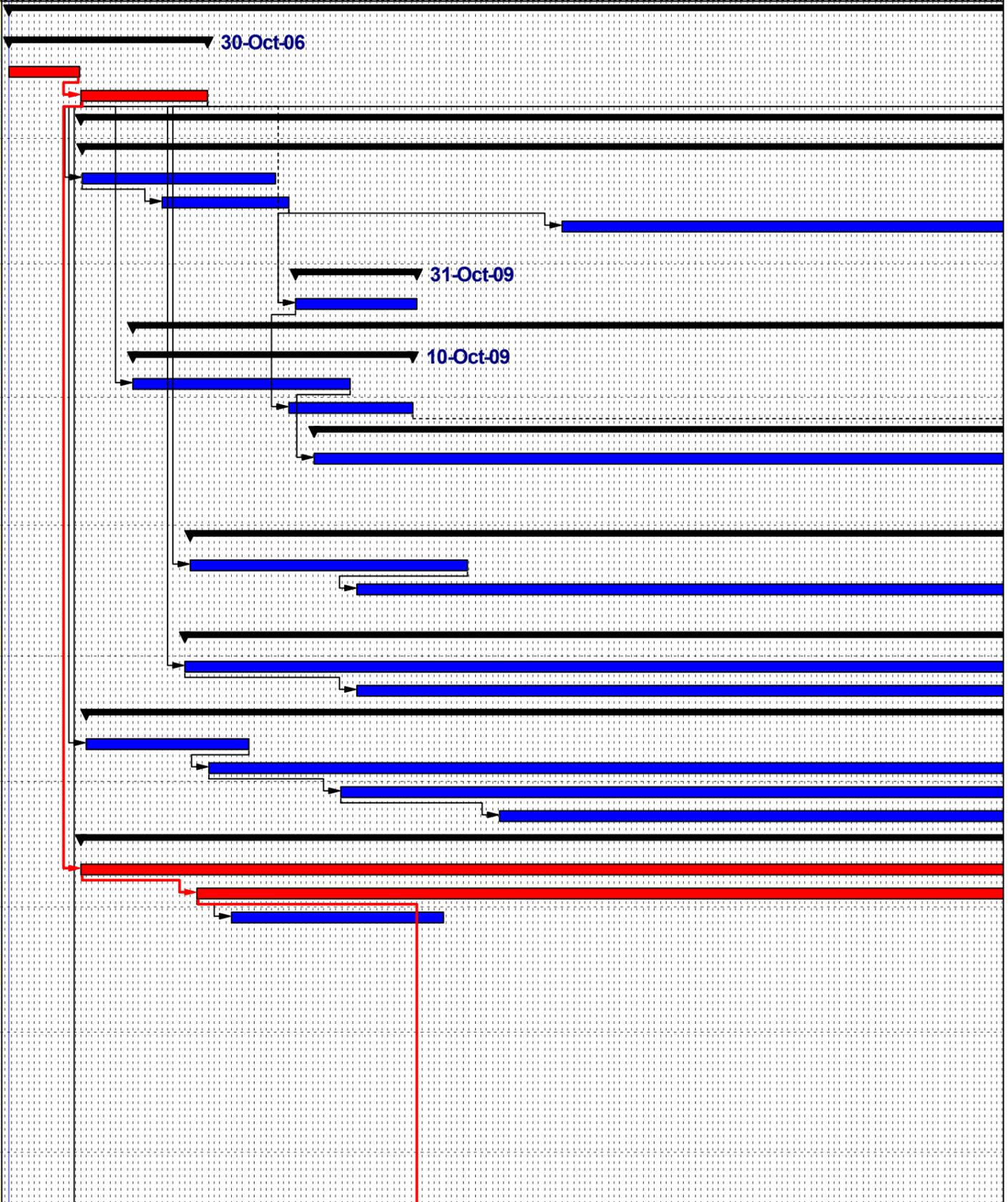
**NHPC Office Complex,
Sector33, Faridabad (Haryana)-121 003**

Volume-VIII

ANNEXURE-XI

Schedule of Subansiri Lower H.E. Project (2000 MW) as per Actual Assam/ Arunachal Pradesh

Activity ID	Activity Name	Original Duration	Start	Finish	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	18
					Q	Q	Q	Q	Q	Q	Q	Q	Q	Q	Q	Q	Q	Q	Q
Subansiri Lower as per Actual_1		8390	19-Dec-03	31-Dec-26															
INFRASTRUCTURE DEVELOPMENT		1047	19-Dec-03	30-Oct-06															
A2875	Acqisition of Forest Land	375	19-Dec-03	27-Dec-04															
A2880	Construction of Road to Major Works	668	01-Jan-05	30-Oct-06															
MAIN WORKS		8011	01-Jan-05	31-Dec-26															
DIVERSION TUNNELS		7793	05-Jan-05	31-May-26															
A2340	Excavation of Diversion tunnel incl. portal	1021	05-Jan-05	22-Oct-07															
A2350	Concreting of Diversion Tunnel	665	01-Mar-06	25-Dec-07															
A2360	Erection & Commissioning of gates	3494	01-Dec-11	07-Jul-21															
A2365	Tunnel Plugging	1206	11-Feb-23	31-May-26															
RIVER DIVERSION WORKS		635	05-Feb-08	31-Oct-09															
A2370	Construction of Coffe Dams	635	05-Feb-08	31-Oct-09															
CONCRETE DAM		6457	01-Oct-05	29-Jun-23															
Excavation		1471	01-Oct-05	10-Oct-09															
A2380	Abutment	1139	01-Oct-05	12-Nov-08															
A2390	Foundation	649	01-Jan-08	10-Oct-09															
Concreting of DAM		5505	10-May-08	29-Jun-23															
A2400	Concreting of DAM	5505	10-May-08	29-Jun-23															
Erection of gates & hydromechanical works		1245	29-Oct-21	26-Mar-25															
A2410	Erection of gates & hydromechanical work	1245	29-Oct-21	26-Mar-25															
INTAKE STRUCTURES		6445	31-Jul-06	15-Apr-24															
A2440	Open Excavation	1454	31-Jul-06	26-Jul-10															
A2450	Concreting	5070	23-Dec-08	03-Dec-22															
A2460	Erection & Commissioning of gates	1355	31-Jul-20	15-Apr-24															
HEAD RACE TUNNELS		6390	01-Jul-06	21-Jan-24															
A2420	Excavation	5766	01-Jul-06	07-May-22															
A2430	Concreting	5488	19-Dec-08	21-Jan-24															
PRESSURE SHAFTS		7352	01-Feb-05	12-Apr-25															
A2470	Adit to Pressure Shaft	850	01-Feb-05	31-May-07															
A2480	Excavation of Pressure Shaft	5648	01-Nov-06	12-May-22															
A2490	Steel Liners & Erection	6016	25-Sep-08	08-Apr-25															
A2500	Concreting & Grouting	5189	11-Jan-11	12-Apr-25															
POWER HOUSE		8011	01-Jan-05	31-Dec-26															
A2510	Excavation of power house cavern	6277	01-Jan-05	02-Apr-22															
A2530	Concreting in super structure	7250	01-Sep-06	31-Jul-26															
A2540	Erection & Commissioning of EOT cranes	1114	01-Mar-07	19-Mar-10															
A2550	Finishing work	1718	19-Apr-22	31-Dec-26															
TRANSFORMER CAVERN / CUM MIV GALLERY		1781	15-Jan-22	30-Nov-26															
A2800	Errection of MIV-1	453	15-Jan-22	12-Apr-23															
A2810	Errection of MIV-2	178	12-Apr-23	06-Oct-23															
A2820	Errection of MIV-3	113	22-Sep-24	12-Jan-25															
A2830	Errection of MIV-4	190	31-Jan-25	08-Aug-25															
A2840	Errection of MIV-5	275	05-Mar-25	04-Dec-25															
A2850	Errection of MIV-6	82	11-Mar-26	31-May-26															
A2860	Errection of MIV-7	124	30-Jun-26	31-Oct-26															
A2870	Errection of MIV-8	80	12-Sep-26	30-Nov-26															
SWITCHYARD		1376	24-Feb-23	30-Nov-26															

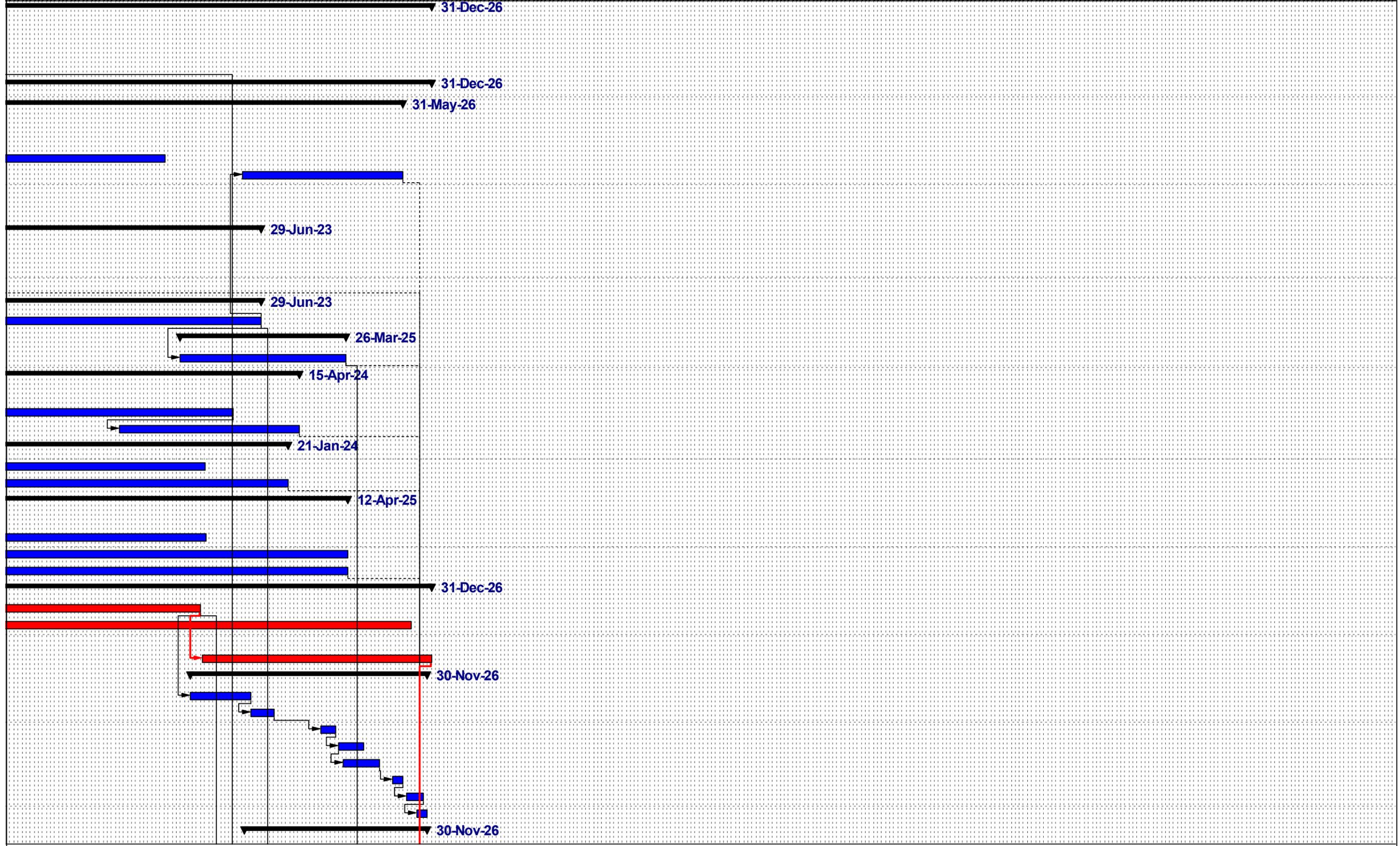


█ Remaining Work ▬ Summary
█ Critical Remaining Work
◆ Milestone

Note: The Plunge Pool works will be taken up after commissioning of Project as per DDRP Report. DT inlet Protection works above EL 210 m shall be continued up to 31.03.2027.

Schedule of Subansiri Lower H.E. Project (2000 MW) as per Actual Assam/ Arunachal Pradesh

2018	2019	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032	2033	2034	2035	2036	2037	2038	2039	2040	2041	2042	2043	2044	2045	2046
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█ Remaining Work ▶ Summary
█ Critical Remaining Work
◆ Milestone

Note: The Plunge Pool works will be taken up after commissioning of Project as per DDRP Report. DT inlet Protection works above EL 210 m shall be continued up to 31.03.2027.

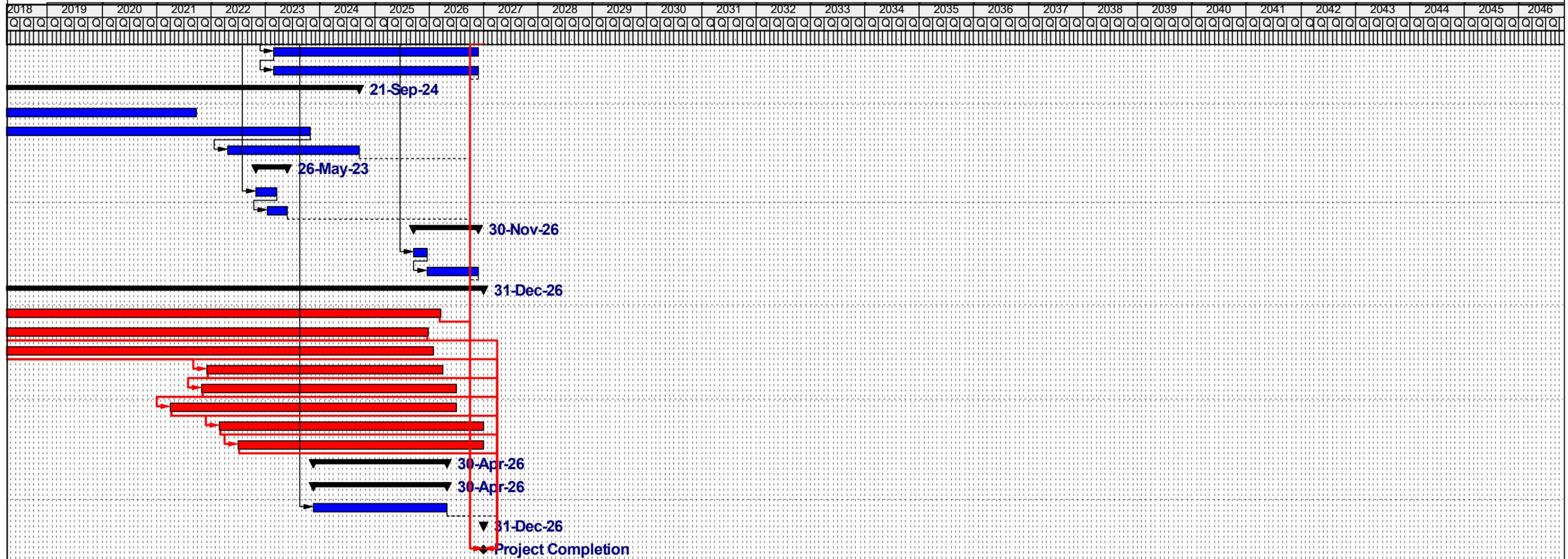
Schedule of Subansiri Lower H.E. Project (2000 MW) as per Actual Assam/ Arunachal Pradesh

Activity ID	Activity Name	Original Duration	Start	Finish	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	18	
					Q	Q	Q	Q	Q	Q	Q	Q	Q	Q	Q	Q	Q	Q	Q	Q
A2620	Erection of Structures	1376	24-Feb-23	30-Nov-26																
A2660	Erection of Equipment etc.	1376	24-Feb-23	30-Nov-26																
SURGE CHAMBER																				
A2670	Adit to Surge Chamber Crown	6031	01-Mar-05	27-Sep-21																
A2680	Excavation to Surge Chamber	6671	01-Jul-05	29-Oct-23																
A2690	Concreting (Surge tunnel over lining conc	880	26-Apr-22	21-Sep-24																
TAIL RACE TUNNEL																				
A2630	Open Excavation, Portal and Protection	136	01-Nov-22	16-Mar-23																
A2650	Concreting	136	11-Jan-23	26-May-23																
RESERVOIR FILLING																				
A2900	Reservoir filling up to EL 180.0 m	91	22-Sep-25	21-Dec-25																
A2920	Reservoir filling up to from EL 180.0 m to E	344	22-Dec-25	30-Nov-26																
INSTALLATION AND TESTING AND COMMISSIONING OF GENER/																				
A2700	Unit-1	5866	01-Feb-10	17-Mar-26																
A2710	Unit-2	5543	01-Oct-10	23-Dec-25																
A2720	Unit-3	2985	01-Dec-17	01-Feb-26																
A2730	Unit-4	1582	01-Dec-21	31-Mar-26																
A2760	Unit-5	1703	01-Nov-21	30-Jun-26																
A2770	Unit-6	1917	01-Apr-21	30-Jun-26																
A2780	Unit-7	1767	01-Mar-22	31-Dec-26																
A2790	Unit-8	1645	01-Jul-22	31-Dec-26																
ADDITIONAL WORKS																				
DT INLET PROTECTION & STABILIZATION MEASURES																				
A2910	DT Inlet Protection Works up to EL 210 m	895	18-Nov-23	30-Apr-26																
COMPLETION OF PROJECT AS PER CCEA																				
A2890	Project Completion	0	31-Dec-26	31-Dec-26																

█ Remaining Work █ Critical Remaining Work
◆ Milestone ◆ Milestone
 Summary

Note: The Plunge Pool works will be taken up after commissioning of Project as per DDRP Report. DT inlet Protection works above EL 210 m shall be continued up to 31.03.2027.

Schedule of Subansiri Lower H.E. Project (2000 MW) as per Actual Assam/ Arunachal Pradesh



█ Remaining Work ▶ Summary
█ Critical Remaining Work
◆ Milestone

Note: The Plunge Pool works will be taken up after commissioning of Project as per DDRP Report. DT inlet Protection works above EL 210 m shall be continued up to 31.03.2027.



भारत सरकार
Govt. of India
विद्युत मंत्रालय
Ministry of Power
केन्द्रीय विद्युत प्राधिकरण
Central Electricity Authority
जल विद्युत परियोजना मूल्यांकन प्रभाग
Hydro Project Appraisal Division

सेवा में

अध्यक्ष एवं प्रबंध निदेशक,
एन.एच.पी.सी. (NHPC) लिमिटेड,
एन.एच.पी.सी. कार्यालय परिसर, सेक्टर -33, फरीदाबाद -121 003

विषय: Examination and Vetting of Revised Cost Estimates (RCE) of Subansiri Lower HE Project (2000 MW) at January 2020 PL in Arunachal Pradesh by M/s. NHPC Ltd. - regarding.

Reference is invited to NHPC letter no. NH/PD/IP/SL/RCE/2627 dated 17.03.2020 submitting therewith proposal of Revised Cost Estimates (RCE) of Subansiri Lower HE Project (2000 MW) in Arunachal Pradesh at January, 2020 price level to CEA for examination and vetting. In this regard, it is stated that HPM division, CEA vide letter dated 11.05.2020 (copy enclosed) vetted time overrun of 160.20 months against 164.20 months proposed by the developer (reducing time overrun of 4 months) in respect of Revised Cost Estimates of Subansiri Lower HE Project (2000 MW) at January 2020 PL .

Therefore, it is requested that RCE proposal of Subansiri Lower HE Project (2000 MW) may be re-framed after considering impact of reduced time overrun. In this regards, it is to state that as decided earlier the impact of reduction in time overrun may be considered in cost estimates under establishment head of the project, at the end of commissioning of the project.

Accordingly, the RCE proposal may be re-framed after deducting establishment cost for last 4 months prior to commissioning of the project and re-submitted for examination in CEA. However, appraising groups will continue to examine the proposal as far as other heads of the cost estimates are concerned.

संलग्न: यथोपरि।

Sd/-
(आशीष कुमार लोहिया)
उपनिदेशक (एच.पी.ए.)

प्रतिलिपी:

निदेशक, [लागत मूल्यांकन (HWF) निदेशालय], के. जल. आयोग

प्रतिलिपी (सूचनार्थ) :

संयुक्त सचिव (जल विद्युत), श्रमशक्ति भवन, विद्युत मंत्रालय, नई दिल्ली- 01



सत्यमेव जयते
भारत सरकार

Government of India
विद्युत मंत्रालय
Ministry of Power
केन्द्रीय विद्युत प्राधिकरण
Central Electricity Authority
जल विद्युत परियोजना प्रबोधन प्रभाग
Hydro Project Monitoring Division

विषय : Examination and vetting of Revised Cost Estimates of Subansiri Lower HE Project (2000 MW) in Arunachal Pradesh by NHPC Ltd. - Regarding.

Please refer to HPA Division letter No. 18/35/2011-HPA/475 dated 20.04.2020 on the subject. In this regard, it is intimated that analysis of time overrun for Subansiri Lower HEP (8 X250 = 2000 MW) has been examined in this division and our comments are as given below:-

S. No.	Major reasons for delays	Net Delay (in months) by NHPC	Net Delay (in months) as per HPM Division	Remarks
1.	Delay in transfer of Forest Land	16	16	
2.	Development of access road due to increased quantity-additional time.	4	0	Delay is due to slow progress of works, therefore not considered.
3.	Major back hill slope failure in Power House area requiring major stabilization measures leading to complete stoppage of Power House Building construction and major design changes	46.5	46.5	

4.	Intermittent Forcible Stoppages/Bandh i/c heavy rainfall before December, 2011	3.5	3.5	
5.	Agitation against construction of the Dam causing forced stoppage of works after December, 2011 upto Resumption of Works w.e.f 15th October, 2019	94	94	
6.	Intermittent Forcible Stoppages/Bandh post resumption w.e.f. 16.10.2019 to 31.12.2019	0.2	0.2	
Total		164.20	160.20	

The total net delay accounted by NHPC Ltd due to all above reasons is 164.20 months. However, the total net impacted delay as assessed by HPM division is 160.20 months.

राजीव वाष्णोय
11/05/2020

(राजीव वाष्णोय)

उप निदेशक (एच.पी.एम)

मुख्य अभियंता (HPA), के.वि.प्रा.

संख्या के.वि.प्रा./एच.पी.एम/129/18/2020/ 335

दिनांक - 11.05.2020



भारत सरकार
Government of India
विद्युत मंत्रालय
Ministry of Power
केंद्रीय विद्युत प्राधिकरण
Central Electricity Authority
जल विद्युत परियोजना प्रबोधन प्रभाग
Hydro Projects Monitoring Division

Date: 21.03.2023

विषय: Revised Cost Estimate (RCE) in respect of Subansiri Lower HE Project, 2000 MW (8x250 MW) in Arunachal Pradesh / Assam at Completion Level.

Ref.: HPA Division's subject emails dated 02.02.2023 and 18.02.2023

Reference is made to HPA's subject emails wherein HPM Division, CEA was requested to examine the subject NHPC proposal with respect to time overrun aspect and furnish comments. It is informed that delays till 31.12.2019 were vetted earlier and HPM Division's observations were provided regarding the same vide its letter no. CEA/HPM/129/18/2020/335 dated 11.05.2020. NHPC's current proposal received for examination has taken the time overrun/ hindrances up to 31.12.2022 taking anticipated commissioning date as June 2024. The same has been examined in light of the *Guidelines for Examination of Time Over-Run in Execution of Hydro Power Projects in Central Sector*, supporting documents provided by NHPC vide its emails dated 17.02.2023, 13.03.2023 and 21.03.2023, and information available in HPM Division; HPM Division's observations are as follows:

S. No.	Major reasons for delays	Net delay as per NHPC (in days)	Net impacted delay taken in to account (in days)	Remarks/ Comments
1.	On account of additional works (Implementation of DDRP's recommendations) for resumption of Dam Works - Pre requisite for starting concerting in the extended spillway portion of the Dam.	60	60	Appears justified in light of DDRP's recommendations (Accepted by MoP vide its letter to NHPC dated 26.06.2013).
2.	a. Delays on account	100	100	Appears justified in

I/26853/2023

	of Lockdown due to COVID-19 during 2020. b. Delays on account of Lockdown due to COVID-19 during 2021.	37	37	light of 1 st wave of COVID pandemic. Appears justified in light of 2 nd wave of COVID pandemic. As per Min. of Finance OM dated 13th May, 2020 maximum 180 days delay is permissible. NHPC has requested (100 + 37 = 137 days < 180 days).
3.	On account of additional work due to breach of Power House Coffor wall (Right Bank)	116	81 (22.07.2020 – 11.10.2020)	Seems not justified. Failure of Deo Nallah Slope and PH Coffor Wall breach cut off left bank dam access (26.05.2020) and right bank dam access (22.07.2020). However, the TRC road and thereby access to the dam was restored on 11.10.2020.
4.	On account of additional work involving construction of approach from the left bank to Dam site due to failure of Deo Nallah Slope.	46		
5.	Delays on account of Overtopping of water over dam due to Flood during Aug'21	35	35	Appears justified.
6.	Collapse of Diversion Tunnels 2, 3 & 4 in Sep-Oct 2022	43	0	Seems not justified. Vide CEA's Tour Report (Tour dated 21.04.2022) sent to MoP/ NHPC on 29.04.2022, the issues of Power House Protection Wall and Diversion Tunnels had been raised and measures were suggested at Para 9.i and 9.iii respectively. However, no ATR was furnished by NHPC regarding the same; the same was intimated to MoP also in reply to its
7.	Flooding of Power House occurred due to collapse of coffer wall on 25.09.2022.	Overlapping Period		

I/26853/2023

				query regarding the ATR by NHPC. Further, a similar event had occurred earlier also in July 2020.
	Total	437	313	

Note 1 – As per NHPC, time overrun has been calculated taking hindrances up to December 2022. However, NHPC has given time extension to M/s BGS-SGS-SOMA JV considering hindrances up to 31.07.2020. Time extensions have also been granted to M/s Texmaco and M/s GE till 30.04.2023 and 31.08.2023 respectively. Hence, the *Net impacted delay taken in to account* above is **provisional** and NHPC is requested to further squeeze the above permitted time overrun period.

Note 2 – The anticipated commissioning has been taken as **March 2024** as initially committed by NHPC to the MoP. No time overrun may be permitted after March 2024 except in *force majeure* situations.

2. This issues with the approval of the Chief Engineer, HPM Division, CEA

फराज
21/03/2023
(फराज)

उप-निदेशक

Email: cea-hpmd@gov.in

✓ मुख्य अभियंता (HPA), CEA

**प्रेषक/From**

SANAKA LUHA
GENERAL MANAGER (CIVIL)
SUBANSIRI LOWER PROJECT

प्रेषित/To

BABITENDRA KUMAR, GENERAL MANAGER (CIVIL), Technical Services, SLP

संख्या/No.: NH\SLP\Power House-Civil\2023\114

दिनांक/Date: 16-September-2023

विषय/Subject: RCE of Subansiri Lower HE Project- Time overrun regarding

संदर्भ/Reference: Nil

With reference to the e-IoM no. NH\SLP\Technical Services\2023\ 107 dated 07.08.23 regarding time overrun of Lot SSL-6. In this regard, please find attached herewith the requisite information for information and further necessary action.

SUMEGH MEGHRAJ KAWADE
SENIOR MANAGER (CIVIL)
SUBANSIRI LOWER PROJECT

Encl:

- [120230000044583_638304612878216153_Hindrances wrt Lot SSL_6.docx](#)
[220230000044583_638304613307655552_Covid_Letters.pdf](#)
[320230000044583_638304613464470188_EM_handover.pdf](#)
[420230000044583_638304613585407509_Rise_in_water_level.pdf](#)
[520230000044583_638304614005926287_Hindrance_Register.pdf](#)

कृपया अग्रसारित किया जाता है -

PANKAJ GUPTA, DEPUTY GENERAL MANAGER (CIVIL), dt: 9/16/2023 1:54:13 PM

कृपया उचित कार्रवाई हेतु अग्रसारित है -

SANAKA LUHA, GENERAL MANAGER (CIVIL), dt: 9/16/2023 3:52:51 PM

कृपया अग्रसारित किया जाता है -

BABITENDRA KUMAR, GENERAL MANAGER (CIVIL), dt: 9/16/2023 4:25:25 PM

कृपया अग्रसारित किया जाता है -

NAVIN KUMAR SINGH, DEPUTY GENERAL MANAGER (CIVIL), dt: 9/16/2023 4:50:53 PM

Print

Hindrances upto Aug 2023 with respect to Lot SSL-6 works.

A. Introduction:

Lot SSL 6 Works have been awarded to M/s Patel Engineering Limited vide LOA no. NH/CCW/CC-I/SO-76/2020/781-789 dated 01.09.2020. As per the Contract, the works have to be completed within 39 months reckoned from the 7th day of issue of LOA i.e. by 06.12.2023.

The contractor accepted the terms and conditions of the LoA and accordingly started mobilization of the resources at site.

The work was started by the contractor on 07.09.2020, however, due to breach of Coffor wall and subsequent submergence of Power House pit with silt, debris and flood waters, the site couldn't be accessed.

As such, the main activities of power house could be started after dewatering and removal of the slush from the site from 30.01.2021.

Various delays encountered during execution of Lot SSI-6 Contract are deliberated as below:

a. Initial delay in handing over of site due to submerged power house pit:

The work was started by the contractor by 7th Sept 20', however, due to breach of Coffor wall and subsequent submergence of Power House pit with silt, debris and flood waters, the same couldn't be accessed.

Thus, before starting the main activities at Power House pit, the same had to be dewatered and cleared of slush /silt.

As such, the main activities of power house could be started by 19th Feb 21'.

Accordingly, **total delay of 136 days** has been considered on this account.

b. Delay due to epidemic (COVID 19)

During 2nd COVID wave, from 1st April 21 to 15th June 21' i.e. for a period of 76 days. However, the work was not fully stopped and was partially impacted during the second COVID wave from dated 01.04.2021 to 07.05.2021, 11.05.2021 to 27.05.2021, 30.05.2021 and 01.06.2021 to 15.06.2021 totaling to 70 days.

The guidelines issued to reduce the manpower to 50% and accordingly the efficiency was reduced to 50%, as such an EOT of 50% of 70 days i.e. 35 days were considered on this account. However, the work was completely stopped due to Covid-19 restrictions from dated 08.05.2021 to 10.05.2021(3 days), 28.05.2021 to 29.05.2021(2days) and 31.05.2021(1 day), i.e. for 6 days.

The consequential impact due to pandemic for **46 days** has been considered on this account

c. Delays due to various hindrances

Following delays were observed during execution of works

Election	1 day
Local Issues	3 days
Rise in water level due to flash flood	5 days
Strikes / Local disturbances	3 days
Total	12 days

d. Delay due to breach of coffer wall in Sept'2022

During the breach of coffer wall in Sept' 2022, the power house pit was submerged under flooded water since 24.09.2022. Dewatering and restoration of access road to the Power House pit was carried out upto 22.10.2022.

Therefore, the total time consumed for completion this activity from 24.09.2022 to 22.10.2022 comes to **28 days**.

e. Delay due to removal of accumulated slush in pit during breach of coffer wall

Draft tube pit was buried in the slush and before start of reinforcement activity, draft tube needs to be cleared from accumulated slush. Due to removal of accumulated slush form the draft tube pit, the construction activity got delayed by **92 days**.

Hindrances occurred are tabularized as below:

S.N.	Description of Hindrance	Start Date	End Date	Delays in days	Remarks
1.	Delay in having access to the site	01.09.20	29.01.21	136	7 days overlapping
2	Election	27.03.21	27.03.21	1	
3	Local Issues	08.05.21	10.05.21	3	
4	Rise in water level due to flash flood	26.08.21	31.08.21	5	
5	Strikes / Local disturbances	01.06.21	03.06.21	3	
6	Delay due to decrease in manpower deployment due to pandemic	01.04.21	15.06.21	41	
7	Delay in handing over of site by E&M contractor	21.02.23	09.02.23	93	Effective delay after deducting delays on part of civil contractor
8	Delay due to breach of coffer wall in Sep 2022	24.09.22	22.10.22	28	
9	Delay due to removal of accumulated slush in pit during breach of coffer wall	23.10.22	22.01.23	92	
	Total			402 days	

Ref No.: NH/SLP/Lot SSL-6/PH/2023/1067

Date: 01.09.2023

M/s Patel Engineering Limited,
Subansiri Lower HE Project,
Kolaptukar, Dollungmukh Circle,
Dist. Kamle, Arunachal Pradesh

Sub: Lot SSL-6: Construction of Balance Civil Works of Power House Complex from HRT Intake Structure to Tail Race Channel, Subansiri Lower HE Project – **Regarding 1st Extension of Time**

- Ref: 1. PEL/382/2023-24/1852 dated 16.06.2023
2. NH/SLP/Lot SSL-6/PH/2023/866 dated 23.03.2023
3. PEL/382/2022-23/ dated 28.08.2022 (EoT-2 application)
4. PEL/382/2022-23/ 1034 dated 02.08.2022 (IM-3)
5. PEL/382/2021-22/660 dated 15.03.2022 (EoT-1 application)
6. PEL/382/2021-22/655 dated 14.03.2022 (IM-2)

Kind Attention: Sh. Shakeel Chauhan, Project Director

Sir,

In terms of Clause 8.4 & 8.7 of Contract Agreement (Vol-II of contract), the contractor is hereby notified for grant of 1st Extension of Time without levy of Delay Damages up to 29.11.2024 considering hindrances up to 15.07.2023.

Accordingly, achievement of the following Interdependent Milestones (IM) and Contract /Progress Milestone (CM) has been re-scheduled as below: -

Interdependent Milestones			
S. No	Description of Interdependent Mile stones	Schedule date of achievement	Extension Granted up to
1	IM-1 : Handing over of Unit-1 Pit to E&M Contractor for Generator Stator assembly (4 th Month)	06-01-2020	Achieved
2	IM-2 : Handing over of Unit-4 Pit to E&M Contractor for Generator Stator assembly (mid of 18 th Month)	20-03-2022	23.03.2024
3	IM-3 : Handing over of Unit-8 MIV Building upto EL 125.5 including EOT crane for MIV erection (22 nd Month)	06-07-2022	14.07.2024
4	IM-4 : Completion of HRT Intake, Surge Tunnel, Surge Shaft, Pressure Shaft and Adit Plugging in all respect corresponding to Unit-8 (31 st Month)	06-04-2023	31.05.2024

Contract / Progress Milestones			
S. No.	Description of Contract / Progress Milestones	Schedule date of achievement	Extension Granted up to
1	Completion of reinforcement and 2nd stage concreting of stay ring, spiral case and generator from unit 1 to 4 of Power House (18 th Month).	06.03.2022	23.03.2024
2	Completion of reinforcement and 2nd stage concreting of stay ring, spiral case and generator barrel up to EL 113.0m from unit 5 to 8 of Power House (26 th Month).	06.11.2022	14.11.2024
3	Completion of concrete lining, grouting and finishing works of all surge tunnels (31 st Month)	06.04.2023	31.05.2024
4	Completion of concrete lining, grouting and finishing works of all HRTs (29 th month)	06.02.2023	31.03.2024
5	Completion of steel lining, backfill concreting and plugging of all pressure shafts (31 st Month)	06.04.2023	31.05.2024

The cost compensation if any, arising out of this extension of time shall be dealt as per relevant contract provisions.

Thanking You.

Yours sincerely,

Vipin
1/9/23
(Vipin Gupta)

Executive Director
Engineer-in-charge

Copy to:

1. Executive Director (Contracts)- for information please.
2. Executive Director (PMSG_ -for information please.
3. Group General Manager (Civil), SLP
4. General Manager (Finance), SLP

Hindrance Register

SK



8 of 27



Company 115
Sub Contract 115/003367
Supplier Name PATEL ENGINEERING LIMITED
Project Name SUBANSIRI LOWER
Package LOT SSSL-6

Site 115
Supplier Id S052022
Project Id 115R
Remarks

1-50 of 66



Hindrance No	Activity No.	Activity Description	Activity Actual Start	Planned Finish Date	Sub Project Id	Sub Project Desc	Entry Date	Hindr Nature	Hindr Start Date	Hindr Remov Date	Overlap Period	Net Hindrance	Referenc
1		LOT SSSL-61			6.5	POWER HOUSE & TRC		No work due to non-availability of site from Unit-1 to Unit-8 due to submergence under water in Power House up to EL 107.00 and deposition of slush at Power house pit owing to breach of coffer wall	9/1/20	1/29/21	7	136	
2		LOT SSSL-62			6.5	POWER HOUSE & TRC		No work at site from 11.30 AM to next day due to local agitation between contractor of Assam and arunachal Pradesh.	9/29/20	9/30/20		0	
3		LOT SSSL-627			6	LOT-6		Work hampered due to restrictions on movement imposed due to Boori Boot festival rituals by Locals and Covid-19 pandemic.	2/8/21	2/10/21		2	
4		LOT SSSL-628			6	LOT-6		Shortage of labour and operators on account of State Assembly election on 27.03.2021 in Assam.	3/26/21	3/27/21		1.5	
5		LOT SSSL-630			6	LOT-6		Contractor has declared two days holiday for local festival Bohag Bihu on 14th & 15th April 2021	4/14/21	4/15/21		0	
6		LOT SSSL-629			6	LOT-6		Work hampered due to lockdown imposed by Dollungmukh residents in the entire right bank area from 8.00 PM on 08.05.2021 up to 8.00PM on 10-05-2021 for performing local rituals/pooja to avoid spread of Covid-19.	5/8/21	5/10/21		2	
7		LOT SSSL-63			6.5	POWER HOUSE & TRC		Site closed from 8.00 PM on 08.05.2021 up to 8.00PM on 10-05-2021 due to lockdown imposed by local residents of Dollungmukh Circle by performing local rituals to control covid pandaemic.	5/8/21	5/10/21		3	
8		LOT SSSL-622			6	LOT-6		Labour availability affected due to restrictions imposed through various circulars from Govt. of Assam and Arunachal Pradesh on Covid-19 pandemic, restrictions on movement by local admin/police.	5/28/21	6/3/21		3	
9		LOT SSSL-64			6.5	POWER HOUSE & TRC		Due to Covid restrictions imposed by Govt. of Assam and Arunachal Pradesh, the workers left the site before time thereby hampering the progress of works.	5/28/21	5/28/21		1	
10		LOT SSSL-65			6.5	POWER HOUSE & TRC		Due to Covid testing of contractor's workers and employees, the work got hampered.	5/29/21	5/29/21		1	
11		LOT SSSL-66			6.5	POWER HOUSE & TRC		Labour availability severely affected due to restrictions imposed by Govt. orders of Assam & Arunachal Pradesh. Moreover, the worker union leaders also opposed to work at site due to rapid surge of Covid positive cases amongst the workers thereby hampering the progress of works.	5/30/21	5/30/21		1	
12		LOT SSSL-67			6.5	POWER HOUSE & TRC		Due to Covid restrictions no workers turned up at site to work.	5/31/21	5/31/21		1	
13		LOT SSSL-68			6.5	POWER HOUSE & TRC		Less manpower deployed at site owing to mass Covid testing and also due to restrictions imposed by Govt. orders thereby causing hindrance in progress of works.	6/1/21	6/1/21		1	
14		LOT SSSL-69			6.5	POWER HOUSE & TRC		Less manpower deployed at site owing to mass Covid testing and also due to restrictions imposed by Govt. orders thereby causing hindrance in progress of works.	6/2/21	6/2/21		1	
15		LOT SSSL-610			6.5	POWER HOUSE & TRC		Less manpower deployed at site owing to mass Covid testing and also due to restrictions imposed by Govt. orders thereby causing hindrance in progress of works.	6/3/21	6/3/21		1	
16		LOT SSSL-624			6.1	INTAKE STRUCTURE		Concrete cladding Work hampered due to death of a worker.	6/23/21	6/27/21		0	
17		LOT SSSL-623			6	LOT-6		No work due to contractor's labour strike.	6/23/21	6/23/21		0	
18		LOT SSSL-611			6.5	POWER HOUSE & TRC		No work due to labour agitation	6/23/21	6/23/21		0	
19		LOT SSSL-612			6.5	POWER HOUSE & TRC		No work due to labour agitation	6/28/21	6/28/21		0	
20		LOT SSSL-613			6.5	POWER HOUSE & TRC		No work due to labour meeting from 4PM to 6PM	6/30/21	6/30/21		0	
21		LOT SSSL-625			6.1	INTAKE STRUCTURE		Work hampered due to contractor's labour strike.	7/31/21	8/3/21		0	
22		LOT SSSL-616			6.5	POWER HOUSE & TRC		Labour strike due to labour payment issue	8/12/21	8/12/21		0	
23		LOT SSSL-631			6.2	HEAD RACE TUNNEL		Work hampered due to labour strike.	8/12/21	8/12/21		0	
24		LOT SSSL-617			6.5	POWER HOUSE & TRC		No work in Power House, below EL 113m due to rise in water level	8/26/21	8/30/21		5	

Point No. 14

North Block, New Delhi

Dated: 15 March, 2021

OFFICE MEMORANDUM

Subject: General Elections to legislative Assemblies of Assam, Kerala, Tamil Nadu, West Bengal, Puducherry, 2021 and Bye- election in 6-Malappuram PC of Kerala and 39-Kanniyakumari PC of Tamil Nadu – Grant of Paid holiday to employees on the day of poll- regarding

The undersigned is directed to state that, as informed by the Election Commission of India, vide their letter No.ECI/PN/16/2021, dated 26/02/2021, has announced schedule for the General Election in respect of the Legislative Assemblies of Assam, Kerala, Tamil Nadu, West Bengal, Puducherry and Bye- election in r/o 6-Malappuram PC of Kerala and 39-Kanniyakumari PC of Tamil Nadu as under:

Schedule for General Election to the Legislative Assemblies of Assam, Kerala, Tamil Nadu, West Bengal, Puducherry and Bye- election in 6-Malappuram PC of Kerala and 39-Kanniyakumari PC of Tamil Nadu announced by the Election Commission of India are as under:

Schedule for General Election to the Legislative Assembly of Assam

S. No.	Legislative Assembly of Assam	Date of Poll	Day
1.	Phase -I (47 ACs)	27.03.2021	Saturday
2.	Phase -II (39 ACs)	01.04.2021	Thursday
3.	Phase III (40 ACs)	06.04.2021	Tuesday

Schedule for General Election to the Legislative Assembly of Kerala

S. No.	Legislative Assembly of Kerala	Date of Poll	Day
1.	Kerala (140 ACs)	06.04.2021	Tuesday

Schedule for General Election to the Legislative Assembly of Puducherry

S. No.	Legislative Assembly of Puducherry	Date of Poll	Day
1.	Puducherry (30 ACs)	06.04.2021	Tuesday

Schedule for General Election to the Legislative Assembly of Tamil Nadu

S. No.	Legislative Assembly of Tamil Nadu	Date of Poll	Day
1.	Tamil Nadu (234 ACs)	06.04.2021	Tuesday

Schedule for General Election to the Legislative Assembly of West Bengal

S. No.	Legislative Assembly of West Bengal	Date of Poll	Day
1.	Phase -I (30 ACs)	27.03.2021	Saturday
2.	Phase - II (30 ACs)	01.04.2021	Thursday
3.	Phase - III (31 ACs)	06.04.2021	Tuesday
4.	Phase - IV (44 ACs)	10.04.2021	Saturday
5.	Phase - V (45 ACs)	17.04.2021	Saturday
6.	Phase - VI (43 ACs)	22.04.2021	Thursday
7.	Phase - VII (36 ACs)	26.04.2021	Monday
8.	Phase - VIII (35 ACs)	29.04.2021	Thursday

Schedule for Bye- election to fill casual vacancy in the Parliamentary Constituency of Kerala and Tamil Nadu

S. No.	State	Number & Name of Parliamentary Constituency (PC)	Day and Date of Poll
1.	Kerala	6- Malappuram (PC)	06.04.2021 Tuesday
2.	Tamil Nadu	39 - Kanniyakumari (PC)	06.04.2021 Tuesday

2. In this regard, it is stated that the guidelines issued by this Department, vide OM No. 12/14/99-JCA, dated 10.10.2001, regarding closure of Government Offices and grant of paid holiday, may be followed by all the Central Government Offices and the central industrial establishments, located in the concerned States.
3. The above instructions may please be brought to the notice of all concerned.
4. Hindi version will follow.


(S.P. Pant)

Deputy Secretary to the Government of India

To

1. All Ministries / Departments of Government of India.
2. UPSC/ CVC / C&AG / Lok Sabha Secretariat / Rajya Sabha Secretariat/ President's Secretariat / Vice President's Secretariat / PM's Office / Supreme Court/High Court of Assam/High Court of Kerala/High Court of Tamil Nadu/High Court of West Bengal/High Court of Puducherry/Central Administrative Tribunal.
3. All attached and subordinate offices of Ministry of Personnel, P.G. & Pensions / MHA
4. Secretary, Staff Side, National Council (JCM), 13-C, Ferozeshah Road, New Delhi
5. Chairmen/Secretaries, Central Government Employees Welfare Coordination Committee, in the State Capital of Assam, Kerala, Tamil Nadu, West Bengal and Puducherry.
6. National Commission for Scheduled Castes/National Commission for Scheduled Tribes/ National Commission for Backward Classes
7. The Chief Secretary of the State Government of Assam, Kerala, Tamil Nadu, West Bengal and Puducherry .
8. The Election Commission of India, New Delhi - w.r.t. letter no. ECI/PN/16/2021 dated 26/02/2021.
9. Hindi Section, DoPT - with the request to provide the Hindi Translation.

Point No. 15

GOVERNMENT OF ASSAM
ASSAM STATE DISASTER MANAGEMENT AUTHORITY
ANCILLARY BLOCK, JANATA BHAWAN, DISPUR, GUWAHATI-781006
Phone: 0361-2237221 (O); E-mail: asdmaghy@gmail.com

No. ASDMA.24/2020/Part-1/153

Dated 24th March, 2021.

ORDER

In exercise of the powers, conferred upon me under the Disaster Management Act, 2005 I Shri Jishnu Barua, IAS do hereby order that the guidelines for effective control of COVID-19 issued by MHA vide Order No.40-3/2020-DM-I (A) dated 23.03.2021 will come into force immediately and will remain until further orders.

Sd/-

(Jishnu Barua, IAS)

Chief Secretary, Assam

Memo No. ASDMA.24/2020/Part-1/153-A

Dated 24th March, 2021.

Copy forwarded to:

1. All Additional Chief Secretaries to the Govt. of Assam, Dispur, Guwahati-6
2. The Director General of Police, Assam
3. All Principal Secretaries/Commissioner & Secretaries to the Govt. of Assam, Dispur, Guwahati-6
4. Commissioner of Police, Guwahati
5. The Principal Secretaries of BTC, NCHAC, KAAC.
6. All Deputy Commissioners
7. All Superintendent of Police
8. S.O to the Chief Secretary, Assam, Guwahati-6

(Gyanendra Tripathi, IAS)

Chief Executive Officer, ASDMA

No. 40-3/2020-DM-I(A)
Government of India
Ministry of Home Affairs

North Block, New Delhi-110001

Dated 23rd March, 2021

ORDER

Whereas, an Order of even number dated 27.01.2021 was issued for containment of COVID-19 in the country, for a period upto 28.02.2021, which was further extended for a period upto 31.03.2021 vide an Order of even number dated 26.02.2021;

Whereas, in exercise of the powers under section 6(2)(i) of the Disaster Management Act, 2005, National Disaster Management Authority (NDMA) has directed the undersigned to issue an order with guidelines for containment of COVID-19 in the country;

Now therefore, in exercise of the powers, conferred under Section 10(2)(1) of the Disaster Management Act 2005, the undersigned hereby directs that guidelines for effective control of COVID-19, as annexed, will be in force upto 30.04.2021.


23/03/2021

Union Home Secretary

and, Chairman, National Executive Committee (NEC)

To:

1. The Secretaries of Ministries/ Departments of Government of India
2. The Chief Secretaries/Administrators of States/Union Territories
(As per list attached)

Copy to:

- i. All Members of the National Executive Committee
- ii. Member Secretary, National Disaster Management Authority

Guidelines for effective control of COVID-19

[As per Ministry of Home Affairs (MHA) Order No. 40-3/2020-DM-I (A)
dated 23rd March, 2021]

The coordinated effort of Central and State/UT agencies has resulted in a sustained decline in the number of active COVID-19 cases in the country, continuously for about 5 months. A fresh surge in COVID-19 cases, in some parts of the country, however, is a cause of concern. At this juncture, the substantial gains achieved against the spread of COVID-19 need to be consolidated, and the chain of transmission of the pandemic effectively broken, with a view to expeditiously restore complete normalcy.

With the last guidelines issued by Ministry of Home Affairs (MHA) on 27.1.2021, all economic and other activities have been opened up in a phased manner, with the stipulation that the prescribed Standard Operating Procedures (SOPs) be scrupulously followed. In order to ensure that the resumption of activities is successful, it is imperative to strictly enforce the **Test- Track-Treat** protocol in all parts of the country; ensure that COVID appropriate behaviour is scrupulously observed by everyone; and, the ongoing vaccination drive – the largest in the world – is scaled up rapidly, to cover all the target groups.

The following guidelines are issued to be effective from *1st April, 2021*.

Effective enforcement of the Test-Track-Treat protocol

Test

1. With sustained effort, the capacity of total daily tests that can be conducted across the country has gone up substantially. There is need to ensure that the tests being conducted are uniformly distributed across all districts, with adequate testing to be done in districts reporting higher number of cases. The proportion of RT-PCR tests in the total mix should be scaled up, on best effort basis, to 70% or more. States and UTs, where the proportion of RT-PCR tests is less, should rapidly increase testing through this protocol, to reach the prescribed level.

Track

2. The new positive cases detected as a result of intensive testing need to be isolated/ quarantined at the earliest; and, their contacts have to be traced at the earliest, and similarly isolated/ quarantined. Containment Zones, accordingly, have to be demarcated, and prescribed containment measures implemented within such Zones.
3. Effective demarcation of Containment Zones, in vulnerable and high incidence areas, is key to breaking the chain of transmission and controlling the spread of the virus. Containment Zones shall be carefully demarcated by the district authorities, at the micro level, taking into consideration the guidelines prescribed by the Ministry of Health and Family Welfare

 23/03/2021

(MoHFW) in this regard. The list of Containment Zones will be notified on the websites by the respective District Collectors and by the States/ UTs. This list will also be shared with MoHFW on a regular basis.

4. Within the demarcated Containment Zones, containment measures, as prescribed by MoHFW, shall be scrupulously followed, as under:
 - i. Only essential activities shall be allowed in the Containment Zones.
 - ii. There shall be strict perimeter control to ensure that there is no movement of people in or out of these zones, except for medical emergencies and for maintaining supply of essential goods and services.
 - iii. There shall be intensive house-to-house surveillance by surveillance teams formed for the purpose.
 - iv. Testing shall be carried out as per prescribed protocol.
 - v. Listing of contacts shall be carried out in respect of all persons found positive, along with their tracking, identification, quarantine and follow up of contacts for 14 days (80% of contacts to be traced in 72 hours).
 - vi. Surveillance for ILI/ SARI cases shall be carried out in health facilities or outreach mobile units or through fever clinics in buffer zones.
 - vii. **It shall be the responsibility of local district, police and municipal authorities to ensure that the prescribed Containment measures are strictly followed. State/ UT Governments shall ensure accountability of the officers concerned in this regard.**

Treat

5. Quick isolation of COVID-19 patients shall be ensured in treatment facilities/ home (subject to fulfilling the home isolation guidelines).
6. Clinical interventions, as prescribed, shall be administered. Capacity building of health workers and professionals shall be an ongoing exercise, to be conducted at all levels, with a view to ensure that the prescribed clinical management protocol is understood clearly and administered accordingly.
7. The concerned agencies – of the Central and State/ UT Governments – shall ensure adequate availability of COVID dedicated health and logistics (including ambulatory) infrastructure, based on their assessment of the case trajectory.
8. Effective infection prevention and control practices shall be followed in treatment facilities and by health care workers and professionals.


23/03/2021

COVID appropriate behavior

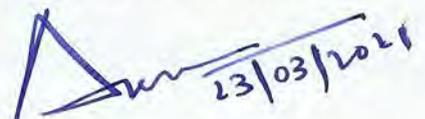
9. State/ UT Governments shall take all necessary measures to promote COVID-19 appropriate behaviour. Strict enforcement of wearing of face masks, hand hygiene and social distancing must be ensured.
10. Wearing of face masks is an essential preventive measure. In order to enforce this core requirement, States and UTs may consider administrative actions, including imposition of appropriate fines, on persons not wearing face masks in public and work spaces.
11. Observance of social distancing in crowded places, especially in markets, weekly bazaars and public transport, is also critical for containing the spread of the infection. SOP issued by Ministry of Health and Family Welfare (MoHFW) to regulate crowds in market places, shall be strictly enforced by States and UTs.
12. SOPs for regulating travel in aircrafts, trains and metro rails are already in place, which shall be strictly enforced. States and UTs shall issue necessary guidelines for regulating travel in other modes of public transport, e.g., buses, boats etc., and ensure that these are strictly complied with.
13. The National Directives for COVID-19 Management, as specified in **Annexure I**, shall be strictly followed throughout the country.

Strict adherence to the prescribed SOPs

14. All activities have been permitted outside Containment Zones and SOPs have been prescribed for various activities. These include: movement by passenger trains; air travel; metro trains; schools; higher educational institutions; hotels and restaurants; shopping malls, multiplexes and entertainment parks; yoga centres and gymnasiums; exhibitions, assemblies and congregations, etc.
15. The SOPs, as updated from time to time, shall be strictly enforced by the authorities concerned, who shall be responsible for their strict observance.

Vaccination

16. Government of India has launched the world's largest vaccination drive against COVID-19. The National Expert Group on Vaccine Administration for COVID-19 (NEGVAC) provides guidance on prioritization of population groups, procurement & inventory management, and vaccine selection delivery and tracking. The recommendations of NEGVAC are considered and finalized by the Central Government.
17. While the vaccination drive is proceeding smoothly, the pace is uneven across different States and UTs; and, the slow pace of vaccination in some States/ UTs is a matter of concern. Vaccination against COVID-19, in the present scenario, is critical to break the chain of transmission. Therefore, all State/ UT Governments should rapidly step up the pace of vaccination,


23/03/2021

to cover all priority groups, as recommended by NEGVAC and approved by the Central Government, urgently and in an expeditious manner.

Local restrictions

18. States and UTs, based on their assessment of the situation, may impose local restrictions at district/ sub-district and city/ ward level, with a view to contain the spread of COVID-19.
19. There shall be no restriction on inter-State and intra-State movement of persons and goods including those for cross land-border trade under Treaties with neighbouring countries. No separate permission/ approval/ e-permit will be required for such movements.

Protection of vulnerable persons

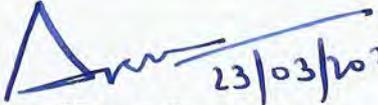
20. Persons above 65 years of age, persons with co-morbidities, pregnant women, and children below the age of 10 years are advised to take necessary precautions.

Use of *Aarogya Setu*

21. Use of *Aarogya Setu* may continue on best effort basis on compatible mobile phones. This will facilitate timely provision of medical attention to those individuals who are at risk.

Strict enforcement of the guidelines

22. All the District Magistrates shall strictly enforce the above measures. For the enforcement of social distancing, State/ UT Governments may, as far as possible, use the provisions of Section 144 of the Criminal Procedure Code (CrPC) of 1973.
23. Any person violating these measures will be liable to be proceeded against as per the provisions of Section 51 to 60 of the Disaster Management Act, 2005, besides legal action under Section 188 of the IPC, and other legal provisions as applicable. Extracts of these penal provisions are at **Annexure II.**


23/03/2021
Union Home Secretary

and, Chairman, National Executive Committee

NATIONAL DIRECTIVES FOR COVID-19 MANAGEMENT

1. **Face coverings:** Wearing of face cover is compulsory in public places; in workplaces; and during transport.
2. **Social distancing:** Individuals must maintain a minimum distance of 6 feet (2 gaz ki doori) in public places.
Shops will ensure physical distancing among customers.
3. **Spitting in public places** will be punishable with fine, as may be prescribed by the State/ UT local authority in accordance with its laws, rules or regulations.

Additional directives for Work Places

4. **Work from home (WfH):** As far as possible the practice of WfH should be followed.
5. **Staggering of work/ business hours** will be followed in offices, work places, shops, markets and industrial & commercial establishments.
6. **Screening & hygiene:** Provision for thermal scanning, hand wash or sanitizer will be made at all entry points and of hand wash or sanitizer at exit points and common areas.
7. **Frequent sanitization** of entire workplace, common facilities and all points which come into human contact e.g. door handles etc., will be ensured, including between shifts.
8. **Social distancing:** All persons in charge of work places will ensure adequate distance between workers and other staff.

A handwritten signature in blue ink, followed by the date '23/03/2021' written in blue ink.

Offences and Penalties for Violation of Lockdown Measures**A. Section 51 to 60 of the Disaster Management Act, 2005**

51. Punishment for obstruction, etc.—Whoever, without reasonable cause —

- (a) obstructs any officer or employee of the Central Government or the State Government, or a person authorised by the National Authority or State Authority or District Authority in the discharge of his functions under this Act; or
- (b) refuses to comply with any direction given by or on behalf of the Central Government or the State Government or the National Executive Committee or the State Executive Committee or the District Authority under this Act,

shall on conviction be punishable with imprisonment for a term which may extend to one year or with fine, or with both, and if such obstruction or refusal to comply with directions results in loss of lives or imminent danger thereof, shall on conviction be punishable with imprisonment for a term which may extend to two years.

52. Punishment for false claim.—Whoever knowingly makes a claim which he knows or has reason to believe to be false for obtaining any relief, assistance, repair, reconstruction or other benefits consequent to disaster from any officer of the Central Government, the State Government, the National Authority, the State Authority or the District Authority, shall, on conviction be punishable with imprisonment for a term which may extend to two years, and also with fine.

53. Punishment for misappropriation of money or materials, etc.—Whoever, being entrusted with any money or materials, or otherwise being, in custody of, or dominion over, any money or goods, meant for providing relief in any threatening disaster situation or disaster, misappropriates or appropriates for his own use or disposes of such money or materials or any part thereof or wilfully compels any other person so to do, shall on conviction be punishable with imprisonment for a term which may extend to two years, and also with fine.

54. Punishment for false warning.—Whoever makes or circulates a false alarm or warning as to disaster or its severity or magnitude, leading to panic, shall on conviction, be punishable with imprisonment which may extend to one year or with fine.

55. Offences by Departments of the Government.—(1) Where an offence under this Act has been committed by any Department of the Government, the head of the Department shall be deemed to be guilty of the offence and shall be liable to be proceeded against and punished accordingly unless he proves that the offence was committed without his

knowledge or that he exercised all due diligence to prevent the commission of such offence.

(2) Notwithstanding anything contained in sub-section (1), where an offence under this Act has been committed by a Department of the Government and it is proved that the offence has been committed with the consent or connivance of, or is attributable to any neglect on the part of, any officer, other than the head of the Department, such officer shall be deemed to be guilty of that offence and shall be liable to be proceeded against and punished accordingly.

56. Failure of officer in duty or his connivance at the contravention of the provisions of this Act.—Any officer, on whom any duty has been imposed by or under this Act and who ceases or refuses to perform or withdraws himself from the duties of his office shall, unless he has obtained the express written permission of his official superior or has other lawful excuse for so doing, be punishable with imprisonment for a term which may extend to one year or with fine.

57. Penalty for contravention of any order regarding requisitioning.—If any person contravenes any order made under section 65, he shall be punishable with imprisonment for a term which may extend to one year or with fine or with both.

58. Offence by companies.—(1) Where an offence under this Act has been committed by a company or body corporate, every person who at the time the offence was committed, was in charge of, and was responsible to, the company, for the conduct of the business of the company, as well as the company, shall be deemed to be guilty of the contravention and shall be liable to be proceeded against and punished accordingly:

Provided that nothing in this sub-section shall render any such person liable to any punishment provided in this Act, if he proves that the offence was committed without his knowledge or that he exercised due diligence to prevent the commission of such offence.

(2) Notwithstanding anything contained in sub-section (1), where an offence under this Act has been committed by a company, and it is proved that the offence was committed with the consent or connivance of or is attributable to any neglect on the part of any director, manager, secretary or other officer of the company, such director, manager, secretary or other officer shall also, be deemed to be guilty of that offence and shall be liable to be proceeded against and punished accordingly.

Explanation.—For the purpose of this section—

- (a) “company” means anybody corporate and includes a firm or other association of individuals; and
- (b) “director”, in relation to a firm, means a partner in the firm.

59. Previous sanction for prosecution.—No prosecution for offences punishable under sections 55 and 56 shall be instituted except with the previous sanction of the Central Government or the State Government, as the case may be, or of any officer authorised in this behalf, by general or special order, by such Government.

60. Cognizance of offences.—No court shall take cognizance of an offence under this Act except on a complaint made by—

- (a) the National Authority, the State Authority, the Central Government, the State Government, the District Authority or any other authority or officer authorised in this behalf by that Authority or Government, as the case may be; or
- (b) any person who has given notice of not less than thirty days in the manner prescribed, of the alleged offence and his intention to make a complaint to the National Authority, the State Authority, the Central Government, the State Government, the District Authority or any other authority or officer authorised as aforesaid.

B. Section 188 in the Indian Penal Code, 1860

188. Disobedience to order duly promulgated by public servant.—Whoever, knowing that, by an order promulgated by a public servant lawfully empowered to promulgate such order, he is directed to abstain from a certain act, or to take certain order with certain property in his possession or under his management, disobeys such direction, shall, if such disobedience causes or tends to cause obstruction, annoyance or injury, or risk of obstruction, annoyance or injury, to any person lawfully employed, be punished with simple imprisonment for a term which may extend to one month or with fine which may extend to two hundred rupees, or with both; and if such disobedience causes or trends to cause danger to human life, health or safety, or causes or tends to cause a riot or affray, shall be punished with imprisonment of either description for a term which may extend to six months, or with fine which may extend to one thousand rupees, or with both.

Explanation.—It is not necessary that the offender should intend to produce harm, or contemplate his disobedience as likely to produce harm. It is sufficient that he knows of the order which he disobeys, and that his disobedience produces, or is likely to produce, harm.

Illustration

An order is promulgated by a public servant lawfully empowered to promulgate such order, directing that a religious procession shall not pass down a certain street. A knowingly disobeys the order, and thereby causes danger of riot. A has committed the offence defined in this section.

W.T MESSAGE

(21.03.2021)

FROM : ASDMA ASSAM DISPUR
TO : DEPCOM (ALL EXCEPT KAMRUP METRO)/DEPCOM KAMRUP METRO (BY
HAND)/
DISPOL(ALL)
COMMISSIONEDR OF POLICE GUWAHATI (BY HAND
DIVCOMS(ALL)
RANGE IG/DIG [ALL]

No. ASDMA.24/2020/ PART-1/147 WITH THE OBJECTIVE OF CONTAINING THE SPREAD OF COVID19 IN THE STATE OF ASSAM (COMMA) VARIOUS ORDERS UNDER DISASTER MANAGEMENT ACT (COMMA) 2005 WERE ISSUED WITH THE OBJECTIVE OF PREVENTING SPREAD OF CORONA VIRUS (.)

DURING THE LAST FEW WEEKS (COMMA) THE NUMBER OF COVID CASES ARE SHOWING AN INCREASING TREND IN SEVERAL PARTS OF THE COUNTRY MAINLY DUE TO LAXITY IN THE OBSERVANCE OF COVID APPROPRIATE BEHAVIOUR BY THE PEOPLE (COMMA) ESPECIALLY IN THE CROWDED PLACES (.)

KEEPING IN VIEW THE FRESH SURGE OF CASES AND UPCOMING FESTIVALS (COMMA) IT IS IMPORTANT TO ENSURE COMPLIANCE OF THE GUIDELINES FOR SURVEILLANCE (COMMA) CONTAINMENT AND CAUTION ISSUED BY MINISTRY OF HOME AFFAIRS' (MHA) VIDE ORDER NO.40-3/2020-DM-I (A) DATED 27TH JANUARY(COMMA) 2021 AND TO STRICTLY ENFORCE COVID APPROPRIATE BEHAVIOUR (COMMA) SUCH AS WEARING OF FACE MASKS (COMMA) HAND HYGIENE AND SOCIAL DISTANCING AMONG PEOPLE SO AS TO FULLY OVERCOME THE PANDEMIC (.)

Sd/-

(GYANENDRA TRIPATHI)
CHIEF EXECUTIVE OFFICER, ASDMA

MEMO NO. ASDMA.24/2020/PART-1/147

DATED 21.03.2021

COPY TO

1. OC, APRO, DISPUR. HE IS REQUESTED TO TRANSMIT THE ABOVE MESSAGE IMMEDIATELY.

MEMO NO. ASDMA.24/2020/PART-1/147-A

DATED 21.03.2021

1. THE STAFF OFFICER TO THE CHIEF SECRETARY, ASSAM FOR INFORMATION.
2. P.S. TO THE DIRECTOR GENERAL OF POLICE FOR INFORMATION.
3. P.S. TO THE PRINCIPAL SECRETARY, HOME & POLITICAL DEPARTMENT, GOVT. OF ASSAM.
4. P.S. TO THE PRINCIPAL SECRETARY, REVENUE & DM DEPARTMENT, GOVT. OF ASSAM.

Gyanendra Tripathi
21/3/2021

CHIEF EXECUTIVE OFFICER, ASDMA



ISO 9001-2008

PATEL ENGINEERING LTD.

Subansiri Lower Hydro Electric Project
Kolaptukar, Dollungmukh Circle
District : Kamle, Arunachal Pradesh -791120

2nd May 2021

Ref: PEL/382/2020-21/127

To
Engineer In-Charge,
Subansiri Lower Hydroelectric Project
NHPC Ltd,
Gerukhamukh, Assam,
Email: jsahninhpc2000@gmail.com

Kind Attention: Mr Janesh Sahni, General Manager-(I/C)

Sub: - Lot SSL-6 "Construction of Balance Civil works of Power House Complex from HRT Intake Structures to Tail Race Channel" for Subansiri Lower HE Project - Covid 19 Outbreak and its Impact on the Project work

- Ref: 1) LOA- NH/CCW/CC-I/SO-76/2020/781-789 dated 01.09.2020
2) Contract Agreement No NH/CCW/SUBANSIRI/LOT SSL-6 dated 21.09.2020
3) Our letter No. PEL/PLAN/2020-21/115 dated 13.04.2021
4) Assam Govt.'s Health & Family Welfare Department' Order No. HLA 301/2020/177 dated Dispur 21st Apr, 2021
5) Assam Govt.'s Health & Family Welfare Department' Order No. HLA 270/2021/Pt/76 dated Dispur 24th Apr, 2021
6) Assam Govt.'s Order No. ASDMA 28/2021/18 dated 26th Apr, 2021
7) Assam Govt.'s Order No. ASDMA 28/2021/27 dated 27th Apr, 2021
8) Copy of Memorandum by All Dollungmukh Area Student's Union dated 27th Apr 2021

Dear Sir,

In continuation of letter under reference (3), we wish to inform you that post detection of 13 of our staff/workmen on 11th/12th Apr 2021, all the project works were directly and completely affected up to 16th Apr. Further, the works remained partially affected from 16th Apr to 30th Apr, firstly due to mass testing camp on 16th and 17th Apr and secondly, due to further spread of Covid-19 among other worker/staff at project site.

As informed by us, there have been steady influx of more symptomatic cases of staff/and workmen despite following all the precautionary protocols and Advisories ordered by the Government from time to time. The current numbers of staff and workmen infected with Covid-19 virus has climbed to 60. All the infected staff/workmen as per the protocol and government guidelines are quarantined at site accommodation. We would like to specifically mention that 3 cases of Covid patients from our project sites have been hospitalised to Demaji Civil Hospital due to breathing problem. The hospital has inadequate facilities.



Received
E/21

Page 1 of 3

REGD OFFICE:

Patel Estate Road, Jogeshwari (West), Mumbai - 400 102, India
Phone +91 22 26767500, 26782916, Fax : +91 22 26782455, 26781505
E-mail : headoffice@pateleng.com www.pateleng.com

2904

The large number of Covid positive cases at project site are indication of the fact that risk of highly contagious Covid virus cannot entirely be prevented in a working environment of project site. NHPC with its large, and well-established set up, and its outreach in local administration in this part of Assam, can arrange for emergency medical facilities such as Covid test centre as well as emergency medicines, to deal with the outbreak at site. Considering the large number of workers at We will appreciate if NHPC creates quarantine centres considering the large number of workers at the project site

Currently, work front in-charges of our HRT/Surge Tunnel/Power Intake, Powerhouse, Accounts, Stores, as well as, many from our staff at the project office are either found to be Covid positive or are suspected with symptoms of Covid-19 infection.

The ever-increasing spread of Covid-19 infections and the severity of the ever-mutating virus at site and all across the country has affected the works as follows.

1. The fabrication team, batching plant operation gang, Tower Crane dismantling team, crusher plant erection team, 12 Nos. of operators/foreman, and 24 Nos. of carpenters/bar benders/welders have left the site due to fear psychosis.
2. The sub-contractors of curtain/consolidation grouting, labour gang for new set of form work for powerhouse have not yet mobilised considering the spread of Covid-19 at project site.
3. The service engineers of newly procured Drum Cutters, TAMROCK drill jumbo, Breakers have delayed their visit to site and are yet to confirm dates of their visit.
4. Oxygen cylinders are in short supply, due to surge in demand of medical oxygen and consequent kerb on production of industrial oxygen.
5. Transportation of balance parts (2 trailers) of 200 TPH crusher plant, tower crane and that of 90 m³/hr batching plant is affected.
6. Supply of spares and consumables of construction equipment is hit hard due to reluctance of transporters or due drivers affected by Covid-19.
7. Refurbishment of Road Header in progress at vendor's fabrication yard in Delhi, which is severely affected by the recent surge in Covid cases, is delayed.
8. The present grim situation at project site and everywhere in the country has also delayed deployment of additional plant and equipment such as transit mixers, excavators and dumpers on hire by our vendors.
9. The infrastructure development work at project site is affected, as Delhi, the place from where the prefab materials are supplied is currently under siege due to tremendous surge in Covid cases there.
10. Delivery of some parts of new formwork materials for powerhouse is also affected.
11. Joining project office/site by new appointees and transfer of staff have also being adversely affected due to travel and other restrictions such as requirement of RT-PCR reports etc.
12. The locals are constantly pressurizing us and creating hindrance to work, while demanding to suspend the works. Enclosed copy of Memorandum by All Dollungmukh Area Student's Union dated 27th Apr 2020, may please be referred to.

The tremendous surge in Covid cases at project site and elsewhere in country, has severely hindered our ability to perform under the circumstances arising out of pandemic situation across the country. Many major cities which are source of supplies to our Subansiri Project are affected and are unable to provide timely services due to breakdown of their logistic chain.



We reiterate that the current situation has impacted our day-to-day work at project site along with professional and personal life. The current situation has become worse than what we experienced during height of pandemic, last year. Though our performance under the contract is affected by the Force Majeure conditions, we will continue to strive for progress of works with available manpower and other resources.

Yours truly

For Patel Engineering Limited

Sunil Kumar Gupta
(Project Manager)



Encl: Copies of Prohibitory Orders and Advisories by Government of Assam and as above.

**GOVERNMENT OF ASSAM
HEALTH & FAMILY WELFARE DEPARTMENT
DISPUR :: GUWAHATI- 781006**

No.HLA 301/2020/177

Dated Dispur the 21st April, 2021**ORDER**

In partial modification of earlier Standard Operating Procedures (SOPs) for persons arriving in Assam, all passengers arriving by flights and trains from outside the State will have to undergo compulsorily home quarantine for seven days, even if the result of the COVID test undergone on arrival, is negative.

However, Government officials and those travelling due to medical reasons and family bereavement are exempted from this mandatory seven days home quarantine.



(Samir K. Sinha, IAS)

Principal Secretary to the Government of Assam
Health & Family Welfare Department

Memo No. HLA 301/2020/175- A

Dated Dispur the 21st April, 2021

Copy to

1. Additional Chief Secretary to Hon'ble Chief Minister, Assam.
2. Principal Secretary, Home & Political and Social Welfare Department, Assam.
3. Director General of Police, Assam.
4. ADGP (L&O) / ADGP (S), Assam.
5. Principal Secretary, Health & Family Welfare Department, Assam.
6. Commissioner & Secretary, Transport Department, Assam.
7. Chief Executive Officer, Assam State Disaster Management Authority.
8. Mission Director, National Health Mission, Assam.
9. All Deputy Commissioners, Assam.
10. All Superintendents of Police, Assam.
11. Director of AYUSH/ Director of Health Services/ Director of Medical Education/ Director of Health Services (FW), Assam.
12. All Joint Directors of Health Services, Assam.
13. All Principal cum Chief Superintendents/ Superintendents, Medical College Hospitals, Assam.
14. P S. to Hon'ble Minister, Health & F W, Assam.
15. P S. to Hon'ble Minister of State, Health & F W, Assam.
16. P S. to Chief Secretary, Assam.
17. Any other concerned.

By orders etc.



Deputy Secretary to Government of Assam
Health & Family Welfare Department




**GOVERNMENT OF ASSAM
HEALTH & FAMILY WELFARE DEPARTMENT
DISPUR :: GUWAHATI- 781006**

No HLA 270/2020/PV76

Dated Dispur the 24th April, 2021**ORDER**

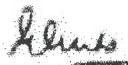
In view of the increasing number of COVID-19 cases in different states in the country, the following measures are put in place:-

1. Driver, handyman etc. of goods carrying vehicles entering Assam through Srirampur or Chagolia check gate will have to undergo COVID-19 testing at their final destination places in Assam. The testing will be organized by the local Deputy Commissioner in parking lot etc.
2. Passengers, drivers etc. of passenger vehicles (private and commercial) entering Assam through Srirampur or Chagolia check gate will have to undergo Rapid Antigen Testing at the check gate itself, in a manner similar to the tests done in previous year.

For this purpose, the existing infrastructure of the erstwhile check gates under Finance (Taxation) Department may be utilized.

Deputy Commissioners of Kokrajhar and Dhubri districts will take necessary action accordingly with support from Health & Family Welfare Department, National Health Mission, Assam etc.

3. The dhabas along the highways which are frequented by vehicles coming from outside the State will be kept under surveillance and random COVID-19 screening and testing will be carried out at these locations.



Principal Secretary to the Government of Assam
Health & Family Welfare Department

Memo. No HLA.270/2020/PV76- A

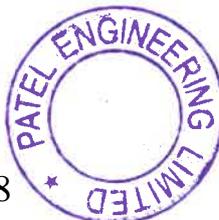
Dated Dispur the 24th April, 2021.

Copy to:

1. Additional Chief Secretary to Hon'ble Chief Minister, Assam,
2. Principal Secretary, Home & Political Department, Assam.
3. Director General of Police, Assam.
4. ADGP (L&O) / ADGP (S), Assam.
5. Principal Secretary, Health & Family Welfare Department, Assam
6. Chief Executive Officer, Assam State Disaster Management Authority.
7. Mission Director, National Health Mission, Assam.
8. All Deputy Commissioners, Assam.
9. All Superintendents of Police, Assam.
10. Director of AYUSH/ Director of Health Services/ Director of Medical Education/ Director of Health Services (FW), Assam.



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GOVERNMENT OF ASSAM
ASSAM STATE DISASTER MANAGEMENT AUTHORITY
 Ancillary Block, Janata Bhawan, Dispur, Guwahati-781006
 Phone: 0361-2237221 (O); E-mail: asdmaghy@gmail.com

ORDER

No. ASDMA.28/2021/27

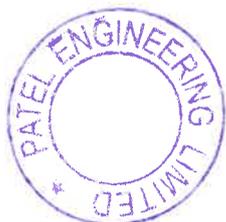
Dated 27th April, 2021

Whereas, the Assam State Disaster Management Authority (ASDMA) has vide order No ASDMA 28/2021/18 dated 26-04-2021 issued consolidated and revised guidelines for all districts for containment of COVID-19 pandemic in Assam.

And whereas, the situation of COVID-19 in Assam has been reviewed and it has been observed that there has been a rapid increase in the number of active cases of COVID-19 across the State and therefore, it is felt that right curfew needs to be imposed in all the districts of Assam, except for essential and emergency activities/services, as an emergency measure for well being and safety of the people.

And, therefore in exercise of the powers, conferred under Section 22(2) (h) of the Disaster Management Act, 2005, the undersigned, in his capacity as Chairperson, State Executive Committee of the State Disaster Management Authority, Assam, hereby directs that there shall be total ban on movement of individuals from 8:00 PM to 5:00 AM daily, except for exemptions as follows:

1. Officers / officials of Government of India/ Government of Assam, its autonomous/subordinate offices & Public Corporations involved in emergency services such as Health and Family Welfare and all related medical establishments, Police, Prisons, Home Guards, Civil Defence, Fire and emergency services, District Administration, Pay & Account Office, Electricity, Water and Sanitation, Public Transport (Air/Railways/Buses) including all incidental services/activities that are essential for smooth functioning of all modes of public transport (such as handling of cargo, ticketing, air freight station, CFS, ICD etc), Disaster Management and related services, NIC, NCC and Municipal services, and all other essential services on production of valid Identity card. The uninterrupted delivery of public services shall be ensured by the concerned departments/agencies.
2. All Judicial officers / officials of courts of Assam on production of valid Identity card.
3. All private medical personnel such as doctors, nursing staff, paramedical staff etc. and other hospital services (such as hospitals, diagnostic centres, clinics, pharmacies, pharmaceutical companies and other medical & health services).
4. Pregnant women and patients for getting medical /health services.
5. Person coming from/going to Airports/Railway stations/ISBTs allowed to travel on production of valid ticket.
6. Officers/officials related to functioning of offices of Diplomats of various countries as well as persons holding any constitutional post on production of valid Identity card.



7. Electronic and print Media on production of valid Identity card
8. There shall be no restriction on inter-state and intra-state movement / transportation of essential / non-essential goods. No separate permission / e-pass will be required for such movements
9. Movement of persons related to commercial and private establishments providing following essential services/commodities shall be allowed:
 - I. Shops dealing with food, groceries, fruits & vegetables, dairy & milk booths, meat & fish, animal fodder, pharmaceuticals, medicines and medical equipments
 - II. Banks, Insurance offices and ATMs.
 - III. Telecommunications, Internet services, Broadcasting and Cable services, IT and IT enabled services.
 - IV. Delivery of all essential goods including food, pharmaceuticals, medical equipments through e-commerce
 - V. Petrol pumps, LPG, CNG, petroleum and gas retail and storage outlets
 - VI. Power generation, transmission and distribution units and services.
 - VII. Cold storage and warehousing services.
 - VIII. Private security services.
 - IX. Manufacturing units of essential commodities
 - X. Production units or services which require continuous process
10. Persons who are going for COVID-19 vaccination

Penal Provisions:-

1. Any person violating these measures will be liable to be proceeded against as per provisions of Section 51 to 60 of the Disaster Management Act, 2005, besides legal action under Sec. 188 of IPC and other legal provisions as applicable

This order shall come into force with immediate effect and will remain in force till **May 1, 2021.**

This order shall operate in continuation and partial modification of Order No.ASDMA 26/2021/16 dated 26-04-2021

(Jishnu Sarua, IAS)

Jishnu Sarua



per hour. However, if any religious place has only a small area, the management committee of such religious institution shall reduce the number of attendees accordingly.

7. All Market places / supermarkets / shops in the Malls / weekly market should be closed by 6.00 PM every day.
8. Restaurants, Dhabas and other eateries can entertain dine-in guest only up to 6.00 PM. However, take away/ home delivery is allowed up to the usual time of closure as per local regulations.
9. Restaurants operating within a Hotel or Resort can allow outside guests up to 6.00 PM only. However, in-house guests of the Hotel/Resort may be allowed to dine-in up to the usual time of operation.
10. Delivery of goods through e-Commerce may continue after 6.00 PM.
11. Cold storages and warehouses may continue beyond 6.00 PM. However, sale counters, showrooms etc. attached to these warehouses or cold storages shall close after 6.00 PM.
12. Pharmacies, Hospitals, Animal Care Centres and Veterinary clinics may operate without restrictions being providers of essential and emergency services.

B. Work Places (Government and Private)

1. Working from home and virtual working should be encouraged.
2. Except officers, only 50% employees can work from office. However, this will not be applicable for organizations rendering Essential/Emergency Services, Law Enforcement Services and Election work.
3. Meetings in the official chambers to be discouraged.
4. Pregnant women employees and women with children of 5 years or below working under any Government / PSU / Financial Institutions / Private Organizations irrespective of their grade shall be eligible to work from home.
5. Persons with disabilities (PwDs) working in any Government/PSU/ Financial Institutions/Private organizations shall be exempted from attending duties in consonance with the O.M No.11013/9/2014/Estt.(A.III) dated 1st April, 2020 issued by DoPT, GoI. However, they may be encouraged to work from home.
6. Social distancing at work places should be ensured through adequate gaps between shifts, staggering of lunch breaks of staff etc.
7. Provision for thermal scanning, hand wash and sanitizer be made at all entry and exit points and common areas. In addition, sufficient quantities of handwash and sanitizer should be made available in the work places.
8. Frequent sanitization of entire workplace, common facilities and all points which come into human contact should be carried out.

C. Educational Institutions (Government and Private)

1. All Educational Institutions including Schools/Colleges/Universities must provide quality virtual options.
2. Not more than 50% students should attend in person on any day.



3. Schools should stagger class timings so that large scale release of students does not arise.
4. There will be no morning assembly/special assembly etc. in the educational institutions.
5. Preference to be given on online mode of teaching for primary classes.
6. Education Department will issue detail guideline/SOP for uninterrupted education service keeping in view of the COVID-19 precautionary measures.

D. Public Transport (Government and Private)

1. All Public transport authorities shall enforce COVID-19 appropriate behavior and seating inside the vehicles, carriers, containers etc.
2. Auto Rickshaws, cycle rickshaws and taxis shall operate with one driver and two passengers maintaining social distancing.
3. City buses, Intra-district, Inter-district and Inter-state buses will be allowed to operate with 50% of seating capacity.
4. No passenger shall be allowed to travel standing in the vehicle.
5. Wearing of mask and observance of COVID-19 appropriate behavior will be mandatory for all passengers.
6. Wearing of face mask is mandatory even for a single person driving a vehicle. In case of persons travelling in any private car, up to 100 % of its seating capacity, wearing of face mask is mandatory for all the persons.

E. Miscellaneous

1. Wearing of face mask is compulsory in all public places.
2. Shop owners shall ensure minimum six feet distance among customers and shall not allow more than 5 persons inside the shop. In addition, shop owners should compulsorily keep sanitizers and hand wash in their shops.
3. Shopkeepers and customers shall have to wear masks, hand gloves and maintain social distancing. Responsibility of maintenance of social distancing will be on the shop owner and failure to do so will be viewed very seriously and may entail summary closure of defaulting shops.
4. Barber shops, salons and parlours shall continue to provide service with strict compliance of COVID-19 appropriate behavior such as wearing of face masks, face cover, hand gloves.
5. Industrial units and Tea gardens may function subject to observance of COVID appropriate behaviour. Head of the unit/tea garden shall be responsible for ensuring social distancing, mask wearing by workers and staff, sanitization of industrial premises, thermal scanning etc.
6. Following Advisories earlier issued by ASDMA shall be strictly enforced
 - a. Advisory for Daily & Weekly Markets/ Haat-Bazaars issued vide Order No.ASDMA.20/2020/Pt./217dt.14.07.2020 (Annexure-I)



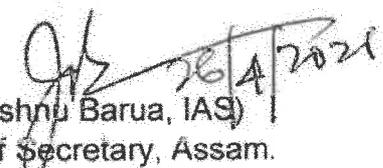
- b. Advisory for Engagement of Domestic Help issued vide Order No.ASDMA.20/2020/Pt./187 dt. 20.05.2020 (Annexure-II)
- c. Advisory for Apartment Societies for COVID-19 prevention issued vide Order No.ASDMA.23/2020/03 dt. 27.03.2020 (Annexure-III)
- d. Advisory for elderly people issued vide Order No.ASDMA.23/2020/08 dt. 31.03.2020 (Annexure-IV)

F. Penal Provisions:-

1. Any person violating these measures will be liable to be proceeded against as per provisions of Section 51 to 60 of the Disaster Management Act, 2005, besides legal action under Sec. 188 of IPC and other legal provisions as applicable.
2. Any person not wearing face mask and/ or spitting in public places shall be fined to the tune of Rs.1000/- vide ASDMA's earlier Order No. ASDMA/24/2020/Part-1/122 dt. 14/10/2020 which can be imposed by District wise Task Force comprising of District Disaster Management Authority, Magistracy, Police, Enforcement wing of District Transport Officer and Enforcement wing of Guwahati Municipal Corporation in their respective jurisdictions.

The aforementioned advisories shall be applicable in addition to the guidelines issued by Ministry of Home Affairs (MHA), Gol, Ministry of Health and Family Welfare(MoH&FW), Gol and Health & Family Welfare Department, Government of Assam.

This Order supersedes earlier Order No. ASDMA.28/2021/11 dt. 20th April, 2021, ASDMA.28/2021/12 and ASDMA.28/2021/13 dt. 21st April, 2021.


 (Jishnu Barua, IAS)
 Chief Secretary, Assam.

Memo No. ASDMA.28/2021/18-A
 Copy forwarded to:

Dated 26th April, 2021

1. All Additional Chief Secretaries to the Govt. of Assam, Dispur, Guwahati-6
2. The Director General of Police, Assam
3. All Principal Secretaries/Commissioner & Secretaries to the Govt. of Assam, Dispur, Guwahati-6
4. Commissioner of Police, Guwahati-6
5. The Principal Secretaries of BTC, NCHAC, KAAC.
6. All Deputy Commissioners





7. The Director, Directorate of Information and Public Relations, Assam
8. All Superintendent of Police
9. S.O to the Chief Secretary, Assam, Guwahati-6
10. PPS to Hon'ble Chief Minister, Assam
11. All P.S to Hon'ble Minister, Assam, Dispur, Guwahati-6
12. All P.S to Advisor to Hon'ble Chief Minister, Assam

Gyanendra Tripathi
(Gyanendra Tripathi, IAS)
Chief Executive Officer, ASDMA
24/1/2022

HL



Annexure - I



ADVISORY FOR DAILY & WEEKLY MARKETS / HAAT BAZAARS

In order to prevent the spread of novel coronavirus (COVID-19) in market places, bus-stands etc. maintaining all protocols of COVID-19, the following advisories are to be followed strictly. District Administration, CEO, Zilla Panshad, Chairman, Municipal Boards will ensure the strict implementation of advisory by the Market committee/ Local administration/ Lessee.

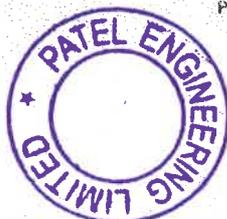
Advisory to be followed by lessee while administering a daily/weekly market:

- a) The Market committee / Local administration / Lessee will follow orders issued by the State Govt. / District Administration regarding date and time of opening and closing of market place including lockdown orders and restrictive orders issued by Govt. of Assam from time to time.
- b) The Market committee/ Local administration/ Lessee will ensure sanitization of market place before opening and after closing of the market/bazaar on daily basis.
- c) The Market committee/ Local administration/ Lessee will make necessary arrangements for announcement through public miking in market place regarding the advisory to be followed at the "entry" and "exit" of market place.
- d) The Market committee/ Local administration/ Lessee will ensure pre-positioning of display board on relevant advisories in the "Entry" and "Exit" of the market place.
- e) The Market committee/ Local administration/ Lessee may restrict entry of customers in large congregations at a time. Batch wise entry into the market place may be allowed and tokens/ time cards may be issued to each batch entering the market.
- f) The distance between each shop or street vendor should not be less than 2 meter.
- g) Specific markings may be made with sufficient distance to manage the queue and ensure social distancing in the market place.
- h) Advisory on Entry and exit into the market place/haat-bazaar should be adhered to by the public.
- i) The Market committee/ Local administration/ Lessee will ensure deployment of volunteers at appropriate locations (including entry and exit) of market places to guide general public / customers on social distancing norms etc.
- j) Install hand washing points in conspicuous places and keep sufficient hand wash.
- k) Impose fine in case of any violations regarding spitting etc.

A. Advisory for "Entry" into the market place:

1. Only asymptomatic persons shall be allowed in the market place.
2. People should wash their hands with soap and water before entering the market place or sanitize hands using hand sanitizers installed by market committee/ local administration/ lessee.
3. Posters/ standees on preventive measures about COVID-19 to be displayed prominently. Audio and Video clips to spread awareness on preventive measures for COVID-19 should be regularly played at selective locations.

Page 1 of 2



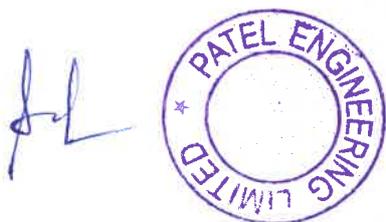
4. The customers / general public entering the market place will ensure compulsory wearing of masks. Fine may be imposed if necessary, for any violations.
5. Strict adherence of social distancing norms will be maintained and 1 meter distance will be maintained amongst the general public/ customers. The customers are advised to stand in queue and maintain 1 meter distance amongst them.
6. Use of Polythene/ Plastic bags in market place is prohibited. People should carry cloth bags or baskets for shopping of essentials items/ groceries/ vegetables etc.
7. Disposal of face masks in public place in market areas shall be strictly prohibited.
8. Spitting in market place / public space shall be strictly prohibited.
9. Persons above 65 years of age, persons with comorbidities, pregnant women and children below the age of 10 years are advised to stay at home, except for essential and health purpose.
10. Respiratory etiquettes to be strictly followed. This involves strict practice of covering one's mouth and nose while coughing/sneezing with a tissue/handkerchief/flexed elbow and disposing off used tissues properly.
11. All vendors/ shopkeepers will compulsorily use face masks and alcohol based hand sanitizers. The notes and coins should be sanitized using alcohol based sanitizer before handing over exchange notes / coins to the customer. The vendors/ shopkeepers will compulsorily wear hand gloves.

B. Advisory for "Exit" from the market place:

1. Token/ time card will be handed over to person assigned by Market committee/ Local administration/ Lessee at the exit.
2. Proper crowd management in the parking lots and outside the market area - duly following social distancing norms shall be organized.
3. Closed dustbins should be installed at appropriate locations outside market place for disposal of face masks and hand gloves.
4. Toilets as per size of the market should be installed at appropriate location.
5. Hygiene should be ensured in toilets.
6. Devise a proper mechanism for waste disposal specifically waste generated due to vegetable waste, garbage etc.

(N.B. 1. This advisory will be applicable on re-opening of daily & weekly markets /haat-areas as per orders issued by Govt. of Assam for opening of markets/ bazaars)

2. In case of non-compliance of the orders, penalty will be imposed u/s 51 to 60 of the Disaster Management Act, 2005 besides legal action under Section 188 of the IPC)



In response to



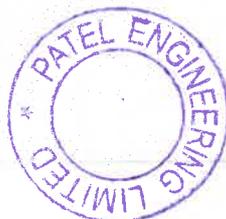
Govt of Assam
Assam State Disaster Management Authority
Dapur, Guwahati-781006

ASDMA 20/2020(pt./1) 7

Dated: 20-05-2020

REVISED ADVISORY FOR ENGAGEMENT OF DOMESTIC HELP(Do's and Don'ts for domestic help to prevent the risk of COVID-19 infection)

1. Teach your house help/ domestic help about COVID-19. What the virus is, how it spreads and the precaution to be taken.
2. Check for orders from local authorities - Police station/ D C office/Circle Office, if your house is located in Containment zone. In containment zones the household may not be able to engage domestic help or if domestic help stays in containment zone, he/she may not be allowed to work. But even if you don't take their services during this period, it is advised that their wage should not be deducted for this period.
3. He/she should sanitise properly before entering the house. Keep soap and water handy at the entrance.
4. He/she should wear face mask at all times.
5. Ask him/her to wash their hand / sanitise every time you send them out for essential items.
6. When they are sent to buy essential items they should wear proper masks, plastic washable gloves, and a sanitizer (to use in case if she/he touched anything suspicious in the shop or shop).
7. Instruct the house help to maintain a safe physical distance of 6 feet from others.
8. Try to keep away the material from your body when carrying from market. It is better to have a plastic basket/bucket with you when going to the market. Put the material in bucket and carry it to your home.
9. Tender exact money for the products purchased. In case you pay more and remaining is returned by the shop keeper, currency notes/coins given by shopkeepers/vendors.
10. If you have a full-time house help, ask him/her to wash her/his hand thoroughly and frequently with soap and running water throughout the day.
11. Maintain physical distancing (6 feet) with domestic help. Don't stay close to him/her at the time for giving instructions.
12. If he/she shows any symptom(s) of COVID-19 s/he should be asked to isolate/home quarantine.
13. If he/she shows any symptom of COVID-19 s/he should be taken for testing and medical check up immediately. Provide him/her with necessary support for getting medical help immediately.
14. He/she should be advised to refrain from consumption of Betel-nut, Gutkha, Tobacco, Alcoholic beverages or any other such intoxicating substances.
15. He/she should be advised to wash hands with soap and water or sanitize hands with sanitizer before coming in contact with elderly persons or children at home.
16. He/she shall ensure personal hygiene at all times.
17. If he/she is suffering from other chronic illness should be taken to nearest health centre for treatment and allowed to take rest.

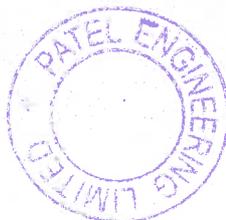


Annexure - III



Advisory for Apartment Societies for COVID-19 prevention

- **Enact preventive measures-**
 - **Visitors protocol-** All Apartment Societies shall enforce a visitors' protocol limiting access of outside visitors to the apartment. Full details of the visitors shall be maintained, and details shall be entered by any person managing the entrance (security/other arrangement) including travel history if any.
 - **Hand Washing-** Each apartment society shall enforce hand washing at the time of entry for all types of visitors and even for the families residing within when they come from outside. Hand washing bay/basin with soap and liquid as well as a poster showing appropriate steps to wash hands shall be placed at the entrance and should be strictly ensured. If sanitizers are available, they can also be provided for use in the entrance.
 - **Shutting down common activities where gathering occurs-** All apartment societies shall ensure that any public gathering platform be it park, swimming pool, fitness centers, common activity centers are closed, and no gathering of people is allowed within the apartment premises. The Apartment Societies shall refrain from organizing any community event, religious events or any other event that may require gathering of more than five people at a time.
 - **Frequent cleaning of common premises-** The Apartment Societies shall also implement cleaning and disinfection measures atleast three times a day particularly for lift buttons, handrails in the staircases, gates and grills and all other such areas within the apartment. As far as possible instruction should be given to visitors to avoid touching anything in the common premises.
 - **Mechanism for contactless delivery-** The Apartment Society shall take measures to ensure contact less delivery by placing delivery baskets at the security points. Or the families should be asked pick up deliveries outside the gate. Necessary disinfection should be carried out for any packet received.
 - **Domestic help-** The Apartment Society shall consider discussing with all resident families to give mandatory **leave with pay** to domestic help who work at multiple locations (except those who are staying within the apartment)
- **Ensuring stricter implementation of Home Quarantine-** The managing committee shall collect all relevant information about the health, travel location and duration of all the residents. If any resident has a travel history to COVID affected places or are being advised for self quarantine, the management committee shall ensure the same while also maintaining confidentiality and not hurting/disrespecting the self-respect of such residents. Further, if any person is being asked for self-quarantine, the management society may consider
 - Supporting the home quarantined person in accessing daily necessities such as groceries, medicines etc.
 - Shall provide necessary psycho social support while maintaining all infection control protocols





- Monitor and restrict any discriminatory practice that may hurt the self esteem of the individual. The detailed guideline on home quarantine can be accessed here https://nhm.assam.gov.in/sites/default/files/swf_utility_folder/departments/nhm_lpl_in_id_6/portlet/level_2/guideline_for_home_quarantine.pdf

- **Information Source**

Verified information can be accessed from the following

- These information can be accessed from Ministry of Health and Family Welfare, Govt. of India <https://www.mohfw.gov.in/awareness.html>
- Department of Health and Family Welfare (National Health Mission, Govt. of Assam) http://nhm.assam.gov.in/portlets/assam_covid_19_documents or
- Assam State Disaster Management Authority <http://asdma.gov.in/>

N.B. If any person has cough and fever help shall be called for contacting @ 6913347770. For any information or support the following helpline numbers can also be accessed

- 104 (Health and family welfare)
- 1070/1079 (State Emergency Operation Centre) and 1077 (District Emergency Operation Centres)

Issued in Public Interest by Assam State Disaster Management Authority (ASDMA)





OFFICE OF THE
DOLLUNG MUKH AREA STUDENTS UNION

(ADASU)
CAMPUS ALL INDIGENOUS YOUTH ASSOCIATION
ESTD.: 1999
H.Q.: DOLLUNG MUKH
KAMLET DISTRICT ARUNACHAL PRADESH
SESSION-2021-2022

L. ANSAGGE
General Secretary
Ph. No. 8732339246

ROTON MALO
President
Ph. No. 9774730648
8787511251

- Yuni Fernan
VICE PRESIDENT PRO TEM
- Eliocara
VICE PRESIDENT ADMIN
- ASST. GEN. SECY
- Rotom Maren
CONVENOR
- Rotom Tol
CO-CONVENOR
- Rotom Shee
GAMES & SPORT SECY.
- Rotom Iage
ASST. GAMES & SPORT SECY.
- Nido Techo
FINANCE SECY.
- Gocham Ama
ASST. FINANCE SECY.
- Kina Dani
EDUCATION SECY.
- Rotom Sipa
ASST. EDUCATION SECY.
- Nido Lumar
IPR SECRETARY
- Rotom Sakter
ASST. IPR SECY.
- Rotom Teli
SOCIAL SERVICE SECY.
- Langin Nima
ASST. SOCIAL S SECY.
- Nido Tapa
CHIEF AUDITOR
- Bilo Apple
AUDITOR
- Rotom Ioshi (Rotom Te In)
ART & CULTURAL SECY.
- Kina Tanya
ASST. ART & CULTURAL SECY.
- Tand Tapa
HEALTH & SANITATION SECY.
- Rotom Tandi O. Ina
ASST. HEALTH & SANITATION SECY.
- Makha Eidan
SPOKESPERSONS
- Nido Tera
OFFICE SECY.
- Rotom Jopa
SPEAKER
- WOMEN WING**
- Nido Yari
PRESIDENT
- Luni Yerin
VICE PRESIDENT
- Chi. N Muriem
GENERAL SECY.
- Mobo Yatom
ASST. GENERAL SECY.

Ref. No. ADASU/11/21

Date 27/04/21

To

The SDO Dollungmukh under kamle Dist.(A.P)

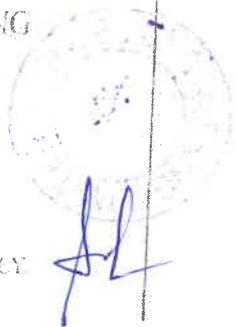
Sub:- Submission Of Memorandum.

Madam,

We on behalf of **All Dollungmukh Area Student's Union (ADASU), All Dollungmukh Indigenous Youth Association (DIYA) and All Right Bank Labour Union (ARBLU)**. Would like to inform you that day by day corona is increasing in Kolaptukar from Pvt. Ltd. company and as you have also declared containment zone to Kolaptukar area ~~that why~~ we don't find any safety from corona.

So, following charter of demands for your immediate redress.

1. New immigration (outsider) should not be allow for 7days in every Pvt. Ltd. company.
2. All the Labours and public of Dollungmukh should be tasted corona under 7th days.
3. All kolaptukar house and shop should sanitized two (2) times in a weeks i.e. on Monday and Thursday by NHPC till corona cure from kolaptukar.
4. Hand sanitizer, hand globe and mask should be provide to all the labours under Pvt. Ltd. companies.
5. Automatic hand sanitizer machine should provide in every office of kolaptukar and in left and right side of kolaptukar bridge with caretaker NHPC.



OFFICE OF THE
DOLLUNGUMUKH AREA STUDENT'S UNION
 (ADASU)
 DOLLUNGUMUKH AREA STUDENT'S UNION
 ESTD. 1989
 H.O.: DOLLUNGUMUKH
 DISTRICT: AKURGACHAL, PRADHESH
 SESSION: 2021-2021

LAA SAGGE
 General Secretary
 Ph. No. 8732850246

ROTOM TALO
 President
 Ph. No. 9774730648/
 8787511251



- Vice President (General)
- Vice President Admin
- Asst. Gen. Secy.
- Publicity
- Co-ordinator
- Patron
- Co-ordinator
- Rotom Shree
- Game & Sport Secy.
- Rotom Taps
- Asst. Game & Sport Secy.
- Nido Tacho
- Finance Secy.
- Cocham Ann
- Asst. Finance Secy.
- Edu. Dept.
- Education Secy.
- Rotom Sipi
- Asst. Education Secy.
- Nido Famar
- IPR Secretary
- Rotom Sakar
- Asst. IPR Secy.
- Rotom Telli
- Social Service Secy.
- Langku Nimra
- Asst. Social S. Secy.
- Nido Japo
- Chief Auditor
- Bilo Apple
- Auditor
- Ratan Teshi (Rotom Teshi)
- Art & Cultural Secy.
- Kina Uma
- Asst. Art & Cultural Secy.
- Uani Piar
- Health & Sanitation Secy.
- Rotom Tania (Uani)
- Asst. Health & Sanitation Secy.
- Mulcha Fadam
- Spokespersons
- Nido Fater
- Office Secy.
- Rotom Topu
- Speaker
- WOMEN WING**
- Nido Yaru
- President
- Uani Yaru
- Vice President
- Chief Minister
- General Secy.
- Mao Yalon
- Asst. General Secy.

Ref. No. ADASU.../21

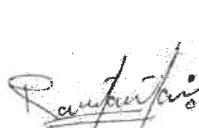
Date 27/04/21

6. All the labour should be well sanitize before leaving from there works.
7. Corona patients should keep in hospital, not in home isolation.

Therefore, we the organization strongly appeal for immediate take up this matter seriously within ~~two~~² days of time after receiving of this memorandum. if fail, we are compel to go for further step/action which may create law and order, *problem*.

Copy:-

1. OC Dollungumukh for kind information.
2. ED and PM of NHPC for necessary action .
3. PM and GM of Patel Pvt. Ltd. company for necessary action.
4. PM and GM of SOMA Pvt. Ltd. company for necessary action.


Rotom Talo
 President
 (ADASU)


Kina Uma
 President
 (DIYA)


Bini Topu
 President
 (ARBLU)

S/D
Laa Sagge
 G/S
 (ADASU)

S/D
Pabo Tebi
 G/S
 (DIYA)


Bini Rillo
 G/S
 (ARBLU)

AL



Point No. 16 NHPC REPRESENTATION

Zimbra

planning-co@nhpc.nic.in

Revised Cost Estimate (RCE) in respect of Subansiri Lower HE Project, 2000 MW (8x250 MW) in Arunachal Pradesh / Assam at Completion Level – Time Overrun regarding.

From : NHPC Planning Divn. <planning-co@nhpc.nic.in> Thu, Apr 20, 2023 12:31 PM
Subject : Revised Cost Estimate (RCE) in respect of Subansiri Lower HE Project, 2000 MW (8x250 MW) in Arunachal Pradesh / Assam at Completion Level – Time Overrun regarding. 1 attachment
To : hpaone-cea <hpaone-cea@gov.in>, krsharvan <krsharvan@nic.in>
Cc : pksangwan <pksangwan@nic.in>, nhpc-mop <nhpc-mop@gov.in>, Sanjay Darbari <sanjaydarbari@nhpc.nic.in>, PMSG <pmsg-co@nhpc.nic.in>, Cost ENGG Division <ced@nhpc.nic.in>, Vipin Gupta <vipingupta@nhpc.nic.in>
Bcc : ranjan1973 <ranjan1973@gmail.com>, raju1708 <raju1708@rediffmail.com>

Sir,

Please find enclosed NHPC letter dated 20-04-2023 on the above subject.

सादर/ Regards,

Pradip Nandi
योजना विभाग/ Planning Division
एन एच पी सी लिमिटेड, सेक्टर-33, फरीदाबाद, हरियाणा
NHPC Ltd., Sec-33, Faridabad, Haryana
पिन कोड / PIN Code 121003

Website: <http://www.nhpcindia.com>

Hydropower - Clean Power For Every Home

 **NHPC letter dated 20-04-2023.pdf**
15 MB

NH/PD/IP/RCE-SLP/2023/ 20

Dated: 20.04.2023

Chief Engineer (HPA),
Central Electricity Authority,
Sewa Bhawan,
R K Puram, New Delhi

Sub: Revised Cost Estimate (RCE) in respect of Subansiri Lower HE Project, 2000 MW (8x250 MW) in Arunachal Pradesh / Assam at Completion Level – Time Overrun regarding.

**Ref: 1. NH/PD/IP/RCE-SLP/2023/532 dated 31.01.2023
2. CEA letter File No.CEA-HY-11-45/1/2021-HPM division dated: 21.03.2023**

महोदय,

Reference is invited to CEA letter under reference dated: 21.03.23 vide which CEA has provided their comments on the Time Overrun chapter of RCE of Subansiri Lower Project. CEA has found 313 days of delay as justified for the period Jan'2020 to Dec'2022. In this regard, it is submitted that:

- (i) NHPC has considered 43 days of hindrances caused due to Collapse of Diversion Tunnels No. 2, 3 & 4 and collapse of PH coffer wall leading to flooding of Power House during Sep-Oct, 22.
- (ii) CEA vide letter dated: 21.03.23 has however not found the above reasons as justified (Point No. 6&7) stating that NHPC has not submitted the action taken report on the measures suggested by CEA regarding assessment of PH protection wall and Diversion Tunnels vide its tour report dated: 21.04.22.

In this regard, it may be stated that:-

The suggested examination of Power House coffer wall to ascertain the adequacy of its strength to bear maximum pressure during monsoon and assessment of the impact of river diversion through DTs for such a long period on the slope stability of surrounding mountain could be possible only during lean season i.e. normally from Oct, 2022 to April, 23 when weather is dry & the discharge in the river is minimum. However during year 2022-23, the Subansiri basin experienced a prolonged and earlier than anticipated monsoon starting from last week of March'22 and continued late up to Oct'22, and as a result of this hindrance, assessment of these structures as suggested could not be

carried out. Following rainfall data will show a picture of behavior of monsoon during year 2022 w.r.t. the previous years:

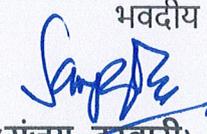
Month	Mar	Apr	May	Jun	July	Aug	Sep	Oct	Total
Monthly average (2001- 2021) (in mm)	97	210	470	1034	1431	1040	758	193	5233
Rainfall 2022 (in mm)	118	353	615	2105	1241	741	1044	805	7022

By the time, above suggestions were made by CEA vide its report dated: 21.04.22, monsoon was already underway. Subsequently the Diversion Tunnels as well as PH Coffers wall collapsed during Sep-Oct, 22 due to unprecedented high rain & discharge in the river Subansiri. The Matter was brought to the notice of MOP and CEA vide incident report dated 16.09.2023 & 25.09.2023 and thereafter, Status Report of the restoration measures continues to be sent regularly to CEA.

Subansiri project was started in 2005. Structures like Coffers walls and Diversion Tunnels are generally temporary in nature constructed to be used for a limited period of time. As such, extended/prolonged use of these structures due to project getting held up for unusually long time beyond 8 years especially in adverse geological and climatic conditions has contributed to its instability and in turn its failure.

In view of the above submissions, it is requested to kindly re-consider the issue and allow above hindrances of 43 days as justified entitling extension of time, in respect of hindrances evaluated by project upto Dec'22.

Thanking You.

भवदीय

(संजय दरबारी) 20.04.2023
विभागाध्यक्ष (योजना)

Copy for kind information:

1. Sh. Pankaj Kumar Sangwan, Dy Director (NHPC Desk), Shram Shakti Bhawan, Rafi Marg, New Delhi.



भारत सरकार
Government of India
विद्युत मंत्रालय
Ministry of Power
केंद्रीय विद्युत प्राधिकरण
Central Electricity Authority
जल विद्युत परियोजना प्रबोधन प्रभाग
Hydro Projects Monitoring Division

Date: 21.03.2023

विषय: Revised Cost Estimate (RCE) in respect of Subansiri Lower HE Project, 2000 MW (8x250 MW) in Arunachal Pradesh / Assam at Completion Level.

Ref.: HPA Division's subject emails dated 02.02.2023 and 18.02.2023

Reference is made to HPA's subject emails wherein HPM Division, CEA was requested to examine the subject NHPC proposal with respect to time overrun aspect and furnish comments. It is informed that delays till 31.12.2019 were vetted earlier and HPM Division's observations were provided regarding the same vide its letter no. CEA/HPM/129/18/2020/335 dated 11.05.2020. NHPC's current proposal received for examination has taken the time overrun/ hindrances up to 31.12.2022 taking anticipated commissioning date as June 2024. The same has been examined in light of the *Guidelines for Examination of Time Over-Run in Execution of Hydro Power Projects in Central Sector*, supporting documents provided by NHPC vide its emails dated 17.02.2023, 13.03.2023 and 21.03.2023, and information available in HPM Division; HPM Division's observations are as follows:

S. No.	Major reasons for delays	Net delay as per NHPC (in days)	Net impacted delay taken in to account (in days)	Remarks/ Comments
1.	On account of additional works (Implementation of DDRP's recommendations) for resumption of Dam Works - Pre requisite for starting concerting in the extended spillway portion of the Dam.	60	60	Appears justified in light of DDRP's recommendations (Accepted by MoP vide its letter to NHPC dated 26.06.2013).
2.	a. Delays on account	100	100	Appears justified in

I/26853/2023

	of Lockdown due to COVID-19 during 2020. b. Delays on account of Lockdown due to COVID-19 during 2021.	37	37	light of 1 st wave of COVID pandemic. Appears justified in light of 2 nd wave of COVID pandemic. As per Min. of Finance OM dated 13th May, 2020 maximum 180 days delay is permissible. NHPC has requested (100 + 37 = 137 days < 180 days).
3.	On account of additional work due to breach of Power House Coffor wall (Right Bank)	116	81 (22.07.2020 – 11.10.2020)	Seems not justified. Failure of Deo Nallah Slope and PH Coffor Wall breach cut off left bank dam access (26.05.2020) and right bank dam access (22.07.2020). However, the TRC road and thereby access to the dam was restored on 11.10.2020.
4.	On account of additional work involving construction of approach from the left bank to Dam site due to failure of Deo Nallah Slope.	46		
5.	Delays on account of Overtopping of water over dam due to Flood during Aug'21	35	35	Appears justified.
6.	Collapse of Diversion Tunnels 2, 3 & 4 in Sep-Oct 2022	43	0	Seems not justified. Vide CEA's Tour Report (Tour dated 21.04.2022) sent to MoP/ NHPC on 29.04.2022, the issues of Power House Protection Wall and Diversion Tunnels had been raised and measures were suggested at Para 9.i and 9.iii respectively. However, no ATR was furnished by NHPC regarding the same; the same was intimated to MoP also in reply to its
7.	Flooding of Power House occurred due to collapse of coffer wall on 25.09.2022.	Overlapping Period		

I/26853/2023

				query regarding the ATR by NHPC. Further, a similar event had occurred earlier also in July 2020.
	Total	437	313	

Note 1 – As per NHPC, time overrun has been calculated taking hindrances up to December 2022. However, NHPC has given time extension to M/s BGS-SGS-SOMA JV considering hindrances up to 31.07.2020. Time extensions have also been granted to M/s Texmaco and M/s GE till 30.04.2023 and 31.08.2023 respectively. Hence, the *Net impacted delay taken in to account* above is **provisional** and NHPC is requested to further squeeze the above permitted time overrun period.

Note 2 – The anticipated commissioning has been taken as **March 2024** as initially committed by NHPC to the MoP. No time overrun may be permitted after March 2024 except in *force majeure* situations.

2. This issues with the approval of the Chief Engineer, HPM Division, CEA

फ़राज़
21/03/2023
(फ़राज़)

उप-निदेशक

Email: cea-hpmd@gov.in

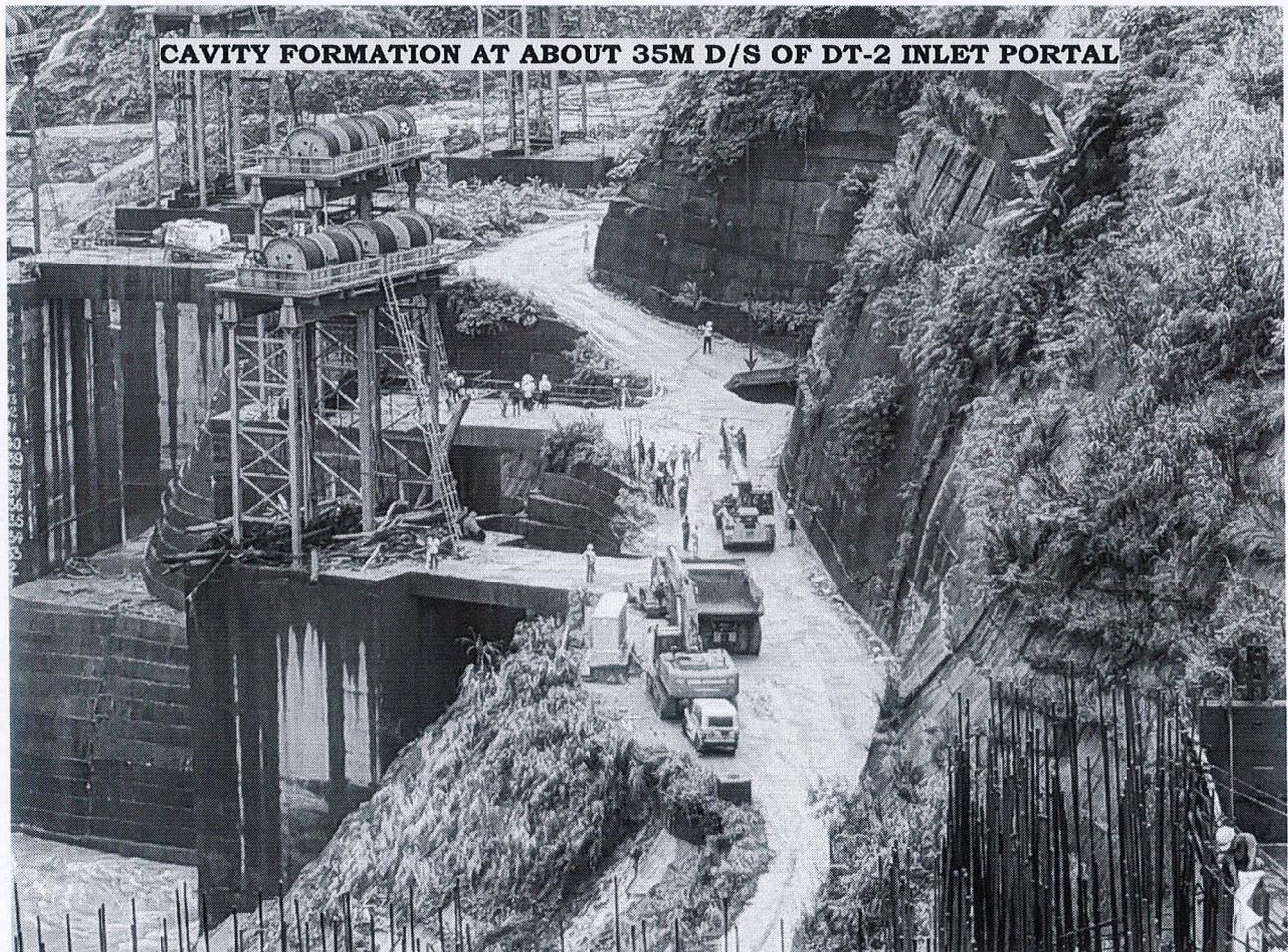
✓ मुख्य अभियंता (HPA), CEA

Subansiri Lower H E Project (2000MW) Dam Complex

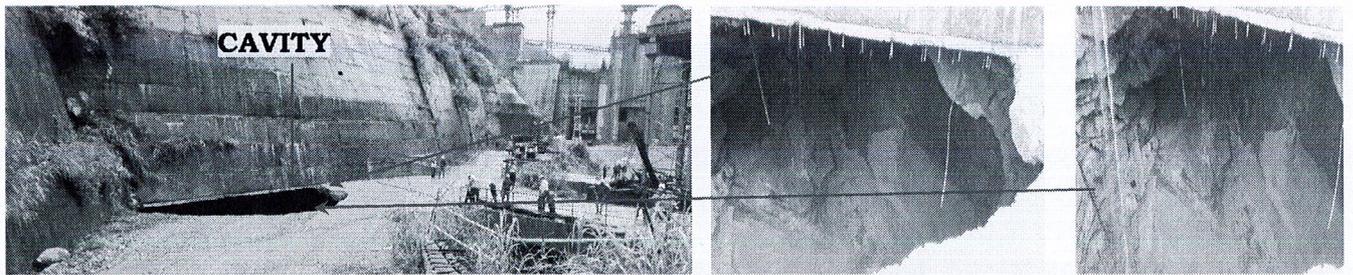
Date: 16.09.2022

Incident Report on formation of large cavity towards hillside at about 35m D/s from Inlet Portal of Diversion Tunnel-2.

On 15th September 2022 at about 8:30PM, a portion of Diversion Tunnel-2 at about 35m D/s from Inlet Portal collapsed and formed a large cavity up to EL± 148m. The Diversion Tunnels of the project are under operation since Dec'2007 and has been working till date without any sign of distress and the collapse has taken place suddenly. A part of the crown of DT is visibly collapsed leading to chimney formation upwards to a height of approx. 39 m i.e. up to road surface. Opening of cavity at road surface i.e. EL±148m is about 15m length and 5m wide. Sound of intermittent heavy loose fall of rock mass into the flowing water in Diversion Tunnel-2 are being heard. The approach road to upstream dyke of Dam is affected by the formation of the above cavity. Photographs of the damaged area are as under for ready reference:



U/s view of cavity at about 35m D/s from Inlet Portal of Diversion Tunnel-2



**D/s view of cavity at about 35m D/s from
Inlet Portal of Diversion Tunnel-2**

Based on the available 3D Log data, the rock stretch negotiated in that area was medium to fine grained sandstone which was moderately jointed in nature. In the initial stretch of 50 m the rock class is Class III with RMR 45 to 54 except one stretch of Class IV between RD 12 to 16 with RMR 39. Hindrance support class IIIB was provided in this stretch except the initial 15 m stretch where Hindrance class-IV support was applied. The entire length of the tunnel was also covered with 600 mm lining after completion of hindrance support.

Three prominent joint sets were observed ($130-140/75^{\circ}-86^{\circ}$); ($210-280/50^{\circ}-80^{\circ}$) and ($320-340/60^{\circ}-70^{\circ}$) along with one random joint. Presently no visible signatures of extension cracks have been observed on the cladding wall along the hill side and nearby vicinity of the cavity.

The damaged site has been immediately visited by Director (Projects), NHPC along with senior officials and contractor's representative in the evening hours of 15th September 2022 and plan for restoration is being formulated. Inlet gates of Diversion Tunnel-2 are being closed for stopping the turbulence of river water flow in the DT-2 to minimize damage to the adjacent rock mass.

Out of total 5 Nos. of Diversion Tunnels, DT-5 had already been closed in previous year by lowering of its gates and now DT-2 is being closed by lowering of its gates and 3 Nos. Diversion Tunnels will remain operational for managing the River inflow.

INCIDENT REPORT FOR COFFER WALL COLLAPSE ALONG POWER HOUSE AT SUBANSIRI LOWER PROJECT ON 25.09.2022

Initially air bubbles at around 2:00PM on 24.09.2022 observed in front of Unit-4 at TRC road probably due to capillary action, followed by formation of crack for a length of 15 meters in front of Unit-4. As a precautionary measure, it was decided to do PU grouting in affected area (3:00PM). Arrangement for drilling and grouting in this area was started (4:00PM) and PU Grouting operation in first hole near coffer wall was started by 7:00PM. Periodical checking of topographic markers on the coffer wall were done to observe any movement in the coffer wall.

Around 8:00 PM, a longitudinal crack up to Unit 6 along coffer wall was observed. The cracked area in cavity portion in front of Unit 4 started to sink and cracks surrounding in cavity portion began to swell. By this time the situation was getting worse as movement in coffer wall was observed, topographical markers showed deflection of 20 to 25 mm towards river in coffer wall (11:30 PM). The width of the crack was increasing and at some points 40 to 50 mm increase in width was observed.

Cracks further prolonged towards unit-3 for a length of around 80-90m and multiple cracks formed at many locations. Topographical markers being continuously observed and grouting operation was in progress. Prolongation and widening of cracks were continuously observed throughout length from unit 3 to 6. Around 00:30 AM of 25.09.2022, topographical marker shown deflection of 50 mm then PU grouting was stopped and people were alerted. At 00:40 am all of sudden coffer wall around 35m collapsed (Part of Unit-3 and 4). There was no loss of manpower but one compressor and grouting equipment could not be shifted. After collapse, some portion of top-level road also collapsed but due to sufficient width at the bend to lower level road the rock still exist and water couldn't enter into PH. It is to mention that rock level obstructing flow to PH is just less than 1 m and continuously width of road is decreasing due to erosion. Around 1:20 AM part of coffer wall (around 50m) from Unit-4 to 6 was collapsed and on inspection it was observed that a large cavity under access road near Unit-6 towards Power House Pit has been formed. After some time, small seepage at lower level at U 2 observed which was intermittently flowing with minor discharge.

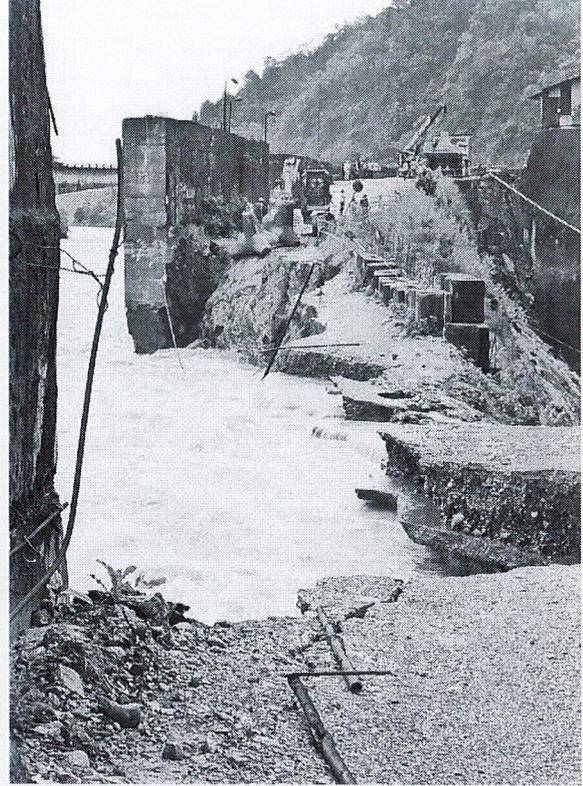
Meanwhile pouring of tetrapod started at 07:00 AM from U-1 and Unit-2 side. Arrangements for filling the cavity portion with sand bags being done. The seepage form river side has been increased and necessary arrangements for dewatering from TRC area is being done. Considering the above situation, it is felt that the current situation is very critical and the access road can be breached any time leading to flooding of Power House Pit. Accordingly, all critical electrical equipment are being shifted to safer places.



Initial formation of cracks for a length of 15 meters in front of Unit 4



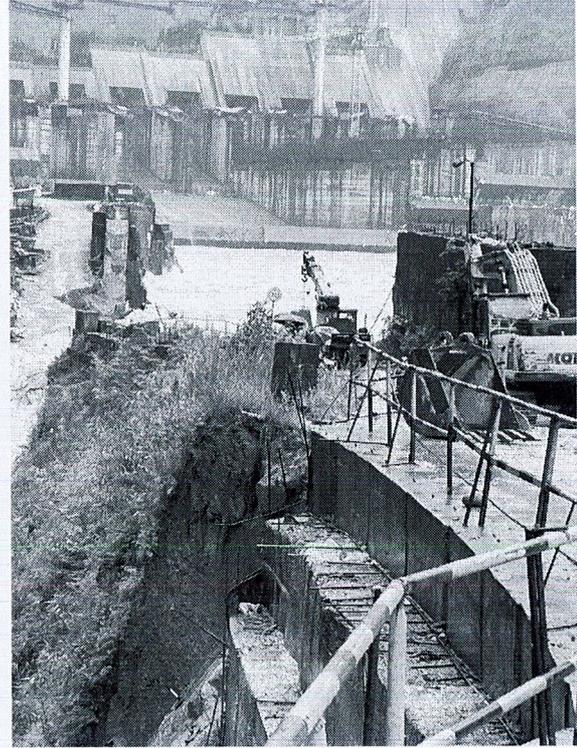
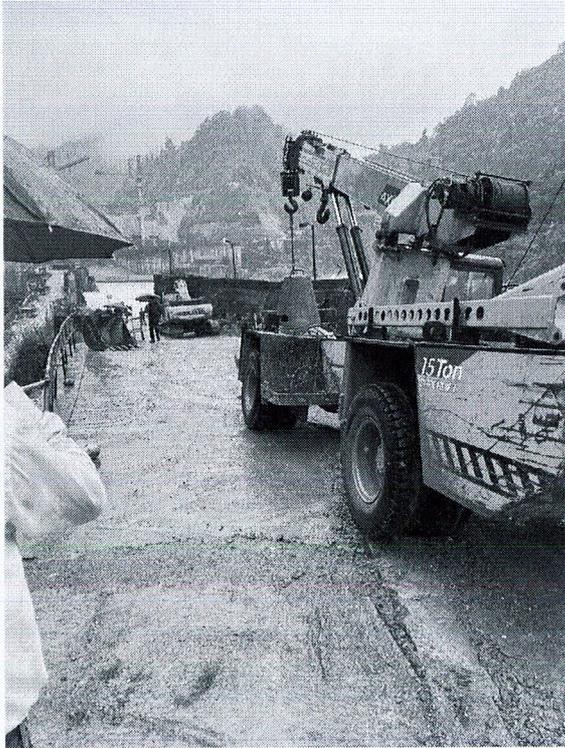
Condition of Coffer Wall



Current situation of PH Cofferd Wall



Efforts to stop breaching of Cofferd wall



Efforts to stop breaching of Coffier wall

PMSG

From: PMSG <pmsg-co@nhpc.nic.in>
Sent: 17 September 2022 09:52
To: NHPC Desk; pksangwan; rp pradhan; cea-hpmd
Cc: CMD; DIRECTOR (PROJECT) SECTT. EMAIL; A K Nauriyal; hsranga
Subject: Incident Report on formation of large cavity towards hillside-at about 35m D/s from Inlet Portal of Diversion Tunnel-2 of Subansiri Lower H.E. Project
Attachments: Incident_Report_for_formation_of_large_cavity_DT_2_15_09_2022.pdf

महोदय,

उपरोक्त संदर्भित विषय पर रिपोर्ट संलग्न किया जा रहा है।

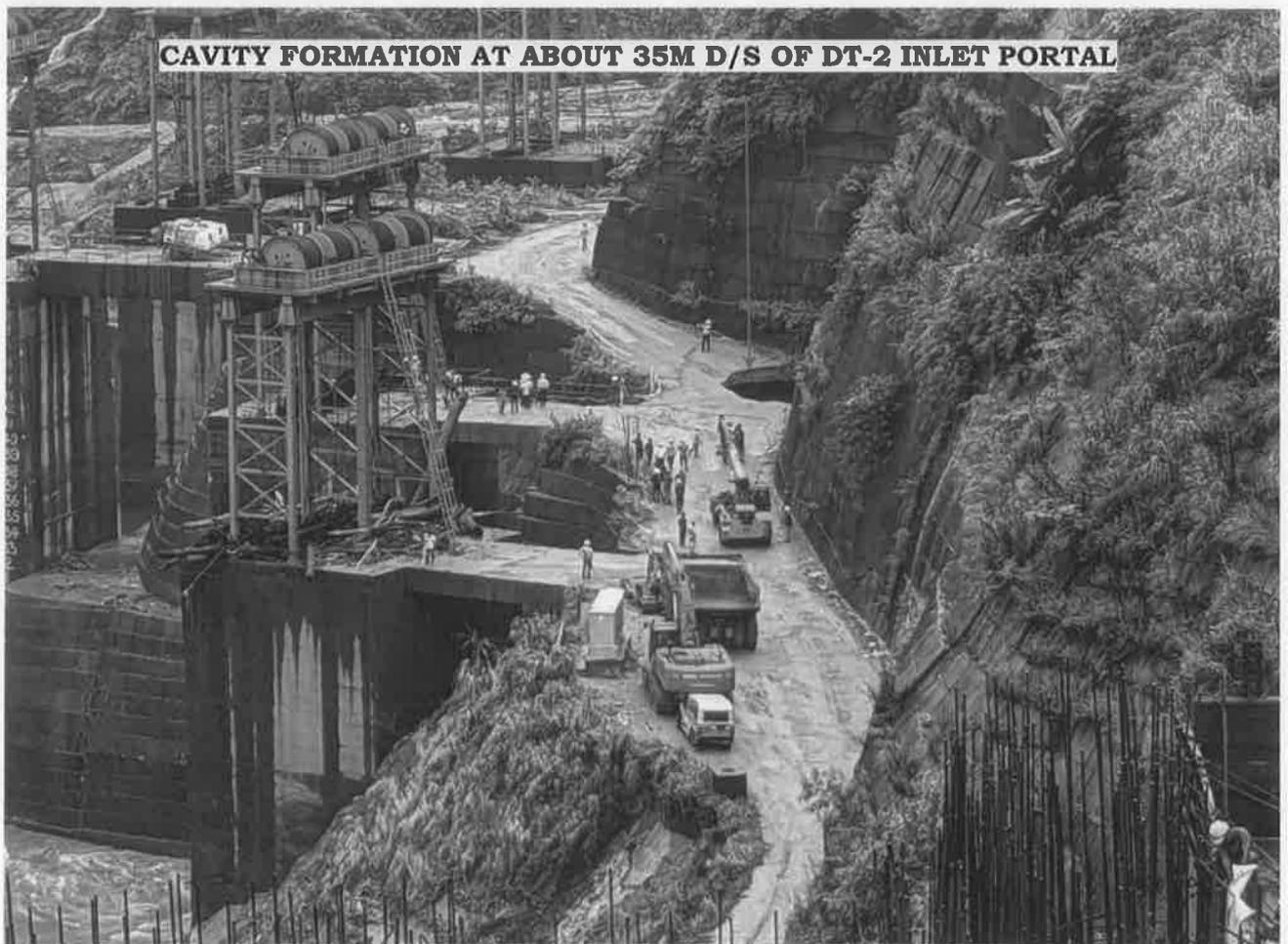
भवदीय,
पीएमएसजी विभाग

Subansiri Lower H E Project (2000MW) Dam Complex

Date: 16.09.2022

Incident Report on formation of large cavity towards hillside at about 35m D/s from Inlet Portal of Diversion Tunnel-2.

On 15th September 2022 at about 8:30PM, a portion of Diversion Tunnel-2 at about 35m D/s from Inlet Portal collapsed and formed a large cavity up to EL± 148m. The Diversion Tunnels of the project are under operation since Dec'2007 and has been working till date without any sign of distress and the collapse has taken place suddenly. A part of the crown of DT is visibly collapsed leading to chimney formation upwards to a height of approx. 39 m i.e. up to road surface. Opening of cavity at road surface i.e. EL±148m is about 15m length and 5m wide. Sound of intermittent heavy loose fall of rock mass into the flowing water in Diversion Tunnel-2 are being heard. The approach road to upstream dyke of Dam is affected by the formation of the above cavity. Photographs of the damaged area are as under for ready reference:



U/s view of cavity at about 35m D/s from Inlet Portal of Diversion Tunnel-2



**D/s view of cavity at about 35m D/s from
Inlet Portal of Diversion Tunnel-2**

Based on the available 3D Log data, the rock stretch negotiated in that area was medium to fine grained sandstone which was moderately jointed in nature. In the initial stretch of 50 m the rock class is Class III with RMR 45 to 54 except one stretch of Class IV between RD 12 to 16 with RMR 39. Hindrance support class IIIB was provided in this stretch except the initial 15 m stretch where Hindrance class-IV support was applied. The entire length of the tunnel was also covered with 600 mm lining after completion of hindrance support.

Three prominent joint sets were observed ($130-140/75^{\circ}-86^{\circ}$); ($210-280/50^{\circ}-80^{\circ}$) and ($320-340/60^{\circ}-70^{\circ}$) along with one random joint. Presently no visible signatures of extension cracks have been observed on the cladding wall along the hill side and nearby vicinity of the cavity.

The damaged site has been immediately visited by Director (Projects), NHPC along with senior officials and contractor's representative in the evening hours of 15th September 2022 and plan for restoration is being formulated. Inlet gates of Diversion Tunnel-2 are being closed for stopping the turbulence of river water flow in the DT-2 to minimize damage to the adjacent rock mass.

Out of total 5 Nos. of Diversion Tunnels, DT-5 had already been closed in previous year by lowering of its gates and now DT-2 is being closed by lowering of its gates and 3 Nos. Diversion Tunnels will remain operational for managing the River inflow.

**Subansiri Lower HE Project (2000MW)
Dam Complex**

Date: 21.09.2022

Sub: Report on restoration measures taken by project in large cavity formed towards hill side at about 35m D/s from Inlet Portal of Diversion Tunnel-2.

Ref: e-IOM no: NH\SLP\Dam & Intake Construction\2022\ 164 dated 17th September 2022

Restoration works of large cavity formed at Diversion Tunnel -2 on 15th September 2022 are being taken up by project. One of the DT gates was lowered on 16.09.22 and the second gate was lowered on 17.09.22. As per the discussions held with D&E team during their visit from 17.09.22 to 19.09.22, the cavity filling has been started from 19.09.22 with following activities:

1. On 19.09.22, filling of large cavity with precast concrete cubes and Tetra pods was carried out and quantity of the same is as under:
 - i. Concrete cubes - 43 nos.
 - ii. Tetra pods - 214 nos.

2. On 20.09.22, filling of large cavity was continued with precast concrete cubes, Tetra pods, aggregates size greater than 80mm and sac gabions filled with boulders and quantity of the same is as under:
 - i. Concrete cubes - 39 nos.
 - ii. Tetra pods - 184 nos.
 - iii. Aggregates size greater than 80mm - 540 cum
 - iv. Sac Gabion filled with boulders - 30nos.(36Cum Approx.)

3. On 21.09.22, cement slurry has been sprayed on exposed rock surface in the cavity. Filling of large cavity is continued with boulders of size > 300mm ~ 500 mm along with aggregates size > 80mm, Tetra pods, precast concrete cubes and sac gabions filled with boulders are being carried out.
4. The volume of cavity created due to successive rock falls is very massive of the order of about 38000 Cum and significant leakage from the Diversion Tunnel Gates is still visible despite of continued filling done. Further, intermittent rock falls in the cavity is continuing resulting increase in size of cavity.
5. Due to continuous seepage, rainfall in the area and intermittent rock falls, there is a general fear psychosis amongst labours working at the location and are mostly hesitant to work.
6. Intermittent rainfall has been continuing in the project area w.e.f. 19.09.22.

7. Further, as advised by D&E Div. Co. during their visit, project has taken up the works of removal of debris and wooden log deposited beneath deck slab of DT-2 & 1 and cleaning of the area, to start construction of concrete wall adjacent to existing cladding wall of DT-2 and DT-1 for widening of approach road near DT-1&2
8. As the size of cavity formed is very large of the order of about 39 m x 25m x 39m and the RCC cladding along the hill side is hanging unsupported in a span of about 25 m, and further collapse cannot be ruled out. Therefore, the condition of the cavity in general is still vulnerable.

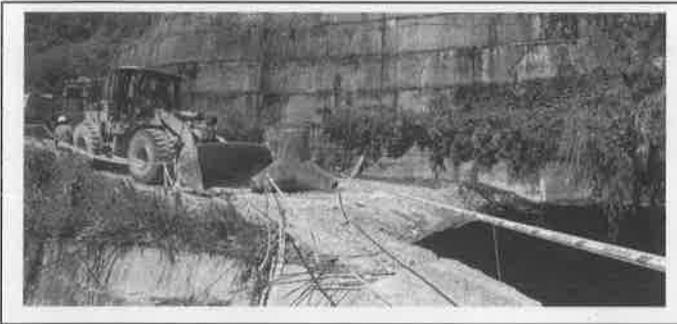
Restoration activities carried out on 19.09.2022



Concrete Cubes filling



Tetra pods filling



Tetra pods filling



Aggregate size >80mm filling with Tetra pods

Restoration activities carried out on 20.09.2022



Boulder filled Sac Gabion



Boulder filled Sac Gabion



Large size Boulders filling



Aggregate size >80mm filling with Tetra pods

Restoration activities carried out on 21.09.2022



Photographs showing spray of Cement slurry

PMSG

From: PMSG <pmsg-co@nhpc.nic.in>
Sent: 27 October 2022 19:26
To: 'NHPC Desk'; pksangwan@nic.in; 'Ravi Prakash Pradhan'; manoj.cea@gov.in
Cc: cmd-mis@nhpc.nic.in; 'DIRECTOR (PROJECT). SECTT'; 'A K Nauriyal'; manoj.cea@gov.in
Subject: Latest status regarding stoppage of Power House works of Subansiri Lower H.E. Project due to Labour unrest.
Attachments: Incident Report dated 27.10.2022.pdf

महोदय,

In continuation to the earlier mail dated: 26.10.2022, please find attached here with the latest status regarding stoppage of Power House works of Subansiri Lower H.E. Project due to Labour unrest.

भवदीय,
पीएमएसजी विभाग

Sub: Flooding of PH at Subansiri Lower Project: Status on 27.10.2022

This is in continuation to the previous incident reports on the subject matter. Different pits of Power House are being dewatered intermittently as and when required.

Cleaning works of Power House, concreting works of lower approach road connecting to power house pit from road, cleaning, drying and refurbishment of Electro Mechanical components are hampered due to labour unrest in the day shift. However, the works will be resumed w.e.f. night shift as agreed by the PRW contractors in the meeting conducted by M/s. PEL.

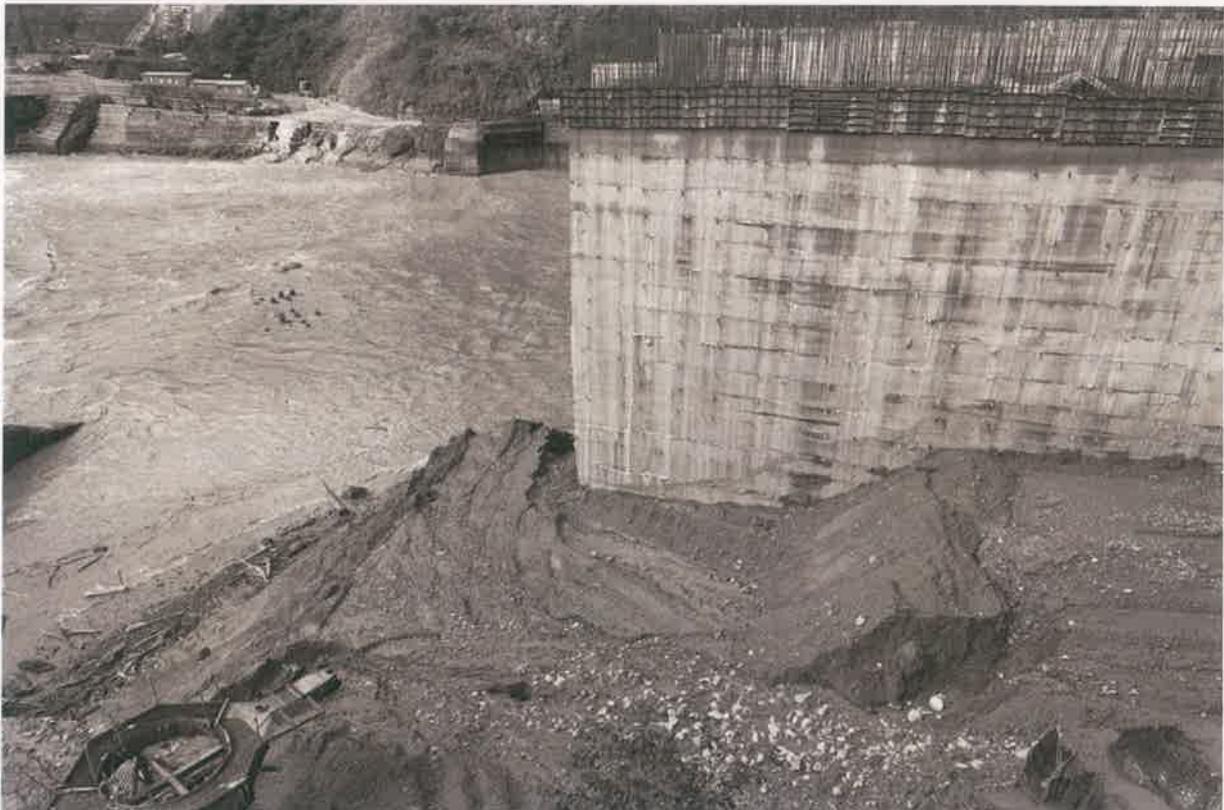
Rainfall is continued from 24th Oct'22 in the project area as well as in the upper areas of the Subansiri region due to impact of Cyclonic Storm 'SITRANG'. The water level is still above EL 130 m at u/s of Dam and the water ingress is continued into the large cavity formed in DT-2, 3 & 4 areas. Any further damages to DTs may be assessed when the water level recedes below EL 120 m.

The hour wise details of discharge of river is as given below:

Discharge and Upstream water level of Dam:

Time	Discharge at Permanent Bridge (Cumec.)	Upstream water level (EL in Mtr.)
08:00 AM	2900	132.80
09:00 AM	2900	133.00
04:00 PM	2840	133.30
05:00 PM	2800	133.00

Images:



Alternate access road from downstream side to upstream side of dam



भारत सरकार
Government of India
विद्युत मंत्रालय
Ministry of Power
केंद्रीय विद्युत प्राधिकरण
Central Electricity Authority
जल विद्युत परियोजना प्रबोधन प्रभाग
Hydro Projects Monitoring Division

विषय: Report of the visit of Shri Balwan Kumar, Director, HPPI Division, CEA and Shri Faraz, Deputy Director, HPM Division, CEA on 21st April 2022 to Subansiri Lower Hydro Electric Project (8x250=2000 MW) in Arunachal Pradesh/ Assam being executed by NHPC Ltd. to review the status of works - regarding.

The Subansiri Lower Hydro Electric Project (8x250=2000 MW) in Arunachal Pradesh/ Assam being executed by NHPC Ltd. was visited by Shri Balwan Kumar, Director, HPPI Division, CEA and Shri Faraz, Deputy Director, HPM Division, CEA to review the status of works. The Tour Report is enclosed herewith for kind perusal please.

(फराज़)

उप-निदेशक

Email: cea-hpmd@gov.in

Deputy Director (NHPC Desk), MoP (Email: nhpc-mop@gov.in)

Copy to:

1. ED, PMSG, NHPC (Email: pmsg-co@nhpc.nic.in)
2. ED, Subansiri Lower HEP, NHPC (Email: ed.ro.kolaptukar@gmail.com)
3. SA to Member (Hydro), CEA (Email: member.he@cea.nic.in)

Tour Report of Subansiri Lower Hydro Electric Project (8x250=2000 MW) in Arunachal Pradesh/ Assam being executed by NHPC Ltd.

Shri Balwan Kumar, Director, HPPI Division, CEA and Shri Faraz, Deputy Director, HPM Division, CEA visited Subansiri Lower Hydro Electric Project (8x250=2000 MW) in Arunachal Pradesh/ Assam being executed by NHPC Ltd. on 21st April 2022 to review the physical progress of various works of the project. Discussions were held with officials/ engineers on various aspects of the on-going works, problem areas and measures being taken to accelerate the pace of works with the aim of timely commissioning of the project as per schedule. The status of works and critical areas/ activities observed during the visit are as under:

1.0 Project Details

The Subansiri Lower Hydro Electric Project situated in Lower Subansiri District (now Kamle District)/ Dhemaji District of Arunachal Pradesh/ Assam is being executed by NHPC Ltd. The project is designed as Run-of-River (with diurnal storage) facility on the River Subansiri/ Brahmaputra. The Techno-Economic Clearance for the project was accorded on 13.01.2003 by CEA at the cost of Rs 6608.68 crores (12/2002 PL) with expected commissioning date September 2010. The installed capacity of the project is 2000 MW (8x250 MW). A copy of the Techno-Economic Clearance of the HEP is enclosed. Further, a copy of the Salient Features along with layout plan of the Subansiri Lower HEP is also enclosed for kind reference.

An expenditure of Rs 15,506.40 crores have been incurred till March 2022. The revised cost of the project is Rs 19,992.43 crores (01/2020 PL). The project got delayed due to various reasons like agitation by local people, proceedings in the Hon'ble NGT, etc.

2.0 Award of Works

Dam Works: M/s BGS-SGS-SOMA JV

Power House Complex: M/s Patel Engineering vide LOA dated 01.09.2020

Hydro-mechanical works: M/s Texmaco Rail & Engineering Ltd., Kolkata

Electro-mechanical Works: Ms GE Ltd.

3.0 Commissioning Program

The project was originally scheduled to be completed by September 2010 but commissioning could not be achieved as per the original schedule due to various reasons, the major of them were: initial delay in start of project due to delay in transfer of Forest Land, agitation by some section of stakeholders of Assam raising issues of safety of Dam and its downstream impact, proceedings in the Hon'ble NGT, etc. The signing of MoA with Govt. of Assam was done on 23.08.2019 and the works were resumed w.e.f. 15.10.2019. Now, as per project authorities, two units (Unit#1 and Unit#2 both of capacity 250 MW each) are scheduled to be commissioned by August 2022 and overall commissioning of the project is scheduled by August 2023.

4.0 Current Status of Works

Civil Works

Dam Concreting is 81% completed. Intake concreting is around 98% achieved. For Head Race Tunnel, Heading Excavation has been achieved, Benching Excavation is around 96% achieved, Overt Lining – 86% overall and Invert Lining – 50% overall. Surge Tunnel: Heading Excavation - 92% achieved overall and Benching Excavation – 58% overall completed. Pressure Shaft: Excavation is 94% complete; Pressure Shaft Liner: 45% completed. Power House (Concrete Quantity) has been around 55% achieved.

E&M Works

All 28 nos. transformers have reached at site. 8 no. GSU transformers have been shifted to Powerhouse. Erection of EOT crane rail in Power House (for Unit -1&2) completed. For Unit-1 & 2, the status as under:

- Unit #1: Stator windings works and lowering of rotor have been completed. Final erection of turbine is in progress. Erection works of R, Y & B Phase GSU Transformers of Unit#1 under progress. Final HV test on Stator was conducted on 01.04.2022. Total 90% installation work has been completed.
- Unit #2: The fixing of all key bars on stator frame completed and measurement of radius of key bars in progress. Regarding rotor, the assembly of Rim lamination has been completed and final pressing of rim is in progress. Total 80% installation work has been completed.
- 90% of Cable Tray erection has been completed in U#1 and U#2.
- Cable laying works in Generator floor, GSU floor, Turbine floor under progress. Other associated E&M works w.r.t commissioning of two Units in Aug 2022 are under progress.

HM Works

Equipment erection is under progress and status is as under:

- Diversion Tunnel Gates: Completed.
- Intake Gate: All 8 Nos. Intake Gates and their embedded parts have been installed at site. Erection works of 6 Nos. Rope drum hoists completed & remaining hoists shall be erected after receipt at site.
- Pressure Shaft liner: 45% completed.
- Spillway Radial Gates, Spillway Bulkhead Gates and Intake Trash Racks: Installation is under progress.

5.0 Deviation in the design of the project

The CEA communicated its acceptance of the recommendations of the various appraising groups (CEA/ CWC/ GSI/ CSMRS) on the Memorandum of Changes from approved DPR for the Subansiri Lower HEP on 11.12.2017. No further design changes were incorporated afterwards.

6.0 Power Evacuation Arrangement

The power generated by Subansiri Lower HEP will be evacuated through four nos. of 400kV HVAC transmission lines (Double Circuit) of approximately 180 km length each from Subansiri Lower HEP to Biswanath Chariali, Assam with main HVDC substation at Biswanath Chariali, Assam which are under construction by PGCIL. As per *Monthly Progress report of Cross border/ Inter-Regional/Inter-State Transmission Schemes* (As on 31.03.2022) prepared by PSPM Division, CEA, the commissioning of 400KV D/C Lower Subansiri - Biswanath Chariali line –I is anticipated in August 2022 and the commissioning of 400KV D/C Lower Subansiri - Biswanath Chariali line –II is anticipated in March 2023.

7.0 Emergency Warning System (EWS) Status

As informed, AWLRs have been installed at Tamen (On Kamala River) on 29.01.22 and Daporijo (on Subansiri River) on 31.01.22 with auto transmission facility (GSM based). Data is being collected on hourly basis at project as well as Corporate office central command control room.

8.0 Infrastructure Grant

Enabling Infrastructure grant is not applicable for Subansiri Lower HEP.

9.0 Issues and Critical Areas – Observations

i. **Power House Protection Wall Partial Collapse** – The Power House Protection Wall's portion facing TRC of Units 1 & 2 collapsed partially on 01.04.2022. Thereafter, protection measures have been undertaken on the river side as well as the power house side for protection of the Power House from any ingress of water from the river side i.e. cladding wall, shotcrete on collapse slope, installation of SD anchors, start of Gravity wall-1 and providing thick layer of concrete on the road over TRC side. The protection works at TRC were in progress on the day of the visit. Significantly higher flow predicted during monsoons would result in higher pressure on the protection wall. It is advised that the adequacy of power house protection wall's strength to be able to bear maximum water pressure during monsoons may be got vetted by a specialized agency before the coming monsoons.



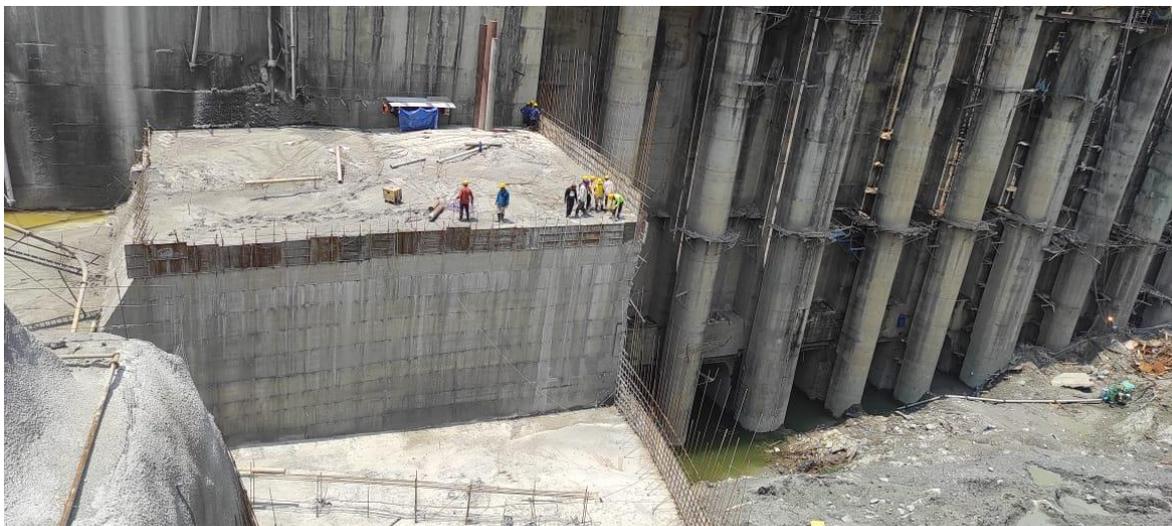
Wall over TRC side prior to partial collapse



Wall over TRC side after partial collapse



Wall over TRC side during reinforcement



Gravity Wall Reinforcement

ii. **Safety Measures** – A checklist was prepared by CEA and the same was shared with NHPC for their inputs. NHPC’s reply on CEA’s checklist regarding compliance of Central Electricity Authority (Safety Requirements for Construction, Operation and Maintenance of Electrical Plants and Electric Lines) Regulations, 2011 is enclosed. During the visit at the dam site, it was observed that few workers were working without safety helmets and without proper safety harnesses. The same was pointed to the NHPC officials for compliance.

It is suggested that the Contractors may be advised to submit the details of the accidents mentioned in their monthly Accident Reports submitted to NHPC so that NHPC is able to assess the exact cause behind the accident(s) and take appropriate measures/ issue necessary directions for prevention of the same in the future. It was also observed from the Audit Reports that Safety Committee meetings were not held periodically in the recent past. Further, NHPC is advised to engage adequate resources for ensuring safety of the workmen in the project premises and to ensure that the Safety Officers are not required or permitted to do any work, which is unconnected to, inconsistent with or detrimental to the performance of the duties prescribed to them as regards ensuring safety in the premises as per applicable Regulations.

iii. **The case of Diversion Tunnels** – Due to left bank slide earlier, one of the DTs had got blocked and currently, only four DTs are diverting the river. The DTs are temporary structures unlike HRTs which are designed for 100 years. The continuous water flow through DTs for such a long time in the case of Subansiri Lower HEP might have the effect of eroding its walls. A reassessment of the impact of river diversion through DTs for such a long period on the slope stability of surrounding mountains may be carried out by NHPC.

10.0 Likely Commissioning of Units

The project authorities informed that two units (Unit # 1 and Unit # 2 each of 250 MW) are scheduled to be commissioned in August 2022 and the remaining six units (Unit # 3-8 each of 250 MW) are scheduled to be commissioned in August 2023. In this regard, the following is submitted:

i. **Dam Civil Works and HM Works:** NHPC Officials informed that generally the average rate of dam concreting is around 1800-2000 m³/day. The remaining concreting quantity is approximately 400000 m³. Further, the reservoir filling would commence only after the dam achieves a certain height and provided all Spillway Radial Gates have been erected and tested. It is understood that the civil works would proceed only in dry/ lean season. Further, after the Civil Contractor hands over the bays to HM Contractor, it would take a minimum of 3.5 months for erection of Spillway Radial Gates and their testing. M/s Texmaco official at the site assured that it has sufficient resources for parallel gate erection in all bays simultaneously. Considering the above and taking into account the parallel works of dam concreting in some bays and gate erection in some others, the completion of dam civil works and HM works are likely to be achieved during the last quarter (Q4) of 2022-23, subject to substantial concreting in the monsoon months (i.e., less rainfall) and expediting HM works.

ii. **TRC:** Due to the apprehension of further damage to Power House Protection Wall due to TRC construction activities, NHPC has decided to resume the construction of TRC in post-monsoon period. Monsoon generally lasts till October in Arunachal Pradesh as observed from historical IMD rainfall data. Considering the TRC construction from November, the most likely scenario for its completion is January 2023.

iii. **HRTs and Intake Gates:** The same are in almost final stages of construction and erection and would not likely prove to be a bottleneck with regard to commissioning of two Units as

HRTs and Intake Gates construction and erection works would not be hampered by monsoons.

iv. **Power House EM Works:** The Power House EM Works with regard to two Units are in progress and would not likely prove to be a bottleneck with regard to commissioning of two Units as Power House EM Works would not be hampered by monsoons.

It may be observed from the above analysis that the scheduled commissioning of two units (viz. Units#1&2) in the year 2022-23 can be achieved, subject to substantial concreting in the monsoon months (i.e., less rainfall) and expediting HM works. The rest six units are programmed to be commissioned in 2023-24.

11.0 Assistance required from the Central Government

No assistance is required from the Central Government as of now with regard to the project's construction.

Revised Cost Estimate (RCE) in respect of Subansiri Lower HE Project, 2000 MW (8x250 MW) in Arunachal Pradesh / Assam at Completion Level – Time Overrun regarding.

From : NHPC Planning Divn. <planning-co@nhpc.nic.in> Thu, Apr 20, 2023 12:31 PM
Subject : Revised Cost Estimate (RCE) in respect of Subansiri Lower HE Project, 2000 MW (8x250 MW) in Arunachal Pradesh / Assam at Completion Level – Time Overrun regarding. 1 attachment
To : hpaone-cea <hpaone-cea@gov.in>, krsharvan <krsharvan@nic.in>
Cc : pksangwan <pksangwan@nic.in>, nhpc-mop <nhpc-mop@gov.in>, Sanjay Darbari <sanjaydarbari@nhpc.nic.in>, PMSG <pmsg-co@nhpc.nic.in>, Cost ENGG Division <ced@nhpc.nic.in>, Vipin Gupta <vipingupta@nhpc.nic.in>
Bcc : ranjan1973 <ranjan1973@gmail.com>, raju1708 <raju1708@rediffmail.com>

Sir,

Please find enclosed NHPC letter dated 20-04-2023 on the above subject.

सादर/ Regards,

Pradip Nandi
योजना विभाग/ Planning Division
एन एच पी सी लिमिटेड, सेक्टर-33, फरीदाबाद, हरियाणा
NHPC Ltd., Sec-33, Faridabad, Haryana
पिन कोड / PIN Code 121003

Website: <http://www.nhpcindia.com>

Hydropower - Clean Power For Every Home

 **NHPC letter dated 20-04-2023.pdf**
15 MB

NH/PD/IP/RCE-SLP/2023/ 20

Dated: 20.04.2023

Chief Engineer (HPA),
Central Electricity Authority,
Sewa Bhawan,
R K Puram, New Delhi

Sub: Revised Cost Estimate (RCE) in respect of Subansiri Lower HE Project, 2000 MW (8x250 MW) in Arunachal Pradesh / Assam at Completion Level – Time Overrun regarding.

**Ref: 1. NH/PD/IP/RCE-SLP/2023/532 dated 31.01.2023
2. CEA letter File No.CEA-HY-11-45/1/2021-HPM division dated: 21.03.2023**

महोदय,

Reference is invited to CEA letter under reference dated: 21.03.23 vide which CEA has provided their comments on the Time Overrun chapter of RCE of Subansiri Lower Project. CEA has found 313 days of delay as justified for the period Jan'2020 to Dec'2022. In this regard, it is submitted that:

- (i) NHPC has considered 43 days of hindrances caused due to Collapse of Diversion Tunnels No. 2, 3 & 4 and collapse of PH coffer wall leading to flooding of Power House during Sep-Oct, 22.
- (ii) CEA vide letter dated: 21.03.23 has however not found the above reasons as justified (Point No. 6&7) stating that NHPC has not submitted the action taken report on the measures suggested by CEA regarding assessment of PH protection wall and Diversion Tunnels vide its tour report dated: 21.04.22.

In this regard, it may be stated that:-

The suggested examination of Power House coffer wall to ascertain the adequacy of its strength to bear maximum pressure during monsoon and assessment of the impact of river diversion through DTs for such a long period on the slope stability of surrounding mountain could be possible only during lean season i.e. normally from Oct, 2022 to April, 23 when weather is dry & the discharge in the river is minimum. However during year 2022-23, the Subansiri basin experienced a prolonged and earlier than anticipated monsoon starting from last week of March'22 and continued late up to Oct'22, and as a result of this hindrance, assessment of these structures as suggested could not be

पंजीकृत कार्यालय: एनएचपीसी कार्यालय परिसर, सैक्टर-33, फरीदाबाद-121 003, हरियाणा (भारत)

Regd. Office: NHPC Office Complex, Sector-33, Faridabad -121 003, Haryana (India)

CIN : L40101GOI1975HR032564 **Website :** www.nhncindia.com

carried out. Following rainfall data will show a picture of behavior of monsoon during year 2022 w.r.t. the previous years:

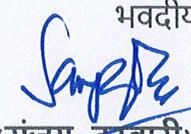
Month	Mar	Apr	May	Jun	July	Aug	Sep	Oct	Total
Monthly average (2001- 2021) (in mm)	97	210	470	1034	1431	1040	758	193	5233
Rainfall 2022 (in mm)	118	353	615	2105	1241	741	1044	805	7022

By the time, above suggestions were made by CEA vide its report dated: 21.04.22, monsoon was already underway. Subsequently the Diversion Tunnels as well as PH Coffers collapsed during Sep-Oct, 22 due to unprecedented high rain & discharge in the river Subansiri. The Matter was brought to the notice of MOP and CEA vide incident report dated 16.09.2023 & 25.09.2023 and thereafter, Status Report of the restoration measures continues to be sent regularly to CEA.

Subansiri project was started in 2005. Structures like Coffers walls and Diversion Tunnels are generally temporary in nature constructed to be used for a limited period of time. As such, extended/prolonged use of these structures due to project getting held up for unusually long time beyond 8 years especially in adverse geological and climatic conditions has contributed to its instability and in turn its failure.

In view of the above submissions, it is requested to kindly re-consider the issue and allow above hindrances of 43 days as justified entitling extension of time, in respect of hindrances evaluated by project upto Dec'22.

Thanking You.

भवदीय

(संजय दरबारी) 20.04.2023
विभागाध्यक्ष (योजना)

Copy for kind information:

1. Sh. Pankaj Kumar Sangwan, Dy Director (NHPC Desk), Shram Shakti Bhawan, Rafi Marg, New Delhi.



भारत सरकार
Government of India
विद्युत मंत्रालय
Ministry of Power
केंद्रीय विद्युत प्राधिकरण
Central Electricity Authority
जल विद्युत परियोजना प्रबोधन प्रभाग
Hydro Projects Monitoring Division

Date: 21.03.2023

विषय: Revised Cost Estimate (RCE) in respect of Subansiri Lower HE Project, 2000 MW (8x250 MW) in Arunachal Pradesh / Assam at Completion Level.

Ref.: HPA Division's subject emails dated 02.02.2023 and 18.02.2023

Reference is made to HPA's subject emails wherein HPM Division, CEA was requested to examine the subject NHPC proposal with respect to time overrun aspect and furnish comments. It is informed that delays till 31.12.2019 were vetted earlier and HPM Division's observations were provided regarding the same vide its letter no. CEA/HPM/129/18/2020/335 dated 11.05.2020. NHPC's current proposal received for examination has taken the time overrun/ hindrances up to 31.12.2022 taking anticipated commissioning date as June 2024. The same has been examined in light of the *Guidelines for Examination of Time Over-Run in Execution of Hydro Power Projects in Central Sector*, supporting documents provided by NHPC vide its emails dated 17.02.2023, 13.03.2023 and 21.03.2023, and information available in HPM Division; HPM Division's observations are as follows:

S. No.	Major reasons for delays	Net delay as per NHPC (in days)	Net impacted delay taken in to account (in days)	Remarks/ Comments
1.	On account of additional works (Implementation of DDRP's recommendations) for resumption of Dam Works - Pre requisite for starting concerting in the extended spillway portion of the Dam.	60	60	Appears justified in light of DDRP's recommendations (Accepted by MoP vide its letter to NHPC dated 26.06.2013).
2.	a. Delays on account	100	100	Appears justified in

I/26853/2023

	of Lockdown due to COVID-19 during 2020. b. Delays on account of Lockdown due to COVID-19 during 2021.	37	37	light of 1 st wave of COVID pandemic. Appears justified in light of 2 nd wave of COVID pandemic. As per Min. of Finance OM dated 13th May, 2020 maximum 180 days delay is permissible. NHPC has requested (100 + 37 = 137 days < 180 days).
3.	On account of additional work due to breach of Power House Coffor wall (Right Bank)	116	81 (22.07.2020 – 11.10.2020)	Seems not justified. Failure of Deo Nallah Slope and PH Coffor Wall breach cut off left bank dam access (26.05.2020) and right bank dam access (22.07.2020). However, the TRC road and thereby access to the dam was restored on 11.10.2020.
4.	On account of additional work involving construction of approach from the left bank to Dam site due to failure of Deo Nallah Slope.	46		
5.	Delays on account of Overtopping of water over dam due to Flood during Aug'21	35	35	Appears justified.
6.	Collapse of Diversion Tunnels 2, 3 & 4 in Sep-Oct 2022	43	0	Seems not justified. Vide CEA's Tour Report (Tour dated 21.04.2022) sent to MoP/ NHPC on 29.04.2022, the issues of Power House Protection Wall and Diversion Tunnels had been raised and measures were suggested at Para 9.i and 9.iii respectively. However, no ATR was furnished by NHPC regarding the same; the same was intimated to MoP also in reply to its
7.	Flooding of Power House occurred due to collapse of coffer wall on 25.09.2022.	Overlapping Period		

I/26853/2023

				query regarding the ATR by NHPC. Further, a similar event had occurred earlier also in July 2020.
	Total	437	313	

Note 1 – As per NHPC, time overrun has been calculated taking hindrances up to December 2022. However, NHPC has given time extension to M/s BGS-SGS-SOMA JV considering hindrances up to 31.07.2020. Time extensions have also been granted to M/s Texmaco and M/s GE till 30.04.2023 and 31.08.2023 respectively. Hence, the *Net impacted delay taken in to account* above is **provisional** and NHPC is requested to further squeeze the above permitted time overrun period.

Note 2 – The anticipated commissioning has been taken as **March 2024** as initially committed by NHPC to the MoP. No time overrun may be permitted after March 2024 except in *force majeure* situations.

2. This issues with the approval of the Chief Engineer, HPM Division, CEA

फ़राज़
21/03/2023
(फ़राज़)

उप-निदेशक

Email: cea-hpmd@gov.in

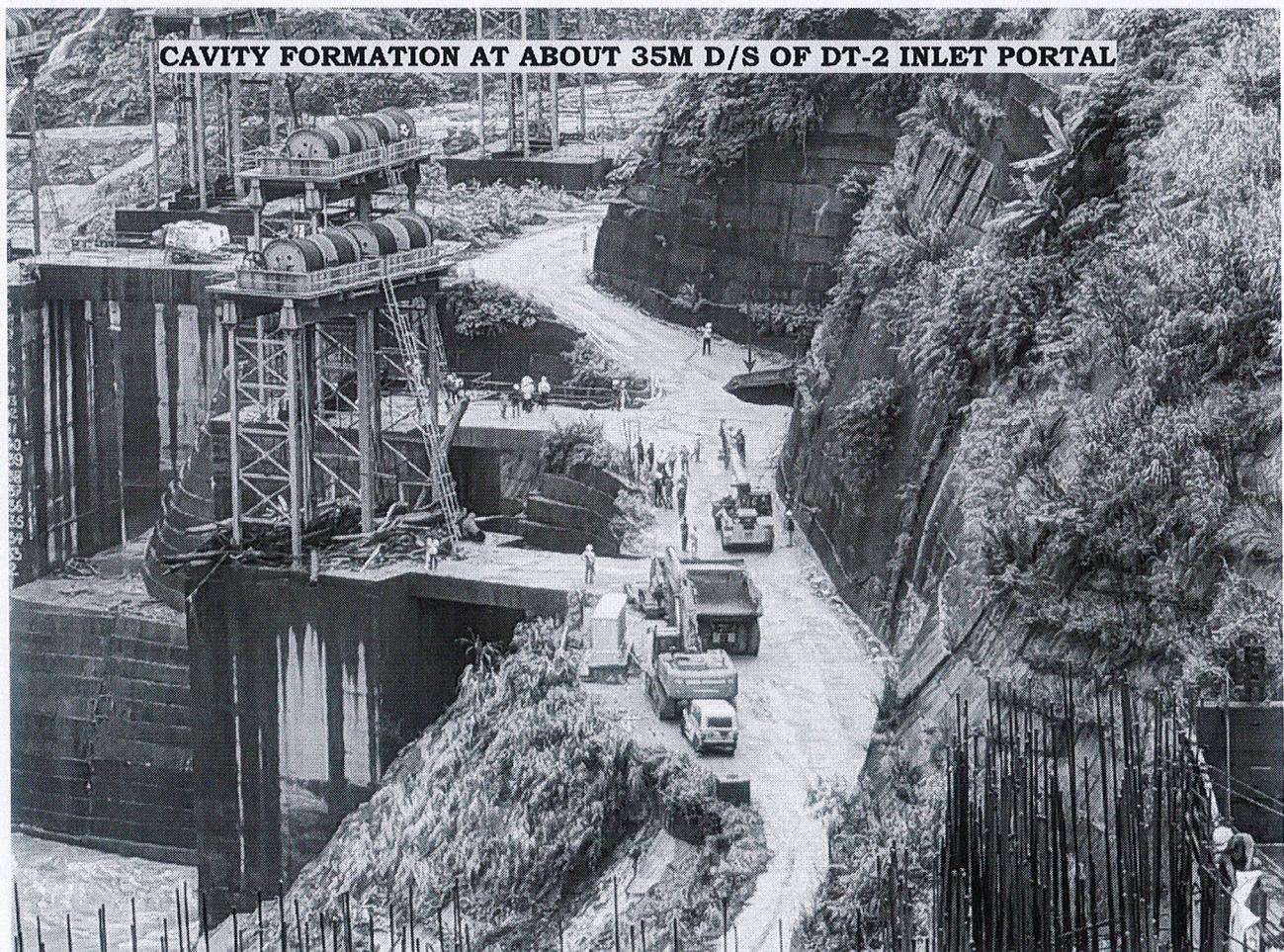
✓ मुख्य अभियंता (HPA), CEA

Subansiri Lower H E Project (2000MW) Dam Complex

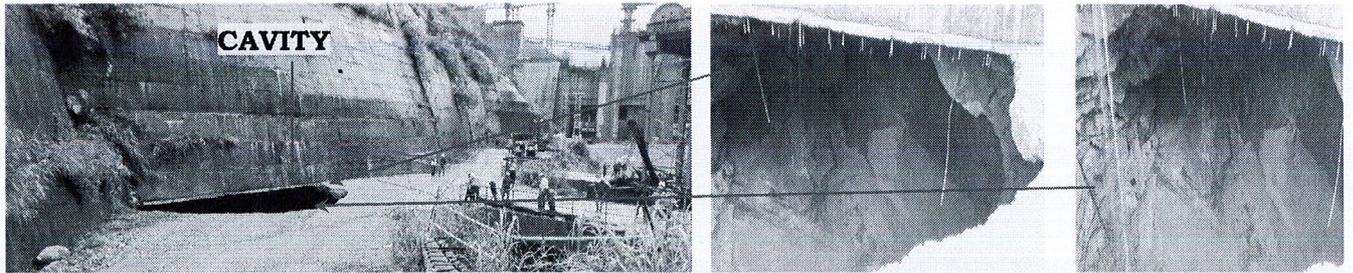
Date: 16.09.2022

Incident Report on formation of large cavity towards hillside at about 35m D/s from Inlet Portal of Diversion Tunnel-2.

On 15th September 2022 at about 8:30PM, a portion of Diversion Tunnel-2 at about 35m D/s from Inlet Portal collapsed and formed a large cavity up to EL± 148m. The Diversion Tunnels of the project are under operation since Dec'2007 and has been working till date without any sign of distress and the collapse has taken place suddenly. A part of the crown of DT is visibly collapsed leading to chimney formation upwards to a height of approx. 39 m i.e. up to road surface. Opening of cavity at road surface i.e. EL±148m is about 15m length and 5m wide. Sound of intermittent heavy loose fall of rock mass into the flowing water in Diversion Tunnel-2 are being heard. The approach road to upstream dyke of Dam is affected by the formation of the above cavity. Photographs of the damaged area are as under for ready reference:



U/s view of cavity at about 35m D/s from Inlet Portal of Diversion Tunnel-2



**D/s view of cavity at about 35m D/s from
Inlet Portal of Diversion Tunnel-2**

Based on the available 3D Log data, the rock stretch negotiated in that area was medium to fine grained sandstone which was moderately jointed in nature. In the initial stretch of 50 m the rock class is Class III with RMR 45 to 54 except one stretch of Class IV between RD 12 to 16 with RMR 39. Hindrance support class IIIB was provided in this stretch except the initial 15 m stretch where Hindrance class-IV support was applied. The entire length of the tunnel was also covered with 600 mm lining after completion of hindrance support.

Three prominent joint sets were observed ($130-140/75^{\circ}-86^{\circ}$); ($210-280/50^{\circ}-80^{\circ}$) and ($320-340/60^{\circ}-70^{\circ}$) along with one random joint. Presently no visible signatures of extension cracks have been observed on the cladding wall along the hill side and nearby vicinity of the cavity.

The damaged site has been immediately visited by Director (Projects), NHPC along with senior officials and contractor's representative in the evening hours of 15th September 2022 and plan for restoration is being formulated. Inlet gates of Diversion Tunnel-2 are being closed for stopping the turbulence of river water flow in the DT-2 to minimize damage to the adjacent rock mass.

Out of total 5 Nos. of Diversion Tunnels, DT-5 had already been closed in previous year by lowering of its gates and now DT-2 is being closed by lowering of its gates and 3 Nos. Diversion Tunnels will remain operational for managing the River inflow.

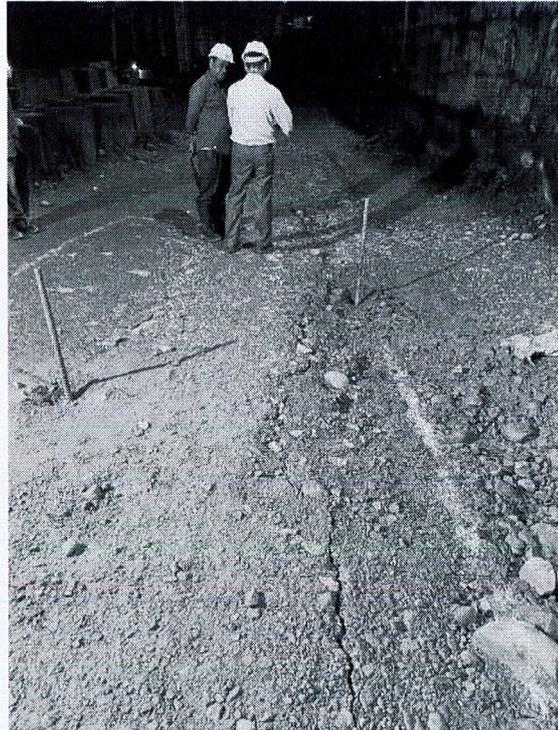
INCIDENT REPORT FOR COFFER WALL COLLAPSE ALONG POWER HOUSE AT SUBANSIRI LOWER PROJECT ON 25.09.2022

Initially air bubbles at around 2:00PM on 24.09.2022 observed in front of Unit-4 at TRC road probably due to capillary action, followed by formation of crack for a length of 15 meters in front of Unit-4. As a precautionary measure, it was decided to do PU grouting in affected area (3:00PM). Arrangement for drilling and grouting in this area was started (4:00PM) and PU Grouting operation in first hole near coffer wall was started by 7:00PM. Periodical checking of topographic markers on the coffer wall were done to observe any movement in the coffer wall.

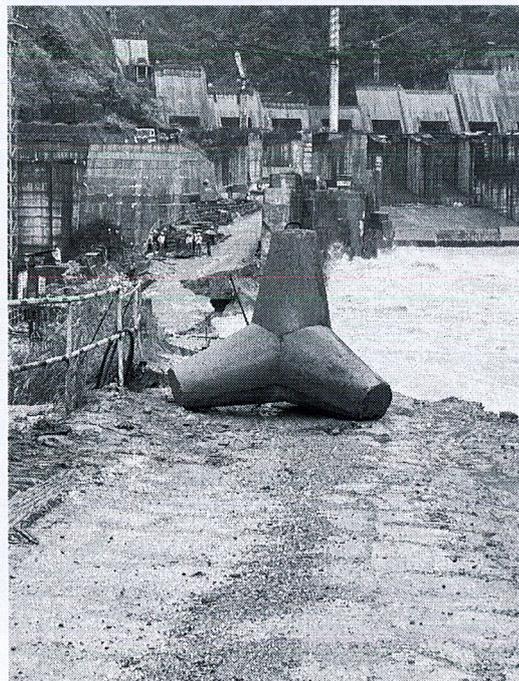
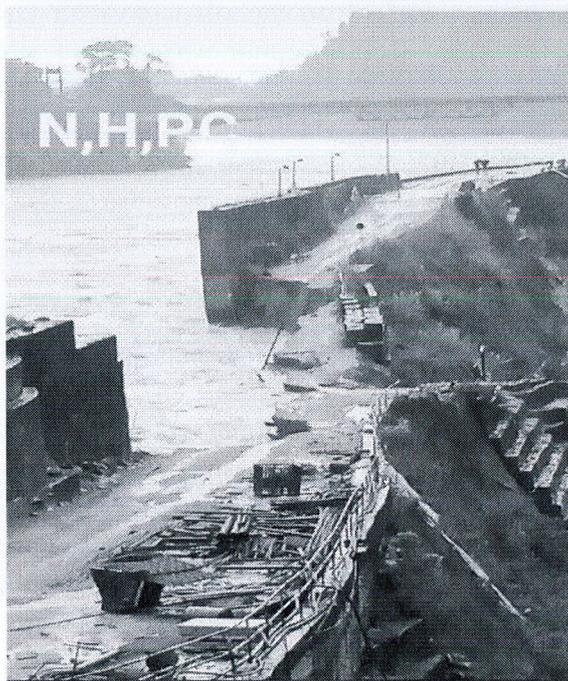
Around 8:00 PM, a longitudinal crack up to Unit 6 along coffer wall was observed. The cracked area in cavity portion in front of Unit 4 started to sink and cracks surrounding in cavity portion began to swell. By this time the situation was getting worse as movement in coffer wall was observed, topographical markers showed deflection of 20 to 25 mm towards river in coffer wall (11:30 PM). The width of the crack was increasing and at some points 40 to 50 mm increase in width was observed.

Cracks further prolonged towards unit-3 for a length of around 80-90m and multiple cracks formed at many locations. Topographical markers being continuously observed and grouting operation was in progress. Prolongation and widening of cracks were continuously observed throughout length from unit 3 to 6. Around 00:30 AM of 25.09.2022, topographical marker shown deflection of 50 mm then PU grouting was stopped and people were alerted. At 00:40 am all of sudden coffer wall around 35m collapsed (Part of Unit-3 and 4). There was no loss of manpower but one compressor and grouting equipment could not be shifted. After collapse, some portion of top-level road also collapsed but due to sufficient width at the bend to lower level road the rock still exist and water couldn't enter into PH. It is to mention that rock level obstructing flow to PH is just less than 1 m and continuously width of road is decreasing due to erosion. Around 1:20 AM part of coffer wall (around 50m) from Unit-4 to 6 was collapsed and on inspection it was observed that a large cavity under access road near Unit-6 towards Power House Pit has been formed. After some time, small seepage at lower level at U 2 observed which was intermittently flowing with minor discharge.

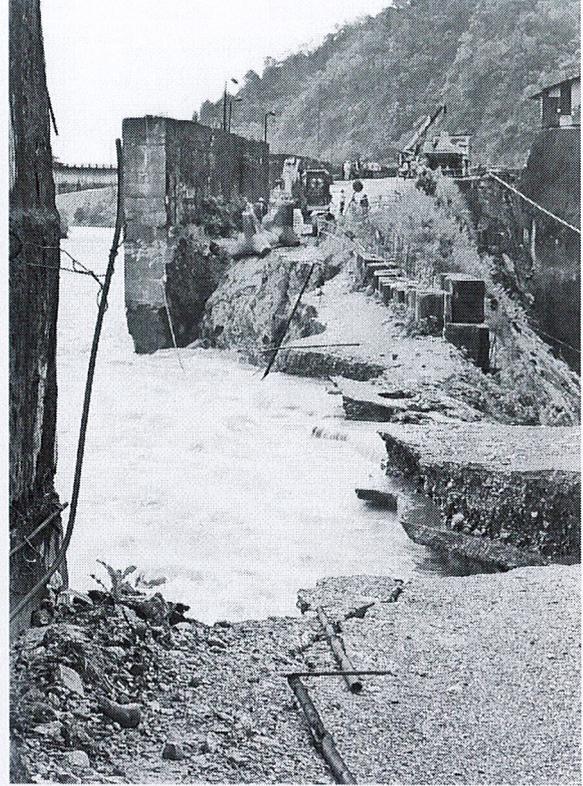
Meanwhile pouring of tetrapod started at 07:00 AM from U-1 and Unit-2 side. Arrangements for filling the cavity portion with sand bags being done. The seepage form river side has been increased and necessary arrangements for dewatering from TRC area is being done. Considering the above situation, it is felt that the current situation is very critical and the access road can be breached any time leading to flooding of Power House Pit. Accordingly, all critical electrical equipment are being shifted to safer places.



Initial formation of cracks for a length of 15 meters in front of Unit 4



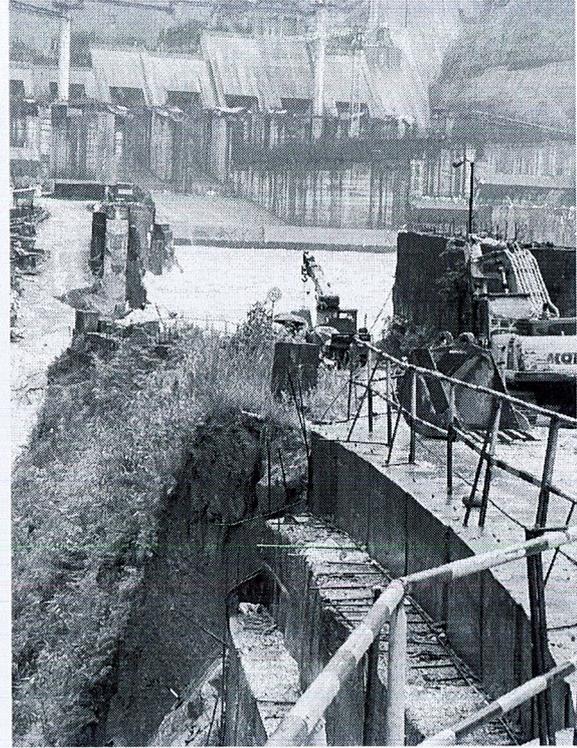
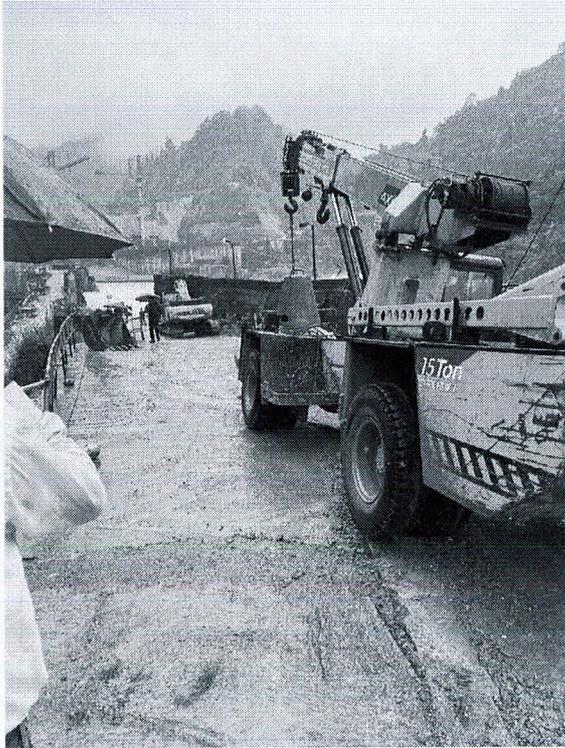
Condition of Coffier Wall



Current situation of PH Cofferd Wall



Efforts to stop breaching of Cofferd wall



Efforts to stop breaching of Coffier wall

PMSG

From: PMSG <pmsg-co@nhpc.nic.in>
Sent: Sunday, September 25, 2022 8:22 PM
To: NHPC Desk; 'pksangwan'; 'rp pradhan'; 'Manoj Tripathi'
Cc: cmd-mis@nhpc.nic.in; 'DIRECTOR (PROJECT). SECTT'; 'A K Nauriyal'; hsranga@nhpc.nic.in
Subject: Incident Report on flooding of Subansiri Project Power House on 25.09.2022.
Attachments: WhatsApp Video 2022-09-25 at 18.21.30.mp4; Incident Report_SLP_PH_25.09.22.pdf

Sir,

This is in continuation to our earlier incident report sent today (25.09.22), please find attached the latest Incident Report of Flooding of Powerhouse on 25.09.2022.

भवदीय,
पीएमएसजी विभाग

INCIDENT REPORT FOR COFFER WALL COLLAPSE ALONG POWER HOUSE AT SUBANSIRI LOWER PROJECT ON 25.09.2022

Initially air bubbles at around 2:00PM on 24.09.2022 observed in front of Unit-4 at TRC road probably due to capillary action, followed by formation of crack for a length of 15 meters in front of Unit-4. As a precautionary measure, it was decided to do PU grouting in affected area (3:00PM). Arrangement for drilling and grouting in this area was started (4:00PM) and PU Grouting operation in first hole near coffer wall was started by 7:00PM. Periodical checking of topographic markers on the coffer wall were done to observe any movement in the coffer wall.

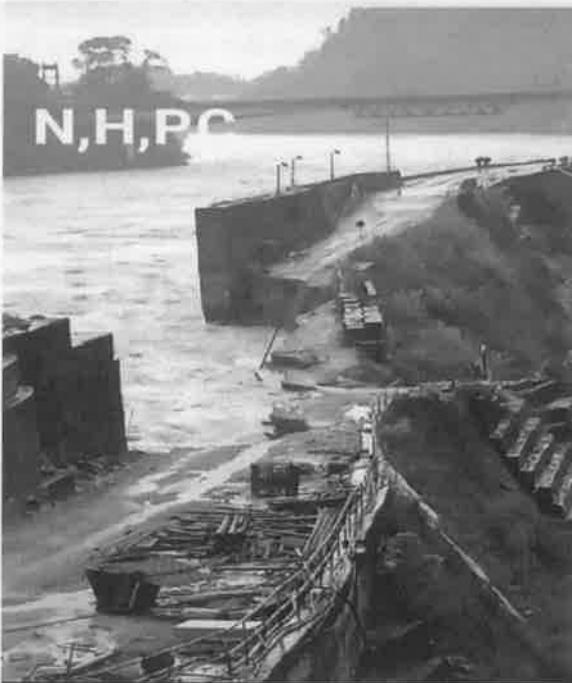
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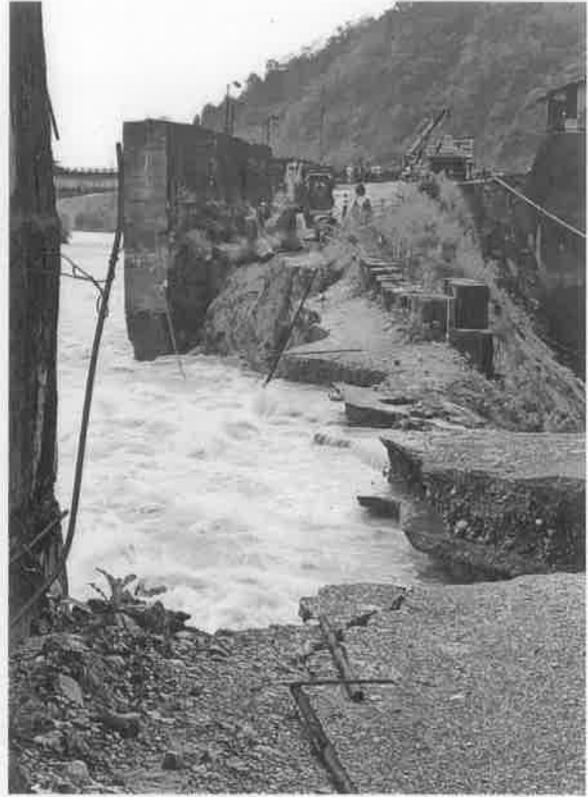
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Initial formation of cracks for a length of 15 meters in front of Unit 4



Condition of Coffer Wall



Current situation of PH Cofferd Wall



Efforts to stop breaching of Cofferd wall



Efforts to stop breaching of Coffe wall

Sub: Incident Report on flooding of Subansiri Project Power House on 25.09.2022.

This is in continuation to previous incident report sent today (25.09.22). Because of rise of water level, river breached the road by cutting the rock ledges behind Unit 4 and flooding of Power House started at 4:00 pm.

The remedial measures like putting tetrapods, sand bags, cement bags etc. were going on from both sides but at 4:00 pm water level rose and overtopped the road along Power House to dam and flooding of PH started.



Overtopping of water from PH Coffe Wall

**प्रेषक/From**

VIPIN GUPTA
EXECUTIVE DIRECTOR
SUBANSIRI LOWER PROJECT

प्रेषित/To

ASHOK KUMAR NAURIYAL, EXECUTIVE DIRECTOR, PMSG, CO
AJAY MITTAL, EXECUTIVE DIRECTOR, Design & Engg., CO

संख्या/No.: NH\SLP\Power House-Civil\2022\77

दिनांक/Date: 25-September-2022

विषय/Subject: INCIDENT REPORT FOR COFFER WALL COLLAPSE ALONG POWER HOUSE AT SUBANSIRI LOWER HEP PROJECT ON 24.09.2022

संदर्भ/Reference: Nil

Initially air bubbles (around 2:00PM) observed in front of Unit-4 at TRC road probably due to capillary action, followed by formation of crack for a length of 15 meters in front of Unit 4. As a precautionary measure, it was decided to do PU grouting in affected area (3:00PM). Arrangements for drilling and grouting in this area were started (4:00PM) and PU Grouting operation in first hole near coffer wall was started by 7:00PM. Periodical checking of topographic markers on the coffer wall were done to observe any movement in the coffer wall.

Around 8:00 PM, a longitudinal crack up to Unit 6 along coffer wall was observed. The cracked area in cavity portion in front of Unit 4 started to sink and cracks surrounding in cavity portion began to swell. By this time the situation was getting worse as movement in coffer wall was observed, topographical markers showed deflection of 20 to 25 mm towards river in coffer wall (11:30 PM). The width of the crack was increasing and at some points 40 to 50 mm increase in width was observed.

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Meanwhile pouring of tetrapod started from Unit-1 & 2 (07:00 AM) side. Arrangements for filling the cavity portion with sand bags being done. The seepage from river side has been increased and necessary arrangements for dewatering from TRC area is being done. Considering the above situation it is felt that the current situation is very critical and the access road can be breached any time leading to flooding of Power House Pit.

**RAJENDRA KUMAR
GENERAL MANAGER (CIVIL)
SUBANSIRI LOWER PROJECT**

कृपया अग्रसारित किया जाता है -

VIPIN GUPTA, EXECUTIVE DIRECTOR, dt: 9/25/2022 10:57:42 AM

कृपया आवश्यक कार्रवाई करें -

ASHOK KUMAR NAURIYAL, EXECUTIVE DIRECTOR, dt: 9/26/2022 1:09:21 PM

कृपया आवश्यक कार्रवाई करें -

HARGOVIND SINGH RANGA, GENERAL MANAGER (CIVIL), dt: 9/27/2022 5:21:36 PM

Copy To:

- 1 SUDHIR KUMAR, DEPUTY GENERAL MANAGER (MECHANICAL), Dir (Proj.) Sectt., CO,

** This Is a system generated document and does not require signature of the sender

PMSG

From: PMSG <pmsg-co@nhpc.nic.in>
Sent: 22 October 2022 21:18
To: nhpc-mop@gov.in; pksangwan; rp pradhan; manoj cea
Cc: CMD MIS; DIRECTOR (PROJECT) SECTT. EMAIL; A K Nauriyal; hsranga@nhpc.nic.in
Subject: Flooding of PH at Subansiri Lower Project: Restoration works Status on 22.10.2022
Attachments: Status Report of SLP_22.10.22.pdf

महोदय

In continuation to the previous mails regarding Flooding of Power House of Subansiri Lower Project, please find attached the status report of restoration works on 22.10.2022.

भवदीय,
पीएमएसजी विभाग

Sub: Flooding of PH at Subansiri Lower Project: Status on 22.10.2022

This is in continuation to the previous incident reports on the subject matter. Different pits of Power House are being dewatered intermittently as and when required.

Cleaning including sludge removal of different floors of Power House, cleaning, drying and refurbishment of Electro Mechanical components which were submersed in the inundation of Power House are in progress.

Construction works for alternate access road from downstream side to upstream side of dam for facilitating HM gate erection and dam concreting are in progress.

Road connectivity from Unit 1 to Unit 8 side (along coffer wall) has been completed and gradient making of road for proper movement of equipment is in progress. In addition to this, widening of road is being done by placing concrete cubes, tetrapods and sac gabion. Concreting of lower approach road connecting to power house pit from road (along coffer wall) with appropriate gradient has been completed for approx. 80 m length out of approx. 150m length and road work for remaining length is in progress

Restoration works of coffer wall were continued from 21.10.22 (8:00 AM) to 22.10.22 (8:00 AM) by placing concrete blocks, Tetrapod, sac gabion and pouring concrete.

Details of Coffor Wall protection work:

From Unit- 1 Side:

1. Placing of 47 nos. Concrete Block.

From Unit- 8 Side:

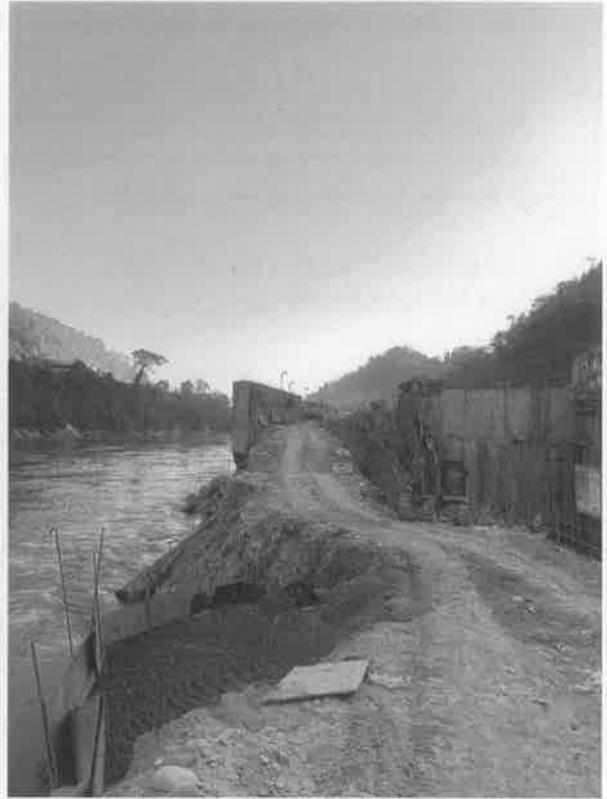
1. 84 cum Concreting work.
2. Placing of 80 nos. Sac gabion.
3. Placing of 50 nos. Concrete Block.
4. Placing of 11 nos. Tetrapod.

The pics of restoration measures and hour wise details of discharge of river is as given below:

Discharge & Upstream water level of Dam:

Time	Discharge at Permanent Bridge (Cumec.)	Upstream water level (EL in Mtr.)
8:00 AM	1500	-
9:00 AM	1500	112.7
3:00 PM	1400	112.5

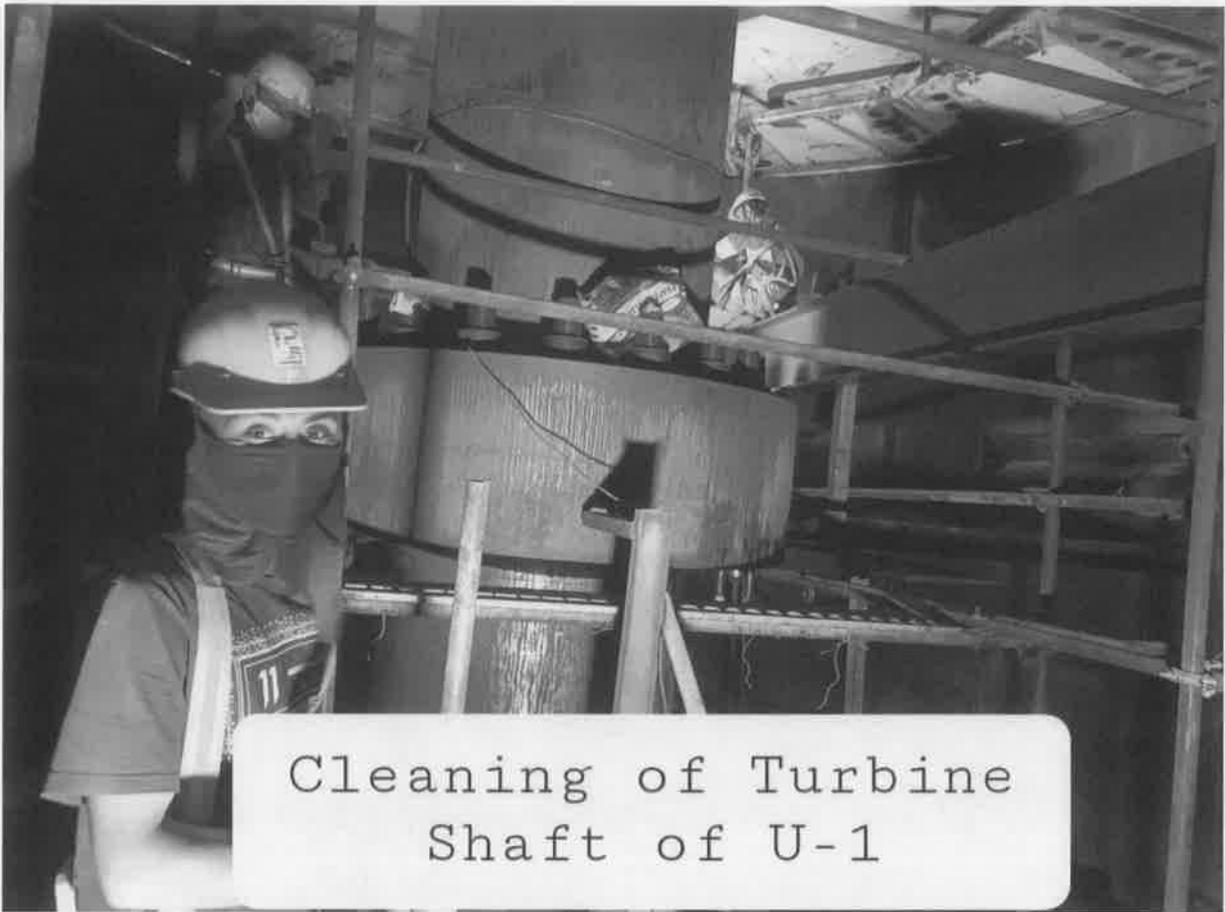
Images:



Restoration works of breached Coffe Wall

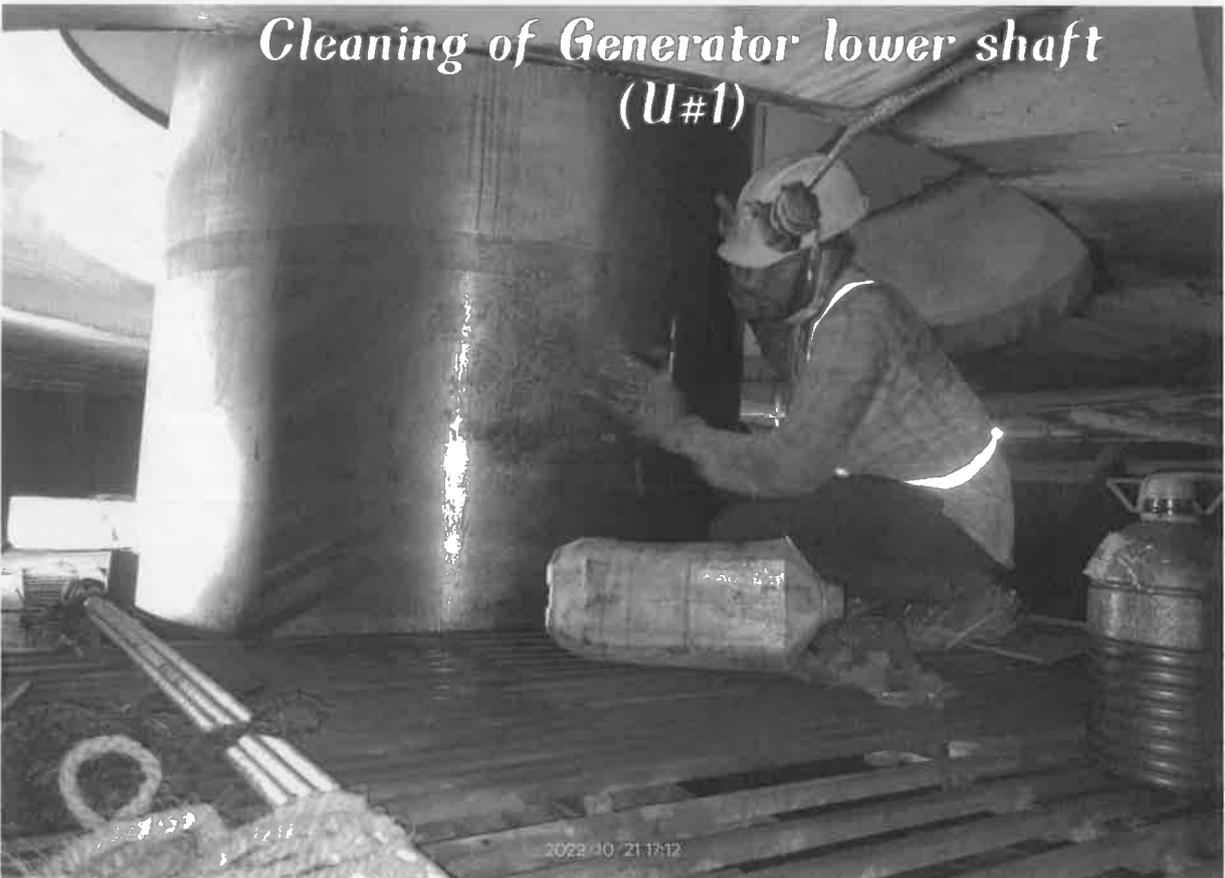


Restoration of lower approach road connecting to power house pit from road along coffe wall



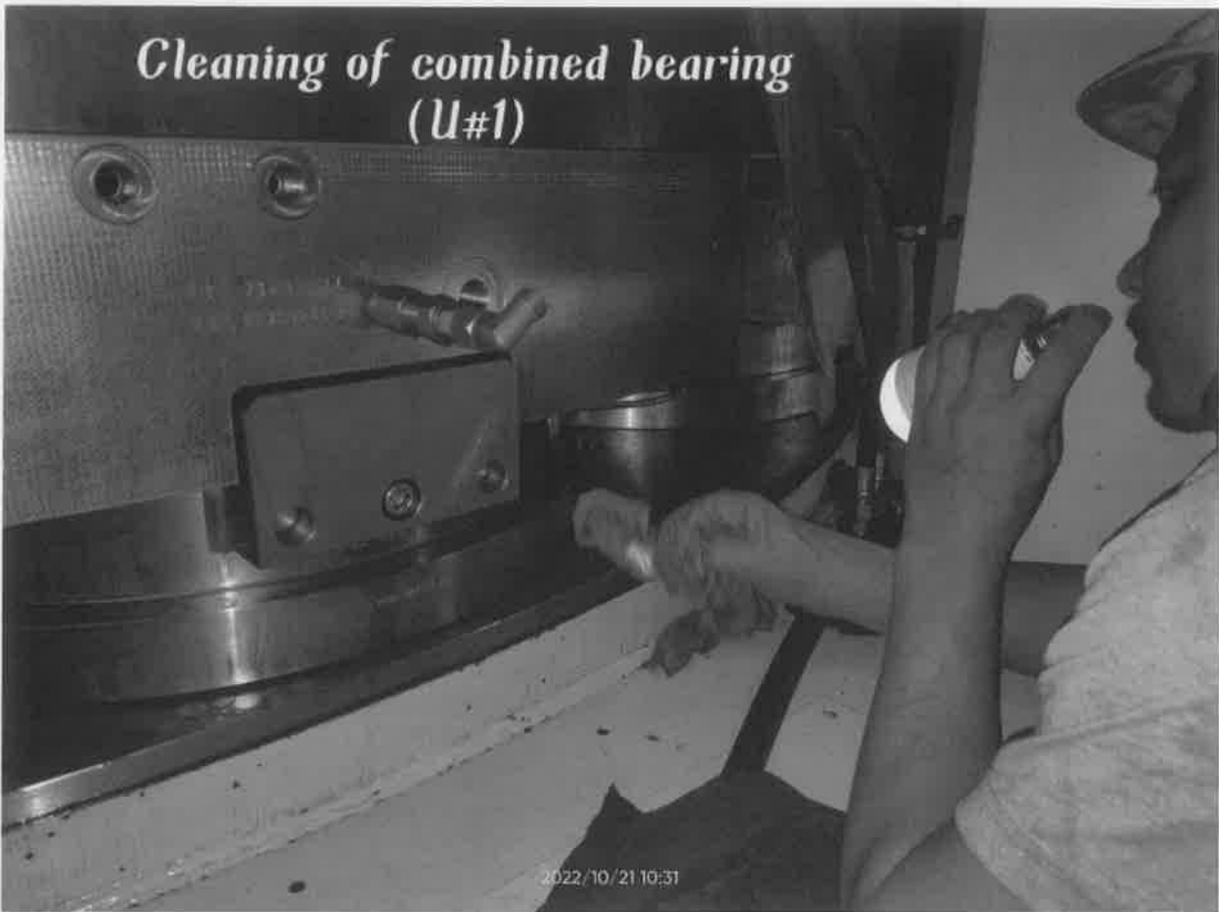
Cleaning of Turbine
Shaft of U-1

Cleaning of E&M Components



*Cleaning of Generator lower shaft
(U#1)*

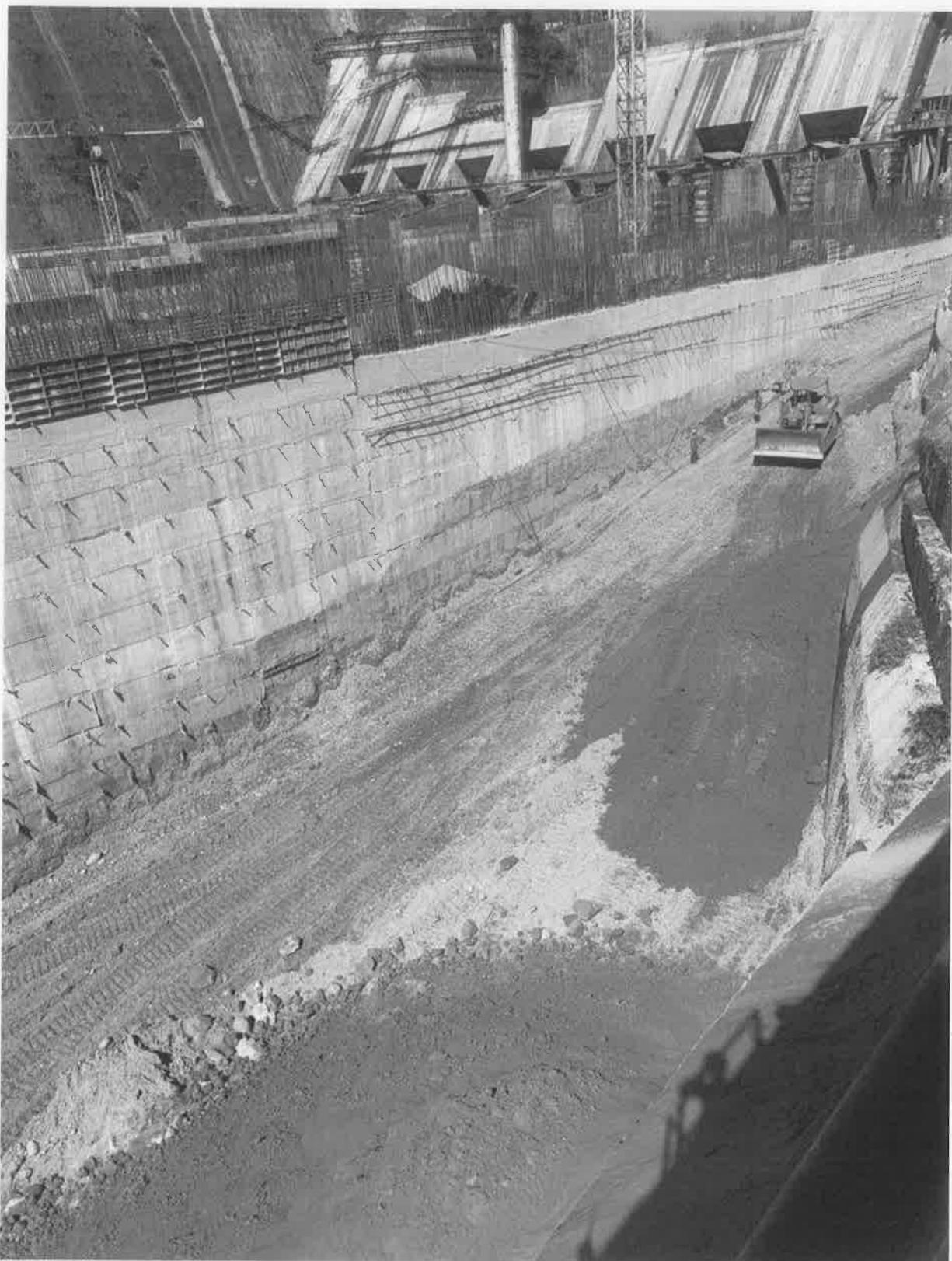
Cleaning of E&M Components



Cleaning of E&M Components



Works of alternative road from d/s to u/s of Dam



Works of alternative road from d/s to u/s of Dam

Major restoration works for damaged Diversion Tunnel area can only be started after completion of dyke from D/s of Dam to U/s dyke and construction of the same is under progress.

**प्रेषक/From**

SANAKA LUHA
GENERAL MANAGER (CIVIL)
SUBANSIRI LOWER PROJECT

प्रेषित/To

BABITENDRA KUMAR, GENERAL MANAGER (CIVIL), Technical Services, SLP

संख्या/No.: NH\SLP\Power House-Civil\2023\114

दिनांक/Date: 16-September-2023

विषय/Subject: RCE of Subansiri Lower HE Project- Time overrun regarding

संदर्भ/Reference: Nil

With reference to the e-IoM no. NH\SLP\Technical Services\2023\ 107 dated 07.08.23 regarding time overrun of Lot SSL-6. In this regard, please find attached herewith the requisite information for information and further necessary action.

SUMEGH MEGHRAJ KAWADE
SENIOR MANAGER (CIVIL)
SUBANSIRI LOWER PROJECT

Encl:

[120230000044583_638304612878216153_Hindrances wrt Lot SSL_6.docx](#)
[220230000044583_638304613307655552_Covid Letters.pdf](#)
[320230000044583_638304613464470188_EM_handover.pdf](#)
[420230000044583_638304613585407509_Rise in water level.pdf](#)
[520230000044583_638304614005926287_Hindrance Register.pdf](#)

कृपया अग्रसारित किया जाता है -

PANKAJ GUPTA, DEPUTY GENERAL MANAGER (CIVIL), dt: 9/16/2023 1:54:13 PM

कृपया उचित कार्रवाई हेतु अग्रसारित है -

SANAKA LUHA, GENERAL MANAGER (CIVIL), dt: 9/16/2023 3:52:51 PM

कृपया अग्रसारित किया जाता है -

BABITENDRA KUMAR, GENERAL MANAGER (CIVIL), dt: 9/16/2023 4:25:25 PM

कृपया अग्रसारित किया जाता है -

NAVIN KUMAR SINGH, DEPUTY GENERAL MANAGER (CIVIL), dt: 9/16/2023 4:50:53 PM

Print

Hindrances upto Aug 2023 with respect to Lot SSL-6 works.

A. Introduction:

Lot SSL 6 Works have been awarded to M/s Patel Engineering Limited vide LOA no. NH/CCW/CC-I/SO-76/2020/781-789 dated 01.09.2020. As per the Contract, the works have to be completed within 39 months reckoned from the 7th day of issue of LOA i.e. by 06.12.2023.

The contractor accepted the terms and conditions of the LoA and accordingly started mobilization of the resources at site.

The work was started by the contractor on 07.09.2020, however, due to breach of Coffor wall and subsequent submergence of Power House pit with silt, debris and flood waters, the site couldn't be accessed.

As such, the main activities of power house could be started after dewatering and removal of the slush from the site from 30.01.2021.

Various delays encountered during execution of Lot SSI-6 Contract are deliberated as below:

a. Initial delay in handing over of site due to submerged power house pit:

The work was started by the contractor by 7th Sept 20', however, due to breach of Coffor wall and subsequent submergence of Power House pit with silt, debris and flood waters, the same couldn't be accessed.

Thus, before starting the main activities at Power House pit, the same had to be dewatered and cleared of slush /silt.

As such, the main activities of power house could be started by 19th Feb 21'.

Accordingly, **total delay of 136 days** has been considered on this account.

b. Delay due to epidemic (COVID 19)

During 2nd COVID wave, from 1st April 21 to 15th June 21' i.e. for a period of 76 days. However, the work was not fully stopped and was partially impacted during the second COVID wave from dated 01.04.2021 to 07.05.2021, 11.05.2021 to 27.05.2021, 30.05.2021 and 01.06.2021 to 15.06.2021 totaling to 70 days.

The guidelines issued to reduce the manpower to 50% and accordingly the efficiency was reduced to 50%, as such an EOT of 50% of 70 days i.e. 35 days were considered on this account. However, the work was completely stopped due to Covid-19 restrictions from dated 08.05.2021 to 10.05.2021(3 days), 28.05.2021 to 29.05.2021(2days) and 31.05.2021(1 day), i.e. for 6 days.

The consequential impact due to pandemic for **46 days** has been considered on this account

c. Delays due to various hindrances

Following delays were observed during execution of works

Election	1 day
Local Issues	3 days
Rise in water level due to flash flood	5 days
Strikes / Local disturbances	3 days
Total	12 days

d. Delay due to breach of coffer wall in Sept'2022

During the breach of coffer wall in Sept' 2022, the power house pit was submerged under flooded water since 24.09.2022. Dewatering and restoration of access road to the Power House pit was carried out upto 22.10.2022.

Therefore, the total time consumed for completion this activity from 24.09.2022 to 22.10.2022 comes to **28 days**.

e. Delay due to removal of accumulated slush in pit during breach of coffer wall

Draft tube pit was buried in the slush and before start of reinforcement activity, draft tube needs to be cleared from accumulated slush. Due to removal of accumulated slush form the draft tube pit, the construction activity got delayed by **92 days**.

Hindrances occurred are tabularized as below:

S.N.	Description of Hindrance	Start Date	End Date	Delays in days	Remarks
1.	Delay in having access to the site	01.09.20	29.01.21	136	7 days overlapping
2	Election	27.03.21	27.03.21	1	
3	Local Issues	08.05.21	10.05.21	3	
4	Rise in water level due to flash flood	26.08.21	31.08.21	5	
5	Strikes / Local disturbances	01.06.21	03.06.21	3	
6	Delay due to decrease in manpower deployment due to pandemic	01.04.21	15.06.21	41	
7	Delay in handing over of site by E&M contractor	21.02.23	09.02.23	93	Effective delay after deducting delays on part of civil contractor
8	Delay due to breach of coffer wall in Sep 2022	24.09.22	22.10.22	28	
9	Delay due to removal of accumulated slush in pit during breach of coffer wall	23.10.22	22.01.23	92	
	Total			402 days	

Ref No.: NH/SLP/Lot SSL-6/PH/2023/1067

Date: 01.09.2023

M/s Patel Engineering Limited,
Subansiri Lower HE Project,
Kolaptukar, Dollungmukh Circle,
Dist. Kamle, Arunachal Pradesh

Sub: Lot SSL-6: Construction of Balance Civil Works of Power House Complex from HRT Intake Structure to Tail Race Channel, Subansiri Lower HE Project – **Regarding 1st Extension of Time**

- Ref: 1. PEL/382/2023-24/1852 dated 16.06.2023
2. NH/SLP/Lot SSL-6/PH/2023/866 dated 23.03.2023
3. PEL/382/2022-23/ dated 28.08.2022 (EoT-2 application)
4. PEL/382/2022-23/ 1034 dated 02.08.2022 (IM-3)
5. PEL/382/2021-22/660 dated 15.03.2022 (EoT-1 application)
6. PEL/382/2021-22/655 dated 14.03.2022 (IM-2)

Kind Attention: Sh. Shakeel Chauhan, Project Director

Sir,

In terms of Clause 8.4 & 8.7 of Contract Agreement (Vol-II of contract), the contractor is hereby notified for grant of 1st Extension of Time without levy of Delay Damages up to 29.11.2024 considering hindrances up to 15.07.2023.

Accordingly, achievement of the following Interdependent Milestones (IM) and Contract /Progress Milestone (CM) has been re-scheduled as below: -

Interdependent Milestones			
S. No	Description of Interdependent Mile stones	Schedule date of achievement	Extension Granted up to
1	IM-1 : Handing over of Unit-1 Pit to E&M Contractor for Generator Stator assembly (4 th Month)	06-01-2020	Achieved
2	IM-2 : Handing over of Unit-4 Pit to E&M Contractor for Generator Stator assembly (mid of 18 th Month)	20-03-2022	23.03.2024
3	IM-3 : Handing over of Unit-8 MIV Building upto EL 125.5 including EOT crane for MIV erection (22 nd Month)	06-07-2022	14.07.2024
4	IM-4 : Completion of HRT Intake, Surge Tunnel, Surge Shaft, Pressure Shaft and Adit Plugging in all respect corresponding to Unit-8 (31 st Month)	06-04-2023	31.05.2024

संरक्षित एवं राष्ट्रहित में उर्जा बचाएँ/Save Energy for Benefit of Self and Nation
Corres. Address: Subansiri Lower HE Project, Gerukamukh, Dhemaji-787035(Assam)

Contract / Progress Milestones			
S. No.	Description of Contract / Progress Milestones	Schedule date of achievement	Extension Granted up to
1	Completion of reinforcement and 2nd stage concreting of stay ring, spiral case and generator from unit 1 to 4 of Power House (18 th Month).	06.03.2022	23.03.2024
2	Completion of reinforcement and 2nd stage concreting of stay ring, spiral case and generator barrel up to EL 113.0m from unit 5 to 8 of Power House (26 th Month).	06.11.2022	14.11.2024
3	Completion of concrete lining, grouting and finishing works of all surge tunnels (31 st Month)	06.04.2023	31.05.2024
4	Completion of concrete lining, grouting and finishing works of all HRTs (29 th month)	06.02.2023	31.03.2024
5	Completion of steel lining, backfill concreting and plugging of all pressure shafts (31 st Month)	06.04.2023	31.05.2024

The cost compensation if any, arising out of this extension of time shall be dealt as per relevant contract provisions.

Thanking You.

Yours sincerely,

Vipin
1/9/23
(Vipin Gupta)

Executive Director
Engineer-in-charge

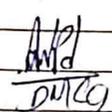
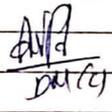
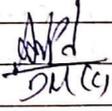
Copy to:

1. Executive Director (Contracts)- for information please.
2. Executive Director (PMSG_ -for information please.
3. Group General Manager (Civil), SLP
4. General Manager (Finance), SLP

Date	Work Description	Location	Scale	H/S	Total	Machinery Engaged		Sig. of PEL	Sig. of NHDC	Remarks
						1st	2nd			
22/10/22	Man power Engaged for									
(Ray)										
	1) unit-1 (RtoE) MEV	unit-1	of	18	19					seen
	EL-88 slush muck clearing	(RtoE)								
	work	EL-88 (MEV)								
	2) unit-4 (BtoD) Shell Take	unit-4	of	22	23					done DMLC
	EL-77.5 area slush muck	(BtoD)								
	removing work	EL-77.5								
	3) unit-6 (RtoE) MEV	unit-6	of	15	16					done DMLC
	EL-85.5 area slush clearing	(RtoE)								
	work	EL-85.5								
	4) unit-7 (AtoB) EL-81 to 87	unit-7	of	23	24					
	slush muck removing	(AtoB)								
	work	EL-81 to 87								
	5) unit-8 (AtoB) EL-81 to 87	unit-8	of	33	34					
	slush removing	(AtoB)								
		EL-81 to 87								
	6) unit-8 (BtoD) (RtoE)	unit-8 (RtoE)	of	27	28					
	EL-85.5 area slush clearing									
		EL-85.5								
22/10/22	1) unit-4 (BtoD) EL-76 to 77.5	unit-4	of	31	32					done DMLC
(Nagpal)	slush muck removing in	(BtoD)								
	of Take area	EL-76, 77.5								
	2) unit-2 MEV (RtoE)	unit-2 (RtoE)	of	20	21					seen
	EL-88 slush removing	EL-88 (MEV)								
	3) unit-7 (BtoD) (AtoB) Line	unit-7 (BtoD)	of	41	42					
	EL-81 to 87 slush clearing	(AtoB)								
	work	EL-81 to 87								

2985

Date	Working Activity	Location	Manpower Engaged	Skid UPS	Total
27/11/22	Man power Engaged for:- (Day)				
	1) unit-3 (A to B) EL-93 slush muck removing & filling empty Cement bag & shifting to EL-107 (E) km	unit-3 EL-93 (A to B)	01	18	19
	2) unit-3 MEV (D to E) line area slush muck shifting from EL-88 to EL-113	unit-3 (D to E) MEV EL-88	01	14	15
	3) unit-1 (D to E) EL-113 area stacking slush bag shifting to EL-12A-5 (out side)	unit-1 (D to E) EL-113	01	29	30
	4) unit-7 (A to B) EL(81, 87) area slush clearing creek	unit-7 EL(81, 87) (A to B)	01	18	19
	5) unit-8 (B to D) EL(76 to 81) area slush clearing bank	unit-8 (B to D) EL(76, 81)	01	20	21
	6) unit-4 (B to D) line Draft Truck area EL-78 area slush muck removing	unit-4 (B to D) EL-78	01	13	14

Time	Mechanism Engaged	Sig of	Sig of	Remarks
		DEL	NHPC	
11:00				    

Sl. No.	Activity	Location	Machinery Engaged	Start	End
1	(Asst) 1) unit-1 MCV (A to E) area EL-113 stacking slash muck longer shifting to EL-124.5	unit-1 (D to E) EL-113	of 15	16	
2	2) unit-3 MCV EL-85 (A to E) slash muck long. shifting & shifting to EL-110 area	unit-3 MCV EL-85 (D to E)	of 12	13	
3	3) unit-(283) (A to D) EL-93 area filling slash in comp. Concr. long & shift to EL-103 El line	unit-(283) (A to D) EL-93	of 12	13	
4	4) unit-7 (B to D) EL-72.5 area slash fitting muck	unit-7 (B to D) EL-72.5	of 21	22	
5	5) unit-4 (B to D) Refractory area slash muck removal of & shifting work.	unit-4 (B to D) Refractory EL-76.5	of 18	19	

Sl. No.	Machinery Engaged	Sig. of	Sig. of	Remarks
1		DEL	MHDC	
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Date	W/ Activity	Location	Max person Engaged
			skilled w/s Total
31/10/20			
(Retired)	1) unit-1 (atop) ^{stacking} slush. muck shifting from EL-113 to EL-124.5 outside area.	und-1 (atop) EL-113	01 19 18
	2) unit-3 EL-88 MEV (atop) slush removing & shifting to EL-113 area.	und-3 EL-88 (atop) (MEV)	01 15 16
	3) unit (283) (atop) EL-93 area slush removing & shifting to EL-107 (EL) line.	und-(283) (atop) EL-93	01 11 12
	4) unit 4 (atop) EL-88 area slush muck removing	und-4 (atop) EL-88	01 10 11
	5) unit-7 (atop) EL-57 area slush removing work	und-7 (atop) EL-57	01 11 12
	6) unit-8 (atop) EL-81.62 area slush muck remaining	und-8 (atop) EL-81.62	01 14 15
	7) unit-4 (atop) affore. area slush muck clearing	und-4 (atop) affore EL-77	01 19 20

Times	Machinery Engaged	Qty. of	Qty. of	Remarks
11-00		PEL	HHPC	
				8m
				$\frac{1000}{1000}$
				8m
				$\frac{1000}{1000}$

Date	Working Activity	Location	Manpower Engaged			Times	Mechanics Engaged	Sig. of PBL	Sig. of NHPC	Remarks
			SKR	US	Total					
1/11/22 (Sat)	Manpower Engaged for:-									
	1) unit-3 MEV (R'toE) line EL-88, slush meek shifting & area cleaning	unit-3 MEV (R'toE) EL-88	01	11	12	11:00				
	2) unit-4 draft tube (BtoD) EL-76 to 77-5, slush meek removing work	unit-4 draft tube (BtoD) EL-76-80 to 77-5	01	17	18					
	3) unit-7 (AtoB) line EL-88, slush meek removing & shifting work	unit-7 (AtoB) EL-88	01	19	20					
	4) unit-6 slush meek cleaning & shifting of (R'toE) line MEV area EL-88	unit-6 MEV (R'toE) EL-88	01	15	16					
	5) unit-3 (BtoD) draft tube area EL-93 slush meek removing & shifting work	unit-3 (BtoD) draft tube EL-93	01	12	13					
	6) unit-8 (BtoD) line area slush meek cleaning & shifting EL-85	unit-8 (BtoD) EL-85	01	20	21					

[Signature]

[Signature]

Date	Working Activity	Location	Manpower Engaged			Time	Mechanicy Engaged	Sig. of P/E	Sig. of NHPC	Remarks
			S	U/S	Total					
1/11/22 (Night)	Max power Engaged :-		5	4/5	Total					
	1) Unit-1 MFV EL-113 E line slush muck removing & shifting tank from EL-113 to EL-1245 (out side)	Unit-1 E line (MFV) EL-113	01	21	22	11:00				
	2) Unit-3 MFV EL-88 (A to E) line slush muck removing & shifting tank	Unit-3 (A to B) line EL-88 MFV	01	16	17					
	3) Unit-4, EL-93 (A to B) line slush muck removing & pouring in empty cement bags & shifting to EL-103 (E) line area	Unit-4 (A to B) line EL-93	01	21	22					
	4) Unit-6 EL- 98-83 ⁸⁵⁻⁵ (D to E) line MFV area slush muck removing. tanks	Unit-6 (D to E) MFV EL-85-5	01	12	13					
	5) Unit-7 (A to B) EL-88-00 slush muck removing & cleaning tank	Unit-7 (A to B) line EL-88	01	39	40					

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2993

Date 2/11/22 (Day)	Working Activity	Location	Manpower Engaged			Time	Machinery Engaged	Sig. of	Sig. of	Remarks
			S	U/S	Total					
	1) Max power Engaged for									
	1) unit 1 EL-113 (E line) stacking slush muck bag shifting to EL-1245	unit-3 EL-(113 to 1245) E line	01	18	19	11:00				BSW
	2) unit-3 (A to E) MFR- EL-88 slush material cleaning & shifting to EL-113	unit-3 (A to E) EL-88	01	18	19					
	3) unit 4 (B to D) EL-76-00 Snell Tube area slush muck removing & clean & shifting muck	unit-4 (B to D) line EL-76-00	01	25	26					
	4) unit-5 EL-89.5 B line Snell Tube area slush muck removing for area cleaning	unit-5 B line EL-89.5	01	17	18					
	5) unit-6 MEV (A to E) line area slush muck cleaning & water jetting tank EL-85.5	unit-6 (A to E) MEV EL-85.5	01	08	9		water pump = (04) Hrs 1.5 Hrs			MS
	6) unit-2 A line Gate grove area slush muck cleaning & shifting muck EL-81.7	unit-2 A line (V-182) EL-81.7-u	01	13	14					BSW

2994

Date	Working Activity	Location	Manpower Engaged			Times	Machinery Engaged	Sig. of PEL	Sig. of NHPC	Remarks
			S	W/S	Total					
2/11/22	(Receipt) Max power Engaged for:-									
	1) Unit-1 (A to E) line slackening slush muck bag's shifting from EL-113 to EL-124.5 (outside)	unit-1 (A to E) EL-113	01	14	15	11-00				
	2) unit-3 (A to E) MIV EL-88 slush muck cleaning & shifting to EL-113	unit-3 (A to E) EL-88	01	11	12					
	3) unit-4 (A to B) line EL-93 slush muck removing & shifting to EL-107 (E) line	unit-4 (A to B) line EL-93	01	19	20					
	4) unit-4 (B to D) line EL-77.9 area (Snolt Tube) slush muck removing & shifting work.	unit-4 (B to D) line EL-77.9	01	14	15					
	5) unit-6 (A to E) line (MIV) slush cleaning for water setting EL-85.5	unit-6 (A to E) MIV EL-85.5	01	15	16		Water pump = 5 (Hw) 1-step			

Chh

SM

Date	Stacking Activity	Location	Manpower Engaged			Time	Machinery Engaged	Sig. of PEL	Sig. of NHPC	Remarks
			S	W/S	Total					
3/11/22	Man power Engaged for:-									
(Day)	1) Unit-1 E line stacking slush muck bag's shifting from EL-113 to EL-124.5	Unit-1 EL-113 (A to B)	01	25	26	11-00				
	2) Unit-3 (A to E) EL-88.49 MFV area slush muck removing & filling empty Cement bag's shifting to EL-113	Unit-3 (A to E) EL-88.49	01	11	12					
	3) Unit-4 (B to D) Line EL-78.00 Small Tube area removing of slush & shifting work	Unit-4 (B to D) EL-78.00	01	34	35					
	4) Unit-6 (A to E) Line EL-85.50 MFV area slush muck cleaning work	Unit-6 (A to E) EL-85.50	01	15	16					
	5) Unit-7 (B to D) Line also (A to B) Line EL-89.2, 77.5 area slush muck removing work.	Unit-7 EL-89.2, 77.5 (A to B), (B to D)	01	14	15					
	6) Unit-8 (A to B) Line EL-89.2 slush muck cleaning work & shifting work	Unit-8 EL-89.2 (A to B)	01	09	10					
	7) Unit-8 (A to E) Line EL-85.00 slush muck cleaning work.	Unit-8 (A to E) EL-85.00	01	07	08					

2996





Date	Workings Activity	Location	Man power Engaged			Time	Machinery Engaged	Sig. of	Sig. of	Remarks
			S	W/S	Total					
3/11/22 (Accident)	Man power Engaged for:-									
	1) Unit-3 (A to E) Line EL-88 MVV area slush muck removing, filling in empty Cement bags & shuttling to EL-113	Unit-3 (A to E) MVV EL-88	01	14	15	11:00				
	2) Unit-1 (A to E) EL-113 area stacking slush muck bag shuttling from EL-113 to EL-124-5 (out side) area.	Unit-1 (A to E) EL-113	01	21	22					John
	3) Unit-4 (A to B) Line EL-93 slush muck lifting & filling empty Cement bags & shuttling to EL-107 (E) line.	Unit-4 (A to B) EL-93	01	11	12					
	4) Unit-6 (A to E) Line MVV area EL-85-5 slush cleaning for pit with water Jetting	Unit-6 (A to E) EL-85-5	01	15	16		Water pump = 4.50 (Hr) 1.5 (Hr) Water pump = 4.5 (Hr) 1.5 (Hr)			John
	5) Unit-3 (B to D) Line EL-93 Small tube area slush cleaning & with APC Water Jetting	Unit-3 (B to D) Small tube EL-93	01	35	36		Water pump Air Compressor = 3.5 (Hr)			

2997

Date	Work/Activity	Location	Max position Engaged			Times	Machining Engaged	Sig of PEL	Sig of MHPC	Remarks
			S	ups	Total					
4/11/22	Max position Engaged (cont.)					11:00				
(Day)	1) Unit-1 (S to E) Line EL-113 stocking slush bags shifting from EL-113 to EL-1245 (West side)	Unit-1 (S to E) EL-113	01	15	16					
	2) Unit-3 MEV EL-58 (S to E) line slush muck removing & filling in empty cement bags also shifting to EL-113	Unit-3 (S to E) EL-58 (MEV)	01	13	14					
	3) Unit-3 (B to D) Draft tube area EL-93 area cleaning & Air Jetting work	Unit-3 (B to D) (R/tube) EL-93	01	25	26		1) Air Compressor (10) Plus			
	4) Unit-4 (B to D) Line R/tube slush muck removing & shifting work EL-77-5	Unit-4 (B to D) EL-77-5	01	29	30					
	5) Unit-7 (B to D) Line slush muck removing work at Draft Tube area EL-77-5	Unit-7 (B to D) R/tube EL-77-5	01	21	22					
	6) Unit-5 (S to E) Line slush muck clearing & shifting work EL-85	Unit-5 (S to E) EL-85	01	11	12					
	7) Unit-2 G/Grove Seal Beam A' Line EL-81-7 area slush muck removing & shifting work	Unit-2 A' Line EL-81-7 (G/Grove)	01	13	14					

Ben

Ben

Ben

2998

Date	Activity	Locations	Manpower Engaged		Time	Mechanical Engaged		Sig. of PEL	Sig. of HHPC	Remarks
			S	U/S Total						
4/11/22	(Negligible) Manpower Engaged for									
	1) Unit-1 (R'toE) line EL-113 slush cleaning & shutoff to EL-124-5 (out side) area	Unit-1 (R'toE) EL-113	01	23	24					
	2) Unit-3 MEV (R'toE) line EL-88 slush muck removing & shutoff work to EL-113	Unit-3 EL-88 MEV (R'toE)	01	30	31					
	3) Unit-4 (BtoD) EL-78-00 Raft Tube slush muck cleaning work	Unit-4 EL-78 (BtoD) R/Tube	01	16	17					
	4) Unit-6 (R'toE) line MEV area EL-85-5 slush removing & cleaning work	Unit-6 (R'toE) MEV EL-85-5	01	14	15					
	5) Unit-7 (BtoD) EL-77-5 Raft tube area slush cleaning work	Unit-7 (BtoD) EL-77-5	01	21	22					
	6) Unit-8 (R'toE) line slush removing & cleaning of area EL-85-00	Unit-8 (R'toE) EL-85-00	01	13	14					

SM

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2999

Sl. No.	Activity	Locations	Manpower Engaged	Time	Machinery Engaged	Signal	Sign-off
			S U/S Total			PEL	HHDC
1	Unit-1 (A to E) stacking slush muck bag: shifting from EL-113 to EL-124.5 (outside)	Unit-1 (A to E) EL-113	01 12 13	11:00			SM
2	Unit-3 MEV (A to E) line EL-88 slush removing & filling empty cement bag: & shifting to EL-113	Unit-3 (MEV) (A to E) EL-113	01 15 16				
3	Unit-4 (B to D) shaft tube area slush muck removing & shifting EL-76	Unit-4 (B to D) (A to Tube) EL-76	01 34 35				
4	Shaft Tube Gate Grove slush cleaning, shifting & tank Unit-2 EL-81-7 (A) line	Unit-2 A line EL-81-7	01 15 16				
5	Unit-3 (B to D) line shaft MEV area slush cleaning with Air Compressor Mammully EL-93	Unit-3 (B to D) (A to Tube) EL-93	01 25 26		1) Air Compressor = 9 (HP)		
6	Unit-6 (A to E) EL-85-6 MEV area slush removing & area cleaning	Unit-6 (B to D) EL-85-5	01 11 12			SM	
7	Unit-7 (B to D) line (A to Tube) EL-77-5 area slush cleaning & tank R	Unit-7 (B to D) EL-77-5	01 17 18				SM
8	Unit-8 (B to D) & (A to E) line area cleaning & tank EL-76 & EL-85	Unit-8 (B to D) EL-76 (A to E) EL-85	01 33 34				SM

3000

Date	W/ Activity	Location	Manpower Engaged			Time	Machinery Engaged	Sig-of PEL	Sig-of NHPC	Remarks
			S	US	Total					
5/11/22 (Night)	Manpower Engaged for									
	1) und-1 MIV area (A'toE) stocking slush muck bag' shifting from EL-113 to EL-124S	und-1 (A'toE) EL-113	01	18	19	11				
	2) und-3 MIV (A'toE) EL-88 slush muck clearing & filling in empty cement bag' also shifting to EL-113	und-3 (A'toE) EL-88	01	11	12					
	3) und-4 Draft Tube (B'toD) wire slush muck removal & shifting to tank EL-76	und-4 (B'toD) A'toE EL-76	01	09	24 10					
	4) und-6 (A'toE) MIV area slush muck removing & clearing tank EL-85-S	und-6 (A'toE) MIV EL-85-S	01	22	23					
	5) und-7 (B'toD) Draft Tube area slush muck removing & clearing tank EL-76 to	und-7 (B'toD) A'toE EL-76 to	01	25	26					

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Date	Activity	Description	Manpower Engaged		Time	Machinery Engaged	Sig. of PEL	Sig. of MHPC	Remarks
			S	u/c Total					
11/22	Man power Engaged for:				11:00				
Day									
	1) unit-1 M&V area (A to E)	unit-1	01	15	16				
	stacking slush muck bag's	(A to E)							
	shifting from EL-113 to EL-115	EL-113							
	2) unit-3 (A to E) M&V	unit-3	01	41	42				
	area EL-88 slush muck	(A to E)							
	removing & filling in	EL-88							
	empty cement bag & shifting								
	to EL-113 area								
	3) unit-4 (A to D) line	unit-4	01	38	39				
	snoff tube slush muck	(A to D)							
	removing work:	EL-76, 77-5							
	EL-76 to 77-5								
	4) unit-2 snoff tube G/grove	unit-2	01	15	16				
	scat beam area slush	(A) line							
	muck removing & shifting	EL-81.7							
	EL-81.7								
	5) unit-5 M&V (A to E)	unit-5	01	12	13				
	EL-85-5 slush muck	(A to E)							
	removing & clearing	EL-85-5							
	6) unit-6 (A to E) M&V	unit-6	01	07	08				
	area clearing work	(A to E)							
	EL-85-5	EL-85-5							
	7) unit-8 (B to D) line	unit-8	01	14	15				
	slush clearing work	(B to D)							
	EL-83, 85	EL-83, 85							

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3002

Date	Co/Activity	Description	Man power Engaged			Time	Mach/Equip Engaged	Sig. of PEL	Sig. of MHPG	Remarks
			S	U/C	Total					
6/11/22 (Neglect)	Man power Engaged for:									
	1) Unit-4 MEV area (D'to E) slush muck (bag) shifting from EL-113 to EL-124.5 area	Unit-1 (D'to E) EL-113	01	20	21	11-00				
	2) Unit-3 MEV area (D'to E) EL-88 slush muck removing & filling in empty Cement-bag & shifting to EL-113 area	Unit-3 (D'to E) EL-88	01	08	09					
	3) Unit-4 (B to D) Small Tube EL-76 area slush muck removing & shifting work	Unit-4 (B to D) EL-76, 77.5	01	09	10					
	4) Unit-6 (D'to E) MEV area EL-85.5 area slush cleaning work	Unit-6 (D'to E) EL-85.5	01	15	16					
	5) Unit-7 (B to D) Small tube area EL 76. slush muck removing work	Unit-7 (B to D) EL-76,	01	18	19					
	6) Unit-8 (D'to E) EL-(85, 83) slush cleaning	Unit-8 (D'to E) EL-85,	01	09	10					
	7) Unit-8 (B to D) Small Tube area slush cleaning EL-77.5	Unit-8 (B to D) EL-77.5	01	11	12					

3003

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Date	CD / Activity	Location	Man power Engaged			Times	Machinery Engaged	Sig-of PEL	Sig-of NHPC	Remarks
			S	U/S	Total					
7/11/22	Man power Engaged for:									
Day	1) unit-1 MEV (D'toE) line slush meek bag. sluffing from EL-113 to EL-124.5	unit-1 (D'toE) EL-113	01	22	23	11-00			Ben	
	2) unit-3 MEV (A'toE) EL-88 slush meek removing & filling in empty Cement- bags & sluffing from EL-88 to EL-113 area	unit-3 (A'toE) EL-88	01	31	32					
	3) unit-4 Small tube (BtoD) EL-76, 77.5 area slush meek removing & sluffing	unit-4 (BtoD) EL-76, 77.5	01	42	43					
	4) unit-1 Dewatering Chamber (A'toE) line slush meek removing & filling empty Cement bags & sluffing from EL-78.8 to EL-88 area.	unit-1 (A'toE) EL-78.8 of chamber	01	17	18				Ben	
	5) unit-2 of Tube Gate Grove Scal Beam area slush meek removing EL 81.7 (A') line	unit-2 G/Grove EL-81.7 A' line	01	19	20				Ben	
	6) unit-3 of Tube (B+D) line EL-93 area cleaning work	unit-3 (B+D) line EL-93	01	19	20					
	7) unit-5 (A'toE), EL-83, 85 of cleaning work.	unit-5 (A'toE) EL(83, 85)	01	14	15				1) Dewatering pump = (A) Hr 1.5 (Hr) water settling. 	
	8) unit-6 (A'toE) EL-85.5 slush cleaning work	unit-6 (A'toE) EL-85.5	01	11	12					
	9) unit-8 (D'toE) (BtoD) EL-85	unit-8 (D'toE) EL-85	01	05	06					

3004

Date	Activity	Location	S	U/S	Total	Time	Machinery Engaged	Sig. of PEL	Sig. of NHPC	Remarks	Job
7/11/22			5	4/5	Total						
(Height)	Max powder Engaged for:										
1)	unit 1 MEV (A'toE) stacking slush meek bag's shifting from EL-113 to EL-124-5 outside	unit-1 (A'toE) EL-113	01	20	21	11:00			Ben		
2)	unit-4 Draft Tube EL-76, 77.5 (BtoD) line slush meek removing & shifting work	unit-4 (BtoD) EL-76, 77.5	01	23	24						
3)	unit-6 MEV EL-85.5 (A'toE) line cleaning work	unit-6 MEV (A'toE) EL-85.5	01	18	19						
4)	unit-8 MEV EL-83, 85 (A'toE) slush cleaning work	unit-8 (A'toE) EL-83, 85	01	11	12				Alma		
5)	unit-8 Draft Tube EL-77.5 (BtoD) area slush meek cleaning work	unit-8 Draft (BtoD) EL-77.5	01	19	20			Alma	Alma		

3005

Date	Activity	Location	Man power Engaged			Time	Mechanical	Engaged	Signal	Sig of Resident	Jub
			S	U/S	Total						
21/12/22	Man power Engaged for:-		S	U/S	Total	11:00			PEL	MHDC	
(Recy)	1) unit-1 MIV (D'to E) shush stacking shuffling from EL-113 to EL-124.5	unit-1 (D+E) MIV EL-113 to EL-124.5	01	17	18						Shu
	2) unit-1 Oxidizing chamber EL-88 (D to E) shush muck removing & shuffling	unit-1 (D+E) EL-88	01	23	24						Shu
	3) unit-2 G/Grove seat Beam EL-81.7 A-line shush muck removing	unit 2 G/Grove EL-81.7 A line	01	18	19						
	4) unit-3 MIV (D'to E) line EL-88.00 area shush cleaning work	(unit)-3 (D+E) (MIV) EL-88	01	38	39						
	5) unit-3 draft tube area (B to D) line EL-93 cleaning work	unit-3 draft tube (B to D) EL-93	01	25	26						
	6) unit-4 draft tube (B to D) EL-76 to 77.5 area shush muck removing work	unit-4 (B to D) EL-(76 to 77.5)	01	36	37						
	7) unit-5 MIV area cleaning work (D'to E) EL (83 to 85)	unit-5 MIV (D'to E) EL-83, 85	01	12	13						
	8) unit-6 MIV (D'to E) EL 85.5 shush cleaning work	unit-6 (D'to E) EL-85.5	01	12	13						

3006

Shu

Date	Activity	Location	Manpower Engaged			Times	Machinery Engaged	Sig of PEL	Sig of NHPC	Remarks
			S	W/S	Total					
8/11/22 (Day)	⑨ Unit-6 draft tube area slush shifting with slush pump (B to D) line EL-86	Unit-6 (B to D) EL-86	01	01	12	4-10	1) slush pump = 07(Hr) (25HP) 2) water pump = 09 (Hr) (25HP)			
	⑩ Unit-8 (D'LoE) line EL-85 slush cleaning work	Unit-8 (D'LoE) EL-85	01	14	15					AS
8/12/22 (Night)	Manpower Engaged for:	Unit-7 (D'LoE) EL-113	01	17	18					AS
	① Unit-7 MIV (D+E) Stacking slush muck (bag) shifting form EL-113 to EL-124.5									
	② Unit-4 draft tube EL-76 to 77.5 (A to D) line slush removing & shifting work	Unit-4 (D+B) EL-76 to 77.5	01	41	42					
	③ Unit-6 MIV area (D+E) line cleaning work EL-85.5	Unit-6 MIV (D+E) EL-85.5	01	18	19					
	④ Unit-8 (D+E) line area slush removing & shifting EL-85.	Unit-8 (D+E) EL-85	01	13	14					AS

3007

9/4/22
 Manpower Engaged
 Location: 5
 H/S: 4/5
 Total: 22

Times: 12-00
 Machinery Engaged
 Sig. of PEL
 Sig. of NHPC
 Remarks

Unit	Description	Unit	OP	H/S	Total
Unit-1	Decommissioning chimney EL-88 slush shifting (D+E) line	Unit-1 (D+E) EL-88	01	21	22
Unit-1	MIV (D+E) EL-113 stacking stand slush muck (bag) shifting to EL-124.5	Unit-1 (D+E) EL(113 to 124.5)	01	19	20
Unit-3	MIV (D+E) EL-88 slush cleaning work	Unit-3 (D+E) EL-88	01	39	40
Unit-2	Gate cover seal Room A' line EL-87.7 area slush cleaning work	Unit-2 A' line EL-87.7	01	15	16
Unit-4	Draft tube area (B to D) line EL-76 to 77.5 slush muck removing	Unit-4 (B to D) EL-(76 to 77.5)	01	42	43
Unit-3	Draft tube (B to D) slush cleaning EL-93	Unit-3 (B to D) EL-93	01	22	23
Unit-5	MIV EL(83 to 85) EL-(83 to 85) cleaning work	Unit-5 (D+E) EL-(83 to 85)	01	19	20
Unit-6	(D+E) EL-85.5 cleaning work	Unit-6 (D+E) EL-85.5	01	05	06

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3008

Date 09/11/22 (Day)	Work/Activity	Location	Manpower Engaged			Time	Machinery Engaged	Sig of PEL	Sig of MUPC	Remarks
			S	U/S	Total					
	Manpower Engaged for:									
	(9) Unit-6 draft tube area slush shifting with slush pump EL-86	Unit-6 (B to D) EL-86	01	07	08	11.00	1) Slush pump 25HP 2) Water pump 25HP			ASW
	(10) Unit-8 (D+E) line EL-85 slush cleaning	Unit-8 (D+E) EL-85	01	15	16					ASW
09/11/22 (Night)	Manpower Engaged for	Unit-1 (MIV)	01	20	21					ASW
	(1) Unit-7 MIV (D+E) slush shifting for EL-113 to EL-124 EL-124.5 mat side	EL-113 to EL-124.5 (D+E)								
	(2) Unit-4 draft tube area EL-76 to 77.5 (D to D) line slush removing work	Unit-4 (draft tube) EL-76 (B to D)	01	38	39					
	(3) Unit-6 (D+E) MIV EL-85 area cleaning work	Unit-6 MIV (D+E) EL-85	01	12	13					
	(4) Unit-8 (B to D) line EL-86 foundation area slush cleaning work	Unit-8 MIV (B to D) EL-86	01	25	26					ASW
	(5) Unit-8 (D+E) line EL-83 to 85 area cleaning work	Unit-8 (D+E) (EL-83 to 85)	01	22	23					ASW
	(6) Unit-3 MIV (D+E) EL-88 slush work	Unit-3 (MIV) (D+E) EL-88	01	18	19					

3009

Date 10/11/22 (Day)	w/ Activity Manpower Engaged for:	Location	Manpower Engaged			Times	Machinery Engaged	Sig of PBL	Sig of NHPC	Remarks
			S	W/S	Total					
	① Unit-1 (D+E) line Deaerating chamber slush slush muck shift during & area cleaning work EL-88	Unit-1 (D+E) EL-88	01	25	26	11-00			Bsu	
	② Unit-1 (D+E) EL-113 stocking slush muck (log) shift during to EL-124.5	Unit-1 (D+E) EL-113	01	14	15				Bsu	
	③ Unit-3 MIV (D+E) EL-88 slush removing	Unit-3 MIV (D+E) EL-88	01	30	31					
	④ Unit-2 Draft tube G/ Grove Seal Room A' area slush cleaning work EL-81.7	Unit-2 G/Grove A' line EL-81.7	01	15	16				Bsu	
	⑤ Unit-4 Draft tube (BtoD) EL-76 to 77.5 area area slush removing work	Unit-4 (BtoD) EL-76 to 77.5	01	38	39					
	⑥ Unit-5 MIV (D+E) line EL-83 area cleaning work	Unit-5 (D+E) EL-83	01	12	13					
	⑦ Unit-6 MIV (D+E) line EL-85.5 area cleaning work	Unit-6 MIV (D+E) EL-85.5	01	11	12				Chk	
	⑧ Unit-8 (D+E) line EL-85.00 slush cleaning work	Unit-8 (D+E) EL-85	01	21	22				Bsu	

Date	Activity	Location	Manpower Engaged			Times	Machinery Engaged	Sig. of PEL	Sig. of NHPC	Remarks
			S	u/s	Total					
10/11/22 (Night)	Man power Engaged for :- ① Unit-1 MIV (D+E) EL-113 push muck shuffling EL-124.5 (out side) area	Unit-1 (D+E) EL-113	01	18	19	11.00				
	② Unit-4 draft tube EL-76 to - 75.5 (B to D) line & push removing coeok	Unit-4 (B to D) EL-76-77.5	01	31	32					
	③ Unit-6 MIV area cleaning (D+E) EL-85.5	Unit-6 (D+E) EL-85.5	01	19	20					
	④ Unit-8 MIV area cleaning (D+E) EL-83 to 85	Unit-8 (D+E) EL-83 to 85	01	13	14					Asso.
	⑤ Unit-3 MIV area EL-88 push cleaning (D+E)	Unit-3 MIV EL-88 (D+E)	01	09	10					

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Date 11/11/22 (Day)	Working Activity man power Engaged for:	Location	man power Engaged		Timer	Machinery Engaged	Sig. of PEL	Sig. of MIPC	Remarks
	① Unit-1 EL-113 (D'tot) line Stocking slush mark shifting work to EL-124.5	Unit-1 (D'tE) EL-113	4	17	18	11-00		PEL	Ben
	② Unit-2 draft tube & groove Seal Beam EL-81.7 area Slush removing work	Unit 2 A'line EL 81.7 & groove	4	15	16				Ben
	③ Unit-3 MIV EL-88 (D'tE) slush mark removing & shifting work	Unit-3 MIV EL-88 (D'tE)	4	37	38				
	④ Unit-1 (D'tE) d/ chamber EL-88 slush removing & shifting work	Unit-1 (D'tE) EL-88	4	31	32				Ben
	⑤ Unit-4 (BtoD) draft tube area EL-76 to 77.5 slush mark removing work	Unit-4 (BtoD) EL(76 to 77.5)	4	43	44				
	⑥ Unit-3 (BtoD) EL-93 slush cleaning work	Unit-3 (BtoD) EL-93	4	12	13				
	⑦ Unit-5 (D'tE) MIV area cleaning work EL-83 to 85)	Unit-5 (D'tE) EL-83 to 85)	4	12	13				
	⑧ Unit-6 (BtoD) draft tube EL-76 area slush cleaning manually with slush pump	Unit-6 (BtoD) EL-76	4	11	12				1) Slush pump = 8 (PEL) 25HP 2) Water pump = 10 (PEL) 25HP 3) T/crane = (03) PEL. (Bucket shifting)
	⑨ Unit-8 (D'tE) line EL-85 slush mark removing	Unit-8 (D'tE) EL-85	4	19	20				Ben

3012

Date 11/11/2022 (Night)	Working Activity man power Engaged for:	Location	manpower Engaged			Time	machinery Engaged	Sing DEL	Sing NHPC	Remark
	① Unit-1 EL-113 (D+E) stocking to EL-124.5 out side	Unit-1 (D+E) EL-113	01	15	16	11:20		Bsu		
	② Unit-4 (B+D) EL-76 draft tube area slush muck removing work	Unit-4 (B+D) EL-76:77.5	01	22	23					
	③ Unit-6 (D+E) EL-85.5 area slush cleaning work	Unit-6 (D+E) EL-85.5	01	11	12					
	④ Unit-8 (D+E) EL-85.00 cleaning work	Unit-8 (D+E) EL-85	01	09	18		Akh	Akh		

Date	Activity	Location	man power Engaged		Time	machinery Engaged	Sing PEL	Sing NHPC	Remark
			S	U/S					
12/11/22 (day)	man power Engaged for								
	① unit-1 - MIV EL-113 (D4E) line stocking slush mud (bag) shifting to EL-124.5 out side.	unit-1 MIV EL-113(D4E)	01	15	16	11-00			
	② unit-1 dewatering chamber EL-88 (D4E) slush mud removing etc & shifting work.		01	28	29				
	③ unit-6/Groove A' line EL 81.7 Seat beam area slush mud removing work	unit-2 G/Groove EL-81.7 A' line	01	14	15				
	④ unit-3 MIV EL-88 (D4E) line slush cleaning work	unit-3 MIV EL-88 (D4E)	01	30	31				
	⑤ unit-3 draft tube (B to D) line EL-93 area cleaning	unit-3 (B to D) EL-93	01	08	09				
	⑥ unit-4 draft tube (B to D) EL-76 to 77.5 area slush cleaning work	unit-4 (B to D) EL-76 to 77.5	01	39	40				
	⑦ unit-6 (B to D) draft tube area EL-76 slush cleaning with man power & slush	unit-6 (B to D) EL-76	01	12	13				

- 1) Slush pump = 3-30 (AM) 25 (PEL)
- 2) Water pump = 5-00 (PEL) 25 (PEL)
- 3) Trench = 4-30 (PEL)
- (bucket shifting)

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3014

Date	Activity	Location	Man power Engaged			Time	Machinery Engaged	Sign		Remark
			S	u/s	Total			PEL	NHPC	
12/11/22 (Day)	man power Engaged for :- ⑧ Unit-8 (B to D) line EL-76 Slush cleaning work	Unit-8 (B to D) EL-76	01	07	08	11-00		OK	ASL	
12/11/22 (Night)	man power Engaged for :- ① Unit-1 (D to E) line EL-113 Stocking slush mark (bag) shifting to EL-124.5 (out side)	Unit-1 (D to E) EL-113	01	15	16	11-00			ASL	
	⑧ Unit-4 (B to D) line Dabot tube EL-76 to 77.5 area slush cleaning work	Unit-4 (B to D) EL-76-77.5	01	21	22					
	③ Unit-6 MIV (D+E) line EL-85.5 area cleaning	Unit-6 (D+E) EL-85.5	01	11	12					
	⑨ Unit-3 MIV EL-88 (D+E) line cleaning work	Unit-3 (D+E) EL-88	01	09	10			OK		

3015

Date	Act/Activity	Location	Man power Engaged			Times	Machinery Engaged	Sig	Gig	Remarks
			S	U/S	Total					
14/11/22	Man power Engaged for:									
Ray	1) unit-1 MEV (D'to E)	unit-1	01	18	19	11-00		PEL	MHPC	
	stacking slush truck	(D'to E)								
	bag stuffing from EL-113 to EL-124-5	EL-113								
	2) unit 2 G/grove (A') line	unit-2	01	15	16					
	seal beam EL-81-7 area	G/grove								
	slush cleaning work	A' line EL-81-7								
	3) unit-3 MEV (D'to E)	unit-3	01	28	29					
	EL-88 area slush truck	(D'to E) MEV								
	removing & stuffing to EL-113 area	EL-88								
	4) unit-4 (B to D) line of pipe	unit-4	01	38	39					
	EL-76, 77-5 area slush	(B to D)								
	removing work	EL-76								
	5) unit (182) (A to B) EL-93	unit-(182)	01	26	27					
	area slush removing	(A to B)								
	work	EL-93								
	6) unit-5 MEV (D'to E)	unit-5	01	13	14					
	line EL-83 area slush	(D'to E)								
	cleaning work	EL-83								
	7) unit-6 (B to D) of pipe	unit-6	01	12	13					
	EL-76-00 area slush	(B to D)								
	removing work	EL-76								

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- 1) Slush pump = 5 (Hr) 25 (Ft)
- 2) Water pump = 7 (Hr) 25 (Ft)
- 3) T/crane = 3 (Hr)

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Date	Activity	Location	Manpower Engaged		no	Machinery Engaged		Sig	Sig	Remarks
			Start	Total		no	no			
14/11/22	(Miept) 1) und-1 (S' to E) line EL-113 stacking slush mesh bags shuffeling to EL-124-5 (east side)	und-1 (S' to E) EL-113	of	12	13	11-00		PEL	Bm	
	2) und-1 EL-107 (S' to E) line stacking slush mesh bags shuffeling to EL-113 (E) line	und-1 EL-107 (S' to E)	of	20	21				Bm	
	3) und-4 (B to D) office area EL-77-5 slush removing & shuffeling to creek	und-4 (B to D) EL-77-5	of	31	32					
	4) und-3 MEV (S' to E) line area EL-88 slush removing & filling in empty cement bags & shuffeling to EL-113	und-3 (S' to E) EL-88	of	13	14					

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Date	w/ Activity	Location	Max power engaged			Time	Machinery Engaged	Sig	Sig	Remarks
			skid	W/S	Total					
15/11/22	Max power engaged for:-									
(day)	1) und-1 (A'toB) EL-113 area stacking slush meek shifting to EL-124.5	und-1 (A'toB) EL-124.5 EL-113	of	17	18	11-10				
	2) und-3 A'line Galt Grove scal beam area EL-81.7 slush meek removing	und-3 A'line EL-81.7	of	15	16					
	3) und-3 mek (D'toB) line slush cleaning & shifting work EL-88	und-3 (A'toB) EL-88	of	42	43					
	4) und-4 Draft Tube (B'toD) line EL-76 to 77.5 area slush removing work	und-4 (B'toD) EL-76	of	38	39					
	5) und-2 (A'toB) EL-93 area cleaning & filling in empty cement bags & shifting to EL-107 (D'line)	und-2 (A'toB) EL-93	of	43	44					
	6) slush meek (bag) loading in Ajax Floor & shifting work at E line EL-124.5 (near of garden)	EL-124.5 E' line	of	11	12					1) Ajax Floor = 10 (CAH)
	7) und-6 of tube (B'toD) line EL-76 area slush meek shifting & loading in T/C bucket	und-6 (B'toD) EL-76	of	14	15					2) T/C area = (0.9) ft. bucket slush.

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Date 15/11/22 (Negla)	w/ Activity	Location	Manpower Engaged			Times	Machinery Engaged	Sig. of DEL	Sig. of NHPC	Remarks
			skm	W/S	Total					
	1) unit-1 (RTOE) wire stacking slush creek shifting from EL-113 to EL-124.5 (E) out side	unit-1 (RTOE) EL-113	9	13	14	91-10			<i>[Signature]</i>	
	2) unit-1 (RTOE) EL-107 stacking slush creek bag shifting to EL-107	unit-1 (RTOE) EL-107	9	22	23				<i>[Signature]</i>	
	3) unit-4 small pipe (BTD) (EL-76-77.5) slush creek removing work	unit-4 (BTD) EL-76, 77.5	9	31	32			<i>[Signature]</i>		

Sl. No.	Activity	Unit	Material	Quantity	Unit	Time	Machinery Engaged	Sig. of	Sig. of	Remarks
16/11/22	Man power engaged for							DEL	NHDC	
(Day)	Unit-1 (S to E) slush muck bag stuffing from EL-113 to EL-124.5 out side	unit-1 (S to E)	of	15	16	14-10				
	Unit-3 sluff take gate	unit-3 (S to E)	of	19	15					
	Gate EL-81.7 A line area slush muck clearing work	EL-81.7								
	Unit-3 (A to B) EL-93 slush muck removing & clearing also pouring in empty cement bags & stuffing to EL-107 E line	unit-3 (A to B) EL-93	of	25	26					
	Unit-3 MEV (S to E) line area slush muck removing & filling in empty cement bags & stuffing from EL-88 to EL-113	unit-3 (S to E) EL-88 (MEV)	of	29	30					
	Unit-4 of take (B to D) area slush removing & stuffing EL-76 to 77.5	unit-4 (B to D) EL-76 to 77.5	of	43	44					
	Unit-6 of take (B to D) slush muck removing & stuffing work by manually & T/crane (bucket) EL-76	unit-6 (B to D) EL-76	of	35	36		1) T/crane bucket = 4.30 (hr)			
	EL-124.5 (E) line near C/section slush bag loading in A/Flacio & stuffing	EL-124.5 near C/section	of	14	15		1) Ajax loader = 9.35 (hr)			

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Date	CO/Activity	Manpower	Manpower Engaged			Times	Manpower Engaged	Sig-1	Sig-2	Remarks
			skill	MS	Total					
16/11/22										
(Recg'd)	1) unit-1 EL-113 (D'to E) area stacking slush mess bag. shifting to EL-124-5 out side area	unit-1 (D'to E) EL-113	9	17	18	11-40		DEL	HIDE	Bar
	2) EL-124-5 E' line near the C/garden slush bag. working in A/Flame & shifting work	EL-124-5 E' line near C/garden	9	14	15					1) A Jax (Lead) = 3 (Plw)
	3) unit-6 @ Tube area slush removing work (B to D) line EL-76	unit-6 (B to D) EL-76	9	4	12					

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Date	CO/Activity	Area/Location	Manpower Engaged			Timer	Machinery Engaged	Sig. of PEL	Sig. of NHPC	Remarks
			skilled	unskilled	Total					
12/11/22	1) unit-1 (A to B) EL-113 area slush muck bagging & shifting to EL-124.5 outside.	unit-1 (A to B) EL-113	01	14	15	11-40				
	2) EL-124.5 E line near C/garden slush muck loading in Ajax Floor & shifting to creek	EL-124.5 E' near C/garden	01	12	13		1) Ajax Floor = 6-20 (HA)			
	3) unit-3 S/grove A' line scrap beam area EL-81.7 slush muck removing & shifting to creek	unit-3 A' line EL-81.7	01	14	15					
	4) unit-3 (A to B) EL-88 MEV area slush muck removing & shifting to EL-113 area	unit-3 A to B EL-88	01	21	22					
	5) unit-3 (A to B) line EL-93 slush muck removing & area cleaning also shifting to EL-107 (E) line.	unit-3 (A to B) EL-93	01	30	31					
	6) unit-4 Small Tube (B to D) EL-76, 77.5 area slush removing & shifting to creek.	unit-4 (B to D) EL-76, 77.5	01	33	34					
	7) unit-6 (B to D) of Tube EL-76 slush cleaning & shifting to creek	unit-6 (B to D) EL-76	01	11	12		T/crane = 5-30 (HA) Bucket shift			

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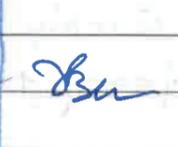
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Date: 12/11/22
 Activity: Slush stacking
 Location: ...
 Manpower: ...
 Skill: 1/5 Total

Unit	Description	Location	of	37	38
Unit-1	Slush stacking muck being sluffing from EL-113 to EL-124.5	Unit-1 (A+E) EL-113	of	37	38
Unit-4	Offshore area EL-76 (B+D) line slush muck remaining work	Unit-4 (B+D) EL-76	of	21	22
Unit-6	(B+D) line Offshore area slush muck remaining & sluffing work EL-76	Unit-6 (B+D) EL-76	of	23	24
Unit-2	(A+B) line EL-93 slush muck remaining work & sluffing to EL-107	Unit-2 (A+B) EL-93	of	17	18

Man: 11-00
 Machinery Engaged: ...
 Sig. of PEL: ...
 Sig. of NHPC: ...
 Remark: ...

1) T/corr = 1.50 (Hm)
(Bucket sluffing)

Date	Activity	Location	Manpower Engaged			Time	Machinery Engaged	Sig. of PEL	Sig. of MHPC	Remarks
			skill	u/s	Total					
18/11/22 Day	1) unit-1 (A to E) stacking slush muck bag shifting from EL-113 to EL-124.5 (outside)	unit-1 (A to E) EL-113	01	14	15	11-00				San
	2) unit-3 (A) line G/Grove scab beam EL-81.7 area slush muck removing & shifting work.	unit-3 (A) line EL-81.7	01	15	16					
	3) unit-3 (A to E) ^{EL-88} MEV area slush muck removing & filling in empty cement-bag & shifting to EL-113 (E)	unit-3 (A to E) EL-88	01	22	23					
	4) unit-4 - strike (B to D) EL-76 area slush muck removing work	unit-4 (B to D) EL-76	01	15	16					
	5) unit-6 (B to D) strike area EL-76 slush muck removing & passing in T/C bucket & shifting	unit-6 (B to D) EL-76	02	19	51		1) T/crane = 7 (HW) (bucket shifting)			
	6) unit-2 (A to B) line EL-93 slush muck removing	unit-2 (A to B) EL-93	02	62	64					San
	7) EL-124.5 (E) line near G/Groove slush muck bag shifting & loading in Ajax Floor & shifting	EL-124.5 (E)	01	14	15		1) Ajax Floor = 6 (HW)			San

Date	w/ Activity	Location	Machinery Engaged			Times	Machinery Engaged	Sig. of PEL	Sig. of MHPC	Remarks
			skid	ups	total					
18/11/22										
18/11/22	1) unit-1 (A to E) stacking slash muck bag: shifting from EL-113 to EL-124.5 (ad side)	unit-1 (A to E) EL-113	9	20	21	11-00				
	2) unit-6 (B to D) small-pike EL-76 slash muck muck	unit-6 (B to D) EL-76	9	17	18					
	3) unit-3 (A to B) EL-93 slash muck clearing work	unit-3 (A to B) EL-93	9	11	12					

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Date	Activity	Location	Start	End	Time	Machinery Engaged	Sig. of	Sig. of	Remarks
19/11/22	1) Unit-1 (D'toe) ^{stack} slush muck bag shifting from EL-113 to EL-124.5	Unit-1 (D'toe) EL-113	07	16	17	11-00	PEL	NHPC	
	2) Unit-3 G/Grove EL-81.7 area (Scal beam) A' line slush muck removing work	Unit-3 G/Grove EL-81.7	07	15	16				
	3) Unit-3 (D'toe) EL-88 slush muck removing & filling in empty Cement bag & shifting to EL-113	Unit-3 (D'toe) EL-88	07	26	27				
	4) Unit-4 (B'to D) A/Take area EL-77.6 area slush muck removing work	Unit-4 (B'to D) EL-77.8	07	15	16				
	5) Unit-6 (B'to D) D/Take area slush muck removing & loading for T/Crane Bucket & shifting work	Unit-6 (B'to D) EL-70 to 72.5	07	47	48				
	6) Unit-3 (A to B) line EL-93 area slush removing & shifting to EL-107	Unit-3 EL-93 (A to B)	07	31	32				
	7)								

D) T/Crane = 4.35 (HR)
(Bucket shifting)

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Date	Activity	Location	Manpower Engaged			Time	Machinery Engaged	Sig. of	Sig. of	Remarks
			Start	U/S	Total					
19/11/21										
(Neglect)	1) unit-1 MEV (D'toE) stacking slush muck bag stuffing from EL-113 to EL124	unit-1 MEV (D'toE) EL-113	07	13	14	11-00		PLL	NHDC	
	2) unit-6 (D'toD) at Take area slush muck removing EL-76	unit-6 (D'toD) EL-76	07	21	22					
	3) unit-1 MEV EL-107 stacking slush muck bag stuffing from EL-107 to EL-124.5 area	unit-1 (D'toE) EL-107	07	14	15					

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Date	w/ Activity	Location	Manpower Engaged			Times	Machinery Engaged	Sig. of PEL	Sig. of NHPC	Remarks
			Skilled	Unskilled	Others					
20/11/22										
Day	1) und-1 (A to E) slackening slush muck bag shifting from EL-113 to EL-124-5 out side area	und-1 (A to E) EL-113	01	16	17					
	2) und-3 G/Grove seal beam EL-81-7 A' line area slush muck removing work.	und-3 A' (seal beam) EL-81-7	01	15	16					
	3) und-3 (A to E) EL-88 slush removing & filling empty cement & shifting to EL-113 area	und-3 (A to E) EL-88	01	41	42					
	4) und-3 (A to B) EL-93 slush muck removing & filling empty cement bags	und-3 (A to B) EL-93	01	15	16					
	5) und-4 (B to D) small tube area EL-76 slush muck removing work	und-4 (B to D) EL-76	01	14	15					
	6) und-6 (B to D) G/Tube area EL-76 slush muck removing & loading T/crane bucket & shifting	und-6 (B to D) EL-76	01	52	53	T/crane = 2.30 (Hr) (bucket shifting)				

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Rate ~~Working~~ Adversely Location 3 No. of people engaged
 20/11/22 291140 148 skill u/s Total

(people) 1) uncl-1 (RTOE) stacking uncl-1 01 21 22
 slush meek bag: shuffing (RTOE)
 from EL-113 to EL-124.5 (outside) EL-113

2) uncl-1 (RTOE) stacking uncl-1 01 16 17
 slush meek bag shuffing (RTOE)
 from EL-107 to EL-124.5 (outside) EL-107

3) uncl-6 RTOE area uncl-6 01 25 26
 EL-75 slush meek (RTOE)
 removing coccoek (RTOE) EL-76

Time Maching Engaged Sig. of Sig. of Remark:
 PEL NHPC

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Date	Working Activity	Location	Max people Engaged			Time	Machinery Engaged	Sig. of	Safety	Remarks
			skill	U/S	Total					
21/11/22 (Sat)	1) unit 1 (A'toE) stacking slush muck bags; shuffling from EL-113 to EL-124.5 (outside)	unit-1 (A'toE) EL-113	01	15	16	11-10		DEL	NHPC	BS
	2) unit-3 S/Grove seal beam A'line EL-81.7 area slush removing work	unit-3 EL-81.7	01	03	04					
	3) unit-3 MEV area (A'toE) EL-88 slush muck removing & filling empty cement bags; & shuffling to EL-113 area	unit-3 MEV (A'toE) EL-88	01	37	38					
	4) unit-4 small tube (BtoD) EL-76 area slush clearing & shuffling work	unit-4 (BtoD) EL-76	01	14	15					
	5) unit-6 small tube (BtoD) EL-76 area slush clearing & loading in T/C bucket & shuffling work	unit-6 (BtoD) EL-76	01	53	54		T/crane = 2.00 (HR) (Bucket shuffling)			
	6) unit-3 (AtoB) EL-93 area slush removing & shuffling to EL-109 (E) line	unit-3 EL-93 (AtoB)	01	15	16					
	7) stacking slush bags loading in Ajax Floor & shuffling at E' line EL-124.5 near C/Garden	EL-124.5 E' line near C/Garden	01	09	10		① Ajax Floor = 2.40 (HR)			

Date	Working Activity	Location	Max persons Engaged			Times	Machining Engaged	Sig. of DEL	Sig. of MHPC	Remarks
			skill	U/s	Total					
21/11/12	(night) ① unit-1 (at top) stacking slush mesh bag's sluffing from EL-107 & EL-113 to EL-124.5 outside	unit 1 (at top) EL-107 & EL-113	01	28	29	16-00				
	② unit 6 at take EL-76 (at top) slush removing	unit-6 EL-76 (at top)	01	11	12					

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Date	Working Activity	Location	Manpower Engaged			Machine Engaged	Sig. of	Sig. of	Remarks
22/11/22							DEL	HPC	
(Night)	1) unit-1 MEV (A to E) stacking slush muck bag stacking from EL-113 to EL124.5 outside	und-1 (A to E) EL-113	01	21	22	11-00			
	2) und-4 of take (A to E) EL-76 slush removing work	und-4 (A to E) EL-76	01	19	20				
	3) und-3 (A to B) EL-93 slush removing	und-3 (A to B) EL-93	01	09	10				

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Date	Working Activity	Location	Max power Engaged	Time	Machinery Engaged	Sig-of	Sig-of	Remarks
22/11/22	Max power Engaged (Run) for							
	1) unit-1 MV - (D to E) stacking slush muck shifting from EL-113 to EL-124.5 out side area.	unit-1 (A to E) MV EL-113	01	23	24			
	2) unit-3 MV - (D to E) EL-88 slush muck remaining muck	unit-3 (D to E) EL-88	01	17	18			
	3) unit-3 (A to B) EL-93 slush muck remaining & shifting work	unit-3 (A to B) EL-93	01	18	19			
	4) unit-4 (B to D) EL-76.8 area (A to B) slush muck cleaning	unit-4 (B to D) (A to B) EL-76.8	02	60	62			
	5) unit-6 (A to B) EL-76 (B to D) slush bag shifting	unit-6 EL-76 (B to D)	01	13	14			
(Night)	1) unit-4 (A to B) EL-76 (B to D) slush muck remaining	unit-4 (B to D) EL-76	01	24	25			
	2) stack slush muck bag shifting from EL-113 to EL-124.5 (D to E) line unit-1	unit-1 (A to E) EL-113	01	18	19			

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Date	Task / Description	Location	No. of hrs / Skill	Time	Machinery Engaged	Sig. of	Sig. of	Remarks
24/11/22 Ray	1) unit-1 MIV (AtoE) stacking slush creek bag stuffing from EL-113 to EL-124.5 (S/bay) area	unit-1 (AtoE) EL-113	01 15 16				Byn	
	2) unit-3 MIV EL-88 (AtoE) slush creek receiving & stuffing to EL-113	unit-3 EL-88 (AtoE)	01 17 18					
	3) unit-3 (AtoB) EL-93 area slush cleaning work	unit-3 (AtoB) EL-93	01 22 23					
	4) unit-4 of take EL-76 (BtoD) line slush receiving & stuffing work	unit-4 EL-76 (BtoD)	02 59 61			Cdk		
	5) unit-6 of take area (BtoB) EL-76 slush cleaning creek	unit-6 (BtoB) EL-76	01 11 12					
(right)	1) unit-4 of take (BtoD) EL-76 area slush receiving & stuffing work	unit-4 (BtoD) EL-76	01 28 29			Cdk		

Working Activity

Date	Main product	Location	Manpower or Engaged			Signature	Signature	Remarks
			Skill	W/S	Total			
25/11/22								
Day	1) und-1 MEV EL-113 (D'to E) line stacking slush muck bag's	und-1 (A'to B) EL-113	01	15	16			
	shuttling from EL-113 to EL-124.5 of bag area							
	2) und-3 MEV EL-88 (D'to B) line slush muck bag's sluffing	EL-3 EL-88 (A'to B) MEV	01	17	18			
	3) und-3 MEV (A'to B) EL-93 area slush clearing work	und-3 (A'to B) EL-93	01	33	34			
	4) und-4 A'to B area EL-76 (A'to D) line slush muck removing & sluffing	und-4 A'to B EL-76 (A'to D)	02	61	63			
(Night)	1) und-4 A'to B area (A'to D) slush muck removing work	und-4 (A'to D) EL-76	01	31	32			
	2) stacking slush muck bag sluffing from EL-113 to EL-124.5 (S/bag) area.	und-1 (A'to B) EL-113	01	18	19			

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Date	Work / Man power	Location	Manpower engaged			Times	Stacking Engaged	Sig. PIEL	Sig. NHPC	Remarks
			Skilled	U/S	Total					
26/11/22 (Day)	1) unit-3 (D'to E) MEV EL-88 area cleaning work	unit-3 (S+E) MEV EL-88	01	21	22					
	2) unit-3 (A to B) EL-93 area slush muck cleaning work; also shifting to EL-107 E' line.	unit-3 (A to B) EL-93	01	43	44					
	3) unit-4 Sp. tube area slush muck removing & shifting work (B to D) EL-76	unit-4 (B to D) EL-76	01	60	61					
	4) unit-8 MEV (D'to E) stacking slush muck bags; shifting from EL-113 to EL-12A-5 (S/bay)	unit-8 MEV (A to E) EL-113	01	15	16					
(Night)	1) unit-4 Sp. tube EL-76 (B to D) cone slush removal & cleaning work	unit-4 (B to D) EL-76	01	24	25					
	2) E' line of bay area stacking slush bag locally in Ajax placed & shifting outside (S/bay) work	E' line EL-12A-5	01	11	12					

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Date	Activity	Location	Manpower		
			Start	U/S	To
29/11/22	1) unit-3 EL-88 (D'to E) mix area slush muck removing & filling in empty Cement bag & shifting work	unit-3 (A to E) EL-88	01	15	16
	2) unit-3 (A to B) EL-93 area slush muck removing filling in empty Cement bag's	unit-3 (A to B) EL-93	02	51	52
	3) unit-4 (B to D) EL-76.00 Affube area slush muck removing work's	unit-4 (A to B) (B to D) EL-76.00	02	57	58
	4) unit-6 (B to D) EL-76.00 slush removing work's	unit-6 EL-76 (A to D)	01	09	10
(Regist)	1) unit-4 Affube (B to D) EL-76.8 area slush muck removing work's	unit-4 Affube. (B to D) EL-76.8	01	30	31

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Date	Activity	Location	Manpower Engaged			Times	Machinery Engaged	Sig PEL	Sig NHPC	Remarks
			skilled	unskilled	total					
30/11/22	1) unit-3 MV- EL-88 (D'top) slush muck removing & skuffing cracks	unit-3 MV EL-88 (D'top)	01	18	19					
	2) unit-3 (A'top) EL-93 slush muck removing & filling in empty cement- bags & skuffing cracks	unit-3 (A'top) EL-93	02	48	50					
	3) unit-4 (B'top) EL-76 of tube slush muck removing & packing in empty cement bags & skuffing	unit-4 (B'top) EL-76	02	57	59					
(revised)	1) unit-4 (B'top) of tube EL-76 area slush removing cracks	unit-4 (B'top) EL-76	01	28	29					

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Date	Activity	Location	Hours	U/S	Total	Times	Machining Engaged	Sig PEL	Sig NHPC	Remarks
11/12/22	① unit-3 (A10B) EL-93 area slush meek cleaning	unit-3 (A10B) EL-93	02	50	52					
	② unit-3 (A10E) EL-88 slush bag shifting work	unit-3 (A10E) (REV) EL-88	01	34	32					
	③ unit-4 A/Tube area (A10D) EL-76 slush meek removal & shifting work	unit-4 (A10D) A/Tube EL-76	02	56	58					
	④ unit-4 A/Tube									

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Date	W/Activity	Location	Manpower Engaged			Machinery Engaged	Sig	Sig	Remarks
			Skilled	US	Total				
2/12/22	1) unit-3 EL-93 (AtoB) slush muck removing & filling in empty cement bags & shifting work	unit-3 EL-93 (AtoB)	02	46	48		DEL	NHDC	
	2) unit-4 Shaft Tube (BtoD) area EL-76-8 slush muck removing & pouring in empty cement bags & shifting work	unit-4 (BtoD) EL 76-8 (Shaft Tube)	02	56	58				
	3) unit-7 Shaft Tube (BtoD) area EL-76.00 slush muck removing & shifting work	unit-7 (BtoD) Shaft Tube EL-76.00	01	20	21				
(negl)	1) unit-4 Shaft Tube (BtoD) area EL-76-8 slush muck removing work	unit-4 (BtoD) EL-76-8	01	26	27				



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Date	W/Activity	Location	Manpower Engaged			Times	Machinery Engaged	Sig		Remarks
			skn	WS	Total			DEL	NHPC	
3/12/22	1) unit-3 (AtoB) EL-93 area slush muck removing & filling in empty cement bag & stuffing work	unit-3 (AtoB) EL-93	2	52	54					
	2) unit 3 (AtoB) slush removing & stuffing work	unit-3 (AtoB) EL-88 (MLV)	01	11	12					
	3) unit-4 (BtoD) @Tube EL-76-8 area slush muck removing & packing in cement bag & stuffing	unit-4 (BtoD) EL-76-8 (@Tube)	02	54	56					
	4) unit-6 (BtoD) @Tube EL-76-00 slush muck removing work	unit-6 (BtoD) EL-76-00	01	09	10					
	5) unit-7 (BtoD) @Tube EL-77-00 slush muck removing work	unit-7 (BtoD) EL-77-00 (@Tube)	01	24	25					

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Date	w/ Activity	Location	Manspans Engaged			Times	Machicing Engaged	Sig		Remarks
			shell	UPS	Total			DEL	NAFPC	
4/12/22	1) und-3 (AtoB) EL-93 area slush meek removing & shifting bank	und-3 (AtoB) EL-93	01	43	44					
	2) und-4 (BtoD) @ Take EL-76-8 slush meek removing & clearing bank	und-4 (BtoD) EL-76-8	02	57	59					
	3) und-7 (BtoD) @ Take EL-76-8 area slush clearing	und-7 (BtoD) EL-76-8	01	15	16					
	4) und-3 (AtoE) @ Take EL-88 slush clearing	und-3 (AtoE) EL-88	01	09	10					

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Date	w/Activity	Location	Manpower Engaged			Times	Machinery Engaged	Sig		Remarks
			Start	Units	Time			PEL	NHPC	
5/11/22	1) und-3 (AtoB) EL-93 slush neck bag stuffing to und-4 (AtoB) EL-93 area	und-3 (AtoB) EL-93	02	56	58					
	2) und-4 (AtoD) AtoB EL-76-8 slush neck removing & filling in empty cement bag & stuff	und-4 AtoB (AtoD) AtoB EL-76-8	02	51	53					
	3) und-7 (BtoD) AtoB EL-76-8 slush neck remaining & stuffing & packing in empty cement bags.	und-7 (AtoD) EL-76-8	01	23	24					
	4) und-3 (AtoE) slush neck remaining EL-88	und-3 (AtoE) EL-88	01	18	19					

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Date	Workings Activity	Location	Manpower Engage			Time	Machinery Engaged	Sig. of P&L	Sig. of NHPC	Remarks
			skilled	US	Total					
6/12/22	1) unit-3 (AtoB) EL-93 slush meek removing & filling & shifting to unit-6-EL-93 area	unit-3 (AtoB) EL-93	01	22	23	12 ⁰⁰				Mamish Mamish Kante
	2) unit-4 (BtoD) Shell Tube EL-76.5 slush removing & packing in empty cement bag & shifting work	unit-4 (BtoD) EL-76.5	01	51	52					
	3) unit-6 (BtoD) Shell Tube EL-76.00 area cleaning	unit-6 (BtoD) EL-76.00	01	14	15					
	4) unit-7 (BtoD) Shell Tube EL-76.6 area slush removing & filling in empty cement bag & shifting work	unit-7 (BtoD) EL-76.6	01	17	18					
	<u>(neglect)</u>									
	1) unit-4 Shell Tube (BtoD) EL-76.00 area slush meek removing work	unit-4 (BtoD) EL-76.00	01	11	12					

3/5/2022
Aashutosh N. Galikhande

3046

Date	Activity	Location	Machinery Engaged			Time	Machinery Engaged	Sig. of PEL	Sig. of NHPC	Remarks
			skid	US	Total					
7/12/22	1) unit-4 (BtoD) soft take area slush muck removing & filling in empty cement bags & shifting	unit-4 (BtoD) soft take EL-76-5	01	51	52	12-00				Wannish handmade
	2) unit-7 (BtoD) soft take area slush muck removing & packing in empty cement bags & shifting work	unit-7 (BtoD) soft take EL-76-5	01	48	49					
	3) unit-6 (BtoD) soft take slush shifting work	unit-6 (BtoD) soft take EL-76-00	01	15	16					
	4) unit-3 (AtoB) EL-93 area slush filling in empty cement bags & shifting work.	unit-3 (AtoB) EL-93	01	22	23					
	(regtd)									
3047	5) unit-4 soft take EL-76-00 area slush removing & filling in empty cement bags & shifting work	unit-4 soft take (BtoD) EL-76-00	01	23	24					

Date 8/12/22	CO/Activity	Location	Machinery Engaged			Times	Machinery Engaged	Sig. of PEL	Sig. of NHPC	Remarks
			skid	u/s	Totals					
	1) unit-4 Small Tube (BtoD) EL-76.00 slush muck removing & filling in empty cement- bags & stuffing danks.	unit-4 (BtoD) EL-76	01	47	AB					
	2) unit-7 Small Tube (BtoD) EL-76.00 slush muck removing & filling in empty cement- bag & loading in T/crane bucket & stuffing	unit-7 (BtoD) EL-76.00	01	31	32					
	3) unit-6 Small Tube (BtoD) EL-76.00 slush remaining dank	unit-6 (BtoD) EL-76.00	01	14	15					
	4) unit-3 (AtoB) EL-93 slush muck filling in empty cement bag & stuffing to unit-6 (AtoB) EL-93	unit-3 (AtoB) EL-93	01	31	32					
	(night)									
	1) unit-4 A/Tube (BtoD) EL-76.5 area slush muck removing & filling in empty cement- bag & stuffing danks.	unit-4 (BtoD) EL-76.5	01	23	24					

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1) T/crane = 1.00 (Hrs)

Date	Activity	Location	Measurment Engaged			Times	Machinery Engaged	Sig. of PEL	Sig. of NHPC	Remarks
			skill	u/s	Total					
9/12/22	1) unit-4 Aftake (Btod) EL-76-6-0 area slush meek removing & filling in empty Cement bag's & shifting	unit-4 (Btod) EL-76-6-0	01	47	48					
	2) unit-7 Aftake (Btod) EL-76-00 area slush meek removing & filling in empty Cement bag's & shifting work's	unit-7 (Btod) EL-76-00	01	21	22					
	3) slush meek bag shifting from unit-3 to unit-C (Aftab) EL-93	unit-3 (Aftab) EL-93	01	23	24					
	(next)									
	1) unit-4 Aftake (Btod) EL-76-00 area slush meek removing & filling in empty Cement bag's & shifting work's	unit-4 (Btod) EL-76-00	01	20	21					

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3049

Date	Activity	Location	Manpower Engaged			Time	Machinery Engaged	Sig-of PBL	Sig-of MHPC	Remarks
			Skilled	Unskilled	Total					
10/12/22	1) unit-4 shaft tube (BtoD) EL-76-00 area slush muck removing & shifting @ work	unit-4 (BtoD) shaft tube EL-76-06	01	42	43					
	2) unit-7 shaft tube (BtoD) EL-76-00 area slush muck removing & loading in T/crane bucket & shifting @ work	unit-7 (BtoD) EL-76	01	38	39		1) T/crane = 1.30(Hr)			
	3) unit-3 EL-93 (AtoB) slush muck bagging shifting to unit-6 (AtoB) EL-93	unit-3 EL-93 (AtoB)	01	21	22					
	(neglect)									
3050	1) unit-4 shaft tube (BtoD) EL-76-00 area slush muck removing @ work	unit-4 (BtoD) EL-76-00	01	23	24					

~~unit-4~~

(neglect)

3050

Date	Activity	Location	Manpower Category			Time	Machinery Engaged	Sig. of PEL	Sig. of NHPC	Remarks
			skilled	U/S	Total					
12/12/22	1) unit-4 strike area EL-76-00 (Btod) line area slush muck filling in empty cement bag & shuffling ceceek.	unit-4 strike EL-76-00 (Btod)	01	42	43					
	2) unit-7 strike EL-76-00 (Btod) line area slush muck removing & filling in empty cement bag & loading in T/crane bucket & shuffling	unit-7 EL-76 (Btod) strike	01	37	38		T/crane = 110 (HPMS)			
	3) unit-3 slush removing & filling in empty cement bag & shuffling from unit-3 (Atob) EL-93 to unit-6 (Atob) EL-93	unit-3 EL-93 (Atob)	01	19	20					
	(neglig)									
	1) unit-4 strike (Btod) EL-76 slush removing bank	unit-4 strike (Btod) EL-76	01	17	18					

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3051

Date	Activity	Location	Manpower Engaged			Times	Machinery Engaged	Sig. of PEL	Sig. of NHPC	Remarks
			skill	ups	Total					
13/12/22	1) unit-7 (BtoB) EL-76-a slush removing & filling in empty cement bag & stuffing & loading in T/crane bucket & stuffing	unit-7 (BtoB) EL-76-a	of	28	29		D) T/crane = 0.50 (PHW)			
	2) unit-4 (BtoB) EL-76-a slush muck removing & filling in empty cement bag & stuffing & danti	unit-4 (BtoB) EL-76-a	of	43	44					
	3) G/grove slush muck removing & clearing EL-81-7 unit-4 V-1	unit-4 EL-81-7 (V-1)	of	4	12					
	4) unit-3 (AtoB) EL-93 slush muck removing	unit-3 (AtoB) EL-93	of	15	16					
	(Neglect)									
	1) unit-4 (BtoB) EL-76 slush muck removing danti	unit-4 (BtoB) EL-76	of	17	18					

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3052

Date	Activity	Location	Manpower Engaged			Time	Machinery Engaged	Sig. of PEL	Sig. of NHDC	Remarks
			skil	u/s	Total					
14/12/22	1) unit-4 (BtoD) kae Small Take area slush meek removing & shuffeing	unit-4 (BtoD) EL-76-00	01	14	15					
	2) unit-6 (BtoD) EL-76-00 slush meek removing work	unit-6 (BtoD) EL-76-00 offtake	01	09	10					
	3) unit-7 (BtoD) EL-76-00 (offtake) area slush meek removing & filling in empty cement- bags & shuffeing work	unit-7 (BtoD) EL-76-00	01	33	34		T/crane = 1.20 (Fem)			
	4) G/grove unit-4 EL-81-7 slush meek removing work (v-i)	unit-4 (G/grove) EL-81-7	01	11	12					
	5) slush bag shuffeing from unit-3 to unit-6 (AtoB) EL-93	unit-6 (AtoB) EL-93	01	19	20					

(Signature)
Aashutosh G.

Date	Activity	Location	Manpower Engaged			Time	Machinery Engaged	Sig. of PEL	Sig. of NHPC	Remarks
			skilled	unskilled	Total					
15/12/22	1) unit-4 strike (Btod) EL-76-0 area slush muck removing & filling in empty cement bag & shifting work	unit-4 (Btod) EL-76-0	01	41	42					
	2) unit-6 strike (Btod) EL-76-0 slush muck removing work	unit-6 (Btod) EL-76	01	05	06					
	3) unit-7 (strike) (Btod) EL-76-0 slush muck removing & filling in empty cement bag & load in T/crane bucket & shifting	unit-7 (Btod) EL-76	01	17	18		T/crane = 1-05 (Hrs)			
	4) G/grove unit-4 (V-1) EL-81-7 slush muck removing work	unit-4 (V-1) EL-81-7	01	11	12					

(Signature)
Aashutosh G.

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Aashutosh G.

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Aashutosh G.

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Aashutosh G.

Date	Working Activity	Location	Machinery Engaged			Time	Machinery Engaged	Sig. of PEL	Sig. of HPC	Remarks
			skt	ups	Total					
17-12-22	working at unit 4 of tube in between BfoD line slush removing work filling at empty bags & manually shifting work	Unit-6 of tube El-76m in between (BfoD done)	01	41	42	11-hrs				
	working at unit 6 Draft-Tube in between BfoD line slush Muck Removing & Debrise Removing work	unit-6 of tube El-76m in between (BfoD done)	01	09	10	11-hrs				
	working at unit-7 of tube slush clearing & floor sweep Loading unloading & manually shifting work	Unit 7 of tube El-76m in between BfoD line	01	23	24	11-hrs				

Manish

Date	Working Activity	Location	Manpower Engaged			Time	Machinery Engaged	Sig. of PEL	Sig. of NFPC	Remarks
			Skill	US	Tote					
18-12-22	Working at unit-4 Draft-Tube in between (BFO) line Slush Removal. Viny work is in progress. Cement Empty bags fill up & slush manually shifting work	Unit-6 Draft-Tube EL: 76.00 in between (BFO) done.	01	44	45	11-hrs				2.10 AM to 2.10 PM. 2.10 PM to 2.10 AM.
27	Working at unit-7 Draft-Tube in between BFO line slush removing work is in progress. Slush bags shifting manually & lifting by crane	Unit-7 Draft-Tube EL: 76.10 in between BFO line.	01	29	30	11-hrs				
27	Two Excavator engaged for unit 6 Draft tube slush lifting & fill loading work 27 trips.	Unit-6 Draft Tube EL: 76.10 (BFO)	-	03	03	11-hrs	LSTPC-300 - 01 Komatsu 220 - 01 No Dumper - 02 Nos			
19-12-22	Working at unit-4 Draft tube in between (BFO) line slush empty bags fill up & shifting along A-line site.	Unit-4 Draft Tube EL: 76.10 in between (BFO line)	01	40	41	11-hrs				2.10 PM to 2.10 AM.
27	Working at unit-7 Draft tube in between BFO line slush bags fill up & shifting by crane.	Unit-7 Draft Tube EL: 76.10 in between (BFO)	01	16	17	11-hrs				
	Two Excavator engaged for Draft tube slush lifting work		-	02	02	11-hrs	Komatsu - 01 Ligon - 01 Dumper - 01 Nos			

Gambir

Gambir

3057

Date	Working Activity	Location	Manpower Engaged			Time (w/Hrs)	Equipment Deployed	Signature		Remarks
			Skilled	Unskilled	Total			PEK	NHPC	
20-12-22	working at unit-6 D/tube slush fill up / shifting & removing work manually.	Unit 6 D/tube @-76m in bet (B/D) done	01	71	72	11-hrs				
21	working at unit-7 D/tube slush removing work manually & shifting by (T/Cran).	Unit-7 D/tube @-76m in bet (B/D) done	01	19	20	11-hrs				
21-12-22	Unit-6 D/tube slush begin fill up & shifting work in between B/D done @-76m	Unit-6 D/tube @-76m in between (B/D) done	01	72	73	11-hrs				
	working at unit-7 D/tube slush fill up & shifting by tower crane in between B/D done.	Unit-7 D/tube @-76m in between (B/D) done	01	17	18	11-hrs				
	Excavator engaged for unit-6 D/tube. Slush shifting & hoaching work near Bent-2.	Unit-6 D/tube	-	03	03	11-hrs	PC-300-01 Kobelcr220-01 Dumper-02 New			

(Signature)
Aashutosh G.

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Aashutosh G.

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Aashutosh G.

(Signature)
Aashutosh G.

3058

Date	Working Activities	Location	manpower Deployed			Time	Equipment	Signature		Remarks
			skill	upskill	total			PEL	whpc	
22/12/22	Unit-6 D/Tube Slush bag'n Group Manually shifting work	Unit-6 D/Tube el-76 in between (B/D)	01	64	65	11-hrs		<i>[Signature]</i>		
22/12/22	Unit-7 D/Tube Slush bag'n Group Manually & Removing shifting SW Along A-Line.	Unit-7 D/Tube el-76 in between (B/D)	01	19	20	11-hrs		<i>[Signature]</i> Aashutosh G.		
22/12/22	Excavator Engaged re Unit-6 D/Tube Slush shifting & debris loading work Near Bent-3 Unit-6 Area slush shifting work	Unit 6 D/Tube el-76.10 (B/D)	-	03	03	11-hrs	Kobelcon 220 - 01 Nm	<i>[Signature]</i>	(2:00 Pm) to (5:00 Pm)	
23/12/22	Unit-3 (MDV) EL-88 (Altos) slush muck bag shifting work manually	Unit-3 EL-88 (Altos) (MDV)	01	41	42			<i>[Signature]</i> Aashutosh G.		
23/12/22	Unit-4 D/Tube EL-76 (B/D) area slush muck removing & shifting work	Unit-4 (B to B) EL-76 EL-76 (B/D)	01	62	63					
23/12/22	Unit-7 D/Tube EL-76 (B/D) area slush muck removing & shifting work	Unit-7 D/Tube EL-76 (B/D)	01	21	22		T/Cran @ 1.20 (Hr) (Bucket shift)			
23/12/22	slush muck removing at Unit-4 D/Tube EL-81.7 Bent-3	Unit-4 (Bent-3) EL-81.7	05	05			Excavator Kobelco-220 = 1.15 (Hr)			

3059

Date	w/Activity	Location	Max power Engaged			Times	Machinery Engaged	Sig PEL	Sig NHPC	Remarks
			Slack	W/S	Total					
24/12/22	1) Max power Engaged for unit-3 MVR area slush creek filling in empty Cement-bag & filling bag-shifting to unit-5 MVR area	unit-3 DL-88 (A/TOD) MVR	01	51	52	11-00				
	2) unit-4 R/Pipe (DL-76) slush creek removing & shifting work	unit-4 R/Pipe DL-76 (B/TOD)	01	50	51	11-00				
	3) unit-7 R/Pipe (DL-76) slush creek removing & shifting & filling in empty Cement-bag	DL-76 unit-7 (A/TOD) (B/TOD)	01	18	19	11-00				
	4) unit-4 G/Grove DL-81-7 Bcol-2 area slush removal & shifting work	unit-4 DL-81-7 Bcol-2 (G/Grove)	01	24	25	11-00				
	5) unit-2 MVR area clearing work	unit-2 MVR (A/TOD) DL-88	01	15	16	11-00				

30/12/22
Ashutosh G.

Bun (S.M.C.)

3060

Date	w/Activity	Location	M/Person Engaged			Times	Mechanical Engaged	Stg		Remarks
			Shift	W/S	Total			PEL	HHPC	
25/12/22	1) unit-3 MIV (D'toe) EL-88 area slush meek removing work!	unit-3 MIV (D'toe) EL-88	01	20	21	11-40	}			
	2) unit-4 R/Tube slush meek removing & shifting work	unit-4 (R/T) EL-76-00 (BtoD) Line	02	54	56	11-40				
	3) unit-6 slush removing work!	unit-6 (R/Tube) EL-76-00 (BtoD) Line	01	07	08	11-40				
	4) unit-7 (D/Tube) EL-76 slush meek removing & shifting work	unit-7 (R/Tube) EL-76 (BtoD)	01	14	15	11-40				
	5) unit-4 G/Grove Bend-2 EL-81-7 slush removing work	unit-4 G/Grove Bend-2 EL-81-7	01	16	17	11-40				

Prithvi
Kashish G.

Date: 27/12/22 Activity: Slush Location: Unit-3 (M/V) EL-88 (D/T) Manpower: 01 Skill-UPS: 20 Total: 21 Time: 11-00 Machinery: Engines Sig: PEL Sig: HHDC Remark:

27/12/22	1) unit-3 (M/V) EL-88 (D/T) slush removing work	unit-3 (M/V) EL-88 (D/T)	01	20	21	11-00			
	2) unit-4 Small Tube (BTD) EL-76 area slush muck removing the filling's empty, cement bags & shuffling work	unit-4 (D/T) (BTD) EL-76	2	59	61				
	3) unit-7 D/Tube (BTD) area slush muck removing work	unit-7 (D/T) (BTD) EL-76	01	06	07				
	4) unit-4 G/Grove Bent-3 area cleaning work	unit-4 (G/Grove) Bent-3 EL-81	01	19	20				

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28/12/22

①	unit-4 Small-Tube (BTD) EL-76 area slush muck removing & shuffling	unit-4 (D/T) EL-76 (BTD)	01	57	58				
②	unit-3 M/V (EL-88) slush cleaning work	unit-3 (EL-88) M/V (D/T)	01	31	32				
3)	unit-7 D/Tube (BTD) EL-76 slush cleaning	unit-7 (D/T) (BTD) EL-76	01	15	16				
4)	G/Grove unit-4 Bent-2 slush cleaning work	unit-4 G/Grove (EL-81)	01	18	19				

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3062

Date	Activity	Location	No. of workers		Time	Mechanical Engg	Sig	Sig	Remarks
			skilled	unskilled					
27/12/22	1) unit-3 (MIV) EL-88 (D/T) slush removing work	unit-3 (MIV) EL-88 (D/T)	01	20	21	11-10			Gambir
	2) unit-4 Small Tube (BTD) EL-76 area slush muck removing the filling is empty, cement bags & shuffling work	unit-4 (D/T) (BTD) EL-76	2	59	61				
	3) unit-7 D/Tube (BTD) area slush muck removing work	unit-7 (D/T) (BTD) EL-76	01	06	07				
	4) unit-4 G/Grove Bent-3 area cleaning work	unit-4 (G/Grove) Bent-3 EL-81-7	01	19	20				
28/12/22	1) unit-4 Small Tube (BTD) EL-76 area slush muck removing & shuffling	unit-4 (D/T) EL-76 (BTD)	01	57	58				
	2) unit-3 MIV (EL-88) slush cleaning work	unit-3 (EL-88) MIV (D/T)	01	31	32				
	3) unit-7 D/Tube (BTD) EL-76 slush cleaning	unit-7 (D/T) (BTD) EL-76	01	15	16				
	4) G/Grove unit-4 Bent-2 slush cleaning work	unit-4 G/Grove (EL-81-7)	01	18	19				

3063

Date	Working Activity	Location	Max powder Engaged			Time	Sig	Sig	
			Shift	ups	Total				
29/12/22	1) Max powder Engaged for unit-A of tube area slush muck removing & cleaning shifting wank's at	unit-A of tube (B to D) EL-76.00	01	51	52	12-00			
	2) unit-3 (MIV) EL-88 (D'to E) area slush muck cleaning & filling in empty Cement bag & shifting wank's	unit-3 (MIV) EL-88 (D'to E)	01	58	59	12-00	}	}	
	3) unit-7 of tube area slush removing wank	unit-7 (of tube) EL-76	01	19	20	12-00			
	4) G/grove unit- ^{Beat-2} & unit-4 (Beat-2) slush muck cleaning wank's	unit-1 Beat-2 EL-81-7 unit-4 (Beat-2) EL-81-7	01	28	29	12-00			
30/12/22	1) unit-4 of tube area slush muck removing & filling in empty Cement-bag & shifting	unit-4 (B to D) of tube EL-76.00	01	55	56	12-00	}	}	
	2) unit 7 of tube area slush muck removing & filling in empty Cement bag & shifting wank	unit-7 of T (B to D) EL-76.00	01	15	16	12-00			
	3) unit-3 MIV (D'to E) cleaning & shifting to unit-5 (MIV) area	unit-3 (D'to E) EL-88	01	38	39	12-00			
	4) G/grove unit-4 Beat-2	unit-4 (B-2) EL-81-7	01	24	25	12-00			

~~Wank's~~

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SMC

T/crane = 1-30 H.
(Bucket shift)

~~Shun~~

3064

Date	Work/Activity	Location	Manpower/Equipment			Time	Equipment	Seg PEL	Stg MNPC	Remarks
			Skilled	Unskilled	Total					
31/12/12	1) unit-3 MRV area slush-muck removing & shuffling w/ceak	unit-3 (MRV) (1) (to B) EL-88	01	54	55	12-00				
	2) unit-4 A/Tube area slush muck removing & filling empty cement bags & shuffling to out-side area	unit-4 A/Tube (B to D) EL-76-00	02	63	65	12-00				
	3) unit-7 (A/Tube) area slush muck removing & filling empty cement bag & shuffling w/ceak	unit-7 A/Tube (B to D) EL-76-00	01	24	25	12-00	T/crane (Bucket shuffling)	1.45 (Hw)		
	4) G/Grove unit-1 Bent-2 EL-81-7 area Logging water Removing & area cleaning w/ceak	unit-1 Bent-2 EL-81-7 (A')	01	18	19	12-00				San SMC

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21/1/23
 Locality: *St. John*
 Unit: *Unit 3 (MEV) - EL-88 (R' to E)*
 Time: *11-00*
 Equipment: *skid 1/2 Total*
 Srg: *PEL*
 Sig: *NNPC*
 Remarks:

21/1/23 unit-3 (MEV) - EL-88 (R' to E)
 line area slush meck removing
 & filling in empty cement bags
 & shifting deck
 unit-3 (MEV) (R' to E) EL-88
 01 21 22

11-00
 PEL
 NNPC

unit-4 shaft tube EL-76 (B to D)
 line slush meck removing &
 filling in empty cement bags
 & shifting deck
 unit-4 (B to D) (R' to E) EL-76 shaft tube
 01 53 54

11-00
~~Wants~~

unit-6 shaft tube area slush
 cleaning deck
 unit-6 shaft tube EL-76 (B to D)
 01 09 10

11-00

unit-4 g/grove Seal beam
 EL-81-7 (Bent-2) slush meck
 cleaning deck
 unit-4 g/grove EL-81-7 (Bent-2)
 01 10

11-00

Date	Activity	Location	Man power			Time	Equipment	Sig PEL	Sig MPC	Remarks
			Skilled	Unskilled	Total					
3/1/23	1) Unit 7 - Air Tube EL-76-00 (BtoD) line slush muck remaining & filling in empty cement bag & stuffing	Unit-7 EL-76-00 (BtoD) Air Tube	01	48	49	12:00				Wanish
	2) Unit-6 Air Tube (BtoD) EL-76-00 slush muck stuffing	Unit-7 EL-76-00 (BtoD)	01	09	10					
	3) Unit-4 Air Tube (BtoD) EL-76-00 area slush muck Removing & cleaning cracks	Unit-4 (BtoD) EL-76-00	01	50	51					
	4) Unit-3 MIV EL-88 (D'toe) line slush muck slipping leak.	Unit-3 (MIV) EL-88 (A'toe)	01	25	26					
	5) G/Grove Unit-4 EL-81-7 (S/beam) Beam-2 area slush Removing	G/Grove Unit-4 EL-81-7 (S/beam)	01	11	12					
	(Recycle)									
	1) Unit-7 Air Tube slush muck Removal & cleaning cracks EL-76 (BtoD) line	Unit-7 (Air Tube) EL-76 (BtoD)	01	20	21					

3067

Date	Activity	Location	Man power Engaged			Time	Machinery Engaged	Sig PEL	Sig NHPC	Remarks
			Sket	U/S	Total					
4/1/23	1) unit-3 MLV EL-88 (A/T/E) slush meek removing & cleaning & check	unit-3 EL-88 (A/T/E)	01	17	18	12:00				
	2) unit-4 A/T EL-76-0 slush meek removing & cleaning & check	unit-4 (A/T) (B/T/D) EL-76	01	49	50					
	3) unit-7 A/T/abe EL-76-0 slush meek removing & filling in empty cement bags & shuffing	unit-7 (B/T/D) EL-76	01	60	61		T/crane (bucket) = 1.50 (Hrs)			
	4) S/Grove EL-81-7 (scat beam) Beam-2 area slush cleaning & check.	S/Grove (S/Beam) EL-81-7 Beam-2	01	08	09					
	(recycle)									
	5) unit-7 A/T/abe slush meek removing & shuffing & check	unit-7 (B/T/D) EL-76 (A/T)	01	21	22					

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3068

Date	Activity	Location	Manpower Engaged			Time	Machinery Engaged	Sig PEL	Sig NHDC	Remarks
			Skilled	MS	Total					
5/1/23	1) unit-7 (BtoD) Airlock area EL-76 slush muck cleaning & shuffling work	unit-7 (BtoD) EL-76 (APT)	02	64	66	11-00	S/Crane (Buckel) = 1-AS (HA)			
	2) unit-4 (BtoD) Airlock area slush muck cleaning & shuffling in empty cement bag & shuffling work	unit-4 (BtoD) EL-76	01	90 48	31 49					
	3) unit-6 (BtoD) Airlock slush muck cleaning work	unit-6 (BtoD) Airlock EL-76	01	4	12					
	4) unit-3 (D'toE) MEV area slush cleaning work	unit-3 MEV (D'toE) EL-88	01	12	13					
	5) S/Grove unit-4 Bent-2 slush cleaning work	S/Grove Bent-2 EL-81.7 (S/beam)	01	10	11					
	(Neglig)									
	6) unit-7 APT EL-76 area slush muck cleaning work & shuffling	unit-7 (APT) EL-76 (B to D)	01	15	16					

~~Work~~

Date	Activity	Location	Manpower Engaged			Machinery Engaged	Sig. of PEL	Sig. of NHPC	Remarks
			Skilled	Unskilled	Total				
6/11/23	1) unit 8 shaft tube (Btod) DL-76 slush meek removing	unit 8 (Btod) EL-76 (R/Tube)	01	25	26	11-00			
	2) unit 7 shaft tube (Btod) DL-76-a slush meek removing & shifting	unit 8 (Btod) EL-76 (R/Tube)	02	65	67	T/case (Bucket slush) = 1.00 (hr)			
	3) unit 6 shaft tube (Btod) DL-76-a slush shifting work	unit 6 (Btod) EL-76 (R/Tube)	01	09	10				
	4) unit 4 shaft tube (Btod) DL-76-a slush meek removing & shifting work.	unit 4 (Btod) EL-76 (R/Tube)	01	24	25				
	5) unit 3 MCV drain cleaning work also area slush cleaning	unit 3 (MCV) D'ford DL-88	01	47	48				
	6) unit 1 G/gov. Best-2 slush meek removing.	unit 1-G/gov. Best-2 (DL-87)	01	13	14				Jan SMC
	(next)								
	7) unit 7 (R/T) EL-76 slush meek shifting	unit 7 (D/T) EL-76-a	01	18	19				

~~Jan~~

3070

Date	Working Activity	Location	Manpower Engaged			W/Times	Machinery Engaged	Sig. of PEL	Sig. of NHDC	Remarks
			BKOH	UPS	Total					
A 7/1/23	1) unit-8 @Tide (BTOD) EL-76 slush muck removing & clearing @ceak's	unit-8 @T (BTOD) EL-76	01	28	29	11-00				
	2) unit-7 @Tide (BTOD) EL-76 slush muck removing & clearing @ceak	unit-7 (ATT) (BTOD) EL-76	02	74	76		T/crane = 1-00 (H) Beedalski			
	3) unit-4 @Tide (BTOD) EL-76 slush clearing & stuffing @ceak	unit-4 (ATT) (BTOD) EL-76	01	20	21					
	4) unit-3 slush muck clearing & stuffing @ceak	unit-3 (MTV) (BTOD) EL-88	01	31	32					
	5)									
	(next)									
	1) unit-7 (ATT) slush muck clearing & stuffing @ceak	unit-7 (ATT) (BTOD) EL-76	01	24	25					

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Date	Working Activity	Location	Manpower Engaged			W/Times	Manpower Engaged	Sig. of AEL	Sig. of NHPC	Remarks
			Skoll	ULS	Total					
8/1/23	1) Unit-8 (BtoD) Line EL-76-0 slush meek removing & cleaning	Unit-8 (BtoD) EL-76 (AIT)	01	41	42	11-00				
	2) Unit-7 (BtoD) Line EL-76-0 slush meek removing & cleaning & shifting work.	Unit-7 (BtoD) EL-76 (AIT)	02	61	63		Bucket (T/can) = 1-20 (Hm)			
	3) Unit-4 A/Tube EL-76-0 slush meek removing & cleaning work	Unit-4 (AIT) EL-76	02	57	59					
	4) Unit-3 (MLV) EL-88 slush meek cleaning at drain & sump area	Unit-3 (MLV) EL-88	01	35	36					
	(Night) shift									
	1) Unit-7 A/Tube slush meek shifting work	Unit-7 (BtoD) EL-76 (AIT)	01	23	24					

Gambale

Date	w/Activity	Materials	Max period Engaged Skill hrs Total	No. Times	Max period Engaged	Sig. of DEL	Sig. of NHPC	Remarks
9/1/23	1) unit-8 A/Take (Btod) EL-76 area slush meek cleecing & shifting work.	unit-8 (A/T) (Btod) EL-76	01 31 32	11-00				
	2) unit-7 (A/T) (Btod) EL-76 area slush meek cleecing & shifting work	unit-7 (A/T) (Btod) EL-76	01 53 54	11-00	T/cano. (Buckel) = 1-50(Hu)			
	3) unit-4 (A/T) (Btod) EL-76 slush meek rumoring & shifting work	unit-4 (A/T) (Btod) EL-76	01 30 31					
	4) unit-3 (M/V) EL-88 (D'toe) slush meek cleecing & shifting work.	unit-3 (M/V)	01 33 34					
	5) G/grove unit-1 Bend-1 slush meek shifting & cleecing work. EL-81-7	G/grove unit-1 Bend-1 EL-81-7	01 15 16				Bun SMC	
	(Recyle)							
	6) unit-7 A/Take cleecing work	unit-7 (Btod) A/Take EL-76	01 20 21					

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3073

Q	Sub	W/Activity	Manpower	Manpower Engaged	W/Time	Manpower Engaged	Sig	Sig	Remarks
A				slot hrs total			REL	HPE.	
10/1/23	unit-7	W/Tube (BtoD) EL-76 area slush meek remaining & sluffing deck	unit-7 (BtoD) EL-76 (BtoD)	02 66 68	11-00	T/Chene = 1.00 (Hrs) (Buckat sluff)			
	unit-4	W/Tube (BtoD) EL-76 area slush meek remaining & sluffing	unit-4 (BtoD) EL-76 (BtoD)	01 41 42					
	unit-3	M/V (D'toE) line slush meek cleaning deck	unit-3 M/V (BtoD) EL-88	01 19 20					
	unit-2	M/V (D'toE) line. Galley sump slush cleaning deck	unit-2 (BtoD) EL-88	01 09 10					
	unit-1	M/V (D'toE) line. Galley sump slush cleaning deck	unit-1 (BtoD) EL-88	01 09 10					
	S/Grove	unit-1 (B-1) area slush meek cleaning deck	S/Grove unit-1 (B-1) EL-81-3	01 11 12					
		(reighl)							
	unit-7	(BtoD) line EL-76 W/Tube slush meek cleaning deck	unit-7 (BtoD) EL-76	01 22 23					

3074

Date	Activity	Location	Manpower Engaged			W/Time	Machinery Engaged	Sig	Sig	Remarks
			Skill	W/S	Total					
A. 10/11/23	1) Man power Engaged for unit-8 (BtoD) EL-76 small tube area slush muck removing & cleaning work	unit-8 (BtoD) EL-76 (BtoD)	01	10	11	11-00		PEL	NHPC.	
	2) unit-7 (BtoD) R/Tube EL-76-00 slush muck removing & filling in empty cement bag & shifting work	unit-7 (BtoD) EL-76-00 (R/T)	02	61	62	11-00	T/crane = 1.50 (Bucket slush)			
	3) unit-6 (BtoD) R/Tube EL-76-00 slush muck removing work	unit-6 (BtoD) EL-76-00	01	09	10	11-00				
	4) unit-4 (BtoD) R/Tube EL-76-00 slush muck filling empty cement bags & shifting work	unit-4 (BtoD) (BtoD) EL-76-00	01	31	32	11-00				
	5) unit-3 (D'toe) Wae EL-88 slush cleaning work	unit-3 (R'toe) EL-88	01	18	19	11-00				
	6) unit-2 G/Grove Bent-1 area slush cleaning work (EL-81-7) & lagging water remaining	unit-2 (G/Grove) Bent-1 EL-81-70	01	09	10	11-00				Sm (6)
	7) unit-2 MEV EL-88 (D'toe) Gully sump slush muck cleaning work	unit-2 MEV EL-88 (R'toe)	01	01	32					Sm (6)
	8) unit-1 MEV EL-88 (R'toe) Gully sump slush muck cleaning work	unit-1 MEV (R'toe) EL-88	01	01	12					Sm (6)

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3075

Date	Activity	Location	Manpower Engaged			Offtime	Machinery Engaged	Sig. of PEL	Sig. of NHPC	Remarks
			Skilled	Unskilled	Total					
12/1/23	Unit-8 (Btod) Line EL-76 Aftube area slush muck removing & loading in empty Cement-bag also shifting manually	Unit-8 EL-76 Aftube (Btod)	01	14	15	11-10				
	2) Unit-7 (Btod) Aftube EL-76-00 area slush muck removing & shifting with manually & Excavator.	Unit-7 (Btod) EL-76-00 (Aftube)	02	64	66		1) Excavator = 5.00 (Hm) 2) T/Crane = 1.35 (Hm) (Bucket shifting)			Manually
	3) Unit-6 (Btod) Aftube area slush clearing & shifting	Unit-6 (Btod) Aftube EL-76	01	16	17					
	4) Unit-3 (D'toe) M&V area EL-88 Galley valve sump clearing & shifting work	Unit-3 (D'toe) M&V (EL-88)	01	23	24					
	5) Unit-2 (D'toe) M&V area EL-88 Galley valve pit slush muck clearing work	Unit-2 (D'toe) M&V EL-88	01	28	29					By SM (C)
	6) Unit-1 (D'toe) M&V area EL-88 Galley valve pit slush muck removing	Unit-1 (D'toe) M&V EL-88	01	14	15					By SM (C)
	7) G/Grove Unit-2 Bent-1 seal beam area slush muck clearing work	Unit-2 Bent-1 G/Grove (S/Beam) EL-81-70	01	11	12					By SM (C)

3076

Date	Activity	Location	Manpower Engaged			Shift	Machinery Engaged	Sig. of PEL	Sig. of NHPC	Remarks
			Skilled	U/S	Total					
13/1/23	1) Unit-7 Refractor (Btod) EL-76 area slush muck removing & shifting work	Unit-7 (Btod) EL-76 (A/refractor)	02	70	72	11-00	1) Excavator 1 = 10.30 (Hrs) 2) T/crane (Bucket skills) = 1.20 (H)			
	2) Unit-6 Refractor (Btod) EL-76 area slush muck removing & filling in empty cement bag & shifting work.	Unit-6 (Btod) EL-76	01	20	21					
	3) Unit-4 Refractor (Btod) EL-76 area slush muck removing & filling in empty cement bag & shifting work	Unit-4 (Btod) EL-76	01	42	43					
	4) Unit-3 Refractor (D'toe) Galley valve pit area slush muck clearing & shifting	Unit-3 Refractor (D'toe) EL-88	01	25	26					
	5) Unit-2 Refractor (A'toe) EL-88 Galley valve pit area slush muck clearing & shifting	Unit-2 Refractor (A'toe) EL-88	01	15	16					By SMC
	6) Unit-1 Refractor (A'toe) EL-88 Galley valve pit area slush muck clearing & shifting	Unit-1 (Refractor) A'toe EL-88	01	11	12					By SMC

~~Amish~~

Date	Activity	Location	Manpower Engaged			W/Time	Machinery Engaged	Sig-of PEL	Sig-of NHPC	Remarks
			skilled	unskilled	Total					
16/1/23	1) unit-7 (BtoD) EL-76 R/trake area slush muck removing & clearing work	unit-7 (BtoD) EL-76 (R/trake)	02	52	54	11-0				1) T/crane = 1:30 (HPC's) 2) Excavator = 10:30 (HPC)
	2) unit-4 (BtoD) EL-76 R/trake area slush muck removing & clearing work	unit-4 (BtoD) EL-76 (R/tr)	01	24	25					
	3) unit-3 M/V EL-58 (D/toe) Galleys valve pit area slush muck clearing & shifting	unit-3 M/V (R/toe) EL-58	01	17	18					
	4) unit-2 M/V EL-58 (R/toe) Galleys valve pit area slush muck clearing & shifting	unit-2 M/V EL-58 (R/toe)	01	08	09					Sign sm (6)
	5) unit-1 M/V EL-58 (R/toe) Galleys valve pit area slush muck clearing	unit-1 M/V EL-58 (R/toe)	01	06	07					Sign sm (6)
	6) G/Grove unit-2 Bont-2 area slush clearing work EL-51-7	unit-2 (B-2) G/Grove EL-51-7	01	4	12					Sign sm (6)

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Date	Working Activity	Location	M/Person Engaged			W/Time	Machinery Engaged	Sig. of PEL	Sig. of NHPC	Remarks
			skill	a/s	Total					
17/1/23	1) unit-7 R/Tube (BTD) line EL-76 area slush muck Receiving & clearing deck also stuffing	und-7 (BTD) EL-76 (R/T)	02	67	69	11-00	1) Excavator (220) = 8.30 (Hr) 2) Excavator (130) = 10.50 (Hr) 3) T/crane = 2.00 (Hrs)			
	2) und-4 R/T (BTD) line EL-76 area slush muck filling in empty cement bag & stuffing deck	und-4 R/T (BTD) EL-76	01	30	31					
	3) und-3 M/V (D/T) Galleys valve pit area slush muck cleaning deck	und-3 (M/V) (D/T)	01	24	25					
	4) unit-2 M/V (R/T) Galleys valve pit area slush muck clearing & stuffing deck	und-2 (R/T) M/V-EL-88	01	17	18					Jun Smith
	5) und-1 M/V (R/T) Galleys valve pit area slush muck clearing & stuffing deck	und-1 (R/T) M/V EL-88	01	09	10					Jun
	6) G/grove und-4 (Bent-2) Seal beam area slush muck clearing deck	G/grove und-4 Bent-2 EL-81.7	01	14	15					
	7) G/grove und-1 (Bent-3) slush muck clearing & stuffing	G/grove und-1 Bent-3 EL-81.7	01	11	12					Jun S.M.D

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3079

Date	Working Activity	Location	M/Person Engaged			w/Time	Machinery Engaged	Sig. of PEL	Sig. of NHPC	Remarks
			skill	ops	Total					
18/1/23	1) unit-7 RTube (BtoD) EL-76 area slush meek removing & shifting	und-7 (RT) (BtoD) EL-76	2	69	71	11:00	1) Excavator (130) = 10.00 (Hrs) 2) Excavator (220) = 9.00 (Hrs) 3) T/crane = 2.30 (Hrs) (Bucket shifting)			
	2) und-4 RTube (BtoD) EL-76 area slush meek removing & shifting	und-4 (BtoD) EL-76-00	01	38	39					
	3) und-3 MIV (BtoE) EL-88 Gully valve pit area slush meek removing & shifting	und-3 (MIV) (BtoE) valve pit EL-88	01	25	26					
	4) und-2 MIV (BtoE) EL-88 Gully valve pit area slush meek removing & shifting	und-2 (MIV) (BtoE) valve pit EL-88	01	08	09					Sam (1)
	5) und-1 MIV (BtoE) EL-88 Gully valve pit area slush meek cleaning	und-1 (MIV) (BtoE) valve pit EL-88	01	11	12					Sam (1)
	6) G/grove und-4 Bent-2 (S/beam) EL-81-7 area slush cleaning	und-4 (B-2) EL-81-7 (G/grove)	01	10	11					

~~Sam~~

Date	W/Activity	Location	M/Person Engaged			W/Time	Mechanism Engaged	Sig. of PEL	Sig. of NHDC	Remarks
			Start	U/S	Total					
19/1/23	und-7 (RTOE) R/Tube area slush muck removing & clearing work	und-7 (RTOE) EL-76 (R/Tube)	02	70	72	11-40	1) T/Care = 1.30 (Hrs) 2) Excavator (130) = 11.00 (Hrs) 3) Excavator (220) = 9.50 (Hrs)			
	2) und-4 (BTOE) R/Tube area slush muck removing & clearing work	und-4 (BTOE) EL-76 (R/Tube)	01	41	42	11-00				
	3) und-3 (MAY) (D'TOE) EL-88 valve pit area slush muck clearing work	und-3 (MAY) (D'TOE) EL-88	01	07	08	11-00				
	4) und-2 (MAY) (R'TOE) EL-88 valve pit area slush muck clearing work	und-2 (MAY) (R'TOE) EL-88 (valve pit)	01	09	10	11-00				Sam
	5) und-1 (RTOE) MAY EL-88 valve pit area slush muck clearing work	und-1 (D'TOE) EL-88 (valve pit)	01	18	19	11-00				Sam
	6) und-4 G/Grove (Bent-2) seal beam EL-81.7 area slush muck clearing work	und-4 G/Grove Bent-2 EL-81.7	01	10	11	11-00				

~~Sam~~

Sam

Sam

Date	w/ Activity	Location	M/Person Engaged			W/H	Machinery Engaged	Sig. of PEL	Sig. of NHPC	Remarks
			Skilled	U/S	Top					
20/1/23	1) unit-7 (Bot) of Tube EL-76 area slush neck removing & stuffing work.	unit-7 (Bot) EL-76 (of Tube)	2	72	74	11:00	1) T/crane = 2.10 (hr) (Bucket skidding) 2) Excavator (130) = 10.30 (hr) 3) Excavator (220) = 10.00 (hr)			
	2) unit-6 (Bot) of Tube EL-76 area slush clearing & digging work removing.	unit-6 (Bot) EL-76 (of Tube)	01	03	04					
	3) unit-4 (Bot) of Tube EL-76 area slush clearing & stuffing	unit-4 (Bot) of Tube EL-76	01	44	45					
	4) unit-3 (MEV) area clearing work	unit-3 (MEV) EL-88 (of Tube)	01	15	16					
	5)									

~~Signature~~

Signature

Date	Activity	Location	M/P Engaged			W/H	Machinery Engaged	Sig. of PEL	Sig. of NHDC	Remarks
			Skil	U/S	T/H					
21/1/23	1) Man power engaged for slush clearing work in unit-7 (Alt) (BtoD) EL-76 area	und-7 (Alt) EL-76 (BtoD)	01	35	36	1100	T/crane (bucket shifting) = 2-30 Excavator (130) = 4-50			
	2) und-6 (BtoD) EL-76 & Take area lagging water removal & slush clearing work	und-6 (Alt) EL-76 (BtoD)	01	10	11					
	3) und-4 (BtoD) EL-76 & Take area slush muck clearing filling in empty cement bags & shifting	und-4 (BtoD) EL-76 (Alt)	01	22	23					
	4) G/Grove und-1 (Bent-1) Bottom sill area slush muck removing	und-1 (B-1) G/Grove ^{EL} EL-70	01	4	12					
	5) G/Grove (B-3) ^{und 2} Seal Beam area slush muck removing & lagging water receive	G/Grove und-2 (B-3)	01	09	10					
	(night)									
	① Man power engaged for und-7 (Alt) EL-76 (BtoD) area slush clearing work	und-7 (Alt) EL-76 (Alt)	01	4	12					

Rajesh

Rajesh

Rajesh

Rajesh
Smt

Rajesh
Smt

Rajesh

3083

Date	w/ Activity	Location	M/P Engaged		w/t	Machinery Engaged	Seq. of PEL	Seq. of NHPC	Remarks
			skn	up					
22/1/23	1) Max power Engaged for und-7 of tube (Btod) area slush muck removal & filling in empty cement bags of shifting work	und-7 (Btod) EL-76	01	41	42	11-00 T/crane = 3-20 (Ph) B/shifty 2) Excavator (130) = 5-35 (Ph)			Rajesh
	2) und-4 of tube EL-76 (Btod) line area slush muck removal & loading filling in empty cement bags & shifting work	und-4 (Btod) EL-76 (Btod)	01	20	21				Rajesh
	3) und-283 M/R (Btod) line Galleys sump area slush clearing & shifting work	und-2 (Btod) M/R (Gally)	01	16	17				Rajesh Sun sm(6)
	4)								
23/1/23	1) Max power Engaged for und-7 of tube (Btod) EL-76 area slush muck clearing work	und-7 (Btod) EL-76 (Btod)	01	38	39	T/crane (bucket/shifty) = 2-10			Rajesh
	2) und-4 (of tube) (Btod) EL-76 area slush muck removal & area clearing work	und-4 (Btod) of tube EL-76	01	24	25				Rajesh
	3) und-2 Gally M/R (EL-88) slush muck shifting	und-2 M/R Gally sump EL-88	01	22	23				Rajesh
	4) S/Grove und-2 (Btod-3) Bottom area slush muck removal work	S/Grove und-2 (B-3)	01	09	10				Rajesh Sun sm(6)



1 of 1



Company	115	Site	115
Sub Contract	115/003193	Supplier Id	S046153
Supplier Name	BGS-SGS-SOMA JV AS	Project Id	115R
Project Name	SUBANSIRI LOWER	Remarks	Construction of Diversion Tunnels, Cofferdams, Concrete Gravity Dam, Plunge Pool and Cut off Wall (LOT SSL-1) Assam Side
Package	SSL.1Works		



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Hindrance No	SSL.1Works150	Activity No.	
Activity Description		Activity Actual Start	
Planned Finish Date		Sub Project Id	3.2.02
Sub Project Desc	DIVERSTION TUNNELS	Entry Date	
Hind Nature	Flooding in DT outlet	Hind Start Date	2/22/23
Hind Remov Date	3/1/23	Overlap Period	
Net Hindrance	8 days	Reference	
Comment1	Due to flooding in DT. Plugging of DT affected.	Comment2	
Comment3		Initiated By	103903A
Review By	101971V	Accepted By	101141Y
State	Accepted		



NHPC Limited

(A Government of India Enterprise)
India's Premier Hydro Power Utility

ISO 9001, 14001, IS 18001 & PAS 99 Certified Company
Regd. Office: NHPC Office Complex, Sector-33, Faridabad - 121003 (Haryana)

सुबनसिरी लोअर जलविद्युत परियोजना
Subansiri Lower H.E. Project
कोलपतुकर/Kolaptukar
दोलुंमुख सर्किल/Dollungmukh Circle
लोअर सुबनसिरी जिला/Kamle District
अरुणाचल प्रदेश/Arunachal Pradesh

No. : NH/SLP/GM(Dam)/99(A)/2023/ | 3 |

Date: 21.07.2023

To,

M/S BGS-SGS-SOMA JV
Subansiri Lower HE Project,
Gerukamukh, Dhemaji, Assam.

Subject: Construction of Diversion Tunnels, Coffor Dams, Concrete Gravity Dam, Plunge Pool and Cut off Walls (Lot SSL.1) – Regarding 10th Time Extension

- Ref: 1. Letter no NH/SLP/CE(Dam)/99(A)/2008/68(A)/233 dated 24.07.2008.
2. Letter no NH/SLP/CE(Dam)/48/2012/2427 dated 14.09.2012.
3. Letter no NH/SLP/ED/15/2014/671 dated 18.02.2014.
4. Letter no NH/SLP/CE(DAM)/2015/410 dated 21.03.2015.
5. Letter no NH/SLP/M(Dam)/2015/250 dated 26.12.2015.
6. Letter no NH/SLP/CE(Dam)/99(A)/2017/242 dated 15.02.2017.
7 Letter no NH/SLP/CE(Dam)/99(A)/2018/344 dated 28.04.2018.
8. Letter no No:NH/SLP/GM(Dam)/99(A)/2019/212 dated 22.06.2019.
9. Letter no NH/SLP/GM(Dam)/99(A)/2020/427 dated 19.10.2020

Sir,

In terms of Clause No: 44.1 of COPA, the Contractor is hereby notified for grant of 10th Time Extension without levy of Liquidated Damages for a total of 290 days (i.e. up to 29.12.2023) considering hindrances up to 18.04.2023 as detailed here under:

Sl. No.	Delays /Hindrances	Net Days	Contract clause under which time extension has been granted
1.	Delays on account of damage to right bank and left bank approach road and breaching of downstream dyke	19	Clause No:44.1(a) and 44.1 (d) of COPA
2.	Delay due to lock down due to Covid 19, scarcity of Oxygen cylinder etc	9.5	Clause No:44.1(d) of COPA
3.	Delay due to Hindrance in concreting at Extended Spillway at Dam from 01.04.22 to 21.04.22	5.25	Clause No:44.1(d) of COPA
4.	Hindrance due to non-availability of approach road to dam area due to formation of cavity in DT Inlet	66	Clause No:44.1(a) of COPA
5.	Delays on account of additional works due to	32	Clause No:44.1(a) of COPA

Hindrance Register

MS



1 of 1



Company	115	Site	115
Sub Contract	115/003193	Supplier Id	S046153
Supplier Name	BGS-SGS-SOMA JV AS	Project Id	115R
Project Name	SUBANSIRI LOWER	Remarks	Construction of Diversion Tunnels, Coffor Dams, Concrete Gravity Dam, Plunge Pool and Cut off Wall (LOT SSL-1) Assam Side
Package	SSL.1Works		

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Hindrance No	SSL.1Works149	Activity No.	
Activity Description		Activity Actual Start	
Planned Finish Date		Sub Project Id	3.2.02
Sub Project Desc	DIVERSTION TUNNELS	Entry Date	
Hind Nature	Additional work and reconstruction of DT5 portal due to Slope failure at DT outlet portal on 23.05.2022	Hind Start Date	10/27/22
Hind Remov Date	4/18/23	Overlap Period	17
Net Hindrance	32 days	Reference	
Comment1	Due to slope failure on 23.05.2022 at DT outlet, protection measures as well as reconstruction of DT 5 portal was taken up. Due to this slope failure DT plugging work was affected and it DT plugging could not be completed in time as per schedule.	Comment2	
Comment3		Initiated By	103903A
Review By	101971V	Accepted By	101141Y
State	Accepted		



NHPC Limited

(A Government of India Enterprise)
India's Premier Hydro Power Utility

ISO 9001, 14001, IS 18001 & PAS 99 Certified Company
Regd. Office: NHPC Office Complex, Sector-33, Faridabad - 121003 (Haryana)

सुबनसिरी लोअर जलविद्युत परियोजना
Subansiri Lower H.E. Project
कोलपतुकर/Kolaptukar
दोलुंमुख सर्किल/Dollungmukh Circle
लोअर सुबनसिरी जिला/Kamle District
अरुणाचल प्रदेश/Arunachal Pradesh

No. : NH/SLP/GM(Dam)/99(A)/2023/ | 3 |

Date: 21.07.2023

To,

M/S BGS-SGS-SOMA JV
Subansiri Lower HE Project,
Gerukamukh, Dhemaji, Assam.

Subject: Construction of Diversion Tunnels, Coffor Dams, Concrete Gravity Dam, Plunge Pool and Cut off Walls (Lot SSL.1) – Regarding 10th Time Extension

- Ref: 1. Letter no NH/SLP/CE(Dam)/99(A)/2008/68(A)/233 dated 24.07.2008.
2. Letter no NH/SLP/CE(Dam)/48/2012/2427 dated 14.09.2012.
3. Letter no NH/SLP/ED/15/2014/671 dated 18.02.2014.
4. Letter no NH/SLP/CE(DAM)/2015/410 dated 21.03.2015.
5. Letter no NH/SLP/M(Dam)/2015/250 dated 26.12.2015.
6. Letter no NH/SLP/CE(Dam)/99(A)/2017/242 dated 15.02.2017.
7 Letter no NH/SLP/CE(Dam)/99(A)/2018/344 dated 28.04.2018.
8. Letter no No:NH/SLP/GM(Dam)/99(A)/2019/212 dated 22.06.2019.
9. Letter no NH/SLP/GM(Dam)/99(A)/2020/427 dated 19.10.2020

Sir,

In terms of Clause No: 44.1 of COPA, the Contractor is hereby notified for grant of 10th Time Extension without levy of Liquidated Damages for a total of 290 days (i.e. up to 29.12.2023) considering hindrances up to 18.04.2023 as detailed here under:

Sl. No.	Delays /Hindrances	Net Days	Contract clause under which time extension has been granted
1.	Delays on account of damage to right bank and left bank approach road and breaching of downstream dyke	19	Clause No:44.1(a) and 44.1 (d) of COPA
2.	Delay due to lock down due to Covid 19, scarcity of Oxygen cylinder etc	9.5	Clause No:44.1(d) of COPA
3.	Delay due to Hindrance in concreting at Extended Spillway at Dam from 01.04.22 to 21.04.22	5.25	Clause No:44.1(d) of COPA
4.	Hindrance due to non-availability of approach road to dam area due to formation of cavity in DT Inlet	66	Clause No:44.1(a) of COPA
5.	Delays on account of additional works due to	32	Clause No:44.1(a) of COPA



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सुबनसिरी लोअर जलविद्युत परियोजना
Subansiri Lower H.E. Project
कोलपतुकर/Kolaptukar
दोलुंमुख सर्किल/Dollungmukh Circle
लोअर सुबनसिरी जिला/Kamle District
अरुणाचल प्रदेश/Arunachal Pradesh

	slope failure at DT outlet and DT#5:		
6.	Delay in DT plugging due site conditions and change in methodology	24	Clause No:44.1(a) of COPA
7.	Additional works of Dyke preparation for DT#1 plugging due site conditions and change in methodology	30	Clause No:44.1(a) of COPA
8.	Concreting for DT#1 plugging due site conditions and change in methodology	60	Clause No:44.1(a) of COPA
9.	Additional time required for new item 'Curtain Grouting' in DTs not envisaged in contract	44	Clause No:44.1(a) of COPA
10.	Total	289.75 days	
	Say	290 days	

The cost compensation if any, arising out of this extension of time shall be dealt as per relevant contract provision.

Thanking you,

Yours faithfully,

(Vipin Gupta)
Executive Director &
Engineer-in-Charge

Copy to:

1. Executive Director (Contracts)- for information please.
2. Executive Director (PMSG)- for information please.
3. GGM (Civil) - for information.
4. GM (Finance) - for information.

Hindrance Register

MS



1 of 1



Company	115	Site	115
Sub Contract	115/003193	Supplier Id	S046153
Supplier Name	BGS-SGS-SOMA JV AS	Project Id	115R
Project Name	SUBANSIRI LOWER	Remarks	Construction of Diversion Tunnels, Coffor Dams, Concrete Gravity Dam, Plunge Pool and Cut off Wall (LOT SSL-1) Assam Side
Package	SSL.1Works		



146 of 157



Hindrance No	SSL.1Works151	Activity No.	
Activity Description		Activity Actual Start	
Planned Finish Date		Sub Project Id	3.2.02
Sub Project Desc	DIVERSTION TUNNELS	Entry Date	
Hind Nature	Flooding in DT outlet	Hind Start Date	3/28/23
Hind Remov Date	4/12/23	Overlap Period	
Net Hindrance	16 days	Reference	
Comment1	Due to flooding in DT. Plugging of DT affected.	Comment2	
Comment3		Initiated By	103903A
Review By	101971V	Accepted By	101141Y
State	Accepted		

Point No. 21

Minutes of the 7th meeting of Monitoring Committee to look after ongoing construction works of Subansiri Lower Project held on 22.05.23 through VC.

7th meeting of the Monitoring Committee constituted to look after the ongoing construction works of Subansiri Lower Project was held on 22.05.23 through Video Conference. Meeting was chaired by Joint Secretary (Hydro). Apart from Committee members, the meeting was also attended by Member (Hydro) CEA, Director (Technical), Director (Finance) and Director (Projects) of NHPC.

Executive Director (Subansiri Lower Project) appraised the current status of the project through Power Point Presentation. It was appraised by ED (SLP) that collapse of Diversion Tunnels (DT-2 to DT-4) during Sep, 22 and breach of PH Coffor wall resulting into flooding of Power House during the same was a major setback in commissioning of the project, as decided. These two major events have dislodged all ongoing construction activities and practically demobilized the deployed resources. However, the project team demonstrated its best efforts to come out of the situation. Component wise status w.r.t. defined targets was explained by ED, SLP, as under:

1. **DAM:**

- i. **Dam Concreting:** Target for completion of dam concreting up to dam top level (EL 210m) was set to be achieved before onset of the monsoon season. In this regard, it was informed that project has achieved top elevation of EL 210m in seven blocks. Works in remaining 02 blocks (S6 & S7) are near completion having current elevations of 197m & 198.5m respectively which would be completed by June, 23. It was also appraised by ED (SLP) that project has achieved a dam height of about 37m in nearly 5.5 months (Dec, 22 – 20th May, 23) with concrete pouring of more than 2.0 lakh cum despite works affected by intermittent rainfall since Feb, 23. Committee appreciated this work of project team as it allowed the dam structure to reach at the safe level in the current monsoon. Committee noticed that with this, dam concreting works are at the verge of completion now.
- ii. **Plugging of Diversion Tunnels:** Plugging of Diversion Tunnels (DT-2 to DT-4) was planned to be completed by March, 23 and DT-1 & DT-5 by May, 23. In this regard, it was appraised by ED (SLP) that as per the plan, 10 m of concrete plugging in DT-2 to DT-5 u/s of Dam axis has already been completed. Plugging works got hampered due to flooding of DT outlet pit due to increase in discharge in Subansiri river. Dewatering of DT outlet area is in progress. Accordingly, balance 20 m of concrete plug d/s of Dam axis would

be taken up after dewatering of pit and will be completed by June, 2023.

Right side Gate of Diversion Tunnel No. 1 has been lowered and efforts are being made to lower Left Side gate which has got stuck and couldn't be lowered. Efforts are being made to identify the problem area and boat/ pontoons are being deployed for the same. All efforts would be made to rectify the same as soon as water recedes to appropriate level or by some other suitable means.

Chief Engineer, CEA highlighted that the problem being faced in lowering of Gate No. 2 is quite challenging but needs to be fixed & rectified at the earliest or else it may pose danger to DT-1 due to high water flow/velocity in DT.

2. POWER HOUSE:

- i. **A-A1 Line of Unit No. 6, 7 & 8** It was brought to the notice of the Committee that safety of Power House from flooding was a big concern as well as a challenge for the project as Unit No. 6, 7 & 8 were targeted to be raised from below the level of EL 90.0m to a safe level of EL 116m before onset of the monsoon season. As A-A1 line is having dense reinforcement it initially required around 21 days for a concrete lift of 2.4m. With continuous efforts and resource optimization, Cycle time per lift was reduced to 14 days and then to 7 days.

Now, A-A1 line of all Units of Power House have been raised up to safe elevation of 116m thereby avoiding any risk of PH flooding.

- ii. **Tail Race Channel (TRC):** Completion of TRC of all Units (excavation as well as concreting) before onset of monsoon was another big challenge for the project. In order to carry out TRC works, the existing coffer wall was dismantled and construction of temporary dyke was started in Nov, 2022 which was completed in January, 2023. The stability of dyke was essential to smoothly carry out TRC works. Accordingly, stability of the TRC dyke was ensured using approx. 5.0 lakh cum of filling material and extra strength provided by using nearly 9000 Nos. of Tetrapods.

With all the above efforts, TRC of all Units has now been completed.

3. UNDERGROUND WORKS:

- i. **Head Race Tunnels (HRTs):** Most of the overt Lining of all 08 Nos. HRTs have been completed except only 19m at junction portion which is likely to be

completed within a period of 01 week. Similarly, only 175 m of invert lining is balance at junction portion, plug portion/ below orifice which is expected to be completed by 15th June, 23.

- ii. **Surge Tunnels (ST-1 & ST-2):** Most of the overt Lining of 02 Nos. STs have been completed except only 9m balance at Crown portion above SPL(ST-1). Similarly, only 6 m balance at junction portion (ST-1). Hence, 02 Nos. of Surge Tunnels planned to be completed for commissioning of 02 Units are now almost complete.

With the near completion of HRTs and 02 Nos. Surge Tunnels, Water Conductor System is now almost ready.

4. HYDROMECHANICAL WORKS:

- i. **Intake Gates:** All Intake Gates are operational.
- ii. **Spillway Radial Gates:** It was planned to make 06 Nos. of Spillway Radial Gates operational before onset of monsoon. In this regard, it was informed by ED (SLP) that 03Nos. Radial gates (S1, S2 & S-3) have been made operational. Erection works in 03 Nos. of Radial gates (S-5, S-8, & S-9) are in advanced stage. Works balance in these 03 Nos. gates were planned to be completed within 4-5 days. However, works affected during last week of April, 23 for 5-6 days due to increase in u/s water level forcing HM team to demobilize the resources from site on 23rd April, 23 and their shifting to the safe place. Resources were re-mobilized on 27th April, 23. However, water level started rising again from 1st May, 23 and started overflowing from 2nd May, 23 over spillway of dam thereby putting all ongoing HM works on halt. Since then, water is flowing over spillway with an average water column of 4-5m. No HM works can be taken up under such circumstances.

Member (Hydro) raised his concern that rise in water is quite normal during this period in the river Subansiri and project should have taken sufficient precautionary measures in advance. ED (SLP) informed that primary reason for rise in water level u/s of dam was availability of only 01 No. Diversion Tunnel (DT-1). During previous year, 04 Nos. of DTs were available to divert water away from the dam. However, due to collapse of DT-2 to DT-4 during Sep, 22, project was left with no other option but to plug DT-2 to DT-4 and only one DT was left to pass the discharge. Due to sudden increase in discharge on 23rd April, 23, all

machine and men had to be demobilised to ensure their safety which was done well in time. Member (Hydro) stressed the need for continuous efforts to be made in lowering of 2nd gate of Diversion Tunnel No. 1 so as to ensure safety of structures.

- iii. **Draft Tube Gates:** Erection of gates of Unit No. 1 to Unit No. 4 were planned to be completed before onset of monsoon season. Out of 04 Nos., 02 Nos. of DT Gates (Unit No. 4 & 3) have been made operational. Works are in progress in balance 02 Nos. (Unit No. 2 & 1) and shall be made operational by 31st May, 2023.
- iv. **Erection of Pressure Shaft (PS) Liners:** 11 Nos. ferrules in Lane-2 (for commissioning of Unit-2 first) are balance and their erection shall be completed by 15th June, 2023.

5. **E&M WORKS:**

General Manager (Electrical) informed that progress of E&M works is going well and is aligned as per targets fixed for commissioning of 02 Units with minor deviations. Status of some of critical components was brought to the notice of the Committee as follows:

- i. **MIV (Unit-2):** U/s body and plug of Unit – 2 MIV is to be shifted to next week and Unit-2 MIV erection will be completed by 5th July, 2023.
 - ii. **GIS:** GIS Erection works are going well and will be completed by 15th June, 2023.
 - iii. **Cabling Works:** Cabling works of approx. 70 Km length has been completed and balance 15 Km length (GIS Related) will be completed by 15th June, 2023.
6. **Wet Spinning (Unit-2):** Unit-2 will be ready for Wet Spinning by 7th July, 2023.
7. CE (HPM), CEA said that though targets kept for the anticipated working period of Nov'22 till April'23 have been achieved at all critical fronts, however, the radial gates of Dam could not be fully completed in the working season and so the main focus now should be to complete the balance works of the gates at the earliest, with close watch on activities of the HM contractor. Further, the dyke being prepared at Diversion tunnel outlet also needs to be

completed at the earliest so that balance plugging for 20 m length of DT-2-5 can be completed

9. Further, it was discussed to address the following issue also:

- In order to address the long term slope stability of the left bank of the Dam a thorough analysis needs to be done by NHPC in association with GSI and Specialized geological firms/ consultants.
- DT-1 Gate needs to be closed at the earliest for which NHPC may consult other HM agencies and developers who had faced similar issues.

8. Joint Secretary (H) stated that the committee constituted for the purpose is closely monitoring the progress of work and the work at all fronts was going as per schedule . However, due to reasons highlighted during the meeting, we are now lagging in achieving the target. He suggested to take all efforts so that the units are commissioned at the earliest without compromising with the safety.
9. CMD NHPC Stressed that presently all TRC works have been completed and levels of Powerhouse Units (A-A') have also been raised well above the safety level of EL 116.0m so project is safe from risk of flooding of Powerhouse. DT no 2 to 5 stand plugged but in the worst scenario, risk remains that water level does not recede below requisite level and project is not able to lower other gate of DT-1. But Project is making efforts to lower this gate also.
10. Works done by project during last 5-6 months and targets achieved were well appreciated by the Committee. The only challenge left with the project as of now is to lower 2nd gate of DT-1 in order to avoid any risk to the safety of DT-1 and make all out efforts to achieve wet spinning of the Unit#2 at the earliest. Planning for alternative arrangements for completion of balance HM works of Radial Gates from u/s may also be explored, if practically feasible.
11. Director (Projects) acknowledged the gravity of situation and stated that Project is well aware of the risks and shall try their best to handle the situation effectively and appropriately to lower Gates of DT-1.
12. Joint Secretary (H) directed that the meeting of Monitoring Committee should be kept at regular interval, without fail.
13. It was decided to hold the next meeting of Monitoring Committee in first Monday of June 23.

--- Meeting ended with the vote of thanks to the Chair----

Incident Report Dated: 02.05.2023

Sub: Overtopping of flood water over Dam of Subansiri Lower Project

Due to continuous rainfall over past few days in and around the catchment area of Subansiri Lower HE Project, the discharge in Subansiri river had started rising since 28th April 2023. The U/s water Level was EL 121.60 m observed on 28th April 2023 at 2:30 PM which gradually increased to U/s water level of EL 145.00 m (Crest Level of Spillway) on 2nd May 2023 (Today) resulting in overflow from the Dam bays at about 06:25 AM. Water Level is at EL 149.80 m at 04:00 PM and water is flowing over the Dam.

Due to availability of Real time information from Early Warning System (EWS) installed at Daporijo and Tamen in Upper Subansiri district of Arunachal Pradesh trend of increase in inflows in the Tamen and Daporijo were available with project for taking advance action for evacuation of men and material beforehand. As such all Heavy Equipment viz 3 nos crawler Crane (110 T, 200 T & 250 T), Concrete Pumps, DG Sets etc. were shifted from the Dam site to the safe place well in advance. There had been no injury to anybody and no loss/ damage to Equipment and Material at site.

Presently flood is passing from 1 No Diversion Tunnel (DT-1) as well as over Dam bays. All efforts are being made to lower the Gate of DT- 1. Project team is trying to reach DT-1 gate from Intake site through Boat for lowering the Gate of DT-1 and attempt will be made for same shortly.

About 5 days of work which was required for complete installation of balance Radial gates at S-5, S-8 & S-9 at Dam such as erection of Skin Plates, Arms etc. couldn't be completed due to overflow of water over dam. As soon as water recedes sufficiently, NHPC shall make attempt to complete the balance HM works from upstream after lifting DT Gate for passing river discharge, if situation permits.



Dam D/s view



Dam U/s view



Equipment shifted to Safe Place



TRC Dyke View from Dam Top



DT-1 Inlet View

**प्रेषक/From**

RAJESH RANJAN
GENERAL MANAGER (MECHANICAL)
SUBANSIRI LOWER PROJECT

प्रेषित/To

BABITENDRA KUMAR, GENERAL MANAGER (CIVIL), Technical Services, SLP

संख्या/No.: NHSLPHYDRO-MECH WORK\2023\177

दिनांक/Date: 21-September-2023

विषय/Subject: RCE of Subansiri Lower HE project- Time overrun regarding.

संदर्भ/Reference: Nil

PMSG विभाग के IOM संख्या. NH\CO\PMSG\2023\ 893 दिनांक 08-09-2023 के तहत मांगे गए जल यांत्रिकी विभाग के संशोधित टाइम ओवररन (अगस्त-2023 तक बाधाओं को शामिल करके) संलग्न शीट पर दिया गया है जिसे अग्रिम कार्यवाही हेतु कृपया तकनीकी विभाग को भेजा जाए |

MANASH BARUAH
SENIOR MANAGER (MECHANICAL)
SUBANSIRI LOWER PROJECT

Encl:

[120230000045278_638308929106150877_Hindrance_Register_final.pdf](#)

कृपया अग्रसारित किया जाता है -

SUVEER PANDEY, DEPUTY GENERAL MANAGER (MECHANICAL), dt: 9/21/2023 12:35:41 PM

कृपया अग्रसारित किया जाता है -

RAJESH RANJAN, GENERAL MANAGER (MECHANICAL), dt: 9/21/2023 1:22:31 PM

कृपया चर्चा करें -

BABITENDRA KUMAR, GENERAL MANAGER (CIVIL), dt: 9/21/2023 1:35:00 PM

कृपया अग्रसारित किया जाता है -

NAVIN KUMAR SINGH, DEPUTY GENERAL MANAGER (CIVIL), dt: 9/21/2023 3:27:04 PM

Copy To:

- 1 **VIPIN GUPTA, EXECUTIVE DIRECTOR, HOP Sectt., SLP,**
- 2 **RAJENDRA PRASAD, GROUP GENERAL MANAGER (CIVIL), HOP Sectt., SLP,**

Print

** This is a system generated document and does not require signature of the sender

Company 115
Sub Contract 115/003210
Supplier Name TEXMACO RAIL & ENGINEERING LTD
Project Name SUBANSIRI LOWER HYDRO ELECTRIC
Package Lot-SSL-3

Site 115
Supplier Id S047031
Project Id 115
Remarks

	Hindrance No	Activity No.	Activity Description	Activity Actual Start	Planned Finish Date	Sub Project Id	Sub Project Desc	Entry Date	Hind Nature	Hind Start Date	Hind Remov Date	Overlap Period	Net Hindrance	Reference	Comment1	Comment2	Comment3	Initiated By	Review By	Accepted By	State
1	Lot-SSL-32					3.3	HYDRO MECHANICAL WORKS		Complete	2/1/20	2/8/22	739 days	Nil	Spillway Radial Gate No. 02	Civil front not available			103598Y	102005V	101141Y	Accepted
2	Lot-SSL-310					3.3	HYDRO MECHANICAL WORKS		Complete	2/1/20	3/29/23	1155 days	Nil	Hydraulic cylinder & pipelines of Spillway Radial gate No. 01 to 09	Civil front not available			101943H	102005V	101141Y	Accepted
3	Lot-SSL-338					3.3	HYDRO MECHANICAL WORKS		Complete	4/16/22	4/16/22	01 day	NIL	Spillway Radial gate no. 02	Non-availability of manpower of TREL			101943H	102005V	101141Y	Accepted
4	Lot-SSL-366					3.3	HYDRO MECHANICAL WORKS		Complete	3/14/22	3/14/22	01 day	Nil	All PS Liner lanes	Due to labour strike by manpower of TREL			102691T	102005V	101141Y	Accepted
5	Lot-SSL-322					3.3	HYDRO MECHANICAL WORKS		Partial	2/1/20	2/17/23	1113 days	Nil	Intake Trash Rack No. 01	Civil front not available			102384W	102005V	101141Y	Accepted
6	Lot-SSL-369					3.3	HYDRO MECHANICAL WORKS		Complete	12/22/22	12/22/22	01 day	Nil	All PS Liner lanes	Due to labour strike by manpower of TREL			102691T	102005V	101141Y	Accepted
7	Lot-SSL-33					3.3	HYDRO MECHANICAL WORKS		Complete	2/1/20	5/4/22	824 days	Nil	Spillway Radial gate No. 03	Civil Front not available			101943H	102005V	101141Y	Accepted
8	Lot-SSL-35					3.3	HYDRO MECHANICAL WORKS		Complete	2/1/20	8/30/22	942 days	Nil	Spillway Radial Gate No. 05	Civil front not available			101943H	102005V	101141Y	Accepted
9	Lot-SSL-327					3.3	HYDRO MECHANICAL WORKS		Partial	2/1/20	2/25/23	1121days	Nil	Intake Trash Rack No. 07	Civil front not available			102384W	102005V	101141Y	Accepted
10	Lot-SSL-352					3.3	HYDRO MECHANICAL WORKS		Complete	5/31/22	9/12/22	105 days	Nil	PS Liner VPS no. 01	Civil front not available			102691T	102005V	101141Y	Accepted
11	Lot-SSL-353					3.3	HYDRO MECHANICAL WORKS		Complete	3/29/23	4/22/23	25 days	Nil	PS Liner VPS No. 02	Civil front not available			102691T	102005V	101141Y	Accepted
12	Lot-SSL-360					3.3	HYDRO MECHANICAL WORKS		Partial	2/1/20	5/18/23	1203 days	Nil	Intake Bulkhead Gantry Crane Unit#1 to 4	Civil Front not available			102384W	102005V	101141Y	Accepted
13	Lot-SSL-381					3.3	HYDRO MECHANICAL WORKS		Complete	10/15/19	1/31/20	109 days	Nil	Spillway Radial gates & Draft Tube Gates	Non-availability of Civil Fronts			103598Y	102005V	101141Y	Accepted
14	Lot-SSL-378					3.3	HYDRO MECHANICAL WORKS		Complete	8/26/22	9/1/22	07 days	Nil	Spillway Radial gate No. 02	Work stopped due to removal of shuttering by Civil Agency			101943H	102005V	101141Y	Accepted
15	Lot-SSL-325					3.3	HYDRO MECHANICAL WORKS		Complete	2/1/20	3/1/22	760 days	Nil	Intake Trash Rack No. 04	Civil front not available			102384W	102005V	101141Y	Accepted
16	Lot-SSL-331					3.3	HYDRO MECHANICAL WORKS		Complete	2/1/20	11/21/22	974 days	Nil	Draft Tube Gate No. 03	Civil front not available			102384W	102005V	101141Y	Accepted
17	Lot-SSL-336					3.3	HYDRO MECHANICAL WORKS		Complete	4/5/22	4/7/22	3 days	NIL	Spillway Radial Gate No.02	Non-availability of manpower and crane of M/s TREL			101943H	102005V	101141Y	Accepted
18	Lot-SSL-339					3.3	HYDRO MECHANICAL WORKS		Complete	4/24/22	4/24/22	01 day	Nil	Spillway Radial Gate No. 02	Work stopped due to Labour strike of Civil Agency			101943H	102005V	101141Y	Accepted
19	Lot-SSL-355					3.3	HYDRO MECHANICAL WORKS		Complete	3/4/23	4/16/23	44 days	Nil	PS Liner VPS No. 04	Civil front not available			102691T	102005V	101141Y	Accepted
20	Lot-SSL-356					3.3	HYDRO MECHANICAL WORKS		Complete	2/3/23	4/28/23	85 days	Nil	PS Liner VPS No. 05	Civil front not available			102691T	102005V	101141Y	Accepted
21	Lot-SSL-357					3.3	HYDRO MECHANICAL WORKS		Complete	2/3/23	3/7/23	33 days	Nil	PS Liner VPS No. 06	Civil front not available			102691T	102005V	101141Y	Accepted
22	Lot-SSL-376					3.3	HYDRO MECHANICAL WORKS		Complete	1/10/22	4/9/22	90 days	Nil	PS Liner VPS No. 08	Work stopped due to VPS excavation by Civil agency			102691T	102005V	101141Y	Accepted
23	Lot-SSL-377					3.3	HYDRO MECHANICAL WORKS		Complete	7/5/22	7/30/22	26 days	Nil	PS Liner VPS No. 08	Work stopped due to backfill concrete and undercut removal by Civil agency			102691T	102005V	101141Y	Accepted
24	Lot-SSL-38					3.3	HYDRO MECHANICAL WORKS		Complete	2/1/20	12/7/22	1041 days	Nil	Spillway Radial Gate No. 08	Civil front not available			101943H	102005V	101141Y	Accepted
25	Lot-SSL-340					3.3	HYDRO MECHANICAL WORKS		Complete	6/16/22	6/21/22	06 days	Nil	Spillway Radial gate No.02	Rise of water level and overflow of water from spillway			101943H	102005V	101141Y	Accepted
26	Lot-SSL-358					3.3	HYDRO MECHANICAL WORKS		Complete	3/29/23	5/7/23	40 days	8 days	PS Liner VPS No. 07	Civil front not available			102691T	102005V	101141Y	Accepted
27	Lot-SSL-330					3.3	HYDRO MECHANICAL WORKS		Complete	2/1/20	7/16/22	820 days	Nil	Draft Tube Gate No. 02	Civil front not available			102384W	102005V	101141Y	Accepted
28	Lot-SSL-374					3.3	HYDRO MECHANICAL WORKS		Complete	3/14/22	4/16/22	34 days	Nil	PS Liner VPS No. 07	Work stopped due to VPS excavation by Civil Agency			102691T	102005V	101141Y	Accepted
29	Lot-SSL-370					3.3	HYDRO MECHANICAL WORKS		Complete	6/4/23	6/7/23	0	4 days	All PS Liner lanes	Due to labour strike by manpower of TREL			102691T	102005V	101141Y	Accepted
30	Lot-SSL-368					3.3	HYDRO MECHANICAL WORKS		Complete	10/29/22	10/29/22	01 day	Nil	All PS Liner lanes	Due to labour strike by manpower of TREL			102691T	102005V	101141Y	Accepted

31		Lot-SSL-365	3.3	HYDRO MECHANICAL WORKS	Complete	10/21/22	10/21/22	01 day	Nil	All PS Liner lanes	Due to labour strike by manpower of TREL	102691T	102005V	101141Y	Accepted
32		Lot-SSL-335	3.3	HYDRO MECHANICAL WORKS	Complete	9/4/22	11/20/22	78 days	Nil	Spillway Radial Gates and Spillway Bulkheads	Overflow of spillway and sliding of approach road near DT inlet-02 & 03	101943H	102005V	101141Y	Accepted
33		Lot-SSL-333	3.3	HYDRO MECHANICAL WORKS	Complete	3/24/20	4/5/20	13 days	Nil	All HM Works	Lockdown due to COVID	103598Y	102005V	101141Y	Accepted
34		Lot-SSL-342	3.3	HYDRO MECHANICAL WORKS	Complete	7/21/22	7/21/22	01 day	Nil	Spillway Radial gate No. 01 & 02	Non-availability of manpower of TREL	101943H	102005V	101141Y	Accepted
35		Lot-SSL-343	3.3	HYDRO MECHANICAL WORKS	Complete	7/26/22	7/26/22	01 day	Nil	Spillway Radial gate No. 01, 02 & 03	Labour strike of manpower deployed by TREL	101943H	102005V	101141Y	Accepted
36		Lot-SSL-345	3.3	HYDRO MECHANICAL WORKS	Complete	8/18/22	8/18/22	01 day	Nil	Spillway Radial gate No. 03	Non-availability of surveyor of TREL	101943H	102005V	101141Y	Accepted
37		Lot-SSL-341	3.3	HYDRO MECHANICAL WORKS	Complete	7/4/22	7/4/22	01 day	Nil	Spillway Radial gate No. 02	Non-availability of manpower of TREL	101943H	102005V	101141Y	Accepted
38		Lot-SSL-347	3.3	HYDRO MECHANICAL WORKS	Complete	9/1/22	9/1/22	01 day	Nil	Spillway Radial gate No. 09	Due to non-availability of power supply	101943H	102005V	101141Y	Accepted
39		Lot-SSL-348	3.3	HYDRO MECHANICAL WORKS	Complete	2/1/20				Continued Draft Tube Gate No. 05,06,07,08	Civil front not available till date				Planned
40		Lot-SSL-349	3.3	HYDRO MECHANICAL WORKS	Partial	2/1/20				Continued Intake Trash Rack No. 06	Civil front not available till date as work is stopped to facilitate approach to Intake area				Planned
41		Lot-SSL-372	3.3	HYDRO MECHANICAL WORKS	Complete	5/12/23	6/1/23	Nil	21 days	PS Liner VPS No. 06	Work stopped due to undercut removal in VPS by Civil Agency	102691T	102005V	101141Y	Accepted
42		Lot-SSL-375	3.3	HYDRO MECHANICAL WORKS	Complete	7/9/22	7/21/22	13 days	Nil	PS Liner VPS No. 07	Work stopped due to backfill concrete and undercut removal by Civil agency	102691T	102005V	101141Y	Accepted
43		Lot-SSL-329	3.3	HYDRO MECHANICAL WORKS	Complete	2/1/20	12/28/21	791 days	Nil	Draft Tube Gate No. 01	Civil front not available	102384W	102005V	101141Y	Accepted
44		Lot-SSL-380	3.3	HYDRO MECHANICAL WORKS	Partial	10/15/19	1/31/20	Nil	109 days	PS Liner, Intake Gates & Diversion Tunnel Gates	Non availability of Civil Fronts	103598Y	102005V	101141Y	Accepted
45		Lot-SSL-328	3.3	HYDRO MECHANICAL WORKS	Partial	2/1/20	12/6/22	1040 days	Nil	Intake TRASH RACK no. 08	Civil front not available	102384W	102005V	101141Y	Accepted
46		Lot-SSL-350	3.3	HYDRO MECHANICAL WORKS	Complete	2/1/20				Continued Dam Control Room, Power Pack Rooms & DG Room	Civil front not available till date				Planned
47		Lot-SSL-31	3.3	HYDRO MECHANICAL WORKS	Complete	2/1/20	6/23/22	Nil	874 days	Spillway Radial Gate No. 01	Civil front not available	103598Y	102005V	101141Y	Accepted
48		Lot-SSL-337	3.3	HYDRO MECHANICAL WORKS	Complete	4/11/22	4/11/22	01 day	NIL	Spillway Radial gate No. 02	Non-availability of manpower of TREL	101943H	102005V	101141Y	Accepted
49		Lot-SSL-34	3.3	HYDRO MECHANICAL WORKS	Complete	2/1/20	4/29/23	874 days	310 days	Spillway Radial gate No.- 04	Civil front not available as approach to upstream dyke was made through S#4 bay	101943H	102005V	101141Y	Accepted
50		Lot-SSL-373	3.3	HYDRO MECHANICAL WORKS	Complete	6/21/23	7/3/23	Nil	13 days	PS Liner VPS No. 06	Work stopped due to undercut removal in VPS by Civil Agency	102691T	102005V	101141Y	Accepted

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Company 115
Sub Contract 115/003210
Supplier Name TEXMACO RAIL & ENGINEERING LTD
Project Name SUBANSIRI LOWER HYDRO ELECTRIC
Package Lot-SSL-3

Site 115
Supplier Id S047031
Project Id 115
Remarks

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	Hindrance No	Activity No.	Activity Description	Activity Actual Start	Planned Finish Date	Sub Project Id	Sub Project Desc	Entry Date	Hind Nature	Hind Start Date	Hind Remov Date	Overlap Period	Net Hindrance	Reference	Comment1	Comment2	Comment3	Initiated By	Review By	Accepted By	State
51	Lot-SSL-361					3.3	HYDRO MECHANICAL WORKS		Partial	2/1/20	4/29/23	1184 days	Nil	Intake Bulkhead Gantry Crane Unit#5 to 8	Civil Front not available			102384W	102005V	101141Y	Accepted
52	Lot-SSL-321					3.3	HYDRO MECHANICAL WORKS		Complete	9/25/22	10/11/22	17 days	Nil	PS Liner	Ingress of water through power house			102691T	102005V	101141Y	Accepted
53	Lot-SSL-324					3.3	HYDRO MECHANICAL WORKS		Partial	2/1/20	2/3/23	1099 days	Nil	Intake Trash Rack No. 03	Civil front not available			102384W	102005V	101141Y	Accepted
54	Lot-SSL-326					3.3	HYDRO MECHANICAL WORKS		Partial	2/1/20	2/25/23	1121 days	Nil	Intake Trash Rack No. 05	Civil front not available			102384W	102005V	101141Y	Accepted
55	Lot-SSL-359					3.3	HYDRO MECHANICAL WORKS		Complete	9/24/22	11/19/22	57 days	Nil	PS Liner VPS No. 08	Civil front not available			102691T	102005V	101141Y	Accepted
56	Lot-SSL-367					3.3	HYDRO MECHANICAL WORKS		Complete	9/15/22	9/16/22	02 days	Nil	All PS Liner lanes	Due to labour strike by manpower of TREL			102691T	102005V	101141Y	Accepted
57	Lot-SSL-332					3.3	HYDRO MECHANICAL WORKS		Complete	2/1/20	11/23/22	974 days	Nil	Draft Tube Gate No. 04	Civil front not available			102384W	102005V	101141Y	Accepted
58	Lot-SSL-323					3.3	HYDRO MECHANICAL WORKS		Partial	2/1/20	1/22/23	1087 days	Nil	Intake Trash Rack No. 02	Civil front not available			102384W	102005V	101141Y	Accepted
59	Lot-SSL-371					3.3	HYDRO MECHANICAL WORKS		Complete	3/31/23	4/10/23	11 days	Nil	PS Liner VPS No. 06	Work stopped due to undercut removal in VPS by Civil Agency			102691T	102005V	101141Y	Accepted
60	Lot-SSL-36					3.3	HYDRO MECHANICAL WORKS		Complete	2/1/20	12/7/22	1041 days	Nil	Spillway Radial gate No. 06	Civil front not available			101943H	102005V	101141Y	Accepted
61	Lot-SSL-379					3.3	HYDRO MECHANICAL WORKS		Complete	2/2/18	10/14/19	Nil	620 days	All HM works	Complete stoppage of work due to agitation by some pressure groups and petition filed in NGT against the Project			103598Y	102005V	101141Y	Accepted
62	Lot-SSL-351					3.3	HYDRO MECHANICAL WORKS		Complete	5/2/23			Continued	Spillway Bulkhead Gate Groove No. 04,05,06,07,08,09	Due to overflow of water from spillway crest and non-availability of Civil fronts due to existing materials such as reinforcements, shuttering plates, temporary stair, scrap holdings etc. of Civil Agency in gate grooves..						Planned
63	Lot-SSL-37					3.3	HYDRO MECHANICAL WORKS		Complete	2/1/20	12/18/22	1052 days	Nil	Spillway radial gate no. 07	Civil front not available			101943H	102005V	101141Y	Accepted
64	Lot-SSL-39					3.3	HYDRO MECHANICAL WORKS		Complete	2/1/20	4/16/22	806 days	Nil	Spillway Radial Gate No. 09	Civil front not available			101943H	102005V	101141Y	Accepted
65	Lot-SSL-313					3.3	HYDRO MECHANICAL WORKS		Complete	5/27/20	1/18/21	237 days	Nil	Diversion tunnel gates	Sliding of high level road			101943H	102005V	101141Y	Accepted
66	Lot-SSL-344					3.3	HYDRO MECHANICAL WORKS		Complete	8/17/22	8/17/22	01 day	Nil	Spillway Radial gate No. 01, 02, 03 & 09	Due to shortage of diesel at site			101943H	102005V	101141Y	Accepted
67	Lot-SSL-354					3.3	HYDRO MECHANICAL WORKS		Complete	12/13/22	3/7/23	85 days	Nil	PS Liner VPS No. 03	Civil front not available			102691T	102005V	101141Y	Accepted

सुबनसिरी नं. जलविद्युत परियोजना (2000 MW), अरुणाचल प्रदेश
दैनिक प्रगति रिपोर्ट Daily Progress Report on All Activities दिनांक :23.04.2023

क्र. Sl. No.	गतिविधि Activity	इकाई Unit	मात्रा Total Qty.	31.03.2023 प्रगति	प्रगति प्राप्त FY: 2023-24	दैनिक प्रगति		मासिक प्रगति		प्रगति	मात्रा प्रगति (%)	Remarks
						लक्ष्य	वास्तविक	लक्ष्य	वास्तविक			
सिविल विभाग Civil Works:												
A	विभाग Dam Works											
1	कमीदिन Dam concreting											No work at dam site due to rest/Sunday. Only de-watering in Diversion tunnel are in progress
(i)	मुख्य सहित Main Dam including HPC											
	बलाक एस -Block S-1	m³	92961	89280	0.00	24	0.00	720	315.00	89595	3366	
	बलाक एस - Block S-2	m³	88853	79705	0.00	0	0.00	0	308.00	80013	8840	
	बलाक एस - Block S-3	m³	116525	111911.5	0.00	0	0.00	0	293.50	112205	4320	
	बलाक एस -Block S-4	m³	158668	149158	0.00	7	0.00	200	2412.00	151570	7098	
	बलाक एस - Block S-5	m³	173171	167116	0.00	17	0.00	520	1755.00	168871	4300	
	बलाक एस -Block S-6	m³	176997	162215	0.00	3	0.00	100	2893.00	165108	11889	
	बलाक एस - Block S-7	m³	164262	149851	0.00	3	0.00	100	2885.00	152736	11526	
	बलाक एस -Block S-8	m³	149997	141889	0.00	3	0.00	100	2044.50	143933.5	6063.5	
	बलाक एस - Block S-9	m³	87796	85186	0.00	36	0.00	1090	452.00	85638	2158	
	ओल्ड डाम Old Dam Shear Key & Apron	m³	35774	35774	0	0	0	0	35774	completed		
	मुख्य सहित Total Main Dam including HPC		1245004	1172085.5	0	94.3	0.0	2830	13358	1185443.5	59560.5	95%
(ii)	विस्तार Extended Spillway including Shear Key & Apron		0									
	बलाक एस Block S-1	m³	54586	54926.5	0.00	0	0.00	0	0.00	54926.5	-340.5	
	बलाक एस Block S-2	m³	46008	47623.5	0.00	0	0.00	0	1640.00	49263.5	-3255.5	
	बलाक एस Block S-3	m³	72366	75758.5	0.00	0	0.00	0	875.00	76633.5	-4267.5	
	बलाक एस Block S-4	m³	65206	67021	0.00	0	0.00	0	0.00	67021	-1815	
	बलाक एस Block S-5	m³	56530	56530	0.00	0	0.00	0	0.00	56530	0	
	बलाक एस Block S-6	m³	54412	54562	0.00	0	0.00	0	0.00	54562	-150	
	बलाक एस Block S-7	m³	64428	66273	0.00	0	0.00	0	0.00	66273	-1845	
	बलाक एस Block S-8	m³	97291	101836	0.00	0	0.00	0	0.00	101836	-4545	
	बलाक एस Block S-9	m³	117284	117594.5	0.00	0	0.00	0	570.00	118164.50	-880.5	
	विस्तार Total Extended Spillway including Shear Key & Apron		628111	642125	0	0	0	0	3085	645210	-17099	103%
2	बलाक Non Over Flow Block											
	लेफ्ट बैंक Left Bank	m³	95154	99605	0.00	0	0.00	0	40.00	99645	-4491	
	राइट बैंक Right Bank	m³	89123	92248	0.00	0	0.00	0	315.00	92563.00	-3440	
	मात्रा Total Qty.	m³	2057392	2006063.5	0	94.333	0	2830	16798	2022861.5	34530.5	98%
3	Cutoff Wall (Excavation and Concreting)				0							
	Cut off Wall Excavation	m²	17634	18182	0					18182.00	Completed	
	Cut off Wall Concreting	m²	18606	19447	0					19447.00	Completed	
4	नसेडिंग कमीदिन Cladding Concrete in Dam (U/S & D/S)	m²	87000	65704	0					65704.00	21296	
5	S1 and S2 Old Apron Demolition	m²	3200	3170	0					3170.00	Completed	
B	HRT and Power House Area				0							
1	HRT				0							
1.1	Heading Excavation				0							
1.1.1	HRT-1	RM	1165	1165	0	0.00	0	0		1165.00		
1.1.2	HRT-2	RM	1089	1089	0	0.00	0	0		1089.00		
1.1.3	HRT-3	RM	1013	1013	0	0.00	0	0		1013.00		
1.1.4	HRT-4	RM	937	937	0	0.00	0	0		937.00		Completed
1.1.5	HRT-5	RM	840	840	0.00	0.00	0	0		840.00		
1.1.6	HRT-6	RM	764	764	0	0.00	0	0		764.00		
1.1.7	HRT-7	RM	689	689	0	0.00	0	0		689.00		
1.1.8	HRT-8	RM	605	605	0	0.00	0	0		605.00		
	Total	RM	7102	7102.00	0.00	0.00	0.00	0.00	0.00	7102.00	0	100%
1.2	Benching Excavation				0							
1.2.1	HRT-1	RM	1165	1165	0.00	0.00	0	0		1165.00		
1.2.2	HRT-2	RM	1089	1089	0.00	0.00	0	0		1089.00		
1.2.3	HRT-3	RM	1013	1013	0.00	0.00	0	0		1012.91		
1.2.4	HRT-4	RM	937	937	0.00	0.00	0	0		937.00		Completed
1.2.5	HRT-5	RM	840	840	0.00	0.00	0	0.00		839.62		
1.2.6	HRT-6	RM	764	764	0.00	0.00	0	0		764.00		
1.2.7	HRT-7	RM	689	689	0.00	0.00	0	0		689.40		
1.2.8	HRT-8	RM	605	605	0.00	0.00	0	0		605.00		
	Total	RM	7102	7102	0	0.00	0.00	0.00	0.00	7101.92	0	100%
1.3	Overt Concrete Lining											
1.3.1	HRT-1	RM	1165	1144.15	0.00	0.00	0.00	0	0.00	1144.15	21	
1.3.2	HRT-2	RM	1089	1089	0.00	0.00	0.00	0	0.00	1089.01	0	* HRT_2 u/s - Contact Grouting in progress.
1.3.3	HRT-3	RM	1013	994	0.00	0.00	0.00	0	0.00	994.00	19.00	* HRT_2 d/s - Contact Grouting in progress.
1.3.4	HRT-4	RM	937	938	0.00	0.00	0.00	0	0.00	938.11	-1	U/S - Contact Grouting in progress.
1.3.5	HRT-5	RM	840	844	0.00	0.00	0.00	0	0.00	843.73	-3.73	* HRT_5 u/s - Contact Grouting in progress.
1.3.6	HRT-6	RM	764	750	0.00	0.00	0	0	0.00	749.92	14.1	D/S - Surge Shaft_ RD6m_ Overt1 Completed.
1.3.7	HRT-7	RM	689	684	0.00	0.00	0	0	0.00	683.99	5.01	D/S - Surge Shaft_Orifice #34 Cum
1.3.8	HRT-8	RM	605	604.81	0.00	0.00	0.00	0.00	0.00	604.81	0	
	Total	RM	7102	7048	0	0.00	0.00	0.00	0.00	7047.7	54.28	99%
1.4	Invert Concrete Lining											
1.4.1	HRT-1	RM	1165	1127	0.00	0.00	0.00	0	0.00	1127.00	38	
1.4.2	HRT-2	RM	1089	1018	0.00	0.00	0.00	0	11.00	1029.00	60	
1.4.3	HRT-3	RM	1013	1000	0.00	0.00	0.00	0	0.00	1000.29	12.7	
1.4.4	HRT-4	RM	937	891	0.00	0.00	0	0	0.00	890.62	46	

1.4.5	HRT-5	RM	840	786	0.00	0.00	0.00	0.00	0.00	785.63	54			
1.4.6	HRT-6	RM	764	717	0.00	0.00	0.00	0	0.00	717.32	47			
1.4.7	HRT-7	RM	689	686.78	0.00	0.00	0.00	0	0.00	686.78	2			
1.4.8	HRT-8	RM	605	582.92	0.00	0.00	0.00	0.00	18.00	600.92	4			
Total			RM	7102	6809	0	0.00	0.00	0.00	29.00	6837.56	264.4	96%	
2	Pressure Shaft													UHPS_3_RD10m_Invert lining Completed UHPS_6_RD3m to RD6m_Invert 12 Cum UHPS_7_Step excavation In progress. UHPS_8_RD10m_Invert Completed ATPS/LHPS_4/5_Plug 54 Cum
2.1	Horizontal Pressure Shaft													
2.1.1	Horizontal Pressure Shaft (Heading)	RM	1429	1429	0					1429.00	Completed	100%		
2.1.2	Horizontal Pressure Shaft (Benching)	RM	1429	1429	0	0.00		0.00		1429.00	Completed	100%		
2.1.3	Concrete in Penstock	RM	1594	1045.02	0.00	6.23	0.00	187	0.00	1045.02	549	66%		
4	Vertical Pressure Shaft				0									
2.2.1	Raise Boring & Reaming (new arrangement)	RM	382	382	0					382.00	Completed	100%		
2.2.2	Slashing	RM	382	382.0	0.00	0.00		0.00		382.00	Completed	100%		
3	Power House				0									*HI NDRANCE* 1. All Construction Activities are Hampered Due to Rainfall 3:00pm to 5:00pm. 2. Slow progress of concreting at Unit#6(A2-B) as the same is executing by Tower Crane. 3. Unit#5 (A2-B) line concreting couldn't be stated after checking of
3.1	Excavation in Power House	m3	3250688.4	3105466.38	0					3105466.38	145222	96%		
3.2	Concreting in PH	m3	512000	415035.2	0.00	0.00	1042.00	0	15128.00	430163.20	81837	84%		Total Concreting:-(534+508) = 1042 Cum* *Gravity wall* 1. Unit-8 Side, Gravity Wall: Concreting Work- *Qty-0+100=100cum 2. End of Additional Service Bay Gravity Wall (A to A1 Line): Concreting Work. *Qty- 54+48=102 Cum* *Hill Side Slope Protection Work* 1. Cladding wall-1 - Nil 2. Cladding wall -2, Concreting Work. *Qty- 16 Cum* *Dyke Protection Work* 1.Tetrapod's placing - 56 No's 2.Tetrapod Concreting Work: *Qty- 156+4.5=160.5 Cum*
a	UNIT-1				0									
	A to B line (Auxiliary Building)				0									
	B to D line (Machine Hall)				0									
	D to E line (MIV Area)				0									
b	UNIT-2				0									
	A to B line (Auxiliary Building)				0									
	B to D line (Machine Hall)				0									
	D to E line (MIV Area)				0									
c	UNIT-3				0									
	A to B line (Auxiliary Building)				0									1. Gate groove vent-2, Shuttering Work. 2. Gate groove vent-3, Shuttering Work. 3. B Line EI-119.00m shuttering work.
	B to D line (Machine Hall)				0									
	D to E line (MIV Area)				0									
	Beyond E-line				0									
d	UNIT-4				0									
	A to B line (Auxiliary Building)				0									1. Gate groove vent-1 Shuttering Work. 2. Gate groove vent-2, Top Sill Area, EL-89.10 to 89.55m: Shuttering Work. 3. B line: EL- 139.50m De-shuttering Work. *Qty- 6 Sam.
	B to D line (Machine Hall)				0									
	D to E line (MIV Area)				0									
	Beyond E-line				0									
e	UNIT-5				0									
	A to B line (Auxiliary Building)				0									A to A1 line: EL- 117.80m (+): Shuttering & Reinforcement work.
	B to D line (Machine Hall)				0									D- Line: EL- 133.00(+) staging work.
	D to E line (MIV Area)				0									Cleaning work.
	Beyond E-line				0									
f	Unit-6				0									
	A to B line (Auxiliary Building)				0									A2 line: EL- 93.00m to 95.40m Reinforcement , Shuttering Work and concreting work. *Qty-0+8=8 Cum
	B to D line (Machine Hall)				0									1. Draft Tube Area: Reinforcement Work. 2. D-Line: EL- 105.33m, Reinforcement & Shuttering works. 3. Cleaning & scrap shifting work.
	D to E line (MIV Area)				0									D' -Line EI- 91.63 m(+), Reinforcement work.
	Beyond E-line				0									
g	Unit-7				0									
	A to B line (Auxiliary Building)				0									A to A1 line: EL -111.00m to 113m: Shuttering, Reinforcement and Concreting Work (In Progress) *Qty- 58+90=148 Cum*
	B to D line (Machine Hall)				0									EL- 90 to 92.00 M (+): D- line, Reinforcement & Shuttering Work.
	D to E line (MIV Area)				0									Slush Cleaning Work.
	Beyond E-line				0									
q	Unit-8				0									
	A to B line (Auxiliary Building)				0									A to A1 line: Wall @ EL- 115.30 m (+): Shuttering & Reinforcement Work
	B to D line (Machine Hall)				0									1. D-Line Reinforcement Work. 2. Slush cleaning work is in progress at EI-77.5m.
	D to E line (MIV Area)				0									EL-93.69 M (+)- D' line, Reinforcement & Shuttering Work.
	Beyond E-line				0									
3.4	TRC	m3			0									*TRC* (A) Structural Work. *Unit-5 * 1.Bottom Raft: Concreting Work. *Qty- 174+60=234 Cum* Unit-7 1.Slope Area: Concreting Work. *Qty- 14 Cum* 2. Shear Key concrete*Qty= 0+156=156 cum Unit-8 1.Slope Area: Concreting Work. *Qty- 62+41.5=103.5 Cum* (B) Earth work 1.Breaking Work in Progress. *Qty-162 Cum 2. Anchor Hole Drilling holes by RCC (3M Depth). 20nos ~ TRCM 2nd stage concreting_Intake-7 3 Cum ~ Cladding concrete 34 Cum
4	Intake Structure													

4.1	Excavation	m3	857475	857475	0				857475.00	Completed	100%		
4.2	Intake Concreting				0								
4.2.1	Unit 1 to 4	m3	139727	139727	0.00	0	0.00	0	0.00	139727.00	0	100%	
4.2.2	Unit 5 to 8	m3	139727	139727	0.00	0		0		139727.00	0	100%	
5	Surge Tunnel												<p>1.) Overt reinforcement work is very slow in ST-3 & ST-6.</p> <p>2.) Irregular deployment of labour for manual muck removal is delaying handing over of VPS-5.</p> <p>3.) Delay in cleaning & dewatering work in HRT & ATPS is resulting delay in handing over to HM contractor.</p> <p>Major Equipment Breakdown Status</p> <p>SURGE TUNNEL</p> <p>DAY SHIFT</p> <p>- 01 No. Breaker B/D.</p> <p>NIGHT SHIFT</p> <p>- 01 No. Breaker B/D.</p>
5.1	ADIT to Surge Tunnel												
5.1.1	Heading Exc. of Adit to Surge Tunnel	RM	1568	1568	0					1568.00	Completed	100%	
5.1.2	Benching Exc. Of Adit to Surge Tunnel	RM	1568	1568	0					1568.00	0.00	100%	
5.2	Surge Tunnels Heading Excavation				0								
5.2.1	ST-1	RM	485	485	0.00	0.0				485.1	Completed		
5.2.2	ST-2	RM	475	475	0.00	0.0		0.00		475.0	Completed		
5.2.3	ST-3	RM	465	465	0.00	0.0		0		464.6	Completed		
5.2.4	ST-4	RM	455	455	0.00	0.0		0		455.0	Completed		
5.2.5	ST-5	RM	430	430	0.00	0.0		0.00		430.0	Completed		
5.2.6	ST-6	RM	425	425	0.00	0.0				425.2	Completed		
5.2.7	ST-7	RM	410	410	0.00	0.0		0.00	0.00	410.0	Completed		
5.2.8	ST-8	RM	400	315	0.00	0.8	0.90	25.00	11.78	327.1	72.88		Heading excavation 65 Cum
Total		RM	3545	3460	0	0.8	0.9	25.0	11.8	3471.97	73	98%	
5.3	Benching Excavation												
5.3.1	ST-1	RM	485	485	0.00	0.0		0		485.00	Completed		
5.3.2	ST-2	RM	475	475	0.00	0.0		0.00		475.00	Completed		
5.3.3	ST-3	RM	465	465	0.00	0.0		0.00		465.00	Completed		
5.3.4	ST-4	RM	455	456	0.00	0.0	0.00	0.00	0.00	455.89	Completed		Benching excavation Side & bottom undercut removal/finishing is in progress.
5.3.5	ST-5	RM	430	422	0.00	1.2	0.00	38.00	0.00	422.15	8		
5.3.6	ST-6	RM	425	425	0.00	0.0		0		425.30	Completed		Benching excavation Side & bottom undercut removal/finishing is in progress.
5.3.7	ST-7	RM	410	374	0.00	1.4	0.63	43.00	13.04	387.47	22.54		Benching excavation 25 Cum
5.3.8	ST-8	RM	400	123	0.00	0.0	0.00	0.00	2.00	124.73	275		
Total		RM	3545	3225.48	0.00	2.6	0.6	81.0	15.0	3240.52	305.66	91%	
5.4	Overt Concrete Lining				0								
5.4.1	ST-1	RM	485	476.32	0.00	0.00	0.00	0	0.00	476.32	9		SS/Transition concrete 65 Cum
5.4.2	ST-2	RM	475	456.82	0.00	0.00	0.00	0	0.00	456.82	18		Extended tunnel Overt concrete 85 Cum
5.4.3	ST-3	RM	465	0.00	0.00	0.00	0.00	0	35.32	35.32	430		Overt Lining RD396.1m to RD384.4m 100 Cum
5.4.4	ST-4	RM	455	0.00	0.00	2.80		84	0.00	0.00	455		PCC +/- Kerb 10 Cum
5.4.5	ST-5	RM	430	0.00	0.00	2.13		64	0.00	0.00	430		PCC/Kerb + 35 Cum
5.4.6	ST-6	RM	425	105.71	0.00	2.77	0.00	83	23.53	129.24	296		PCC/Kerb 12 Cum
5.4.7	ST-7	RM	410	0.00	0.00	1.33		40	0.00	0.00	410		
5.4.8	ST-8	RM	400	0.00	0.00					0.00	400		
Total		RM	3545	1038.85	0	9.0333	0	271	58.85	1097.7	2447.3	31%	
5.5	Invert Concrete Lining												
5.5.1	ST-1	RM	485	461	0		0			461	24		
5.5.2	ST-2	RM	475	434.88	0		0		7	441.88	33.12		
5.5.3	ST-3	RM	465	8.00	0.00		0		0	8	457		
5.5.4	ST-4	RM	455	0	0.00		0		0	0	455		
5.5.5	ST-5	RM	430	0	0.00		0		0	0	430		
5.5.6	ST-6	RM	425	0	0.00		0		0	0	425		
5.5.7	ST-7	RM	410	0	0.00		0		0	0	410		
5.5.8	ST-8	RM	400	0	0.00		0		0	0	400		
Total		RM	3545	903.88	0	0	0	0	7.00	910.88	2634.12	26%	
5.6	Vertical Surge Shaft				0								
5.6.1	Slashing	RM	88.5	3.14	0	0.06		1.70		3.14	85	4%	
C	-3 कार्य Lot-3 -HM Work				0								Hindrances:- 1) Erection work suspended in VPS 5 due to step cutting of upper bend area. 2) UT & Inside painting of Ferrule hampered due to non removal of loose rock mass/ muck from lane 2, lane 3, lane 4, lane 6, & lane 8. 3) Welding in LHPS 6 stalled as the area is not cleared from muck since 03.04.23. 4) PS liner erection work hindered due to shortage of erection team (fitters, riggers & helpers) & welders in day & night shift. No Fitup work in VPS 3, VPS 4, UHPS 4, VPS 6 & UHPS 6 due to non availability of manpower. 5) Erection work stalled in VPS 8 as Unloading/ shifting of ferrule in adit 4 is not possible due to non removal of muck (between VPS 7 & VPS 8) & non levelling of large pot hole in unloading area.
1	DIVERSION TUNNEL GATES												No work
	इन्टेक टनल के गेट का निर्माण Erection of Diversion Tunnel Gate (10 gates)	%	100%	100.00%	0.00%				0%	100.0%	0.00%	100.0%	
	Rope drum Hoist complete in all respect with trestle and control Equipment (Cap 125 T) (10 RDH)	%	100%	100.00%	0.00%				0%	100.0%	0.00%	100.0%	
2	INTAKE SERVICE GATES												No work due to Sunday
	इन्टेक गेट का निर्माण Erection of Intake Service gate (8 sets)	%	100%	95.00%	0.00%					95.00%	5.00%	95%	
	2nd Stage EP of Intake Service Gates (8 sets)	%	100%	100%						100.00%	0.00%	100%	
	RDH for Intake Service Gates (8 sets)	%	100%	100%	0.00%		0.0%		0.0%	100.00%	0.00%	100.00%	
3	INTAKE BULKHEAD GATES												
	Erection of Intake Bulkhead gate (2sets)	%	100%	65%	0.00%					65.00%	35.00%	65%	
	Gantry Crane for Intake Bulkhead Gate (2 sets)	%	100%	65%	0.00%					65.00%	35.00%	65%	
	2nd Stage EP of Intake Bulkhead Gates (8 sets)	%	100%	100%	0.00%					100.00%	0.00%	100%	
4	INTAKE TRASH RACK & PANELS												
	इन्टेक टनल के कचरे का निर्माण Erection of Intake Trash Rack and panels (8 sets)	%	100%	36.95%	0.00%				0.00%	36.95%	63.05%	36.95%	16 nos Trash Rack panel reached at Intake Site..
5	PRESSURE SHAFT STEEL LINER												1. Ferrule shifting in PSL- Ono 2. Ferrule fit up completed- Onos 3. Ferrule welding completed- Onos Monthly target achieved :-08nos
	प्रेसर शेफ्ट लाइनर का निर्माण Erection of Pressure shaft liner												
	LANE-1	RM	193	171.843	0.00		0.000		5.010	176.853	16.147	92%	B-2-SL-4B-L-1 Fitup arrangement in Progress.
	LANE-2	RM	215	185.218	0.00		0.00		1.67	186.888	28.112	87%	(1)B-2-SL-1A-L-2, Lowering arrangement going on. (2) ST-5-SL-2-L-2, Welding in progress (3) LHPS bottom side painting is in progress. *Hindrances* (1) Lower bend inside painting work stalled as bottom side of Ferrule not yet clean by civil contractor.
	LANE-3	RM	210	144.16	0.00		0.000		0.00	144.16	65.84	69%	(1) B-1-SL-5A-L-3, Outside grinding is in progress. (2) Joints are being prepared for UT. (3) Already Taken over From 09.03.23 but muck not cleaned in Lower Bend area. I by civil contractor. As a result UT & inside painting work is stalled.
	LANE-4	RM	210	158.205	0.00		0.000		2.50	160.705	49.295	77%	(1)ST-2SL-18-L-4, Fitup is in progress. (2) B-1SL-7A-L-4, Outside welding in progress *Hindrances* Lower bend-4, UT and painting work stalled due to muck/ loose rock mass not cleared by Civil contractor

	LANE-5	RM	210	145.688	0.00	0.00	0.00	145.688	64.312	69%	(1) LHPS from ST-1A to ST-2-SL-18 Inside painting work in progress. (2) ST-2B-L-5, Welding in progress. (3) Lower bend handed over to civil for concrete from 03.02.23.
	LANE-6	RM	208	163.778	0.00	0.00	2.16	165.94	42.06	80%	No manpower deployed for Erection. *Hindrance*:- (1) In the lower bend area UT work not possible due to heavy muck and loose rock mass accumulation.
	Lane-7	RM	175	143.624	0.00	0.00	0.00	143.624	31.376	82%	VPS -7, Handover to civil for concreting & upper bend step cutting from 29.03.023
	Lane-8	RM	173	115.35	0.00	0.00	5.00	120.35	52.65	70%	(1) B-1SL-5A-L-5 , Inside welding in progress (2) B-1SL-5B-L-5 , Inside welding in progress *Hindrance*:- (1) ferrule shifting not possible due to heavy muck accumulated in unloading position. (2) In the lower bend and LHPS area inside UT and painting work not possible due to heavy accumulation of water and muck Lane wise progress: Nil
	Total	RM	1594	1227.866	0	0.00	16.34	1244.208	349.792	78%	
6	DRAFT TUBE GATES										No work due to Sunday
	EPs of draft tube gates (24 SETS)	%	100%	50.00%	0.00%		0.00%	50.00%	50.00%	50.00%	
	गुफ्ट ट्यूब गेट का निर्माण Erection of Draft tube gate (24 GATEs)	%	100%	19%	0.00%		0.00%	18.83%	81%	18.83%	
	RDH for draft tube gates (24 SETS)	%	100%	10%	0%		0.00%	9.92%	90%	9.92%	
7	स्पिलवे रेडियल गेटों का निर्माण Structural Erection of Spillway Radial Gates										Tensa: No work due to Sunday Montan Hydraulic:- 1) 4nos hydraulic pipe & connector fixing completed at LHS shaft for S#3 2) Flushing completed at LHS & RHS for S#3 Radial Gate:- Radial gate S#1 1) Skin plate lock cutting work under progress . Radial Gate S#3 1) Skin plate lock cutting work under progress Radial Gate S#8 (Indian Erectors) 2. Top Arm-3rd shifting to inside of gate Night Shift:- No night shift
	EPs of spillway radial gates	%	100%	48.67%	0.00%		0.00%	48.67%	51.33%	48.67%	
8	SPILLWAY BULKHEAD GATES										Bulkhead Gate S#8 (Indian Erectors) Liner welding under progress Due to raising of water level, All crane tools & Tackles shifted from Dam site to safe location. NIGHT SHIF:- No night shift
	EPs of spillway bulkhead gates	%	100%	67%	0.00%		0.00%	66.93%	33.1%	66.93%	
	स्पिलवे बल्कहेड गेटों का निर्माण Assembly of Spillway Bulkhead Gates	%	100%	51%	0.00%	0.00%	0.00%	50.79%	49.21%	50.79%	
	Gantry crane for spillway bulkhead gates	%	100%	0%	0%			0.00%	100%	0%	
D	E&M installation works at Powerhouse										Balance of Plant: BOP(M) 1. Erection of 340T EOT crane rails along D line of U#5 is in progress. 2. Cleaning and painting of pipelines of Unit#1&2 in E1 103 floor is in progress. 3. Cooling water cyclone separator discharge line fabrication and erection for Unit#1 is completed. 4. Fabrication of MIV oil pipeline to servomotor of Unit#2 is in progress.
1	Erection of rails for 340T crane at D line	M	284	108.46	0			108	176	38%	
2	Unit-1	%	100%	90.00%	0.00%	0.00%		90.00%	10.00%	90.00%	Generator Transformer: 1. Preparation for heating of GT-1Y is in progress
	Stator				0						
	Rotor				0						
	Turbine				0						
	BOP				0						
	MIV				0						Final tightening of coupling bolts of U/S sleeve to MIV body is in progress.
3	Unit-2	%	100%	83.00%	0.00%			83.00%	17.00%	83.00%	Upper Bracket: Nil 1. Replacement of gaskets of stator air cooler and pressure testing is under progress.
	Stator				0						
	Rotor				0						
	Turbine				0						
	BOP				0						
	MIV				0						Preparations for machining of D/S sleeve D/S part is in progress.
4	Unit-3	%	100%	17.00%	0.00%			17.00%	83.00%	17.00%	Cleaning of key bar and stirrup plate is in progress
	Stator				0						
	Rotor				0						
	Turbine				0						1. Welding of C/S joints of SC strakes 252&251 and 270&251 is in progress. 2. Welding of bottom L/S joint of stay ring & spiral case strake 263 to 255 is in progress.
5	Unit-4	%	100%	10.00%	0.00%			10.00%	90.00%	10.00%	
6	Unit-5	%	100%	10.00%	0.00%			10.00%	90.00%	10.00%	
	Stator				0						
	Rotor				0						
	Turbine				0						
	BOP				0						
7	Unit-6	%	100%	7.00%	0.00%			7.00%	93.00%	7.00%	
8	Unit-7	%	100%	3.00%	0.00%			3.00%	97.00%	3.00%	Installation of bracings on DT part 6 & 5 is in progress(Cumulative progress: 27/36)
9	Unit-8	%	100%	1.00%	0.00%			1.00%	99.00%	1.00%	
E	Right bank Road near P/H:	%	100%		0						Completed
F	Road Tunnel:	%	100%		0						
G	Deonallah (LR EL 113 bench)	%	100%		0						
H	High Level Road:	%	100%		0						
I	Status of camera working st site	job	100%		0						All site Cameras are up

Regarding handover of Bay S6 for balance HM works

From : HM Subansiri <hm-subansiri@nhpc.nic.in> Sun, Dec 01, 2024 04:47 PM
Subject : Regarding handover of Bay S6 for balance HM works
To : mukulesh debnath <mukulesh.debnath@texmaco.in>
Cc : SUBANSIRI LOWER PROJECT HOP <hop-subansirilower@nhpc.nic.in>, alok singh <alok.singh@texmaco.in>, texmaco subansiri <texmaco.subansiri@gmail.com>

Sir,

Spillway Bay S-6 is hereby handed over to start balance HM works on 01.12.2024.

Regards

Rajesh Ranjan
GM (M)
HM Division, SLHEP
NHPC Ltd.

Point No. 22



Company 115
Sub Contract 115/003210
Supplier Name TEXMACO RAIL & ENGINEERING LTD
Project Name SUBANSIRI LOWER HYDRO ELECTRIC
Package Lot-SSL-3

Site 115
Supplier Id S047031
Project Id 115
Remarks

1-50 of 67

	Hindrance No	Activity No.	Activity Description	Activity Actual Start	Planned Finish Date	Sub Project Id	Sub Project Desc	Entry Date	Hind Nature	Hind Start Date	Hind Remov Date	Overlap Period	Net Hindrance	Reference	Comment1	Comment2	Comment3	Initiated By	Review By	Accepted By	State
1	Lot-SSL-32					3.3	HYDRO MECHANICAL WORKS		Complete	2/1/20	2/8/22	739 days	Nil	Spillway Radial Gate No. 02	Civil front not available			103598Y	102005V	101141Y	Accepted
2	Lot-SSL-310					3.3	HYDRO MECHANICAL WORKS		Complete	2/1/20	3/29/23	1155 days	Nil	Hydraulic cylinder & pipelines of Spillway Radial gate No. 01 to 09	Civil front not available			101943H	102005V	101141Y	Accepted
3	Lot-SSL-338					3.3	HYDRO MECHANICAL WORKS		Complete	4/16/22	4/16/22	01 day	NIL	Spillway Radial gate no. 02	Non-availability of manpower of TREL			101943H	102005V	101141Y	Accepted
4	Lot-SSL-366					3.3	HYDRO MECHANICAL WORKS		Complete	3/14/22	3/14/22	01 day	Nil	All PS Liner lanes	Due to labour strike by manpower of TREL			102691T	102005V	101141Y	Accepted
5	Lot-SSL-322					3.3	HYDRO MECHANICAL WORKS		Partial	2/1/20	2/17/23	1113 days	Nil	Intake Trash Rack No. 01	Civil front not available			102384W	102005V	101141Y	Accepted
6	Lot-SSL-369					3.3	HYDRO MECHANICAL WORKS		Complete	12/22/22	12/22/22	01 day	Nil	All PS Liner lanes	Due to labour strike by manpower of TREL			102691T	102005V	101141Y	Accepted
7	Lot-SSL-33					3.3	HYDRO MECHANICAL WORKS		Complete	2/1/20	5/4/22	824 days	Nil	Spillway Radial gate No. 03	Civil Front not available			101943H	102005V	101141Y	Accepted
8	Lot-SSL-35					3.3	HYDRO MECHANICAL WORKS		Complete	2/1/20	8/30/22	942 days	Nil	Spillway Radial Gate No. 05	Civil front not available			101943H	102005V	101141Y	Accepted
9	Lot-SSL-327					3.3	HYDRO MECHANICAL WORKS		Partial	2/1/20	2/25/23	1121days	Nil	Intake Trash Rack No. 07	Civil front not available			102384W	102005V	101141Y	Accepted
10	Lot-SSL-352					3.3	HYDRO MECHANICAL WORKS		Complete	5/31/22	9/12/22	105 days	Nil	PS Liner VPS no. 01	Civil front not available			102691T	102005V	101141Y	Accepted
11	Lot-SSL-353					3.3	HYDRO MECHANICAL WORKS		Complete	3/29/23	4/22/23	25 days	Nil	PS Liner VPS No. 02	Civil front not available			102691T	102005V	101141Y	Accepted
12	Lot-SSL-360					3.3	HYDRO MECHANICAL WORKS		Partial	2/1/20	5/18/23	1203 days	Nil	Intake Bulkhead Gantry Crane Unit#1 to 4	Civil Front not available			102384W	102005V	101141Y	Accepted
13	Lot-SSL-381					3.3	HYDRO MECHANICAL WORKS		Complete	10/15/19	1/31/20	109 days	Nil	Spillway Radial gates & Draft Tube Gates	Non-availability of Civil Fronts			103598Y	102005V	101141Y	Accepted
14	Lot-SSL-378					3.3	HYDRO MECHANICAL WORKS		Complete	8/26/22	9/1/22	07 days	Nil	Spillway Radial gate No. 02	Work stopped due to removal of shuttering by Civil Agency			101943H	102005V	101141Y	Accepted
15	Lot-SSL-325					3.3	HYDRO MECHANICAL WORKS		Complete	2/1/20	3/1/22	760 days	Nil	Intake Trash Rack No. 04	Civil front not available			102384W	102005V	101141Y	Accepted
16	Lot-SSL-331					3.3	HYDRO MECHANICAL WORKS		Complete	2/1/20	11/21/22	974 days	Nil	Draft Tube Gate No. 03	Civil front not available			102384W	102005V	101141Y	Accepted
17	Lot-SSL-336					3.3	HYDRO MECHANICAL WORKS		Complete	4/5/22	4/7/22	3 days	NIL	Spillway Radial Gate No.02	Non-availability of manpower and crane of M/s TREL			101943H	102005V	101141Y	Accepted
18	Lot-SSL-339					3.3	HYDRO MECHANICAL WORKS		Complete	4/24/22	4/24/22	01 day	Nil	Spillway Radial Gate No. 02	Work stopped due to Labour strike of Civil Agency			101943H	102005V	101141Y	Accepted
19	Lot-SSL-355					3.3	HYDRO MECHANICAL WORKS		Complete	3/4/23	4/16/23	44 days	Nil	PS Liner VPS No. 04	Civil front not available			102691T	102005V	101141Y	Accepted
20	Lot-SSL-356					3.3	HYDRO MECHANICAL WORKS		Complete	2/3/23	4/28/23	85 days	Nil	PS Liner VPS No. 05	Civil front not available			102691T	102005V	101141Y	Accepted
21	Lot-SSL-357					3.3	HYDRO MECHANICAL WORKS		Complete	2/3/23	3/7/23	33 days	Nil	PS Liner VPS No. 06	Civil front not available			102691T	102005V	101141Y	Accepted
22	Lot-SSL-376					3.3	HYDRO MECHANICAL WORKS		Complete	1/10/22	4/9/22	90 days	Nil	PS Liner VPS No. 08	Work stopped due to VPS excavation by Civil agency			102691T	102005V	101141Y	Accepted
23	Lot-SSL-377					3.3	HYDRO MECHANICAL WORKS		Complete	7/5/22	7/30/22	26 days	Nil	PS Liner VPS No. 08	Work stopped due to backfill concrete and undercut removal by Civil agency			102691T	102005V	101141Y	Accepted
24	Lot-SSL-38					3.3	HYDRO MECHANICAL WORKS		Complete	2/1/20	12/7/22	1041 days	Nil	Spillway Radial Gate No. 08	Civil front not available			101943H	102005V	101141Y	Accepted
25	Lot-SSL-340					3.3	HYDRO MECHANICAL WORKS		Complete	6/16/22	6/21/22	06 days	Nil	Spillway Radial gate No.02	Rise of water level and overflow of water from spillway			101943H	102005V	101141Y	Accepted
26	Lot-SSL-358					3.3	HYDRO MECHANICAL WORKS		Complete	3/29/23	5/7/23	40 days	8 days	PS Liner VPS No. 07	Civil front not available			102691T	102005V	101141Y	Accepted
27	Lot-SSL-330					3.3	HYDRO MECHANICAL WORKS		Complete	2/1/20	7/16/22	820 days	Nil	Draft Tube Gate No. 02	Civil front not available			102384W	102005V	101141Y	Accepted
28	Lot-SSL-374					3.3	HYDRO MECHANICAL WORKS		Complete	3/14/22	4/16/22	34 days	Nil	PS Liner VPS No. 07	Work stopped due to VPS excavation by Civil Agency			102691T	102005V	101141Y	Accepted
29	Lot-SSL-370					3.3	HYDRO MECHANICAL WORKS		Complete	6/4/23	6/7/23	0	4 days	All PS Liner lanes	Due to labour strike by manpower of TREL			102691T	102005V	101141Y	Accepted
30	Lot-SSL-368					3.3	HYDRO MECHANICAL WORKS		Complete	10/29/22	10/29/22	01 day	Nil	All PS Liner lanes	Due to labour strike by manpower of TREL			102691T	102005V	101141Y	Accepted



1 of 1



Company	115	Site	115
Sub Contract	115/003193	Supplier Id	S046153
Supplier Name	BGS-SGS-SOMA JV AS	Project Id	115R
Project Name	SUBANSIRI LOWER	Remarks	Construction of Diversion Tunnels, Cofferdams, Concrete Gravity Dam, Plunge Pool and Cut off Wall (LOT SSL-1) Assam Side
Package	SSL.1Works		



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Hindrance No	SSL.1Works157	Activity No.	
Activity Description		Activity Actual Start	
Planned Finish Date		Sub Project Id	3.2.06
Sub Project Desc	CONCRETE DAM WORKS	Entry Date	
Hind Nature	Non availability of labour/ worker.	Hind Start Date	6/23/23
Hind Remov Date	6/27/23	Overlap Period	
Net Hindrance	4.66 days	Reference	
Comment1	Dam Site works stopped as no labour/ workers were available at site due to workers union strike since 3:00pm dated 23.06.2023 to 27.06.2023.	Comment2	
Comment3		Initiated By	103903A
Review By	102050F	Accepted By	
State	Reviewed		

Point No. 24

SUBANSIRI LOWER HE PROJECT (2000 MW)

INCIDENT REPORT ON FLOODING OF DT OUTLET AREA DUE TO ABNORMALLY HIGH FLOW FROM DEV NALLAH ON LEFT BANK AND DAMAGE OF DYKE CONSTRUCTED TO ISOLATE RIVER FROM POWER HOUSE, DUE TO HEAVY RAIN IN TAMEN AND DAPORIJO ON 13.06.2023 AND ABNORMAL INCREASE OF FLOW IN SUBANSIRI RIVER.

Brief of Project: -

Subansiri Lower HE Project (2000 MW), a run off the river scheme is located near North Lakhimpur, in the Lower Subansiri district of Arunachal Pradesh. It envisaged the construction of 125 m high dam above deepest foundation and a Surface Power House with 8 units of 250 MW each. The Project is scheduled to generate 7421.59 MU of energy in a 90% dependable year.

Occurrence of incident:

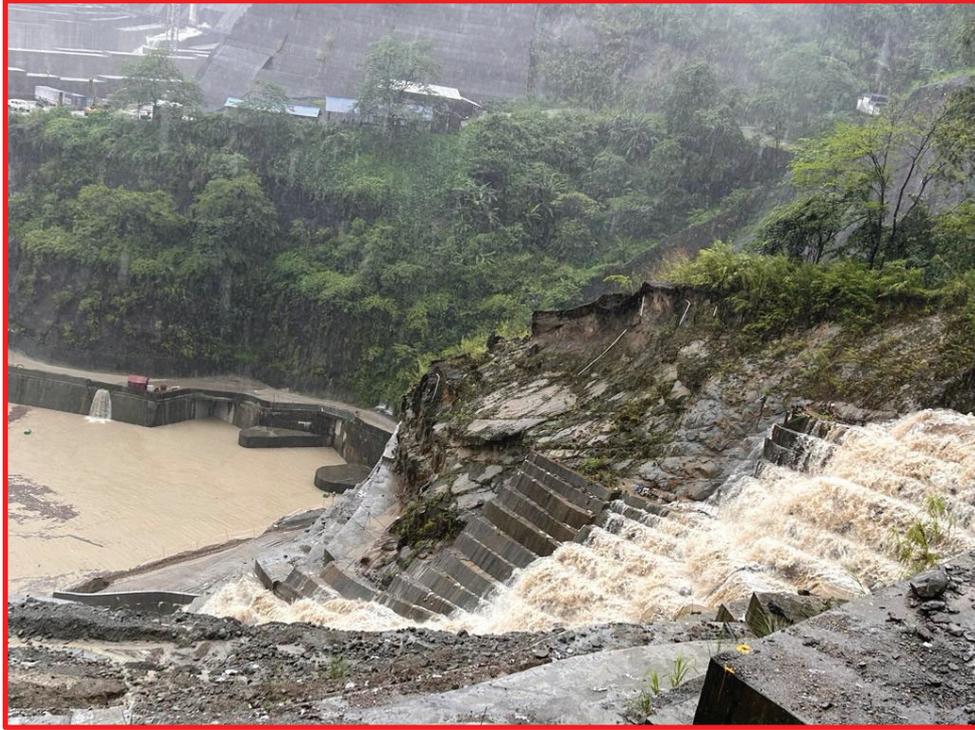
1. High intensity heavy rainfall on 13.06.2023 of 129mm and abnormally high flow from Deo-Nallah over-toppled and damaged the existing drain system and flooded the DT outlet pit, as a result dewatering pump deployed for DT plugging work got submerged. Due to inundation and flooding of DT outlet pit area, all activities in progress for plugging of DT have got hampered, however, all protection works are being taken up to minimize the damage.
2. Due to heavy rainfall in Tamen and Daporijo of Subansiri river catchment area, suddenly the river discharge has increased to above 5000 cumecs on 13.06.2023 and subsequent to release of high flood through Dam spillway has led to damage of stretch of Dyke constructed to isolate the powerhouse from the river. Due to continuous high discharge and hitting of water directly at TRC dyke, the TRC dyke has been breached resulting into flooding of TRC area. However, the Power House is safe.



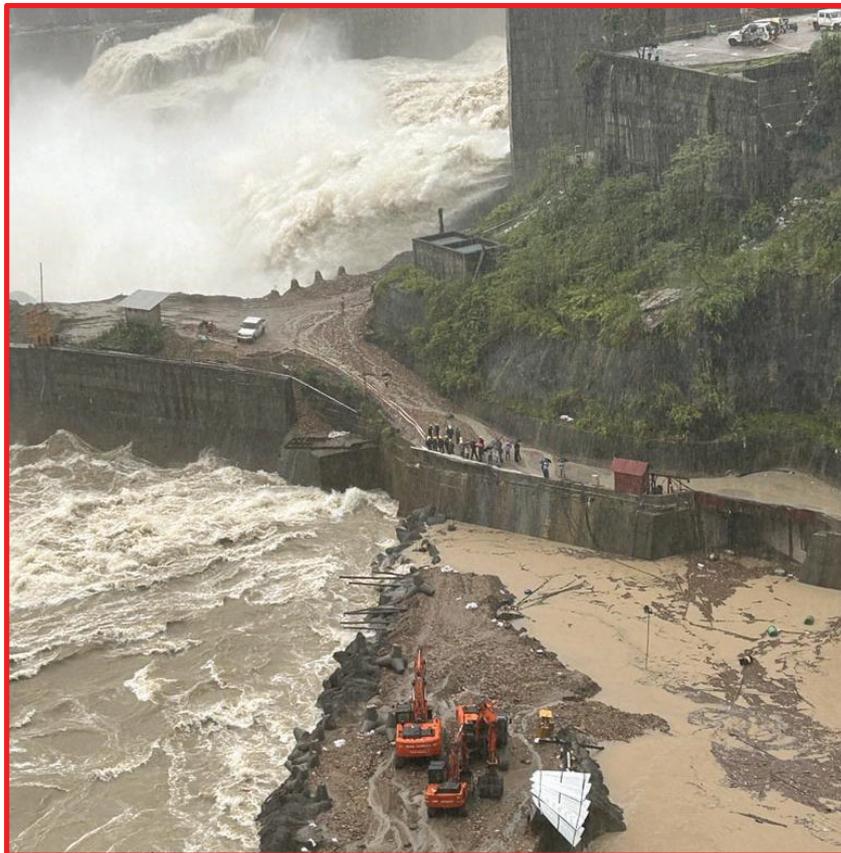
DEO-NALLAH



OVER TOPPLING OF DIVERSION TUNNEL OUTLET PIT



HEAVY DISCHARGE FROM DEO NALLAH



FLOODING OF DT OUTLET



EROSION OF THE DYKE IN THE POWER HOUSE AREA

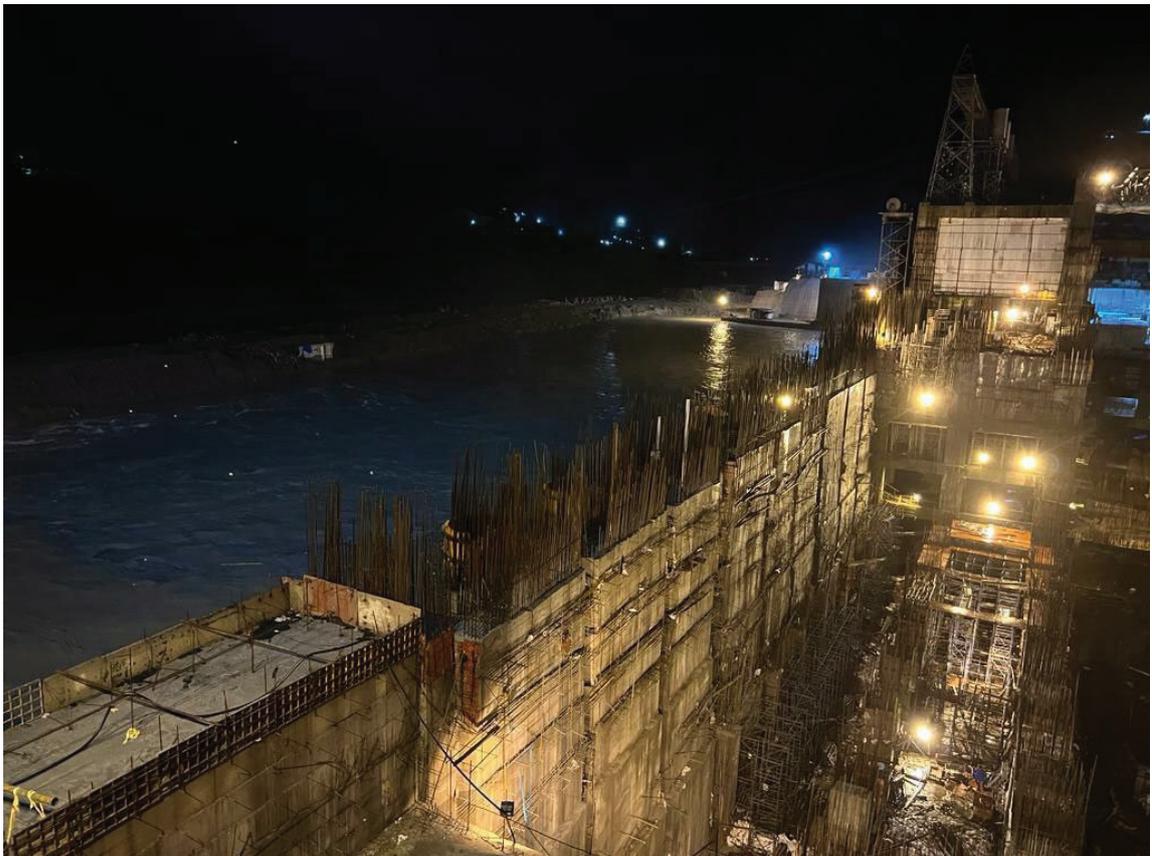


BREACH OF TRC DYKE





FLOODING OF TRC AREA



SUBANSIRI LOWER HE PROJECT (2000MW)

INCIDENT REPORT ON FLOODING OF DT OUTLET PIT AREA DUE TO ABNORMALLY HIGH FLOW FROM DEV NALLAH ON LEFT BANK, DUE TO HEAVY RAIN IN TAMEN AND DAPORIJO AND ABNORMAL INCREASE OFF FLOW IN SUBANSIRI RIVER ON 13.06.23.

Brief of Project:-

Subansiri Lower HE Project (2000MW), a run off the river scheme is located near North Lakhimpur and in the Lower Subansiri district of Arunachal Pradesh. It envisaged the construction of 127m high dam above deepest foundation and a Surface Power House with 8 units of 250MW each. The Project is scheduled to generate 7421.59 MU of energy in a 90% dependable year.

Briefing of various activities taken for Dyke & Dewatering of seepage coming from DT-2 to 5 for plugging of DT:-

1st concreting for plugging of DT-2, 3 & 4 was started by dated 17.03.2023, 18.03.2023 and 19.03.2023 before monsoon and got completed for 10m width. After that Plugging of DT5 got started w.e.f. 20.04.2023, but all the activities for plugging got stopped due to heavy rainfall and abnormally high flood due to Dyke inundation at DT outlet in the early morning of 03.05.2023.

As the weather was improving and water level was reducing, so restoration work of approaching Dyke for DT out let again was started on 15.05.2023 for plugging of remaining portion of DT. The Dyke was filled with Clay, Earth RBM, Tetra pod and concreting for protection from river side (DT-1 outlet). The progress of the Dyke is shown through various date wise Photographs;







As per sequence of activities shown above through various photographs after completion of dyke, Centrifugal Pumps of 75 & 60 HP (6 nos) were placed at site on dated 24.05.2023 (as shown in the photograph). After placing, fixing of its Suction & delivery pipes, 6 Nos. of Pumps were working as shown below:-



By 26.05.2023 two more additional centrifugal Pumps were installed and previously installed two nos. of Submersible Pump (50HP and 125HP) were made functional which was laying in DT-3 outlet portal, as shown in photograph.



During dewatering for lowering of watering level in pit area, another parallel activity was also started for raising the dyke level by placing Tetra pod, concrete, earth and RBM continue to arrest the over topple of water from DT outlet side (as shown in photographs).





After attaining safe height of the Dyke the approach road to DT-5 was started on 29.05.2023. Despite continuous functioning of 12-13 Pumps in days & nights shift, water level of DT outlet pit did not receded, due to which making of approaches towards DT4 & DT5 outlet got hindered.

On 06.06.2023 centrifugal pumps (2nos.) had been placed at DT-4 outlet on existing space. And temporary Dyke with Clay & RBM was placed between DT4 & DT5 outlet which was accomplished on 07.06.2023 (as shown in photographs). Rising of Dyke's height between DT4 & DT5 was continued.





From 08.06.2023 Project has vigorously tried for initiating balance plugging from DT-5. However, due to frequent increases of water level and increases of seepage thereof, men & machineries couldn't go inside DT-5.

On 10/06/2023 water level in DT outlet was recorded as EL103.8m and in DT-5 was below EL103m. Therefore, approach was started toward inside DT-5 by placing RBM and silt, but in the night shift of same days the water level of DT-2 to DT-4 pits rose above EL104.70m

and damaged additional Dyke for dewatering between DT-4 & DT-5. The same Dyke was again restored with Concrete Cube, clay and RBM in the subsequent day and 1no. Centrifugal pump (60HP) & 1no. Submersible pump (50HP) was placed for dewatering of DT-5 on 11.06.2023.



It was further decided to make another Dyke in between DT-3 & DT-4 so that DT-4 which is in advanced stage may be plug simultaneously. Accordingly the preparation of Dyke between DT-4 & DT-5 was in progress on 12.06.2023 (as shown in photograph).



Due to continuously heavy rainfall, the quantum of water from Deonallah, a huge sudden discharge gushed into DT outlet pits by damaging guide wall and submerged entire Pumps and breached the Dyke at DT-1outlet side on 13.06.2023.





Following running dewatering Pumps got submerged in DT outlet pits:-

1. Dewatering Pump (75HP) – 06 Nos.
2. Dewatering Pump (60HP) – 06 Nos.
3. Submersible Pump (50HP) – 2Nos.
4. Submersible Pump (10HP) – 1 No.

To,

The Director,
Disaster and resilience, NDSA,
Ministry of Jal Shakti, New Delhi
(dir-dr-nds@gov.in)

विषय: Inspection visit of dam site of Subansiri Lower HEP (2000 MW) of NHPC before initial filling and review of proposed initial reservoir filling plan – reg

सन्दर्भ: TE-16019/1/2024-NDSA-MOWR dated 04.04.2025

Kind attention is invited to OM under reference vide which CWC, GSI and NDSA officials were authorised by NDSA to visit dam site of Subansiri Lower HEP (2000 MW) of NHPC Ltd. situated in Lower Subansiri District, Arunachal Pradesh and Dhemaji District, Assam for inspection before initial filling and to review the initial filling plan prepared by the project authority. Accordingly, the team has visited the project from 10.04.2025 to 11.04.2025.

The team has observed that various issues such as left bank slope stability after slide and cavity formation in diversion tunnel inlet area which happened in October 2023; Ongoing activities related to this slope stabilization and reservoir filling which are yet to be completed; Upcoming monsoon as well as Construction peculiarities of the project have profound impact on dam safety aspects and have a direct bearing on the first reservoir filling. The team recommends that some activities to improve the present safety aspects related to project should be completed before project authorities may proceed ahead with first filling of reservoir.

A note on these recommended activities has been prepared and enclosed herewith for further necessary action.

Encl. : As above



(Shiv Kumar Sharma)
Director, CMDD (E&NE),
Central Water Commission (CWC)

Recommendations of NDSA team regarding first filling of SLP after site visit dated 10-12 April 2025

As per Clause 27 of the Dam Safety Act 2021 and in response to NHPC Ltd. letter dated 11.03.2025, following representatives on behalf of NDSA visited the dam site of Subansiri Lower HEP (2000 MW) of NHPC Ltd. situated in Lower Subansiri District, Arunachal Pradesh and Dhemaji District, Assam before initial filling and to review the initial filling plan prepared by the project authority.

1. Sh. Shiv Kumar Sharma, Director, CMDD (E&NE), CWC.
2. Sh. Rahul Kumar Singh, Director, Gates Design (NW&S), CWC and Disaster & Resilience, NDSA.
3. Sh. D. P. Dangwal, Director, EG, NER, Geological Survey of India
4. Sh. Adepu Raghavendra, Deputy Director, Embankment Dte. (E&NE), CWC
5. Sh. Vibhor Baghel, Assistant Director, Disaster & Resilience, NDSA

Above team of officers authorized by NDSA along with NHPC officials inspected the Dam of Subansiri Lower HEP (2000 MW) during 10th & 11th April 2025 and found that the Reservoir is currently filled up to EL 152.0 m which is 7.0 m above the crest level in an unrestricted manner.

As per the observations of the NDSA team during the dam site visit and information provided by NHPC officials, The team has determined that various issues such as left bank slope stability after slide and cavity formation in diversion tunnel inlet area which happened in October 2023; Ongoing activities related to this slope stabilization and reservoir filling which are yet to be completed; Upcoming monsoon as well as Construction peculiarities of the project have profound impact on dam safety aspects and have a direct bearing on the first reservoir filling.

The team recommends that following activities to improve the present safety aspects related to project should be completed before project authorities may proceed ahead with first filling of reservoir:

1. Plan and sections of the grouting work carried out at the upstream left bank area where cavity formation had taken place, reveal that grouting is only partially completed in the slide area. The average hole depth varies from 30 m to 50 m and very few hole extend upto 80 m. It implies that at most of the drilled location, the drilled holes have not reached to the bottom of the cavity El.98 m (i.e. upto bottom rock). Further, grouting above El.170 bench has been done in a small area only. The upper mass is not adequately grouted. Geophysical tests have been carried out in a limited area.

Therefore, it is recommended that:

- a) All remaining area may be grouted. Grouting may be attempted to fill all suspected cavities, upstream portion of diversion tunnels etc.
- b) Boreholes may be drilled and cores tested to verify the strength and efficacy of grouted mass.
- c) More Geophysical tests may be carried out to cover left out areas.

It is emphasized that after commencement of reservoir filling, the hydrostatic water pressure shall increase manifold. Therefore, the above activities may be carried out urgently to safeguard as much area as possible before the commencement of filling.

2. Seepage from diversion tunnel is a matter of great concern as it may lead to washing of fines from slide mass and consequent settlement of already provided left bank protection works. It

is also observed with concern that after closing of drain pipes in DT 1 and DT5, seepage was observed shortly thereafter.

Therefore, it is recommended that:

- a) The area immediately downstream of dam where rock cover between DT1 and abutment is very less, may be backfilled with concrete of suitable strength.
- b) Plugging of the diversion tunnels till outlet may be continued and speedup.
- c) Near DT outlet a concrete retaining wall structure covering all DT may be provided for avoiding trash and silt deposit to DTs and monitoring the seepage during reservoir filling and later.
- d) Curtain grout through gallery provided in the plug may be carried out at a few locations in all diversion tunnels especially DT1.
- e) During construction of plug, existing concrete lining may be removed at 20 m intervals such that good impermeable bonding may be created between plug and rock.
- f) Epoxy grouting may be carried out at the face of Plug to make it more impermeable.
- g) Since the DT1 was plugged downstream of dam axis, the curtain grout which was supposed to grout the area between DT1 and bottom of diaphragm wall, could not be executed as well. Since this area has been left untreated, it is prone to seepage. Efforts may be made to remedy this condition. It is pertinent to point out that seepage has been observed from downstream drainage gallery as well.

It is emphasized that after commencement of reservoir filling, the hydrostatic water pressure shall increase manifold. Therefore, the above activities may be carried out urgently to safeguard as much area as possible before the commencement of filling.

3. Installation and functioning of all the requisite instrumentation should be ensured before commencement of reservoir filling. It is observed that many instruments such as inverted pendulum have not been installed so far. The response of the dam to reservoir filling is required to be monitored continuously and intensely through these instruments. Further, constant monitoring of movement in the slope (through instruments) is also very important during the first filling of reservoir.

Therefore, it is recommended that:

- a) Bathymetry survey may be carried out on upstream and downstream of Dam especially at the slide mass area on upstream left bank. Such survey may act as benchmark survey to monitor scouring or settlement if any occurs subsequently.
- b) If instruments such as inverted pendulum could not be installed in dam body before commencement of filling, alternative arrangements such as reflex targets, tilt meter etc may be installed to record tilt response of the dam during filling urgently.
- c) The instrumentation panels may be completed urgently.
- d) Requisite instrumentation at the left bank slope and benches on the left bank upstream area may be planned and installed. Temporary targets may also be planned to monitor the movement, if any, during the first reservoir filling.
- e) Instrumentation like inclinometer and pore pressure meter / piezometer on the left bank hill slope in the slide zone and inside slided mass area may be installed for monitoring the behaviour of the slide mass and settlement/ movement if any during reservoir filling.

- f) Inclinator, MPBX may be installed at El.155 m bench in the toe protection area for monitoring of settlement /movement if any during reservoir filling.
- g) Bireflex targets on the right bank may be installed near intake slope and dam abutment

It is emphasized that quick action based on instrumentation data may have to be taken during first filling of reservoir. Therefore, the above activities may be completed before commencement of reservoir filling.

4. Whereas, maximum number of spillway gates should be ready for operation at the time of first filling, it is observed that spillway gate no S6 may not be operational this monsoon due to pending removal of Rotex pylon. Further, pier raising work in S2 are ongoing after removal of another Rotex pylon. Similarly, some other works such as grouting behind liner, ladder fixing, removal of steel ISMB supports in radial gate area etc. are pending in many gates.

Therefore it is recommended that

- a) The ARMAC system for gate control may be completed urgently
- b) Work of extension of piers (S2 area) and other minor works such as grouting, removal of steel ISMB supports in radial gate area etc. may be completed urgently.

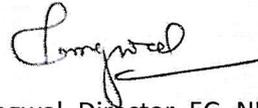
It is emphasized that the water level is required to be carefully controlled during first filling, therefore, the above works may be completed urgently before commencement of reservoir filling.

5. An Expert group was constituted by Ministry of Power which has given its recommendations regarding safety of left bank area after the slide occurred on 27th October ,2023. A visit by the expert group for assessment is pending. It is suggested that the visit by Expert group may be arranged at the earliest before commencement of reservoir filling.
6. Monsoon is approaching in which sudden increase in discharge may be expected which may pose difficulty in case lowering of water level is required. Effect of impinging of 1 in 100 years return flood during monsoon season and subsequent rise of reservoir water level is required to be studied at different RWL i.e. El.150, El.158 m,El.161 m, El.165, El.167 m and El.170 m considering one gate inoperative and other constraints. A detailed note on the same highlighting the dam safety aspects as well as its effect on left bank slide mass may be prepared by NHPC and submitted at the earliest.
7. Lastly, there are other challenges regarding first reservoir filling of this project such as
- a. Plunge Pool has not been constructed.
 - b. Only 3 out of 8 Hydro power units are ready for operation.
 - c. Upstream left bank cladding is complete upto EL 185 m only. Slope protection measures above El.200 m in the slide area is yet to start.
 - d. Filling of a large cavity observed in DT 1 near its outlet is yet to be taken up.
 - e. TRCM at intake is yet to be installed.

The first reservoir filling manual prepared by NHPC may be updated to include the measures proposed to address the challenges mentioned above (vide para 1 to 7) and submitted to NDSA at the earliest.



Sh. Rahul Kumar Singh, Director, Gates Design (NW&S), CWC and Disaster & Resilience, NDSA.



Sh. D. P. Dangwal, Director, EG, NER, Geological Survey of India



Sh. Adepu Raghavendra, Deputy Director, Embankment Dte. (E&NE), CWC



Sh. Vibhor Baghel, Assistant Director, Disaster & Resilience, NDSA



Sh. Shiv Kumar Sharma, Director, CMDD (E&NE), CWC



भारत सरकार/Government of India
जल शक्ति मंत्रालय/Ministry of Jal Shakti
जल संसाधन, नदी विकास एवं गंगा संरक्षण विभाग /Department of Water Resources, RD & GR
राष्ट्रीय बांध सुरक्षा प्राधिकरण /National Dam Safety Authority
कार्यालय सदस्य (आपदा एवं समुत्थान शक्ति) / Member (Disaster & Resilience)

To,

Sh. Rajendra Prasad, Executive Director & Head of Project
Subansiri Lower H E Project, NHPC Limited
Kolaptukar, Dollungmukh Circle
Kamle, Arunachal Pradesh
email : hop-subansirilower@nhpc.nic.in

विषय: Inspection visit of dam site of Subansiri Lower HEP (2000 MW) of NHPC before initial filling and review of proposed initial reservoir filling plan – reg

**सन्दर्भ: 1. TE-16019/1/2024-NDSA-MOWR/ I/111404/2025 dated 09.05.2025
2. NHPC email Dated 22.05.2025 & 24.05.2025**

Sir,

Please refer to your email dated 22.05.2025 & 24.05.2025 vide which compliance of this office letter dated 09.05.2025 was forwarded and requested NDSA team to visit on 27 -28 May 2025.

Accordingly, the team visited the Subansiri Lower HEP during 16.06.2025 to 18.06.2025 and observed that some important activities which were recommended since first visit of NDSA team are yet to be completed. The team has submitted its recommendations which are enclosed herewith.

It is requested that a report on the compliance of these recommended activities may be submitted to NDSA at the earliest. The NDSA committee shall again visit Subansiri Lower HEP to verify the progress on ground before project authorities may proceed ahead with first reservoir filling.

This issues with the approval of Chairman, NDSA.

Encl. : As above

Yours Sincerely
Digitally signed by
Rahul Kumar Singh
Date: 10-07-2025
(Rahul Kumar Singh)
18:06:19
Director, Gates Design (NW&S), CWC
and Disaster & Resilience, NDSA

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Government of India
Ministry of Jal Shakti
Department of Water Resources, River Development & Ganga Rejuvenation

**Site Visit Report of NDSA Team to Subansisir Lower HEP
16th to 18th June 2025
for
Initial Filling of Reservoir**



National Dam Safety Authority

Site visit report of NDSA team to Subansiri Lower HEP, 2000 MW, Arunachal Pradesh / Assam on 16-18 June 2025

1.0 Brief Background:

As per Clause 27 (2) of the Dam Safety Act 2021 and in response to request made by NHPC Ltd. vide Letter No.NH/SLP/HoP/2025/04 Dated 11.03.2025, NDSA constituted a team vide OM dated 4th April 2025 to inspect the Dam of Subansiri Lower HEP (2000 MW), Arunachal Pradesh of NHPC Ltd., before initial filling and to review the initial filling plan prepared by the project authority.

1.1 Members of NDSA team

1. Sh. Shiv Kumar Sharma Director, Director, CMDD (E&NE), CWC
2. Sh. Rahul Kumar Singh Director, Gates Design (NW&S), CWC and Disaster & Resilience, NDSA
3. Shri. D. P. Dangwal Director, EG, NER, Geological Survey of India
4. Sh. Adepur Raghavendra Deputy Director, Embankment Dte. (E&NE), CWC
5. Sh. Vibhor Baghel Assistant Director, Gates Design (NW&S), CWC and Disaster & Resilience, NDSA

2.0 First Visit of NDSA Team

The first visit of NDSA team took place on 10-12 April 2025. The team after inspection of project recommended that certain activities to improve the present safety aspects related to project should be completed before project authorities may proceed ahead with first filling of reservoir. Some of such activities are as follows:

1. Upstream left bank area which should be further grouted and more geophysical tests may be carried out.
2. Installation and functioning of all the requisite instrumentation should be ensured before commencement of reservoir filling
3. Plugging of the diversion tunnels till outlet may be continued and paced up.
4. The area immediately downstream of dam where rock cover between DT1 and abutment is very less, may be backfilled with concrete of suitable strength.
5. Near DT outlet a concrete retaining wall structure covering all DT may be provided for avoiding trash and silt deposit to DTs and monitoring the seepage during reservoir filling and later.
6. Curtain grout through gallery provided in the plug may be carried out at a few locations in all diversion tunnels especially DT1.
7. During construction of plug, existing concrete lining may be removed at 20 m intervals such that good impermeable bonding may be created between plug and rock.
8. Epoxy grouting may be carried out at the face of Plug to make it more impermeable.
9. Since the DT-1 was plugged downstream of dam axis, the curtain grout which was supposed to grout the area between DT1 and bottom of diaphragm wall, could not

be executed as well. Since this area has been left untreated, it is prone to seepage. Efforts may be made to remedy this condition.

10. Bathymetry survey may be carried out on upstream and downstream of Dam especially at the slide mass area on upstream left bank.

Team while forwarding its recommendations vide letter dated 21st April 2025, intimated that a report on the compliance of these recommended activities may urgently be submitted to NDSA. The NDSA committee shall again visit Subansiri Lower HEP project in the second week of May 2025 to verify the progress on ground before project authorities may proceed ahead with first reservoir filling.

2.1 Response of NHPC to recommendations of First Visit of Committee

NHPC provided the reply / compliance of the observations vide letter dated 25th April 2025.

NDSA team upon examination and telephonic discussions held with NHPC officers determined that, whereas progress on the recommendations of NDSA team has been made by the Subansiri Lower HEP project authorities, however, in general, the recommended activities are not completed and no timeline in respect of any activity along with proposed quantum of work has been intimated. The same was communicated to NHPC vide NDSA letter dated 09th May 2025.

NHPC further submitted compliance / reply vide email dated 22nd & 24th May 2025 and requested NDSA team to visit on 27 -28 May 2025.

3.0 Second Visit of NDSA Committee Dated 16th - 18th June 2025

Second visit of NDSA committee took place on **16th - 18th June 2025**. The list of participants is enclosed as **Annexure**. Upon inspection and discussions held with project authorities at project site, it is determined that some important activities which were recommended since first visit of NDSA team are yet to be completed. For example:

1. As advised in earlier visit by NDSA team, consolidation grouting in the untreated zone between El. 170 m to El. 200 m is required to be expedited.
2. Installation and calibration of instruments in Dam and left bank area is required to be completed urgently. For example, Settlement gauge, inclinometer and piezometers as advised in earlier visit are required to be installed at the earliest
3. It was intimated by project authorities that high grout intake has been observed in upstream curtain grout holes from El. 163 m and El. 169 m in the left bank rock mass lying above DT1 alignment. High grout intake indicates presence of the voids / cavities in the rock mass. It is, therefore, recommended to carryout additional deep grout holes in the upstream of the left bank in the intact part of the abutment.
4. Downstream concrete filling to be completed up to El. 173 m, to address hydro fracture where rock cover to DT- 1 is minimal.
5. Upstream part of DT1 lying below the high level road from 23 m u/s of dam axis to around 70 m upstream of dam axis needs to be filled with the underwater concreting

by tremie pipe . After filling of the upstream part of the DT1, cores may extracted at 3-4 location for ascertaining the efficacy of the underwater concrete.

6. Bathymetry survey in upstream portion during the receding part of the monsoon season may be carried out by the Remote operating vehicles (ROV) to see the behavior of the toe area and its erosion if any.
7. TRCM at intake is yet to be installed.
8. Leakage from most of the Spillway gates caused due to seal damage and alignment shall be addressed.

3.1 Expert Group Report constituted by MoP

Expert Committee constituted by Ministry of Power (MoP) had earlier visited the project in November 2024 and June 2025. The Expert Group has conducted its third visit from 2nd to 5th June 2025 and gave its observations / recommendations. The compliance of the latest recommendations of expert group is also under progress.

3.2 Current Water Level of Reservoir

It was observed by NDSA committee that NHPC has gradually increased the reservoir water level from El. 145 m to El. 165 m without due approval on the initial filling schedule. The committee found it objectionable. The present raised water level in the reservoir may be reviewed by NHPC.

3.3 Damage to Glacis and bucket of Bay no 6

The bucket and glacis of bay no 6 of Dam has been reported damaged in the month of June 2025. If the discharge continues with upstream pondage, the chances of further damage to the glacis as well as dam foundation may increase. The damaged bucket and glacis shall be repaired as soon as possible.



4.0 Emergency Action Plan

Following observations on Emergency Action Plan (EAP) submitted by Project Authorities shall also be attended.

1. The purpose of the vicinity map is to show the location of the dam and surrounding roads that provide access to the dam. The vicinity map presented in the EAP shall also include the following:
 - Show the location of the dam in relation to major roads (national and state highways, district roads, village roads etc.), intersections, and landmarks in the area.
 - Mark Upstream and Downstream of Dams.
 - Label all applicable street names.
 - Scale the map appropriately to ensure all applicable features are visible. Include a scale bar.
2. EAP includes inundation maps for assisting the dam owner and emergency management authorities in identifying critical infrastructure and sites with large population-at-risk, which may require protective measures and warning as well as evacuation planning. Whenever communities or significant numbers of dwellings are located in the floodplain downstream of a dam, or for large dams with complex floodplains, detailed inundation maps are usually needed for the development of an adequate evacuation plan and the same shall be prepared based on Dam Break Analysis.
3. The Dam Break Analysis shall consider at least the following cases: (i). Dam Break due to overtopping during passage of Inflow Design Flood that impinges at the Full Reservoir Level (FRL). (ii). Dam Break due to seepage when the reservoir is full (fair weather failure, inflow may be considered at the rate equal to the base flow of the Inflow Design Flood Hydrograph or any other reasonable value). iii. Continuous release of water at the maximum rate through the dam (i.e. Spillway Capacity: dam remaining intact).
4. Evacuation plan shall also be prepared along with description of location & route map to reach from different places to elevation shelters during emergency and attached in the EAP for reviews from members in the distribution list.

5.0 Conclusions and Recommendations

The activities mentioned at para 3.0 and 3.1 may be urgently completed by NHPC and reported to NDSA for field visit to verify the same before first reservoir filling may be initiated. The reservoir filling manual prepared by NHPC may be updated accordingly and submitted to NDSA.

* * * * *

Annexure**List of participants during the 2nd visit****NDSA Team**

1. Sh. Shiv Kumar Sharma, Director, Director, CMDD (E&NE), CWC
2. Sh. Rahul Kumar Singh, Director, Gates Design (NW&S), CWC and Disaster & Resilience, NDSA
3. Sh. Adepu Raghavendra, Deputy Director, Embankment Dte. (E&NE), CWC
4. Sh. Vibhor Baghel, Assistant Director, Gates Design (NW&S), CWC and Disaster & Resilience, NDSA

NHPC

1. Sh. Rajendra Prasad, HOP, Subansiri lower HE Project
2. Sh. Sandeep Mittal, ED (PMSG)
3. Sh. R M A Khan, GM (D&E)
4. Sh. Vachaspati Pandey, GM (Geology)
5. Sh. Himanshu Nagpal, DGM (Civil)

* * * * *

Point No. 25

SUBANSIRI LOWER HE PROJECT (2000 MW)

INCIDENT REPORT ON FLOODING OF DT OUTLET AREA DUE TO ABNORMALLY HIGH FLOW FROM DEV NALLAH ON LEFT BANK AND DAMAGE OF DYKE CONSTRUCTED TO ISOLATE RIVER FROM POWER HOUSE, DUE TO HEAVY RAIN IN TAMEN AND DAPORIJO ON 13.06.2023 AND ABNORMAL INCREASE OF FLOW IN SUBANSIRI RIVER.

Brief of Project: -

Subansiri Lower HE Project (2000 MW), a run off the river scheme is located near North Lakhimpur, in the Lower Subansiri district of Arunachal Pradesh. It envisaged the construction of 125 m high dam above deepest foundation and a Surface Power House with 8 units of 250 MW each. The Project is scheduled to generate 7421.59 MU of energy in a 90% dependable year.

Occurrence of incident:

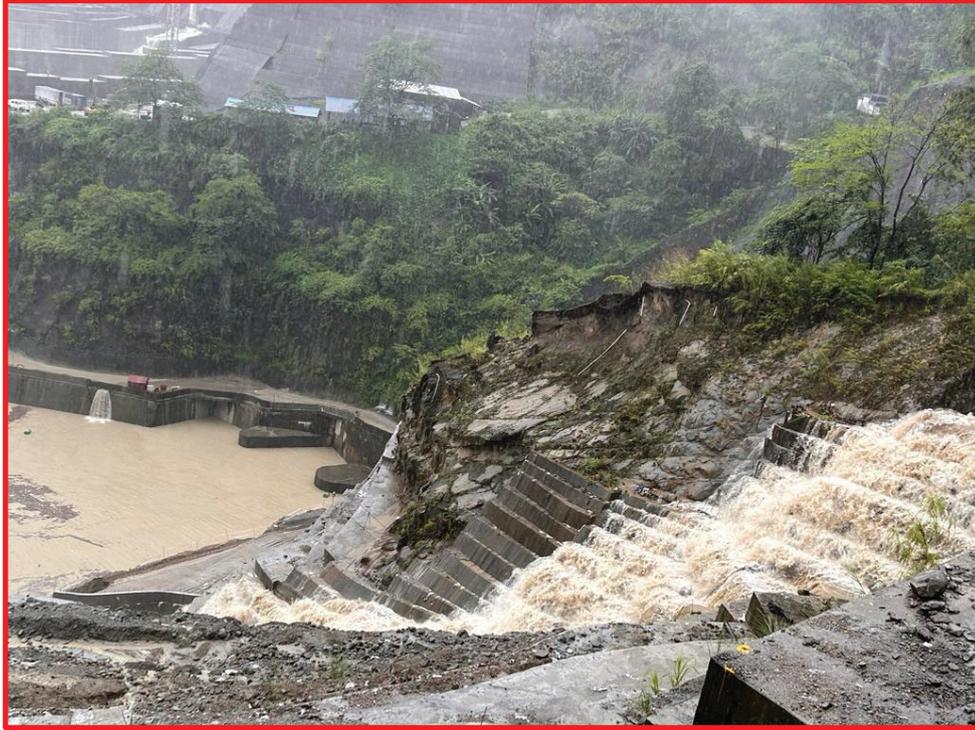
1. High intensity heavy rainfall on 13.06.2023 of 129mm and abnormally high flow from Deo-Nallah over-toppled and damaged the existing drain system and flooded the DT outlet pit, as a result dewatering pump deployed for DT plugging work got submerged. Due to inundation and flooding of DT outlet pit area, all activities in progress for plugging of DT have got hampered, however, all protection works are being taken up to minimize the damage.
2. Due to heavy rainfall in Tamen and Daporijo of Subansiri river catchment area, suddenly the river discharge has increased to above 5000 cumecs on 13.06.2023 and subsequent to release of high flood through Dam spillway has led to damage of stretch of Dyke constructed to isolate the powerhouse from the river. Due to continuous high discharge and hitting of water directly at TRC dyke, the TRC dyke has been breached resulting into flooding of TRC area. However, the Power House is safe.



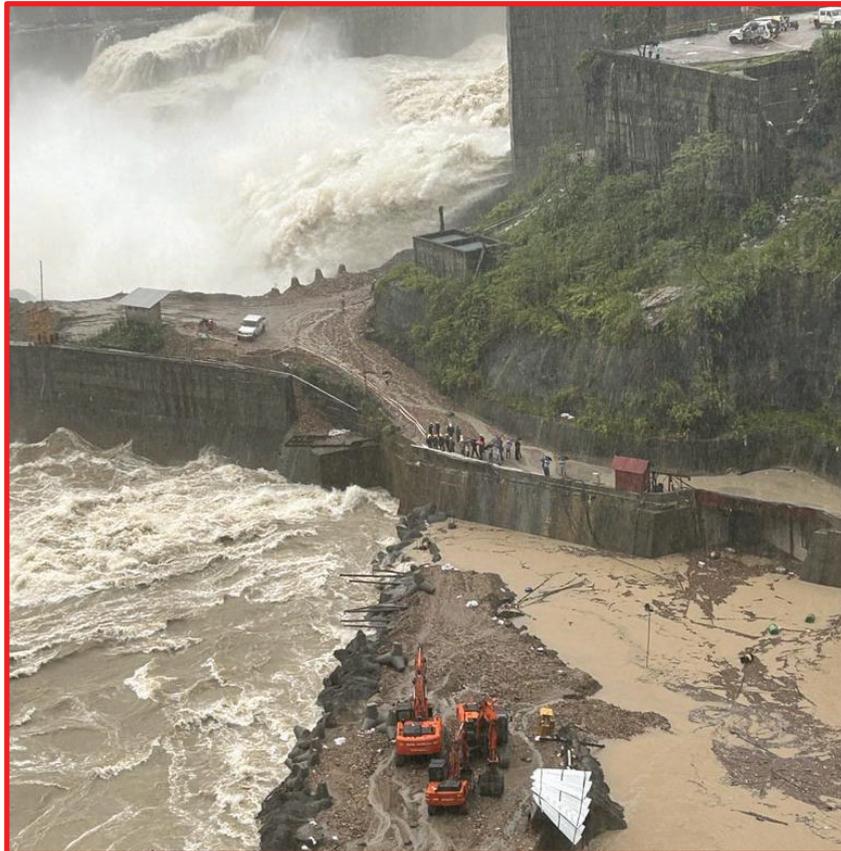
DEO-NALLAH



OVER TOPPLING OF DIVERSION TUNNEL OUTLET PIT



HEAVY DISCHARGE FROM DEO NALLAH



FLOODING OF DT OUTLET



EROSION OF THE DYKE IN THE POWER HOUSE AREA

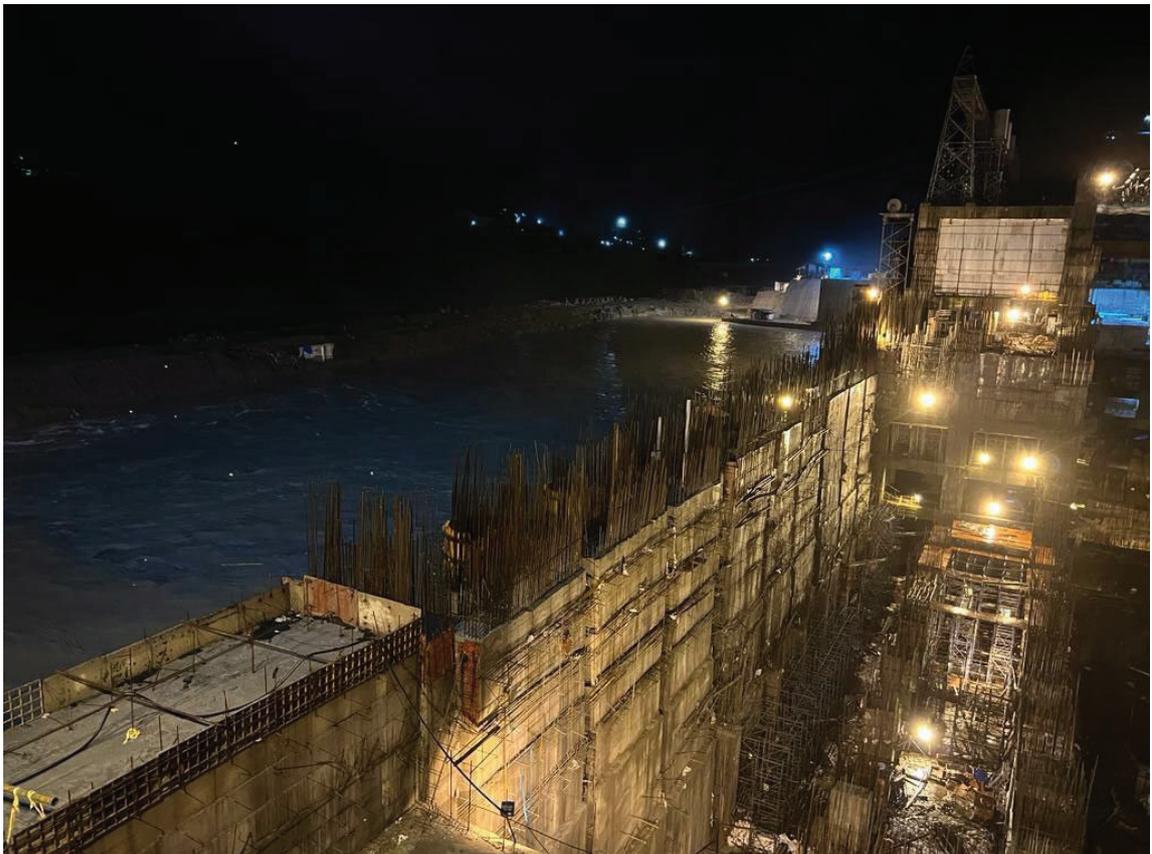


BREACH OF TRC DYKE





FLOODING OF TRC AREA



Subansiri Lower Project (2000 MW), Assam / Arunachal Pradesh Commissioning Schedule

Activity ID	Activity Name	Original Duration	Start	Finish	2023												2024												2025														
					Qtr 2				Qtr 3				Qtr 4				Qtr 1				Qtr 2				Qtr 3				Qtr 4														
					M	J	Jul	A	S	O	N	D	J	F	M	A	M	J	Jul	A	S	O	N	D	J	F	M	A	M	J	Jul	A	S	O	Oct	N							
SUBANSIRI LOWER - COMMISSIONING SCHEDULE BY MAY 2025 - F					744	01-Jun-23	31-May-25	31-May-25																																			
A1000	Baseline Date	0	01-Jun-23	31-May-25	◆ Baseline Date																																						
DAM					259	01-Jun-23	10-Feb-24	▶ 10-Feb-24																																			
A1010	Dam Concreting	29	01-Jun-23	29-Jun-23	▶ 10-Feb-24																																						
RESERVOIR FILLING					16	25-Jan-24	10-Feb-24	▶ 10-Feb-24																																			
A1030	Reservoir Filling	15	25-Jan-24	09-Feb-24	▶ 10-Feb-24																																						
A1040	Water Availability	0		10-Feb-24	▶ 10-Feb-24																																						
UNDERGROUND WORKS					372	01-Jun-23	31-May-24	▶ 31-May-24																																			
A1050	Completion of HRT Works	372	01-Jun-23	31-May-24	▶ 31-May-24																																						
A1060	Completion of ST Works	341	01-Jun-23	30-Apr-24	▶ 29-Nov-24																																						
POWER HOUSE - SURFACE					557	01-Jun-23	29-Nov-24	▶ 29-Nov-24																																			
A1070	Completion of Power House Civil Works	557	01-Jun-23	29-Nov-24	▶ 29-Nov-24																																						
A1080	Completion of TRC	61	15-Oct-23	14-Dec-23	▶ 28-Apr-24																																						
HM WORKS					339	01-Jun-23	28-Apr-24	▶ 28-Apr-24																																			
A1090	Erection of Spillway Radial Gates	245	01-Jun-23	27-Jan-24	▶ 28-Apr-24																																						
A1100	Erection of Spillway Bulkhead gates including 2nd Stage EPs	155	01-Jun-23	31-Oct-23	▶ 28-Apr-24																																						
A1110	Erection of Diversion Tunnel Gates completed	0		01-Jun-23	◆ Erection of Diversion Tunnel Gates completed																																						
A1120	Erection of Draft Tube Gates	339	01-Jun-23	28-Apr-24	▶ 28-Apr-24																																						
A1130	Erection of PS Liners	220	01-Jun-23	03-Jan-24	▶ 28-Apr-24																																						
ELECTROMECHANICAL WORKS					744	01-Jun-23	31-May-25	▶ 31-May-25																																			
COMMON ITEMS					496	01-Jun-23	30-Sep-24	▶ 30-Sep-24																																			
A1140	Completion of Common Items of E&M Works	496	01-Jun-23	30-Sep-24	▶ 30-Sep-24																																						
COMMISSIONING OF UNITS					478	17-Feb-24	31-May-25	▶ 31-May-25																																			
A1160	Commissioning of Unit 1	0		17-Feb-24	▶ 31-May-25																																						
A1170	Commissioning of Unit 2	0		29-Feb-24	▶ 31-May-25																																						
A1180	Commissioning of Unit 3	0		31-Mar-24	▶ 31-May-25																																						
A1190	Commissioning of Unit 4	0		17-Jul-24	▶ 31-May-25																																						
A1200	Commissioning of Unit 5	0		06-Dec-24	▶ 31-May-25																																						
A1210	Commissioning of Unit 6	0		14-Mar-25	▶ 31-May-25																																						
A1220	Commissioning of Unit 7	0		28-May-25	▶ 31-May-25																																						
A1230	Commissioning of Unit 8	0		31-May-25	▶ 31-May-25																																						

█ Remaining Work ◆ Milestone

█ Critical Remaining Work ▶ Summary

Point No: 25



PATEL ENGINEERING LTD.
SUBANSIRI LOWER HYDRO ELECTRIC PROJECT
Kolaptukar, Dollungmukh Circle,
Dist. Kamle, Arunachal Pradesh - 791120,
Email: pel.subansiri@pateleng.com

Ref: PEL/382/2023-24/1830

Date: 14-06-2023

To,
Executive Director,
Subansiri Lower H.E. Project,
NHPC Ltd., Gerukamukh, Dhemaji
Assam-787035

बुधवार 14 जून 2023

परियोजना प्रमुख कार्यालय

14/6/23

Kind Attn.: Mr. Vipin Gupta (Executive Director – I/C)

Sub: LOT SSL-6: Construction of Balance Civil works of Power House Complex from HRT Intake Structures to Tail Race Channel, Subansiri Lower HE Project: **Reg: Work suspension and breach of coffer dyke and subsequent ingress of river water in TRC area under PCC Clause-4.27**

Ref: 1. LOA- NH/CCW/CC-I/SO-76/2020/781-789 Dated: 01.09.2020
2. Contract Agreement No. NH/CCW/SUBANSIRI/LOT SSL-6 dated 21.09.2020

Dear Sir

Pursuant to Engineer's instructions, all works at Power House were put under suspension since 12 Noon of 13-06-2023 due to anticipated rise in river water level. There is apprehension of breach of Coffey Dyke due to continuous rain in project vicinity for last few days followed by rise in river water level and increasing trend in river water discharge.

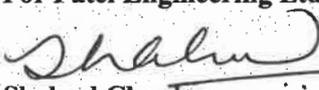
On 13-06-2023 at 2 PM onwards, scouring of Coffey Dyke at multiple location started. At around 8:00PM, the Dyke breached in front of Unit-8 and river water started entering into TRC, and within 2 hours time the entire TRC area got flooded with the river water.

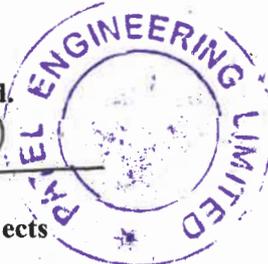
Considering the safety aspect of project structures and resources, the works of Power House are suspended for all work activities. As instructed by Engineer, Contractor have deployed substantial resources including water pumps, machineries and manpower for carrying-out dewatering and mitigation measures.

Due to ongoing situation and mitigation activities, the Contractor hereby notify the hindrances to works caused as per GCC/PCC Clause-8, 4.27 and relevant Contract Condition. The commensurate time and cost claim shall be submitted in due course of time. This is for your kind information and record please.

Thanking you and assuring our best service all the time.

Yours Truly,
For Patel Engineering Ltd.


Shakeel Chouhan
Addl. Vice President-Projects



CC: General Manager, Lot-6, Subansiri Lower H.E. Project, NHPC Ltd.

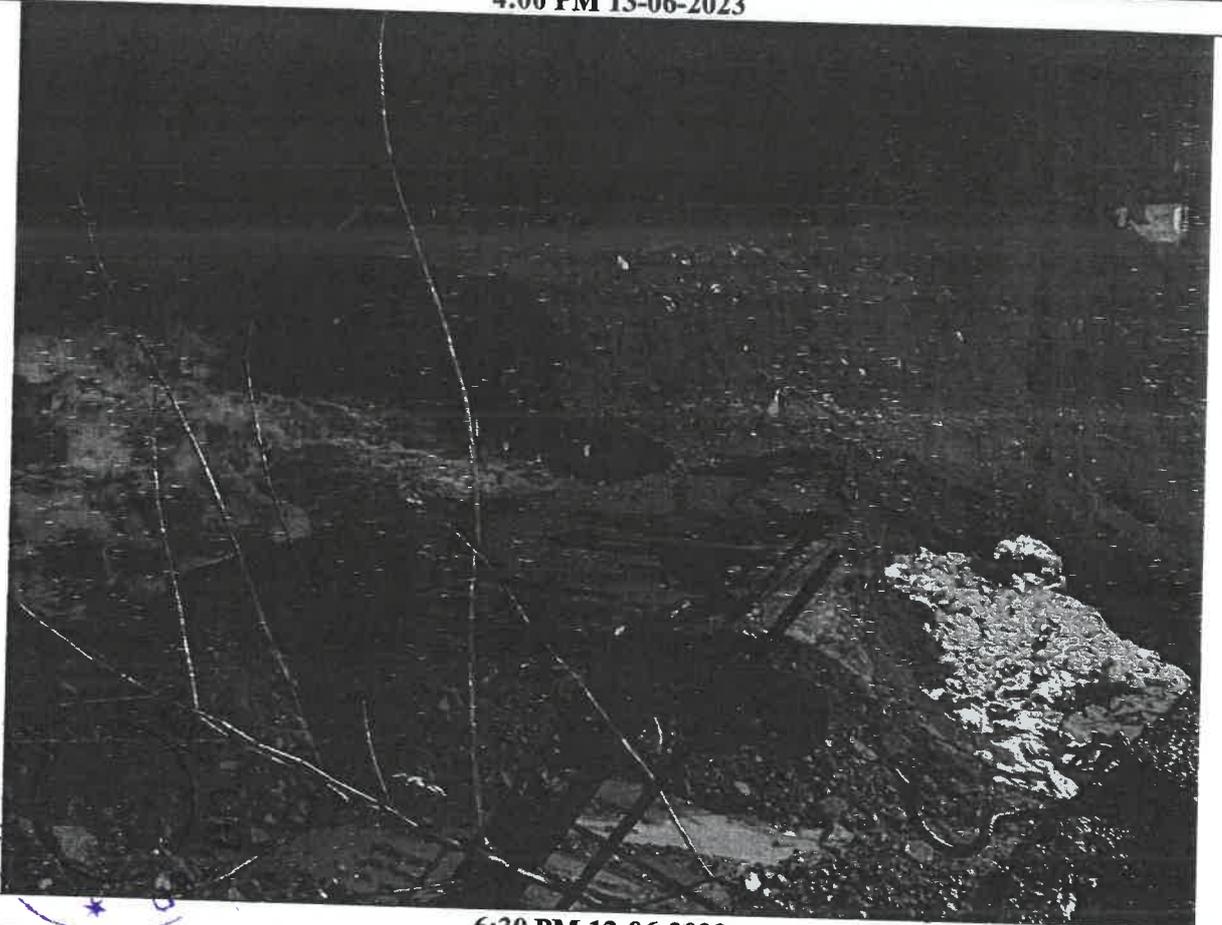
Enclosed: Photographs

REGD. OFFICE: Patel Estate Road, Jogeshwari (W), Mumbai 400 102 India
Tel: +91 22 26767500, 26782916 Fax +91 22 26782455, 26781505
Email: headoffice@pateleng.com Web: www.pateleng.com
CIN: L00000MH19040510007020

Photographs



4:00 PM 13-06-2023



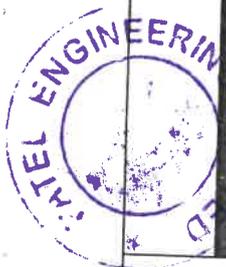
6:30 PM 13-06-2023

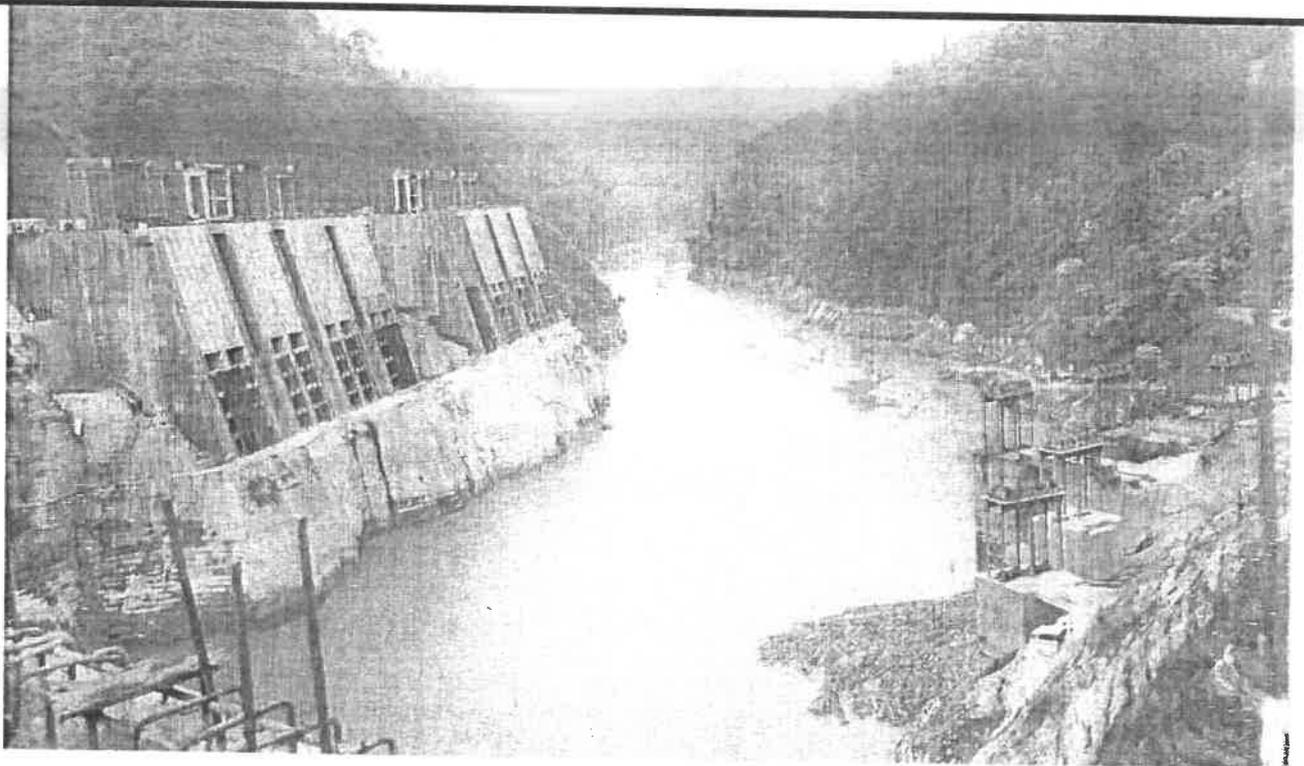


9:00 PM 13-06-2023



9:00 AM of 14-06-2023





Source: Twitter

The Assam Tribune is now on Telegram. [Click here to join our channel \(@assamtribuneoff\)](#) and stay updated with the latest headlines.

North Lakhimpur, June 14: Heavy and continuous rains have damaged the temporary dyke guarding the power house of National Hydroelectric Power Corporation's (NHPC) near-completion Subansiri Lower Hydro Electric Power (SLHEP) project at Gerukamukh this morning.

Heavy rains and strong rising tides created flush floods on both sides of the river Subansiri near the SLHEP-Gerukamukh, causing significant landslides and rising water levels. The current of the rising water of Subansiri breached the dyke constructed temporarily for the powerhouse of the plant inundating the area.

The breached dyke was intended to be hauled down in the next days, according to an NHPC official in Gerukamukh, and its breaching means no threat for the powerhouse.

The SLHEP-Gerukamukh has been plagued with similar landslides and breaching of coffer dams in every monsoon throughout its construction period.



PATEL ENGINEERING LTD.
SUBANSIRI LOWER HYDRO ELECTRIC PROJECT

Kolaptukar, Dollungmukh Circle,
Dist. Kamle, Arunachal Pradesh - 791120,
Email: pei.subansiri@pateleng.com

Ref: 20240625/382/SLHEP/ 2571

Date: 26-06-2024

To,
The Executive Director,
Subansiri Lower H.E. Project,
NHPC Ltd., Gerukamukh, Dhemaji
Assam-787035

Kind Attn.: Mr. Rajendra Prasad (Executive Director – I/C)

Sub: LOT SSL-6: Construction of Balance Civil works of Power House Complex from HRT Intake Structures to Tail Race Channel, Subansiri Lower HE Project: **Reg: Breach of coffer dyke and subsequent ingress of river water in TRC area, Power House under PCC Clause-4.27, 8**

Ref: 1. LOA- NH/CCW/CC-I/SO-76/2020/781-789 Dated: 01.09.2020
2. Contract Agreement No. NH/CCW/SUBANSIRI/LOT SSL-6 dated 21.09.2020

Dear Sir

With regards to the subject matter and under relevant contract conditions, Contractor hereby intimate the breach of Coffor Dyke on 25/06/2024 and subsequent flooding of TRC area as a result of the rise in river water level and discharge.

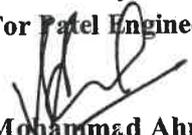
At around 2:00 PM on 25/06/2024, due to release of reservoir water through the Dam Gate S-9 and rise in river water level, scouring of Coffor Dyke started at adjacent to Unit-8 location. And at around 2:15 PM, the Coffor Dyke was breached in front of Unit-8 and river water started entering into TRC. The river water discharge recorded was approx. 6000 cumecs. Within 2 hours time i.e. by 5:30 PM of 25/06/2024, the entire TRC area of Power House got flooded with the river water.

Considering the safety aspect of project structures and resources, the vulnerable working areas of Power House are stopped of all work activities. As a stand-by, Contractor have deployed substantial resources including water pumps, machineries and manpower for mitigation measures.

Due to ongoing situation, the Contractor hereby notify the hindrances caused to works as per GCC/PCC Clause-4.27, 8 and relevant Contract Condition. The commensurate time and cost claim shall be submitted in due course of time. This is for your kind information and record please.

Thanking you and assuring our best service all the time.

Yours Truly,
For Patel Engineering Ltd.

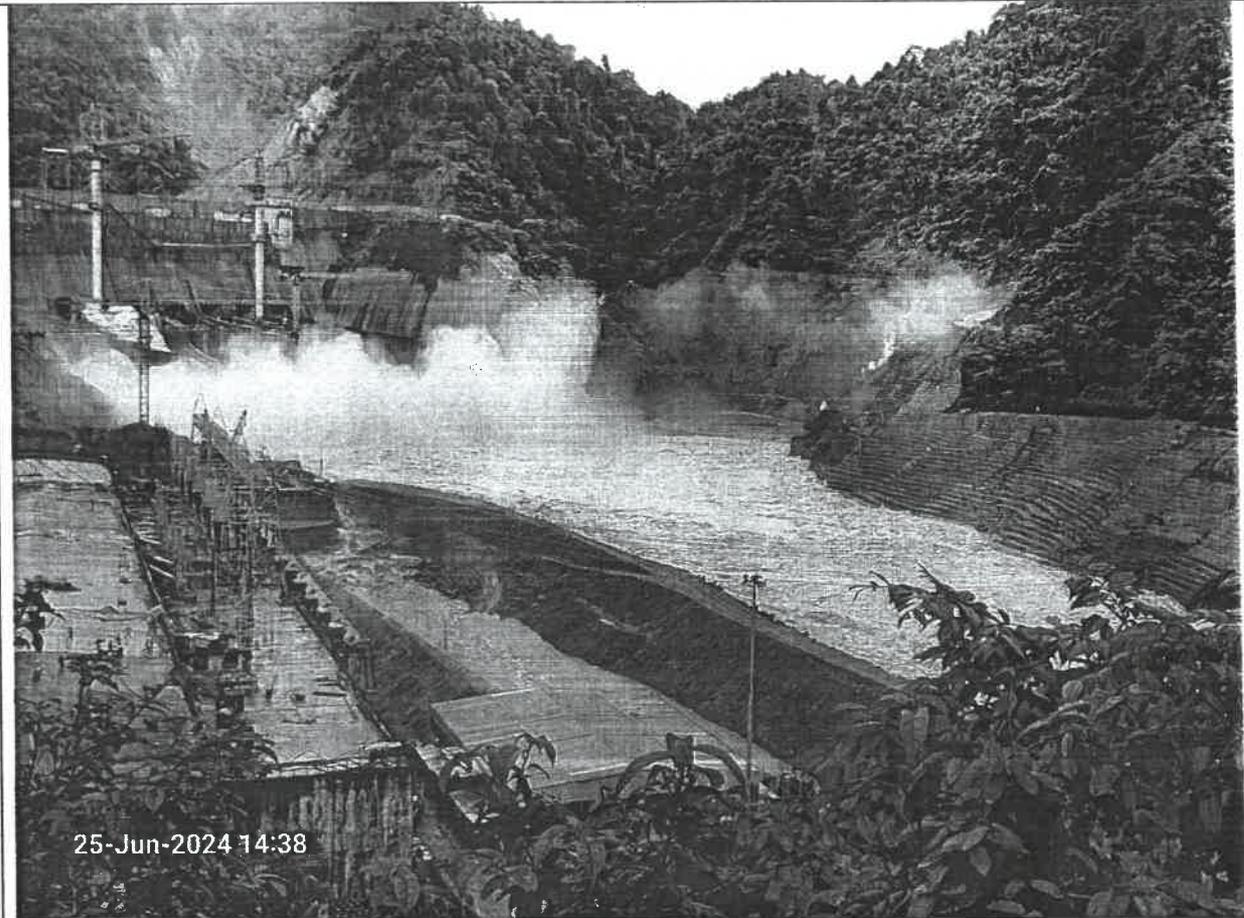

Mohammad Ahmed Khan
Additional General Manager-Projects



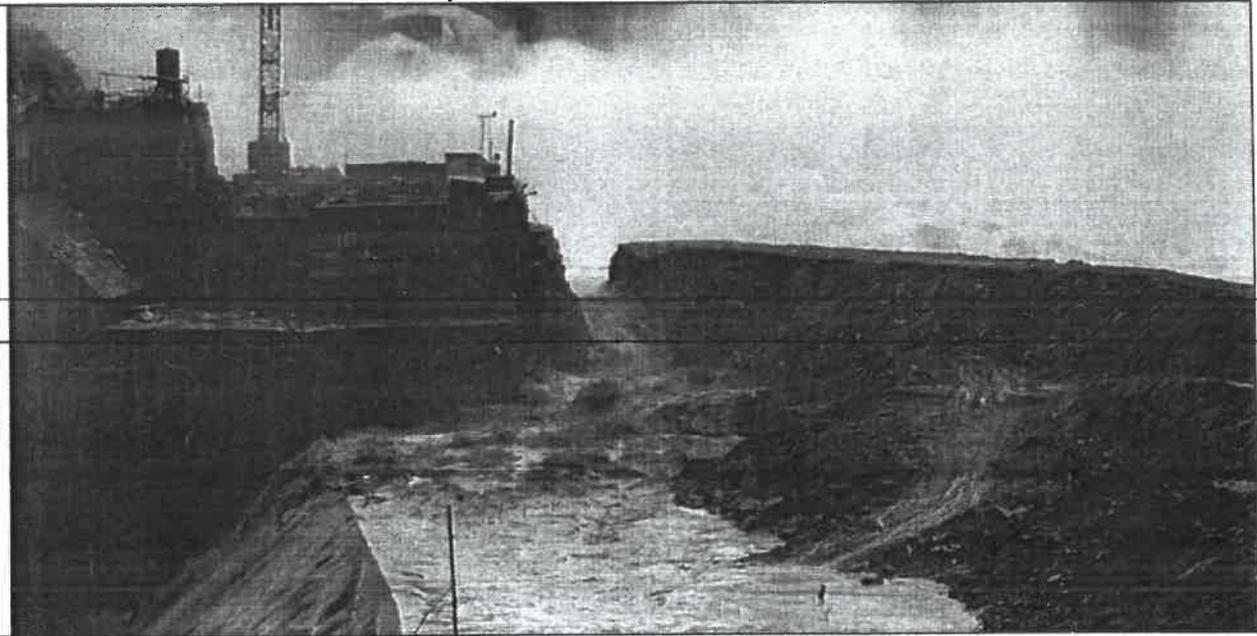
CC: General Manager, PH, Subansiri Lower H.E. Project, NHPC Ltd.

Enclosed: Photographs
REGD. OFFICE : Patel Estate Road, Jogeshwari (W), Mumbai 400 102 India
Tel: +91 22 26767500, 26782916 Fax +91 226782455, 26781505
Email: headoffice@pateleng.com Web: www.pateleng.com
CIN: L99999MH1949PLCOO7039

Photographs



Coffer Dyke Breached at 2:15 PM (25-06-2024)



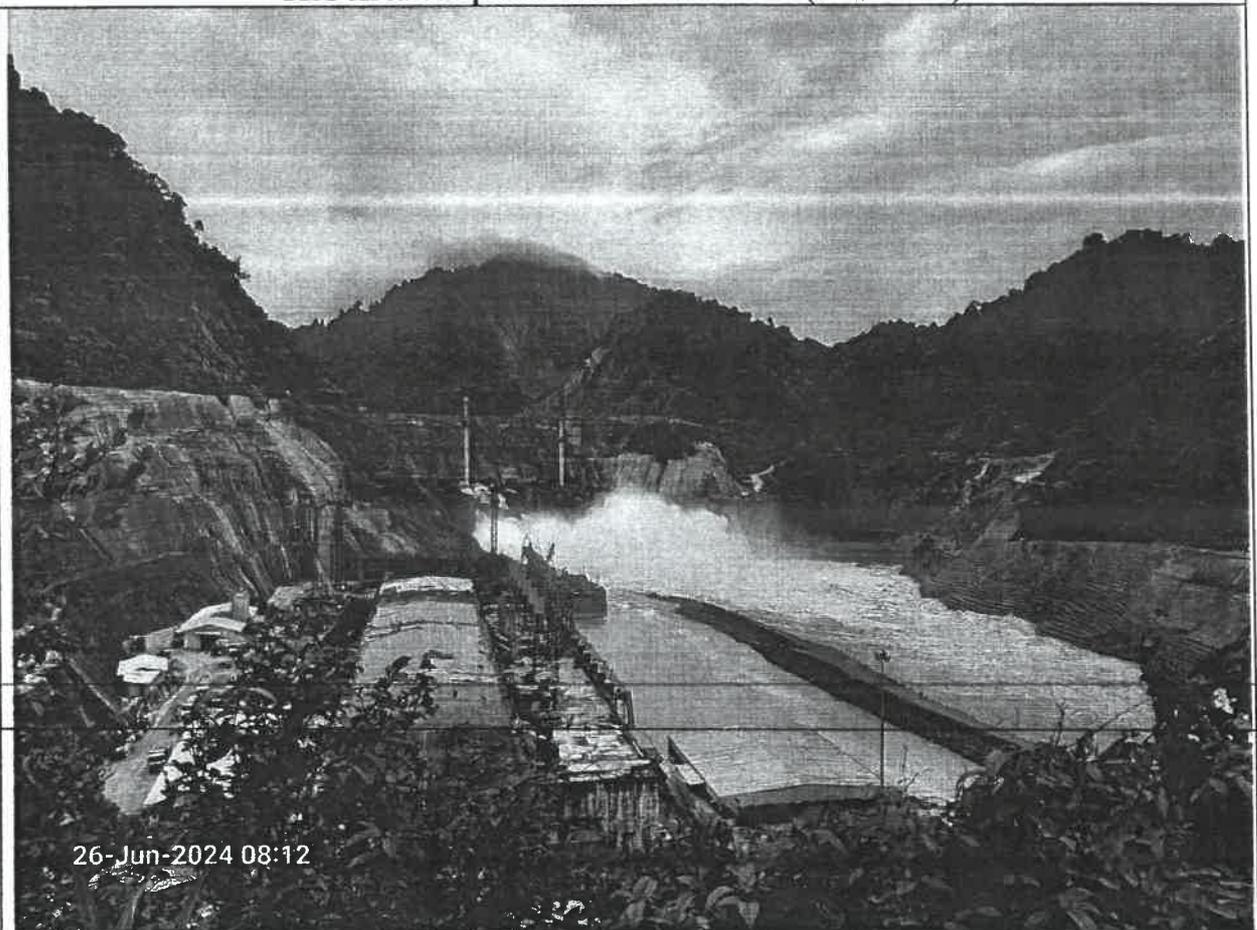
Coffer Dyke Breached at 2:15 PM (25-06-2024)

A handwritten signature in black ink, appearing to be "V. S. S.", located at the bottom left of the page.



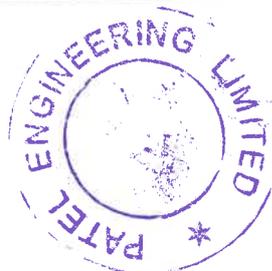


TRC Area completed flooded at 5:30 PM (25-06-2024)



26-Jun-2024 08:12

Flooded TRC Area



सुबनसिरी लोअर जलविद्युत परियोजना (2000 MW), अरुणाचल प्रदेश													
दैनिक प्रगति रिपोर्ट Daily Progress Report on All Activities दिनांक : 18.01.2025													
क्र.सं Sl. No.	गतिविधि Activity	ईकाइ Unit	कुल मात्रा Total Qty.	31.03.2024 तक कुल संचयी प्रगति	गत माह तक प्राप्ति FY: 2024-25	दैनिक प्रगति		मासिक प्रगति		कुल संचयी प्रगति	शेष मात्रा	कुल संचयी प्रगति (%)	Remarks
						लक्ष्य	वास्तविक	लक्ष्य	वास्तविक				
सिविल निर्माण Civil Works:													
ए A बांध निर्माण Dam Works													
1	बांध कंक्रीटिंग Dam concreting												→ Today's Achievement (Dam)= 0 m³ Total Concrete poured in the dam during Jan-2025 = 45+0= 45m³
	Diversion Tunnel(DT) Plugging												→DT plugging:- DT-1:- 95 m³ DT-2:- 0 m³ DT-3:- 0 m³ DT-4:- 0 m³ DT-5:- 70 m³ Total DT plugging today= 165 m³ → Miscellaneous concrete:- • Widening of existing High Level Road in DT Inlet cavity area by filling of M20A40 grade concrete=390(D)+480(N)= 870 m³ Cumulative progress=33880+870= 34750 m³ • Concreting for widening of 153 bench = 0 m³ • Deo Nallah Toe protection = 0 m³ • Left bank (D/S) cladding wall = 0m³ • Left bank HLR cladding wall = 105 m³ • Road tunnel concrete= 27 m³ • Right bank cladding wall = 60 m³ • Hathi Nallah cladding wall = 270 m³ • Right bank electrical panel plinth concreting = 0 m³ • Concreting at 200 bench (DT inlet area)= 0 m³ • Concreting at 150 bench (DT inlet area)= 0 m³ • Concreting at 146 bench (DT inlet area)= 0 m³ • Under water concreting b/w DT1 to DT3- inlet area = 575 m³ ◆ Total Misc. Concrete including DT plugging, poured today= 2072 m³. ◆ Total Misc. Concrete including DT plugging, during Jan-2025 = 23666+2072= 25738 m³ ◆ Grand Total Concrete during Jan-2025 = 45+25738= 25783 m³ → Cement stock:- Opening balance today = 72300 → Main Dam:- → Drainage Gallery maintenance & finishing is in progress. → Total Manpower (D/N shift)- 1056/280 Nos. → SDA drilling at U/S Cavity area above HLR left bank hill.(depth=12m) Today= 0 nos. Total= 318+0= 318 nos. → SDA drilling at U/S of Dam Axis for left bank cladding wall above 153 bench approach road (depth=12m) Today= 0 nos. Total= 164+0 = 164 nos.
(i)	मुख्य बांध एचपीसी सहित Main Dam including HPC												
	बलाक एस Block S-1	m³	89677.5	89734.15	66.50	0	0.00	0	0.00	89801	-123.15		
	बलाक एस - Block S-2	m³	82827	80276.38	20.00	0	0	0	45.00	80341.38	2485.62		
	बलाक एस - Block S-3	m³	112205	112261.11	21.00	0	0	0	0.00	112282.11	-77.11		
	बलाक एस -Block S-4	m³	153971.5	153732.52	89.50	0	0.00	0	0.00	153822.02	149.48		
	बलाक एस - Block S-5	m³	170201	170097.5	51.50	0	0.00	0	0.00	170149	52		
	बलाक एस -Block S-6	m³	173088	172760.49	20.00	0	0	0	0.00	172780.49	307.51		
	बलाक एस - Block S-7	m³	160961.5	160642.67	75.00	0	0	0	0.00	160717.67	243.83		
	बलाक एस -Block S-8	m³	145640.5	145724	81.00	0	0	0	0.00	145805.00	-164.5		
	बलाक एस - Block S-9	m³	85709.25	85770.74	68.00	0	0	0	0.00	85838.74	-129.49		
	ऑल्ड डैम Old Dam Shear Key & Apron	m³	35774	35774	0.00	0	0	0	0.00	35774	completed		
	कुल मुख्य बांध एचपीसी सहित Total Main Dam including HPC		1210055.25	1206773.56	492.50	0.0	0.00	0	45.00	1207311	2744.19	99.77%	
(ii)	स्पिल वे विस्तार Extended Spillway including Shear Key & Apron												
	बलाक एस Block S-1	m³	54926.5	54926.5	0.00	0	0.00	0	0.00	54926.5	0	100%	
	बलाक एस Block S-2	m³	51453.5	51453.5	0.00	0	0.00	0	0.00	51453.5	0	100%	
	बलाक एस Block S-3	m³	77143.5	77143.5	0.00	0	0.00	0	0.00	77143.5	0	100%	
	बलाक एस Block S-4	m³	67021	67021	0.00	0	0.00	0	0.00	67021	0	100%	
	बलाक एस Block S-5	m³	56530	56530	0.00	0	0.00	0	0.00	56530	0	100%	
	बलाक एस Block S-6	m³	54562	54562	0.00	0	0.00	0	0.00	54562	0	100%	
	बलाक एसBlock S-7	m³	66273	66273	0.00	0	0.00	0	0.00	66273	0	100%	
	बलाक एसBlock S-8	m³	101836	101836	0.00	0	0.00	0	0.00	101836	0	100%	
	बलाक एसBlock S-9	m³	118419.5	118419.5	0.00	0	0.00	0	0.00	118419.50	0	100%	
	कुल स्पिल वे विस्तार Total Extended Spillway including Shear Key & Apron		648165	648165	0	0	0.00	0	0	648165	0	100%	Completed
2	नान ओवर फ्लो ब्लॉक Non Over Flow Block												
	लेफ्ट बैंक Left Bank	m³	99648.5	99730.5	83.00	0	0.00	0	0.00	99813.5	-165		
	राइट बैंक Right Bank	m³	92595.5	92709	56.00	0	0.00	0	0.00	92765.00	-169.5		
	कुल मात्रा Total Qty.	m³	2050464.25	2047378.06	631.5	0	0.00	0	45.00	2048054.56	2409.69	99.88%	
3	Cutoff Wall (Excavation and Concreting)												
	Cut off Wall Excavation	m²	17634	18182	0	0	0.00	0	0.00	18182.00	Completed		
	Cut off Wall Concreting	m²	18606	19447	0	0	0.00	0	0.00	19447.00			
4	क्लॉडिंग कंक्रीटिंग Cladding Concrete in Dam (U/S & D/S)	m³	87000	65704	0	0	0.00	0	0.00	65704.00	21296		
5	S1 and S2 Old Apron Demolition	m³	3200	3170	0	0	0.00	0	0.00	3170.00	Completed		
बी B	HRT and Power House Area												★ Concrete plug between UHPS-8 and UHPS-7 completed on 17.01.2025. → Today Concreting ◆ Nil Cum → Month JANUARY_25 ◆ Gross Concreting ◆ 1610 Cum
1	HRT												◆ HRT_1 to 8 Major Civil works completed. ◆ Cleaning & Finishing in progress ◆ HRT-1
1.1	Heading Excavation												
1.1.1	HRT-1	RM	1165	1165	0	0	0	0	0	1165.00		100%	
1.1.2	HRT-2	RM	1089	1089	0	0	0	0	0	1089.00		100%	
1.1.3	HRT-3	RM	1013	1013	0	0	0	0	0	1013.00		100%	
1.1.4	HRT-4	RM	937	937	0	0	0	0	0	937.00		100%	
1.1.5	HRT-5	RM	840	840	0	0	0	0	0	840.00		100%	
1.1.6	HRT-6	RM	764	764	0	0	0	0	0	764.00		100%	
1.1.7	HRT-7	RM	689	689	0	0	0	0	0	689.00		100%	
1.1.8	HRT-8	RM	605	605	0	0	0	0	0	605.00		100%	
	Total	RM	7102	7102.00	0.00	0.00	0.00	0.00	0.00	7102.00	0	100%	Completed
1.2	Benching Excavation												
1.2.1	HRT-1	RM	1165	1165	0.00					1165.00		100%	
1.2.2	HRT-2	RM	1089	1089	0.00					1089.00		100%	
1.2.3	HRT-3	RM	1013	1013	0.00					1012.91		100%	
1.2.4	HRT-4	RM	937	937	0.00					937.00		100%	
1.2.5	HRT-5	RM	840	840	0.00					839.62		100%	Completed

क्र.सं Sl. No.	गतिविधि Activity	इकाई Unit	कुल मात्रा Total Qty.	31.03.2024 तक कुल संचयी प्रगति	गत माह तक प्राप्ति FY: 2024-25	दैनिक प्रगति		मासिक प्रगति		कुल संचयी प्रगति	शेष मात्रा	कुल संचयी प्रगति (%)	Remarks
						लक्ष्य	वास्तविक	लक्ष्य	वास्तविक				
1.2.6	HRT-6	RM	764	764	0.00					764.00		100%	
1.2.7	HRT-7	RM	689	689	0.00					689.40		100%	
1.2.8	HRT-8	RM	605	605	0.00					605.00		100%	
Total		RM	7102	7102	0	0.00	0.00	0.00	0.00	7102	0	100%	
1.3	Overt Concrete Lining												
1.3.1	HRT-1	RM	1165	1165.15	0.00					1165.00		100%	
1.3.2	HRT-2	RM	1089	1089	0.00					1089.00		100%	
1.3.3	HRT-3	RM	1013	1013	0.00					1013.00		100%	
1.3.4	HRT-4	RM	937	937	0.00					937.00		100%	
1.3.5	HRT-5	RM	840	840	0.00					840.00		100%	
1.3.6	HRT-6	RM	764	764	0.00					764.00		100%	
1.3.7	HRT-7	RM	689	689	0.00					689.00		100%	
1.3.8	HRT-8	RM	605	604.81	0.00					605.00		100%	
Total		RM	7102	7102	0.00	0.00	0.00	0.00	0.00	7102	0	100%	
1.4	Invert Concrete Lining												
1.4.1	HRT-1	RM	1165	1165	0.00					1165.00	0	100%	
1.4.2	HRT-2	RM	1089	1089	0.00					1089.00	0	100%	
1.4.3	HRT-3	RM	1013	1013	0.00					1012.99	0.0	100%	
1.4.4	HRT-4	RM	937	937	0.00					937.02	0	100%	
1.4.5	HRT-5	RM	840	840	0.00					840.33	0	100%	
1.4.6	HRT-6	RM	764	764	0.00					764.00	0.00	100.00%	
1.4.7	HRT-7	RM	689	689	0.00					689.00	0	100.00%	
1.4.8	HRT-8	RM	605	604.92	0.00					604.92	0	100%	
Total		RM	7102	7102	0.00	0.00	0.00	0.00	0.00	7102.26	-0.3	100.00%	
2	Pressure Shaft												
2.1	Horizontal Pressure Shaft												
2.1.1	Horizontal Pressure Shaft (Heading)	RM	1429	1429	0					1429.00	Completed	100%	<ul style="list-style-type: none"> Concrete structure ~ UHPS_1 to 8 Major Civil works completed except joint with steel liner in UHPS_7. ◆ Adit_4 concrete Plug (188.6m) ~ UHPS-8/7 (19.3m)◆Completed ~ UHPS-7/6 (30 m)◆Site preparations for balance lining part of UHPS-7 in progress.
2.1.2	Horizontal Pressure Shaft (Benching)	RM	1429	1429	0					1429.00	Completed	100%	
2.1.3	Concrete in Penstock	RM	1594	1342.02	178.98	0.00	0.00	0	0.00	1521.00	73	95.42%	
2.1.3	Concrete in Penstock	RM	1594	1342.02	178.98	0.00	0.00	0	0.00	1521.00	73	95.42%	
2.2	Vertical Pressure Shaft												
2.2.1	Raise Boring & Reaming (new arrangement)	RM	382	382	0.00					382.00	Completed	100%	<ul style="list-style-type: none"> ◆ Backfill Concrete Interdependent with steel liner erection work. ~ LHPS & VPS_1 to 8 and UHPS_2&4&5&6&8◆Completed. ~ UHPS-7_Backfill◆
2.2.2	Slashing	RM	382	382.0	0.00					382.00	Completed	100%	
3	Power House												<p>*Total Manpower: - (D/N) = (371+190) = 561 No's.</p> <p>*Additional Service Bay*</p> <ol style="list-style-type: none"> E Line, EL-120.30m, Column & Main Beam Reinforcement & Shuttering work. D' line ,EL-120.3m, Column & Main Beam Reinforcement work. <p>*TRC*</p> <ol style="list-style-type: none"> Slush removal work is in progress. Unit-5, Draft tube area Cleaning work. Unit-6, Vent- 1 Gate groove area, Chipping work is in progress. Unit-7, Vent- 1 Gate groove area, Chipping work is in progress. Unit-8, Vent- 2 Gate groove area, Chipping work is in progress. <p>*Hill Side Slope Protection Work*</p> <ol style="list-style-type: none"> Cladding wall-1, Concrete work, Nil. Cladding wall-2, Nil. Dyke D/S cladding wall, Nil. <p>*Dewatering *</p> <ol style="list-style-type: none"> Dewatering of PH in Progress. <p>*Hindrances*</p> <ol style="list-style-type: none"> Architectural work hampered due to deviation in E&M drawing.
3.1	Excavation in Power House	m3	3260000	3260000	0.00					3260000.00	Completed	100%	
3.2	Concreting in PH	m3	613553	523199	43881.50	0.00	5.00	0	1875.00	568955.50	44598	92.73%	*Total Concreting (0+5) = 05 cum. *Cumulative Concreting in the month of January(1870+0+5) = 1875cum*
a	UNIT-1												
	A to B line (Auxiliary Building)												
	B to D line (Machine Hall)												
	D to E line (MIV Area)												
b	UNIT-2												
	A to B line (Auxiliary Building)												
	B to D line (Machine Hall)												1.EL-103.00m & 107.00m, Granolithic flooring work.
	D to E line (MIV Area)												
c	UNIT-3												
	A to B line (Auxiliary Building)												
	B to D line (Machine Hall)												
	D to E line (MIV Area)												
	Beyond E-line												
d	UNIT-4												
	A to B line (Auxiliary Building)												
	B to D line (Machine Hall)												
	D to E line (MIV Area)												
	Beyond E-line												
e	UNIT-5												
	A to B line (Auxiliary Building)												A1 to B line, EL-124m , Flooring Concrete work.*Qty:- 05 cum.
	B to D line (Machine Hall)												1. Draft Tube Area, EL-103m(+), Reinforcement & Shuttering work.
	D to E line (MIV Area)												
	Beyond E-line												
f	Unit-6												
	A to B line (Auxiliary Building)												1.A1 to B line, EL-136m , Reinforcement & Slab Staging work.
	B to D line (Machine Hall)												1. B to D line, EL-92.70m(+), Nil.
	D to E line (MIV Area)												
	Beyond E-line												
g	Unit-7												
	A to B line (Auxiliary Building)												1. A1 to B line, EL-136m , Shuttering, Reinforcement & Slab Staging work.
	B to D line (Machine Hall)												1. B to D line EL-92.70m , nil.
	D to E line (MIV Area)												2. D-line EL-131 m, Main Beam Reinforcement work.
	Beyond E-line												1. D-Line EL-122.30, Shuttering work. 2. E line EL-124.50m , Nil.
g	Unit-8												
	A to B line (Auxiliary Building)												1. B line, EL-131m, Crane Beam Soffit fixing work.
	B to D line (Machine Hall)												2. B line, EL-136m(+), Reinforcement work.
	D to E line (MIV Area)												1. Draft Tube Area, EL-92.70m(+), Nil.
	Beyond E-line												2. D-Line, EL131m , Cantilever Slab reinforcement work.
3.4	TRC	m3											
4	Intake Structure												
4.1	Excavation	m3	857475	857475						857475.00	Completed	100%	<ul style="list-style-type: none"> Major Civil works completed. ~ Cladding◆ ~ Control Room Intake Block◆ ~ Intake Betn 5/6 Surface concrete◆
4.2	Intake Concreting												
4.2.1	Unit 1 to 4	m3	139727	139727						139727.00	0	100%	
4.2.2	Unit 5 to 8	m3	139727	139727						139727.00	0	100%	
5	Surge Tunnel												
	Major equipment status												
5.1	ADIT to Surge Tunnel												
5.1.1	Heading Exc. of Adit to Surge Tunnel	RM	1568	1568						1568.00	Completed	100%	<ul style="list-style-type: none"> ◆ ST_1 to 8◆Major Civil works completed. ◆ Grouting, Cleaning & Finishing in progress◆
5.1.2	Benching Exc. Of Adit to Surge Tunnel	RM	1568	1568						1568.00	0.00	100%	
5.2	Surge Tunnels Heading Excavation												
5.2.1	ST-1	RM	485	485	0.00	0.0	0.00	0	0.00	485.1			<p>Completed</p>
5.2.2	ST-2	RM	475	475	0.00	0.0	0.00	0.00	0.00	475.0			
5.2.3	ST-3	RM	465	465	0.00	0.0	0.00	0	0.00	464.6			
5.2.4	ST-4	RM	455	455	0.00	0.0	0.00	0	0.00	455.0			
5.2.5	ST-5	RM	430	430	0.00	0.0	0.00	0.00	0.00	430.0			
5.2.6	ST-6	RM	425	425	0.00	0.0	0.00	0	0.00	425.2			

क्र.सं Sl. No.	गतिविधि Activity	ईकाइ Unit	कुल मात्रा Total Qty.	31.03.2024 तक कुल संचयी प्रगति	गत माह तक प्राप्ति FY: 2024-25	दैनिक प्रगति		मासिक प्रगति		कुल संचयी प्रगति	शेष मात्रा	कुल संचयी प्रगति (%)	Remarks
						लक्ष्य	वास्तविक	लक्ष्य	वास्तविक				
5.2.7	ST-7	RM	410	410	0.00	0.0	0.00	0.00	0.00	410.0			
5.2.8	ST-8	RM	400	400	0.00	0.0	0.00	0.00	0.00	400.0			
Total		RM	3545	3545	0.00	0.0	0.00	0.0	0.0	3544.86	0	100%	
5.3	Benching Excavation												
5.3.1	ST-1	RM	485	485	0.00	0.0	0.00	0.00	0.00	485.00	Completed	Completed	
5.3.2	ST-2	RM	475	475	0.00	0.0	0.00	0.00	0.00	475.00			
5.3.3	ST-3	RM	465	465	0.00	0.0	0.00	0.00	0.00	465.00			
5.3.4	ST-4	RM	455	455	0.00	0.0	0.00	0.00	0.00	455.00			
5.3.5	ST-5	RM	430	430	0.00	0.0	0.00	0.00	0.00	430.00			
5.3.6	ST-6	RM	425	425	0.00	0.0	0.00	0.00	0.00	425.00			
5.3.7	ST-7	RM	410	410	0.00	0.0	0.00	0.00	0.00	410.00			
5.3.8	ST-8	RM	400	400	0.00	0.0	0.00	0.00	0.00	400.00			
Total		RM	3545	3545	0.00	0.0	0.0	0.0	0.0	3545.0	0	100.00%	
5.4	Overt Concrete Lining												
5.4.1	ST-1	RM	485	485.00	0.00	0.00	0.00	0	0.00	485.00	0.00	100.00%	Completed
5.4.2	ST-2	RM	475	475.00	0.00	0.00	0.00	0	0.00	475.00	0.00	100.00%	
5.4.3	ST-3	RM	465	465.00	0.00	0.00	0.00	0	0.00	465.00	0.00	100.00%	
5.4.4	ST-4	RM	455	425.00	30.00	0.00	0.00	0	0.00	455.00	0.00	100.00%	
5.4.5	ST-5	RM	430	412.00	18.00	0.00	0.00	0	0.00	430.00	0.00	100.00%	
5.4.6	ST-6	RM	425	301.29	123.71	0.00	0.00	0	0.00	425.00	0.00	100.00%	
5.4.7	ST-7	RM	410	360.95	49.05	0.00	0.00	0	0.00	410.00	0.00	100.00%	
5.4.8	ST-8	RM	400	198.90	201.10	0.00	0.00	0	0.00	400.00	0.00	100.00%	
Total		RM	3545	3123.14	421.86	0.00	0	0	0.00	3545	0	100.00%	
5.5	Invert Concrete Lining												
5.5.1	ST-1	RM	475	475	0.00	0	0	0	0.00	475.00	0.00	100.00%	Completed
5.5.2	ST-2	RM	465	465	0.00	0	0	0	0.00	465.00	0.00	100.00%	
5.5.3	ST-3	RM	455	455.00	0.00	0	0	0	0.00	455.00	0.00	100.00%	
5.5.4	ST-4	RM	445	282	163.00	0	0	0	0.00	445.00	0.00	100.00%	
5.5.5	ST-5	RM	420	0	420.00	0	0	0	0.00	420.00	0.00	100.00%	
5.5.6	ST-6	RM	415	415	0.00	0	0	0	0.00	415.00	0.00	100.00%	
5.5.7	ST-7	RM	400	0	400.00	0	0	0	0.00	400.00	0.00	100.00%	
5.5.8	ST-8	RM	390	0	390.00	0	0	0	0.00	390.00	0.00	100.00%	
Total		RM	3465	2092	1373.00	0	0	0	0.00	3465.00	0	100.00%	
5.6	Vertical Surge Shaft lining												
5.6.1	Slashing	RM	88.5	82	0	0.00		0.00		88.50	0	100%	
सी C	लॉट -3 एचएम कार्य Lot-3 -HM Work												HINDRANCES 1. LHPS and Lower Bend area from Lane 6 to Lane 7 not cleared by Civil from rock mass & Water logging (from Upper Bend step cutting),grout deposit,water logging,etc.As a result Grout plug welding,repair welding,UT & inside painting of Ferrules are stalled. *MANPOWER* *PS LINER* =44 *DRAFT TUBE* =12 *INTAKE GATE* =07 *RADIAL GATE* =145 Total manpower for HM works=208Nos
1	DIVERSION TUNNEL GATES												
	डाइवर्ज टनल के गेट का निर्माण Erection of Diversion Tunnel Gate (10 gates)	%	100%	100.00%	0.00%	0.000%		0.000%		100.0%	0.00%	100.0%	
	Rope drum Hoist complete in all respect with trestle and control Equipment (Cap 125 T) (10 RDH)	%	100%	100.00%	0.00%	0.000%		0.000%		100.0%	0.00%	100.0%	
2	INTAKE SERVICE GATES												1. ISG#6 Final finishing work under progress
	इन्टेक गेट का निर्माण Erection of Intake Service gate (8 sets)	%	100%	97.50%	0.00%	0.000%		0.00%		97.50%	2.50%	97.50%	
	2nd Stage EP of Intake Service Gates (8 sets)	%	100%	100%	0	0.00		0.00%		100.00%	0.00%	100.00%	
	RDH for Intake Service Gates (8 sets)	%	100%	100%	0.00%	0.0%		0.0%		100.00%	0.00%	100.00%	
3	INTAKE BULKHEAD GATES												
	Erection of Intake Bulkhead gate (2 sets)	%	100%	97.50%	0.00%	0.000%		0.0%		97.50%	2.50%	97.50%	
	Gantry Crane for Intake Bulkhead Gate (2 sets)	%	100%	97.50%	2.50%	0.000%		0.0%		100.00%	0.00%	100.00%	
	2nd Stage EP of Intake Bulkhead Gates (8 sets)	%	100%	100%	0.00%	0.000%		0.0%		100.00%	0.00%	100.00%	
4	INTAKE TRASH RACK & PANELS												
	इन्टेक ट्रेस रैक का निर्माण Erection of Intake Trash Rack and panels (8 sets)	%	100%	97.85%	2.15%	0.00%		0.00%		100.00%	0.00%	100.00%	
5	PRESSURE SHAFT STEEL LINER												
	प्रेसर शाफ्ट लाइनर का निर्माण Erection of Pressure shaft liner												1. Ferrule Shifting in PSL:-Nil 2. Ferrule Fit-up Completed:- Nil 3. Ferrule Welding Completed:- Nil Total Progress during the month of January 2025- 01 nos
	LANE-1	RM	193	187.69	0.00	0.000		0.000		187.693	5.307	97.25%	
	LANE-2	RM	215	215.01	0.00	0.00		0.000		215.01	-0.008	100.00%	1. Erection of Ferrule completed.
	LANE-3	RM	210	202.90	5.85	0.000		1.255		210.00	0.00	100.00%	1. Erection of Ferrule completed. 2. U Bend Closure Ferrule B-2SL-3B, C/S Welding is in progress
	LANE-4	RM	210	205.51	4.50	0.00		0.000		210.00	0	100.00%	1. Erection of Ferrule completed. 2. Cleaning and Final inside painting work under progress. 3. Joint preparation for UT work in progress 4. Repair cutting and welding after UT is in progress 5. LB-4, Bhara erection work under progress 6. B-1SL-4B&5A UT completed
	LANE-5	RM	210	202.26	7.74	0.00		0.000		210	0	100.00%	1. Erection of Ferrule completed.
	LANE-6	RM	208	205.84	2.16	0.00		0.000		208	0	100.00%	1. Erection of Ferrule completed.
	LANE-7	RM	175	168.34	6.66	0.00		0.000		175	0	100.00%	1. Erection of Ferrule completed 2. Transition Ferrule T-2SL-3-7, C/ S & L/S Welding in progress
	LANE-8	RM	173	167.79	5.21	0.00		0.000		172.997	0.003	100.00%	1. Erection of Ferrule completed. 2. LHPS&LB-8, Repair cutting and welding after UT under progress
Total		RM	1594	1555.34	32.11	0.000		1.26		1588.70	5.30	99.67%	
6	DRAFT TUBE GATES												
	EPs of draft tube gates (24 SETS)	%	100%	92.77%	7.23%	0.000%		0.000%		100.00%	0.00%	100.00%	1. DTG #17 rubber seal rectification in progress 2. DTG#22:Gate Sheaves erection is under progress
	ड्राफ्ट ट्यूब गेट का निर्माण Erection of Draft tube gate (24 GATES)	%	100%	50.22%	44.95%	0.00%		0.83%		96.00%	4.00%	96.00%	
	RDH for draft tube gates (24 SETS)	%	100%	50.52%	45.43%	0.00%		0.02%		95.97%	4.03%	95.97%	
7	Spillway Radial Gates												
	स्पिलवे रेडियल गेट का निर्माण Structural Erection of Spillway Radial Gates	%	100%	76.93%	14.03%	0.000%		2.15%		93.11%	6.89%	93.11%	*S#4 Radial Gate* 1. Loading & unloading of skin plate 3/3 completed 2. Top arm TA-1,2,3 & 4 erection completed 3. Loading & unloading of skin plate 4/1 completed 4. Bottom arm & lifting bracket welding is in progress
	EPs of spillway radial gates	%	100%	67.41%	19.89%	0.000%		1.37%		88.67%	11.33%	88.67%	*S#5 Radial Gate* 1. LHS & RHS closer plate from D/s erection completed 2. Clamp plate hole matching with side seal angle is in progress 3. RHS & LHS closer plate from D/s welding is in progress 4. Top seal liner welding is in progress 5. RHS & LHS closer plate from U/s erection is in progress

क्र.सं Sl. No.	गतिविधि Activity	इकाई Unit	कुल मात्रा Total Qty.	31.03.2024 तक कुल संचयी प्रगति	गत माह तक प्राप्ति FY: 2024-25	दैनिक प्रगति		मासिक प्रगति		कुल संचयी प्रगति	शेष मात्रा	कुल संचयी प्रगति (%)	Remarks
						लक्ष्य	वास्तविक	लक्ष्य	वास्तविक				
													<p>*S#6 Radial Gate*</p> <ol style="list-style-type: none"> Web plate welding of skin plate 4/3 & 4/4 is in progress Stiffener of skin plate 3/3 & 3/4 welding of is in progress RHS side seal hole tapping is in progress Vertical girder of skin plate 3/2 & 2/1 welding is in progress Antijet seal erection is in progress Horizontal girder of skin plate 4/2 & 4/3 welding is in progress <p>*Night Shift*</p> <p>*S#4 Radial Gate*</p> <ol style="list-style-type: none"> LHS & RHS closer plate from U/s welding is in progress Bottom arm BA-4 welding is in progress Stiffener welding of skin plate 1/1 & 1/2 is in progress RHS closer plate from D/s welding is in progress <p>*S#5 Radial Gate*</p> <ol style="list-style-type: none"> RHS & LHS closer plate welding is in progress <p>*S#6 Radial Gate*</p> <ol style="list-style-type: none"> Horizontal joint of skin plate unit-3 & 4 welding is in progress LHS & RHS closer plate from U/s welding is in progress Vertical girder of skin plate 3/1 & 2/1,3/2 & 2/1 welding is in progress RHS & LHS closer plate from D/s welding is in progress Skin plate 2/1 & 2/2 vertical joint welding is in progress
8	SPILLWAY BULKHEAD GATES												
	EPs of spillway bulkhead gates	%	100%	94.79%	5.21%	0.00%		0.00%		100.00%	0.00%	100.00%	
	सिपलवे बल्कहेड गेट का निर्माण Assembly of Spillway Bulkhead Gates	%	100%	100.00%	0.00%	0.00%		0.00%		100.00%	0.00%	100.00%	
	Gantry crane for spillway bulkhead gates	%	100%	100%	0.00%	0.00%		0.00%		100.00%	0.00%	100.00%	
डी D	E&M installation works at Powerhouse												<p>► Manpower: M/s GEPIL: 31 nos. M/s PES: 240 nos. M/s Andritz: 20 nos.</p>
1	Balance of plant												<p>►BOP(M)</p> <ol style="list-style-type: none"> Dewatering (drainage pump) of drainage sump (Power house leakage) water is in progress. Fabrication and erection of LP air line in U-3 & 4 turbine floor & EI 88 floor is in progress. Fabrication of sprinkler pipes of GSU transformer R phase U#3 is in progress. Installation of Unit#3 MIV Bypass valve and pipeline is in progress. DG set air exhaust pipeline fabrication is in progress. MIV Unit#3 OPU sprinkler system fabrication is in progress. Firefighting system header pipeline fabrication at pot headyard EL 136.0 M is in progress. Rail line installation at EL 120.0 M for 200 TON MIV EOT crane along E line at Unit#7 & 8 is in progress. Fabrication and erection of fire fighting sprinkler pipes of MIV OPU tank U#3 is in progress Installation of shaft seal cooling cyclone separator & pipeline of U#3 is in progress Installation of J hooks along D line at EI 131 of U#7 is in progress <p>►BOP(E):</p> <ol style="list-style-type: none"> Termination of cable at reactor LCP is in progress. Instrument cable laying for Bus reactor is in progress. Heating of HV & LV bushings of GT is in progress. Installation of cable tray near unit-7, A2-B line, EL-107.5 is in progress. Checking of MIV operation timings of unit- is done. Checking of temperature variables (alarm / trip) from temperature scanner-2 of unit-1 is in progress. Checking of generator initial conditions and breaking initial conditions of unit-2 is done. Testing of generator protection relay P343 of Unit 3 is in progress. Modification of logics in SCADA is in progress. Shifting of SST-4 at EL-107.5 is in progress. Internal wiring of 11KV panel at EL-124.5 is in progress. Laying of cable from UAB to Gov. starter panel at EL-103.0 is in progress. Cleaning of rotor rim laminations at R/B store is in progress (Cumulative progress: 5850 nos.) Over ground earthing of GT rail of unit-3 EL-113.0 is in progress. Fixing of blanking plate for UAT-1 turret is in progress. Illumination conduit near unit-6, A1-A2 line at EL-107.5 is in progress. Installation of conduit in A2-B line of unit-6 at EL-107.5 is in progress.
1.1	Erection of rails for 340T crane at D line	M	270	190	26	0.00		0.00		216.00	54	80.00%	
2	Unit-1	%	100%	99.50%	0.00%	0.00%		0.00%		99.50%	0.50%	99.50%	
	Stator												
	Rotor												
	Turbine												
	Generator Transformer												
	MIV												
3	Unit-2	%	100%	99.50%	0.00%	0.00%		0.00%		99.50%	0.5%	99.50%	
	Stator												
	Rotor												
	Turbine												
	Generator Transformer												
	MIV												1. Filtration of oil of GT-2R is in progress.
4	Unit-3	%	100%	41.30%	41.70%	0.00%		2.0%		85.00%	15.00%	85.00%	<p>►Lower bracket:</p> <ol style="list-style-type: none"> Assembly of LGB cover plates is in progress. <p>►Upper Bracket:</p> <ol style="list-style-type: none"> Welding of upper bracket base plates with arms is in progress. Fabrication of UGB cooler's CW pipeline is done. Fabrication of UGB cooler's oil filling & drain pipeline is in progress. <p>►Bus duct:</p> <p>Nil</p> <ol style="list-style-type: none"> Epoxy grouting of stator sole plates is in progress.
	Stator												
	Rotor												
	Turbine												1. Leakage test of rotating oil sump is in progress 2. Cleaning of shaft seal support is in progress 3. Bracing cutting of draft tube is in progress
	MIV												
	Generator Transformer												
5	Unit-4	%	100%	21.30%	21.70%	0.00%		2.00%		45.00%	55.00%	45.00%	
	Stator												1. Dry out of stator winding bottom bars is in progress. Measurement of IR and PI of bottom bars is taken. 2. Testing of RTDs & DTDs is in progress.
	Rotor												1. Arrangement for 1st intermediate pressing of rotor rim laminations is in progress.
	Turbine												1. Welding of DT grouting hole plug is in progress 2. Bracing cutting of draft tube is in progress
	MIV												1. Scaffolding erection for dimensional measurement and cutting of overlength on penstock is completed 2. Dimensional measurement on penstock is in progress
	Generator Transformer												1. Dry out of GT-4R is in progress.
0.5	Unit-5		100%	13.50%	12.50%	0.00%		0.50%		26.50%	73.5%	26.50%	1. Welding of stator frame segments is done.
	Stator												
	Rotor												
	Turbine												
	BOP												
7	Unit-6		100%	15.00%	3.00%	0%		0.50%		18.50%	81.5%	18.50%	
	Turbine												1. Welding of stay ring halves is in progress 2. Grit blasting & painting of draft tube is in progress
8	Unit-7		100%	13.50%	2.50%	0.00%		0.00%		16.00%	84.0%	16.00%	
	Turbine												
9	Unit-8		100%	9.00%	7.00%	0.00%		0.00%		16.00%	84.0%	16.00%	
	Turbine												
ई(E.)	Right bank Road near P/H:	%	100%										Completed
एफ(F)	Road Tunnel:	%	100%										
जी(G)	Deonallah (LLR EL 113 bench)	%	100%		0.00%								
एच H	High Level Road:	%	100%		0.00%								
आई I	Status of camera working at site	Job	100%		0.00%								All site Cameras are working

BGS - SGS - SOMA JV

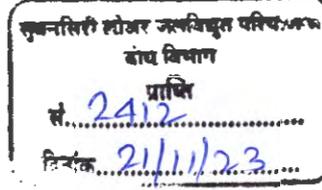
Subansiri Lower HE Project, SSL - 1

सुबनसिरी लोअर जल विद्युत परियोजना
परियोजना प्रमुख सचिवालय
संख्या... 2412
दिनांक 21/11/23

BGS-SGS-SOMA JV/PD/8813/2023-2024

Date: 21st November 2023

To
The Group General Manager (GGM)
"Engineer"



Subansiri Lower HE Project
NHPC Ltd, Gerukamukh

Sub: Construction of Diversion Tunnels, Cofferdams, Concrete Gravity Dam, Plunge Pool and Cut off Wall (LOT – SSL-1) – **Regarding Protection measures at Upstream of Dam Axis - drilling of 200mm dia. hole**

Ref:

- 1) NHPC letter no. NH/SLP/GM(Dam)/99(A)/2023/234 dated 30/10/2023
- 2) Our letter no. BGS-SGS-SOMA JV/PD/8806/2023-2024 dated 17/11/2023
- 3) Our letter no. BGS-SGS-SOMA JV/PD/8775/2023-2024 dated 04/11/2023
- 4) Our letter no. BGS-SGS-SOMA JV/PD/8769/2023-2024 dated 02/11/2023
- 5) Our letter no. BGS-SGS-SOMA JV/PD/8761/2023-2024 dated 27/10/2023
- 6) Our letter no. BGS-SGS-SOMA JV/PD/8740/2023-2024 dated 10/10/2023
- 7) Our letter no. BGS-SGS-SOMA JV/PD/8698/2023-2024 dated 16/09/2023
- 8) Our letter no. BGS-SGS-SOMA JV/PD/8673/2023-2024 dated 29/08/2023

Amongst many more letters on same/similar subject

Dear Sir,

Please refer to the letters referred at Sl. No. 2) to 4) whereby we have informed about the progress of 01st and 02nd 200 mm dia. drill hole at upstream of Dam Axis along DT-1 alignment at RD 55m & RD 64.2m for concreting inside DT-1 to plug the entire tunnel as far as feasible. So far 9,900 cum concreting and 90 cum slurry has been done as on 20.11.2023.

Further as per the instruction of NHPC at site and NHPC's letter referred at Sl. No. 1), drilling of 03rd hole of 200mm dia. hole (97m drilling depth) has been started on 09/11/2023 at RD 60m upstream of Dam Axis along DT-1 at EL 206 m. But at night on 10th Nov'23 after drilling about 96.5 m, further drilling work stopped due to breakage of adopter along with hammer drill bit arrangement and the damaged parts of adopter/hammer drill bit assembly got stuck inside hole, preventing any further drilling through same hole despite of several attempts.

Again on 13/11/2023, 04th drill hole of 200mm dia. hole (97m drilling depth) started at new location as per direction at site of NHPC at RD 64.20m upstream of Dam Axis along DT-1 alignment, at EL 206.20 m left side. But unfortunately at about 05:00 PM on 15/11/2023, after drilling about 94m, the drilling bit got stuck and we removed the drill rod with hammer & drill bit. Attempt is being made to continue further through same hole but this was interrupted due to further instruction of NHPC at site on 18/11/2023 to deploy excavator to

Project Site : Subansiri Lower H.E. Project, Gerukamukh, Dhemaji (Dist.) - 787035, Assam
T +91 3752 269278 Email : shep.project@bgssgsomajv.com

Delhi Office : B4/45, Safdarjung Enclave, New Delhi - 110029
T +91 11 4109 9999 Email : delhi.office@soma.co.in

Gurgaon Office : Quilla No. 21, Plot no. 192, Sarhau Village Road, Opp. Peer Baba Mazzar, Near Vipul Maruti Motor Workshop, Sector - 18, Gurgaon - 122015 T +91 124 4694488 Email : gurgaon.office@soma.co.in

Corporate Office : 2, Avenue - 4, Road No. 10, Banjara Hills, Hyderabad - 500034, Telangana
T +91 40 6653 8899 F +91 040 2332 1286 Email : info@soma.co.in www.soma.co.in

 (Continued.....)

u/s on the slide area to remove the muck to create an access bench over the slide. On 20/11/2023 as per verbal instruction of NHPC at site, we have deployed Dumper and loader to create an access bench over the slide (photographs enclosed). As we mentioned in many letters that no work can be done at bottom/mid level of slide for safety issue vide our letters at Sl. No. 2), 3), 5) to 8) amongst many others. The slide area is highly unstable with overhang/vertical/sub-vertical with crushed/cracked open joint rock formation and at any provocation at EL 200m on the slide may trigger another major slide with injury/fatal injury of manpower and damage/loss of machine. The slide on 27.10.2023 is so far largest and devastating as referred in our letter referred at Sl. No. 5) which happened during complete dry season without any rain or flood for about a month or so. Contractor shall not be responsible in any manner for any serious/fatal injury of men and loss/damage of equipment due to above work being carried out as per site/verbal instruction of NHPC. We request NHPC to review/decide on safety and convey instruction in writing instead of too many verbal instructions, which are often contradictory, keeping in view "Safety First" as explained above.

This is for your information for review and further advice at your earliest.

Thanking you,
For **BGS-SGS-SOMA JV**



(Biswajit Das)
Authorized Signatory

Encl.- As above (2 pages)

- Cc to: 1) The "**Employer**", NHPC, **through** Executive Director, HOP "**Engineer**" Subansiri Lower HE Project.
2) The General Manager (Dam) NHPC, "Authorized Representative of Engineer" Subansiri Lower HE Project.

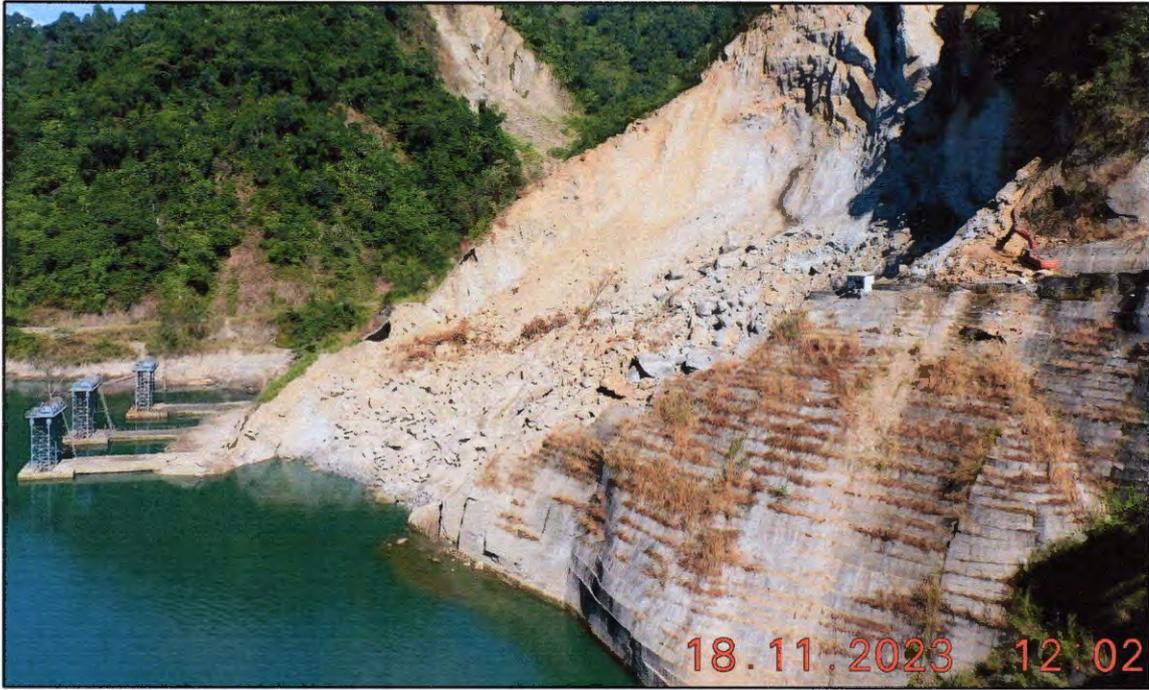


Photo – 1: Removal the muck is in progress using Excavator at u/s on the slide area to create an access bench Over the slide (Long view) as on 18.11.2023



Photo – 2: Removal the muck is in progress using Excavator at u/s on the slide area to create an access bench Over the slide (Close-up view) as on 18.11.2023

klh



Photo – 3: We have deployed Loader at u/s on the slide area to create an access bench Over the slide status as on 20.11.2023



Photo – 4: We have deployed Dumper at u/s on the slide area to create an access bench Over the slide status as on 20.11.2023



Minutes of the review meeting held under the Chairmanship of Hon'ble Minister of Power and NRE on 27.11.2023 at Subansiri Lower Project.

Hon'ble Minister of Power and NRE visited Subansiri Lower Project along with the Senior Officials of Ministry of Power on 27.11.2023. After site visit, a review meeting was chaired by Hon'ble Minister. The list of Participants is placed at **Annexure.**

At the outset, HM expressed his concern on the recent incident of landslide occurred on 27.10.2023. Subsequently, a Power Point Presentation was made by CMD, NHPC wherein issues related to recent slides over inlet of Diversion Tunnels (DTs) including its long-term stability measures were discussed. At the outset, Hon'ble Minister directed that all long-term stability measures be taken to stabilize the hill slope and the cavities formed in the Diversion Tunnels may be filled. The discussion and deliberation of the meeting are as under:

1. Immediate Measures- After detailed consultations CMD NHPC proposed the following immediate measures:

- i. Access Road from High Level Road (HLR) needs to be extended up to cavity area on priority for taking up protection measures in this area.
- ii. Tetrapods and under water concreting need be poured at the toe of the DTs for toe protection and to ensure no further subsidence.
- iii. After placing of tetrapods & under water concreting, the slide needs to be treated with the help of construction of retaining wall(s).
- iv. Additional holes need to be drilled over Diversion Tunnel-1 for pouring concrete in order to build up a barrier for flow of water.
- v. Plugging of DT-2, DT-3, DT-4 & DT-5 needs to be extended.
- vi. A survey be carried out to assess the damages/voids/weak zones in the DTs so that the same can be taken up for its treatment/filling.

2. Resource Mobilization

It was directed by the HM that since the working season at Subansiri Lower Project is very limited, all resources need to be deployed immediately. Suitable agencies be identified to support the main contractor. He directed to ensure adequate resource mobilization at all the fronts immediately.

3. Discussion with Expert Group Members:

The views/suggestions of the Expert group members were as under:

- i. NIRM is studying the cause of slope failure and mechanism for its treatment.
- ii. Member from GSI was of the opinion that instruments to check vertical movement of the hill (if any) be installed at top of the hill. Further, the overhanging portion of the slope be removed first as there is a possibility of its slide.

HM directed the Expert Group to submit its report within 15 days.

4. Replacement of SCADA System.

Member (Hydro), CEA raised the issue of SCADA Software. It was brought to the notice of the HM that the SCADA Software already procured for use at Subansiri Lower Project has got outdated. He also suggested that it will be appropriate to procure a new SCADA Software instead of using the older version available with the project. Secretary (P) directed to bring this issue before the Board of NHPC for deliberations.

5. HM directed the CMD NHPC to prepare a comprehensive action plan containing immediate measures and the slope (left bank) stabilisation measures.

The meeting was ended with vote of thanks to the chair.

Annexure

List of Participants

I. Ministry of Power (MoP):

1. Shri. R. K. Singh, Hon'ble Minister of Power and NRE- In chair
2. Shri Pankaj Agarwal, Secretary (Power)
3. Shri Mohammad Afzal, Joint Secretary (Hydro)

II. Expert Group:

1. Shri M.A.K.P. Singh, Member (Hydro), CEA – Chairman of the Expert Group
2. Dr. Pankaj Jaiswal, Deputy D.G., RMH-IV, GSI, NER
3. Shri Narendra Singh Shekhawat, Director, CMDD (N&W) Dte., CWC
4. Prof. Z. Ahmad, Department of Civil Engineering, IIT Roorkee
5. Dr. Sripad R Naik, Director, NIRM
6. Dr. Santosh Rai, Scientist E, Wadia Institute of Himalayan Geology

III. Officers from CEA & CWC

1. Shri. P K Shukla, Chief Engineer, CEA
2. Shri Shiv Dutt Sharma, Chief Engineer, CWC
3. Shri Ashutosh Anand, Deputy Director, CWC

IV. NHPC:

1. Shri. R. K. Vishnoi, CMD – NHPC
2. Shri. Biswajit Basu, Director (Projects)
3. Shri. R. K. Chaudhary, Director (Technical)
4. Shri. Ram Swaroop, ED (QA & I)
5. Shri. Rajendra Prasad, GGM, HOP (SLP)
6. Shri. Babitendra Kumar GM (Technical)
7. Shri. H. S. Ranga GM (PMSG)
8. Shri. R. M. A. Khan GM(D&E)
9. Shri. Pallav GM (Finance)
10. Shri. Sanaka Luha GM (Civil)
11. Shri. Rajesh Ranjan GM (Mech.)
12. Shri. Ashwatthama Tiwari GM (Elect.)
13. Shri. L. N. Beshra GM (Elect.)
14. Shri. Vachaspati Pandey, DGM (Geo)



एन एच पी सी लिमिटेड
(भारत सरकार का एक नवरात्रि उद्यम)
NHPC Limited
(A Government of India Navratna Enterprise)



सुबनसिरी लोअर जलविद्युत परियोजना
बाँध विभाग, कोलपतुकर, दोलुंमुख सर्किल,
जिला - कामले, अरुणाचल प्रदेश, पिन 791123
Subansiri Lower H.E. Project
Dam Division, Kolaptukar, Dollungmukh Circle
District - Kamle, Arunachal Pradesh, PIN 791123
ई-मेल/ए-मेल: dam-subansiri@nhpc.nic.in

No. : NH/SLP/GM(Dam)/99(A)/2025/70
To,

Date: 29-03-2025

M/S BGS-SGS-SOMA JV
Subansiri Lower HE Project,
Gerukamukh, Dhemaji, Assam.

Subject: Construction of Diversion Tunnels, Coffor Dams, Concrete Gravity Dam, Plunge Pool and Cut off Walls (Lot SSL.1) – **Regarding 12th Interim Time Extension**

- Ref:
- 1st EOT vide letter No: NH/SLP/CE(Dam)/99(A)/2008/68(A)/233, Dt: 24.07.08.
 - 2nd EOT up to 12.03.12 vide letter No: NH/SLP/CE(Dam)/48/2012/2427, Dt: 14.09.12.
 - 3rd EOT up to 13.04.15 vide letter No: NH/SLP/ED/15/2014/671, Dt: 18.02.14.
 - 4th EOT up to 27.12.15 vide letter No: NH/SLP/CE(DAM)/2015/410, Dt: 21.03.15.
 - 5th EOT up to 25.02.17 letter No: NH/SLP/M(Dam)/2015/250, Dt:26.12.15.
 - 6th EOT up to 29.04.18 vide letter No:NH/SLP/CE(Dam)/99(A)/2017/242, Dt:15.02.17.
 - 7th EOT up to 26.06.19 vide letter No:NH/SLP/CE(Dam)/99(A)/2018/344, Dt:28.04.18.
 - 8th EOT up to 23.08.20 vide letter No:NH/SLP/GM(Dam)/99(A)/2019/212,Dt:22.06.19.
 - 9th EOT up to 14.03.2023 vide letter No:NH/SLP/GM(Dam)/99(A)/2020/427 dt 19.10.2020
 - 10th EOT up to 29.12.2023 vide letter No:NH/SLP/GM(Dam)/99(A)/2023/131 dt 21.07.2023
 - 11th EOT upto 31-12-2024 vide letter no NH/SLP/GM(Dam)/99(A)/2024/07 dated 09/04/2024

Sir,

In terms of Clause No: 44.1 of COPA, the Contractor is hereby notified for grant of 12th Time Extension without levy of Liquidated Damages for a total of 365 days (i.e. up to 31.12.2025) considering hindrances up to 31.12.2024 as detailed here under.

Sl. No.	Delays /Hindrances	Net recommended time extension.	Days under	Relevant contract clause under which time extension is proposed.
1.	Additional scope of works in protection of cavity in DT Inlet, plugging of the diversion tunnels and protection works in left bank	365 days		Clause No:44.1(a) of COPA
	Total	365 days		

The cost compensation, if any out of this extension of time will be dealt as per relevant contract provision.

Thanking you,

Yours sincerely,

(Rajendra Prasad)

Executive Director & Engineer-in-Charge

Copy to:

1. Executive Director (Contracts)- for information please.
2. Executive Director (PMSG)- for information please.
3. GM (Dam)
4. GM (Finance)

Correspondence Address: P.O. Gerukamukh, Dist.-Dhemaji, Assam-787 035, ☎ 03752-269210, 📠 03752-269229, Email: dam-subansiri@nhpc.nic.in, Website: www.nhpcindia.com

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प्रेषक/From

SANDEEP MITTAL
EXECUTIVE DIRECTOR
NHPC LIMITED, CORPORATE OFFICE

प्रेषित/To

RAJENDRA PRASAD, EXECUTIVE DIRECTOR, HOP Sectt., SUBANSIRI

संख्या/No.: NH\NHPC CO\PMSC\2025\77

दिनांक/Date: 28-January -2025

विषय/Subject: Commissioning Schedule of Lower Subansiri HEP - Reg

सुबनसिरी लोअर परियोजना की निर्माण अनुसूची के संबंध में।

संदर्भ/Reference: NH\SUBANSIRI\Electro_Mech Works of Construction\2025\29, Dated : 22/01/2025

संदर्भ: NH\SUBANSIRI\Electro_Mech Works of Construction\2025\29 दिनांक 22.01.2025।

With reference to the subject above, the unit wise Commissioning Schedule is as below:

1. Unit-1: 10.05.2025.
2. Unit-2: 20.05.2025.
3. Unit-3: 31.05.2025.
4. Unit-4: 31.07.2025.
5. Unit-5: 31.12.2025.
6. Unit-6: 23.05.2026.
7. Unit-7: 26.05.2026.
8. Unit-8: 31.05.2026.

सूचना एवं अग्रिम कार्यवाही हेतु प्रेषित किया जाता है।

DHARMESH YADAV
MANAGER (CIVIL)
NHPC LIMITED, CORPORATE OFFICE

कृपया अग्रसारित किया जाता है -

HIMANSHU NAGPAL, DEPUTY GENERAL MANAGER (CIVIL), dt: 1/28/2025 3:30:06 PM

कृपया अग्रसारित किया जाता है -

HARGOVIND SINGH RANGA, GENERAL MANAGER (CIVIL), dt: 1/28/2025 3:30:41 PM

Copy To:

1 SUDHIR KUMAR, GENERAL MANAGER (MECHANICAL), Dir (Proj.) Sectt., NHPC CO,

Point No: 27
Brief Status of Ongoing Activities in Subansiri Lower HE Project, Arunachal Pradesh

(Date: 23.12.2025)

I. Commercial Operation of Unit#2

- i. Shri Manohar Lal, Union Minister of Power, Housing & Urban Affairs, inaugurated today the commercial operation of Unit-2 (250 MW) of the 2000 MW (8×250 MW) Subansiri Lower Hydroelectric Project through virtual mode.



I. Dam & Left Bank Protection Works:

- i. EL 150 Bench Protection Wall (P-1):- Reinforcement binding from EL198m to EL200m is in progress.
ii. EL 150 Bench Protection Wall (P-2):- Concreting from EL 196.5 to 198m is in progress.
iii. Initial Reservoir filling is in progress as per NDSA clearance & Reservoir level has been raised upto EL 182 M (as on 22.12.2025).



EL 150 Bench Protection Wall (P-1): Reinforcement binding from EL198m to EL200m is in progress



EL 150 Bench Protection Wall (P-2): Concreting from EL 196.5 to 198m is in progress.

2. DT Plugging & DT Outlet

- i. **DT-1:** RCC plug in steps from RD (+) 23 m u/s of Dam Axis to RD (-) 19 m d/s of Dam Axis, full face RCC plug from RD (-) 19 m to RD (-) 116 m at d/s of Dam axis completed. Concreting completed from RD (-)170m to RD (-)179m up to EL 99.0m. Manual cleaning from RD (-)179m to (-)185 is in progress. Drilling for grouting is in progress.
- ii. **DT-2:** Full face plug of 70m completed. Cleaning from RD (-)110 to RD (-)130m is in progress.
- iii. **DT-3:** Full face plug of 100m completed. Shuttering for gallery's slab from RD (-)110 to (-)130m & EL 104.60 to 105.80m is in progress.
- iv. **DT-4:** Full face plug of 130m completed. Cutting of existing lining is in progress.
- v. **DT-5:** Full face plug of 60m completed. Reinforcement binding from RD (-)120 to (-)140m & EL101.80 to 102.64m is in progress.
- vi. **Deonallah Toe Protection:** Concreting (Grade- M20A40) is in progress.



DT-1:- Manual cleaning from RD (-)179m to (-)185 is in progress.

DT-1:- Drilling for grouting is in progress



DT-2:- Cleaning from RD (-)110 to RD (-)130m is in progress

DT-3:- Shuttering for gallery's slab from RD (-)110 to (-)130m & EL 104.60 to 105.80m is in progress



DT-4:- Cutting of existing lining is in progress

DT-5:- Reinforcement binding from RD (-)120 to (-)140m & EL101.80 to 102.64m is in progress



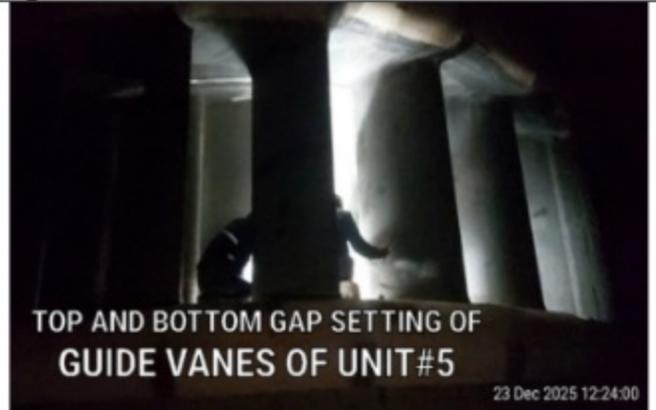
Deonallah Toe Protection: Concreting (Grade- M20A40) is in progress.

3. Power House (E&M):

- (i) **Unit#1:**
 - Wet commissioning of the unit is in progress.
 - Leveling of UGB pad support by grinding is completed.
 - Shrink fitting of repaired collar is in progress.
- (ii) **Unit#2:**
 - Commercial operation of Unit-2 (250 MW) of the 2000 MW (8×250 MW) Subansiri Lower Hydroelectric Project has been successfully commenced from 00:00hrs of 23.12.2025.
- (iii) **Unit#3:**
 - Checking of the unit before mechanical run is in progress.
- (iv) **Unit# 4:**
 - a) **Stator:**
 - Assembly of DE side stator air guides is completed.
 - Clamping of stator air coolers is in progress.
 - Checking of HP injection system is in progress.
 - b) **Turbine:**
 - Dowelling of stay ring and upper cone is completed.
 - Fabrication & installation of inflatable seal pipes & board, shaft seal cooling pipes is in progress.
 - Installation of bottom ring access platform is in progress.
- (v) **Unit #5:**
 - a) **Stator:**
 - Painting of LL16 paint on NDE side winding is completed and painting on DE side winding with GK 128 paint is in progress.
 - Brazing of Level-4 jumper is in progress.
 - b) **Rotor:**
 - Pre-Assembly cleaning of brake track plates is completed.
 - Installation of brake track plate in progress.
 - Pole assembly is in progress
 - c) **Lower Bracket:**
 - Trial assembly of thrust membrane is in progress.
 - Pre assembly cleaning and checking of Brake Jacks is in progress.
 - d) **Turbine:**
 - Guide vane top bottom gap setting is in progress.
 - e) **MIV:**
 - Installation of back flange is in progress.
- (vi) **Unit #6:**
 - a) **Stator:**
 - Painting on stator frame is completed.
- (vii) **Unit#7:**
 - a) **Turbine:**
 - Welding of C/S joints between strakes 263&262, 271&272 is in progress.
 - Welding of L/S joints of spiral case strakes is in progress.
- (viii) **Unit#8:**

a) Turbine:

- Welding of spiral case strake 253 is in progress (at GE store).
- Welding between inlet sleeve 202&203 is in progress.



Zimbra

pmsg-co@nhpc.nic.in

Declaration of Commercial Operation (COD) of Unit#2 (250 MW) of Subansiri Lower HE Project (8x250 MW), Arunachal Pradesh from 00:00 hours of 23 .12.2025.

From : Commercial HOD <hod-commercial-co@nhpc.nic.in> Sat, Dec 20, 2025 05:09 PM

Subject : Declaration of Commercial Operation (COD) of Unit#2 (250 MW) of Subansiri Lower HE Project (8x250 MW), Arunachal Pradesh from 00:00 hours of 23 .12.2025. 📎 Desk-I Subansiri Lower
📎 1 attachment

To : ftcnerldc <ftcnerldc@grid-india.in>, Sajan <Sajan@grid-india.in>, spbarnwal <spbarnwal@grid-india.in>, keshabborah881 <keshabborah881@grid-india.in>, mviswanadh <mviswanadh@grid-india.in>, yekambaram <yekambaram@grid-india.in>, chair <chair@nic.in>, member he <Member.he@cea.nic.in>, member god <Member.god@cea.nic.in>, ms-nerpc <ms-nerpc@gov.in>, secy <secy@cercind.gov.in>, afzal mdp <Afzal_mdp@nic.in>, nhpc-mop <Nhpc-mop@gov.in>, cea-hpmd <Cea-hpmd@gov.in>, commercialcc <commercialcc@powergrid.in>, coo-ctu <coo-ctu@ctuil.in>, regulatory <regulatory@indigrid.com>

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Sir,

कृपया विषय से संबंधित पत्र संलग्न देखें।
 Please find attached letter regarding subject matter.

Regards

वाणिज्यिक विभाग,
 Commercial Division,

NHPC Ltd



<https://www.nhpcindia.com>

 **U2 SLP COD.pdf**
340 KB



एन एच पी सी लिमिटेड
(भारत सरकार का एक नवरात्रि उद्यम)
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वाणिज्यिक विभाग
Commercial Department
एनएचपीसी ऑफिस कॉम्प्लेक्स, सेक्टर-33,
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फोन/Phone: 0129-2259923
ईमेल/Email: hod-commercial-co@nhpc.nic.in
वेबसाइट/Website: www.nhpcindia.com

पत्र संख्या: NH/Commercial/Subansiri Lower/2025/ 1620-1643

दिनांक: 20.12.2025

The General Manager,
MO NERLDC,
Grid Controller of India Limited (GRID-INDIA),
POWERGRID Complex, Lower Nongrah, Lapalang,
P.O : Rynjah, Shillong-793006,
Meghalaya

Sub.: Declaration of Commercial Operation (COD) of Unit#2, 250 MW of Subansiri Lower HE Project (8x250 MW), Arunachal Pradesh from 00:00 hours of 23 .12.2025.

Sir,

This is for your kind information that Unit#2 (250MW) of Subansiri Lower HE Project have been tested and commissioned as per provisions of CERC (IEGC) Regulations,2023. In compliance of regulation 22(2) of CERC (IEGC) Regulations-2023 trial run of Unit#2 has been successfully completed as per details below:

Unit No.	Date and Time
Unit#2 (250 MW)	09:45 hours of 17.12.2025 to 00:30 hours of 18.12.2025

The certificate for successful trial run has been issued by NERLDC on 20.12.2025 in compliance of Regulation 25(2) of IEGC Regulations, 2023.

The certificates of declaration for Unit#2 signed by CMD, NHPC as per Regulation 26(2) of IEGC Regulations-2023 is enclosed.

In view of fulfilment of above statutory requirement as per regulation 27 of CERC (IEGC) Regulations-2023, NHPC hereby declares Commercial Operation of Unit#2 (250 MW) of Subansiri Hydroelectric Project from 00:00 hours of 23.12.2025.

This is for your kind information and further necessary action please.

Encl: As above

Thanking You

Yours Sincerely

प्रदीप कुमार 21st 20/12/2025

(Pradip Kumar Ray)

Executive Director -HOD Commercial

Distribution: As per list enclosed

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3. Member (GOD), Central Electricity Authority, Sewa Bhawan, R.K. Puram, New Delhi-110066.
4. Member Secretary, North Eastern Region Power Committee, NERPC Complex, Dong Parmaw, Lapalang, Shilong- 793006, Meghalaya.
5. The Secretary, Central Electricity Regulatory Commission, 7th Floor, Tower-B, World Trade Centre Block-F, Nauroji Nagar, Safdurjung Enclave, New Delhi- 110 029.
6. Joint Secretary (Hydro), Ministry of Power, Govt. of India, Shram Shakti Bhawan, Rafi Marg, New Delhi-110001
7. Director (HPM), Central Electricity Authority, Sewa Bhawan, R.K. Puram, New Delhi-110066.
8. Executive Director (Comml.), PGCIL, Saudamini Plot No. 2, Sector-29, Gurugram (Haryana) – 122001.
9. COO, CTUIL, Floors No. 5-10, Tower 1, Plot No. 16, IRCON International Tower, Institutional Area, Sector 32, Gurugram, Haryana – 122001
10. Head of Regulatory, M/s Indigrd 10th Floor, Berger Towers, Delhi One Building, Sector-16B, DND Flyway, Noida (U.P)-201301

Beneficiaries:

1. The Chairman cum Managing Director, Dakshin Haryana Bijli Vitran Nigam Limited & Uttar Haryana Bijli Vitran Nigam Limited, Shakti Bhawan, Sector-6, Panchkula, Haryana-134109.
2. The Chairman, Punjab State Power Corporation Ltd (PSPCL), The Mall, PSEB Head Office, Baradari, Patiala, Punjab-147001.
3. The Managing Director, Rajasthan Urja Vikas Nigam Limited (RUVNL), Corporate Office, Vidyut Bhawan, Janpath, Jaipur, Rajasthan -302 005.
4. The Chairman, UP Power Corporation Limited, Shakti Bhawan ,14-Ashok Marg, Lucknow, Uttar Pradesh -226001.
5. Head, PMG, Chandigarh Power Distribution Limited, 4th Floor, SCO 33 to 35, Sector-34A, Chandigarh-160002.
6. The Managing Director, Gujarat Urja Vikas Nigam Limited (GUVNL), Sardar Patel Vidyut Bhawan, Race Course, Vadodara-390007, Gujarat.
7. The Managing Director, M.P. Power Management Company Limited (MPPMCL), Shakti Bhawan, Vidyut Nagar, Jabalpur-482008, Madhya Pradesh.

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8. The Chairman cum Managing Director, Chhattisgarh State Power Co Limited (CSPDCL), Danganiya, PO-Sunder Nagar, Raipur-492013, Chhattisgarh.
9. Chairman & Managing Director, Maharashtra State Electricity Distribution Co. Ltd. (MSEDCL), Hong Kong Bank Building, MG Road, Fort, Mumbai-400051, Maharashtra.
10. Chief Electrical Engineer, Electricity Department, Govt. of Goa, 3rd Floor, Vidyut Bhawan, Panaji-403001, Goa.
11. The Managing Director, Manipur State Power Distribution Co. Ltd, 3rd Floor, New Directorate Building, Near 2nd MR Gate, Imphal-Dimapur Road, Imphal-795001, Manipur.
12. Chief Engineer (T&G), Department of Power, Govt. of Nagaland, Kohima-797011, Nagaland.
13. The Managing Director, Assam power Distribution Co. Ltd, Bijulee Bhawan, Paltan Bazar, Gauwahati- 781001, Assam.
14. Managing Director, Tripura, State Electricity Corporation Limited (TSECL), Bidyut Bhaban, Banamalipur, Agartala-799001, Tripura.
15. The Engineer in Chief, Power and Electricity Department, Govt. of Mizoram, New Secretariat Complex, Khatla, Aizawl-796001, Mizoram.
16. Chief Engineer (Commercial Cum CEI), Department of Power, Vidyut Bhawan, Govt. of Arunachal Pradesh, Itanagar, ARUNACHAL PRADESH – 799111.
17. The Chief Engineer (Commercial), Meghalaya Power Distribution Corporation Ltd, Lum Jingshai Short Round Road, Shilong-793001, Meghalaya.

प्रबल जमा म 20/12/20

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Certificate as per Regulation 26(2) of CERC (Indian Electricity Grid Code)
Regulations 2023 for Hydro Generating Stations

It is to certify that Subansiri Lower Hydroelectric Project (8x250 MW) of NHPC Limited has fulfilled all the key provisions as prescribed below as per Regulation 26(2) of CERC (Indian Electricity Grid Code) Regulations 2023 for Hydro Generating Station for it's **Unit#2:**

- (i) The generating station or unit thereof meets the requirement and relevant provisions of the CEA Technical Standards for Construction, CEA Technical Standards for Connectivity, CEA Technical Standards for Communication, Central Electricity Authority (Measures relating to Safety and Electricity Supply) Regulations, 2010 and these regulations, as applicable.
- (ii) The main plant equipment and auxiliary systems including the drainage dewatering system, primary and secondary cooling system, LP and HP air compressor and firefighting system have been commissioned and are capable of full load operation of units on a sustained basis.
- (iii) Permanent electric supply systems including emergency supplies and all necessary Instrumentations Control and Protection Systems and auto loops for full load operation of the unit are put into service.

19/12/2025

(BHUPENDER GUPTA)
CHAIRMAN AND MANAGING DIRECTOR,

भूपेन्द्र गुप्ता / BHUPENDER GUPTA
अध्यक्ष व प्रबंध निदेशक / Chairman & Managing Director
एन एच पी सी लिमिटेड / NHPC Limited
(भारत सरकार का नवरात्रि उद्यम / A Govt. of India Navratna Enterprise)
सेक्टर-33, फरीदाबाद / Sector-33, Faridabad

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भारत सरकार का उद्यम)

GRID CONTROLLER OF INDIA LIMITED

(A Government of India Enterprise)

{Formerly Power System Operation Corporation Ltd. (POSOCO)}

उत्तर पूर्वी क्षेत्रीय भार प्रेषण केंद्र/North Eastern Regional Load Despatch Centre

कार्यालय : पावर हाउस, काहिलीपारा, गुवाहाटी-781019(असम) /Office : Power House, Kahilipara, Guwahati-781019 (Assam)

CIN : U40105DL2009GO1188682, वेबसाइट/Website: www.nerltdc.in, ई-मेल/E-mail: nerltdccnm@posoco.in

अनुमोदन संख्या /Approval No: NERLDC/MO/FTC/8673

दिनांक/Date: 20-12-2025

सेवा में /To,

महाप्रबंधक (ई एंड एम)/ General Manager (E&M)

सुबनसिरी लोअर एचई प्रोजेक्ट, एनएचपीसी लिमिटेड/ Subansiri Lower HE Project, NHPC Ltd.

गेरुकामुख, जिला: धेमाजी असम / Gerukamukh, Distt: Dhemaji Assam -787035

कृपया ध्यान दें: श्री. दिनेश कुमार/ Kind attention: Sh. Dinesh Kumar

विषय/Sub: 400 केवी सुबनसिरी लोअर एचईपी (एनएचपीसी) पर 250 मेगावाट यूनिट 2 का परीक्षण संचालन प्रमाण पत्र / Trial Operation Certificate of 250 MW Unit 2 at 400 kV Subansiri Lower HEP (NHPC)

महोदया/महोदय,

यह ई-मेल 19-12-2025 के माध्यम से 8 x 250 मेगावाट सुबनसिरी लोअर एचईपी (एनएचपीसी) की 250 मेगावाट यूनिट-2 के ट्रायल रन से संबंधित प्रस्तुत उत्पादन आंकड़ों के संदर्भ में है।

आईईजीसी 2023 के खंड 22(2) के अनुसार, सुबनसिरी लोअर एचईपी (एनएचपीसी) ने इस अवधि के दौरान 17-12-2025 के 09:45 बजे से 18-12-2025 के 00:30 बजे (1:27 घंटे की कुल रुकावट अवधि सहित) यूनिट -2 के ट्रायल रन ऑपरेशन को सफलतापूर्वक पूरा किया, यूनिट ने 194.76 मेगावाट का औसत उत्पादन (कुल 12 घंटे) का प्रदर्शन किया।

आईईजीसी 2023 के खंड 22(2)(क)(iv) के अनुसार,

यदि अपर्याप्त जलाशय या पॉन्ड स्तर या अपर्याप्त पलो के कारण एमसीआर को प्रदर्शित करना संभव न हो, तो सीओडी इस शर्त के अध्यक्षीन घोषित की जा सकती है कि इसे तुरंत प्रदर्शित किया जाएगा जब सीओडी के बाद पर्याप्त जल उपलब्ध हो :

परंतु यह कि यदि ऐसा उत्पादन स्टेशन पर्याप्त जल उपलब्ध होने पर भी एमसीआर को प्रदर्शित करने में समर्थ न हो, तो उत्पादन कंपनी इस खंड के उप-खंड (ख) के संदर्भ में क्षमता का डी - रेट करेगी और ऐसा अवनिर्धारण सीओडी से प्रभावी होगा ।

आरएलडीसी को लिखित में किसी भी लाभार्थी द्वारा उठाई गई किसी आपत्ति की कोई प्राप्ति नहीं हुई है।

यह प्रमाण पत्र सुबनसिरी लोअर एचईपी यूनिट 2 के सफल परीक्षण को प्रमाणित करने के लिए सीईआरसी (भारतीय विद्युत ग्रिड कोड) विनियम, 2023 के नियम 25(1) और 25(2) के अनुसार जारी किया जा रहा है।

किसी अन्य उद्देश्य के लिए इस प्रमाणपत्र का उपयोग निषिद्ध है।

This is with reference to the generation data submitted pertaining to the trial run of 250 MW Unit-2 of 8 x 250 MW Subansiri Lower HEP (NHPC), vide e-mail dated 19-12-2025.

As per Clause 22(2) of the IEGC 2023, Subansiri Lower HEP (NHPC) successfully completed the trial run operation of Unit-2 from 09:45 Hrs of 17-12-2025 to 00:30 Hrs of 18-12-2025 (including total interruption period of 1:27 hours). During this period, the unit demonstrated an average generation (total 12 Hours) of 194.76 MW.

As per Clause 22(2)(a)(iv) of IEGC 2023, if it is not possible to demonstrate the MCR due to insufficient reservoir or pond level or insufficient inflow, COD may be declared, subject to the condition that the same shall be demonstrated immediately when sufficient water is available after COD:

Provided that if such a generating station is not able to demonstrate the MCR when sufficient water is available, the generating company shall de-rate the capacity in terms of sub-clause (b) of this clause, and such de-rating shall be effective from COD.

There has been no receipt of any objection raised by any beneficiary in writing to RLDC.

This certificate is being issued in accordance with regulation 25(1) and 25(2) of CERC (Indian Electricity Grid Code) Regulation, 2023 to certify successful trial run of Subansiri Lower HEP Unit 2.

Usage of this certificate for any other purpose is prohibited.

भवदीय/ Your Sincerely

(सजन जार्ज/ Sajan George)

(मुख्य महाप्रबंधक (प्रभारी)/ Chief General Manager (I/C))

उपक्षेत्राधिकारी, शिलांग/ NERLDC, Shillong

Page 2 of 3

सजन जार्ज / Sajan George

मुख्य महाप्रबंधक (प्रभारी) / Chief General Manager (I/C)

उपक्षेत्राधिकारी, शिलांग / NERLDC, GRID-INDIA

कालिपाड़ा, गुवाहाटी / Kalihpara, Guwahati

पंजीकृत कार्यालय: बी-9, प्रथम तल, कुतुब इंस्टीट्यूशनल एरिया, कटवारी सराय, नई दिल्ली-110016

Registered Office: B-9, First Floor, Qutab Institutional Area, Katwaria Sarai, New Delhi -110016

प्रति:

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- iv. एसएलडीसी प्रभारी, अरुणाचल प्रदेश/असम/मणिपुर/मेघालय/मिजोरम/नागालैंड/त्रिपुरा

Copy to:

- i. Member Secretary, NERPC, NERPC Complex, Dong Parmaw, Lapalang, Shillong-06
- ii. Executive Director, NERTS, POWERGRID, Shillong-793006
- iii. Executive Director, NLDC, B-9, Qutab Institutional Area, Katwaria Sarai, New Delhi-16
- iv. CGM (SO), CGM (SL) & GM (MO), NERLDC
- v. SLDC In-Charge, Arunachal Pradesh/Assam/Manipur/Meghalaya/Mizoram/Nagaland/Tripura

Reservoir Clearance Granted on
19.09.2025



Government of India
Ministry of Jal Shakti
Department of Water Resources, River Development & Ganga Rejuvenation

Site Visit Report of NDSA Team to Subansiri Lower HEP (2000 MW), Assam/ AP 10th – 12th September 2025



National Dam Safety Authority

**Site Visit report of the NDSA team to Subansiri Lower HE Project, Arunachal Pradesh /Assam from
10th September to 12th September, 2025**

As per clause 27(2) of the Dam Safety Act, 2021 and in response to the request made by NHPC vide letter no. NH/SLP/HoP/2025/04 dated 11.03.2025, NDSA constituted a team vide OM dated 4th April, 2025 to inspect the Dam of Subansiri Lower HEP (2000MW), Arunachal Pradesh of NHPC limited before initial filling and to review the initial filling plan prepared by the project authority. **The latest site visit by the team to Subansiri Lower HE Project, Arunachal Pradesh /Assam was held from 10th September to 12th September, 2025.**

1.0 Previous Site Visits by NDSA team

A brief description of sites visits previously conducted by the NDSA team is as follows

1.1 First visit of the NDSA team (10-12 April 2025)

The first visit of the NDSA team took place on 10-12 April, 2025. The team after inspection of the project, recommended certain activities to be completed to proceed ahead with first reservoir filling. For example:

- Consolidation grouting of the slide mass effectively up to required depth and in untreated area between El.170 m to El.200 m, bore holes and core testing, more geophysical tests to be carried out.
- Backfilling of the area with concrete immediately downstream of the dam where rock cover between DT1 and abutment is very less.
- Concrete retaining wall near DT outlet channel for monitoring the seepage during reservoir filling and later.
- Curtain grouting in the upstream near the heel of the dam for covering the area between DT1 and bottom of diaphragm wall
- Installation and functioning of all the requisite instrumentation
- Bathymetry survey in upstream and downstream of the dam specially at the slide mass
- Installation of the inclinometer, pore pressure meter /piezometer on the left bank hill slope in the slide zone
- Inclinometer, MPBX installation at El.155 m bench in the toe protection area
- Expert group visit
- Filling of large cavity observed in DT1 near its outlet yet to be taken up
- Plugging of diversion tunnel till outlet

NHPC provided the preliminary reply / compliance of the observations vide letter dated 25th April, 2025. Subsequently, in response to NDSA letter dated 09th May, 2025; NHPC further submitted compliance /reply vide email dated 22nd & 24th May, 2025.

1.2 Second visit of NDSA Committee (16th June 2025 to 18th June 2025)

Second visit of the NDSA committee took place on 16th -18th June, 2025. Upon inspection and discussion held with project authorities at project site, it was determined that many activities which were recommended in site visit note of first visit, are yet to be completed. For example:

- Completion of the consolidation grouting in untreated area between El.170 m to El.200 m were not fully completed.
- Installation and calibration of dam instruments, instruments in the left bank slide area like pore pressure meter /piezometer, settlement gauge and inclinometer etc. was not fully completed.
- Backfilling of the area with concrete immediately downstream of the dam where rock cover between DT1 and abutment was not completed upto El.173 m

Besides some other issues were also identified such as

- Additional deep grout holes in the intact part of the left abutment to be carried out
- Concrete filling of the upstream part of the Diversion Tunnel-1 from 23 m upstream of dam axis to 70 m upstream of dam axis by tremie pipe, after complete filling of the part of DT1, extraction of the cores at 3-4 locations for ascertain the efficacy of the underwater concrete.
- Repair of damaged S6 bucket
- Emergency action plan and dam break analysis to be updated

2.0 Present (Third) visit of the NDSA committee (10th to 12th September, 2025)

The Present (Third) visit of the NDSA committee took place from 10th September -12th September, 2025. The list of participants is enclosed as Annexure -I.

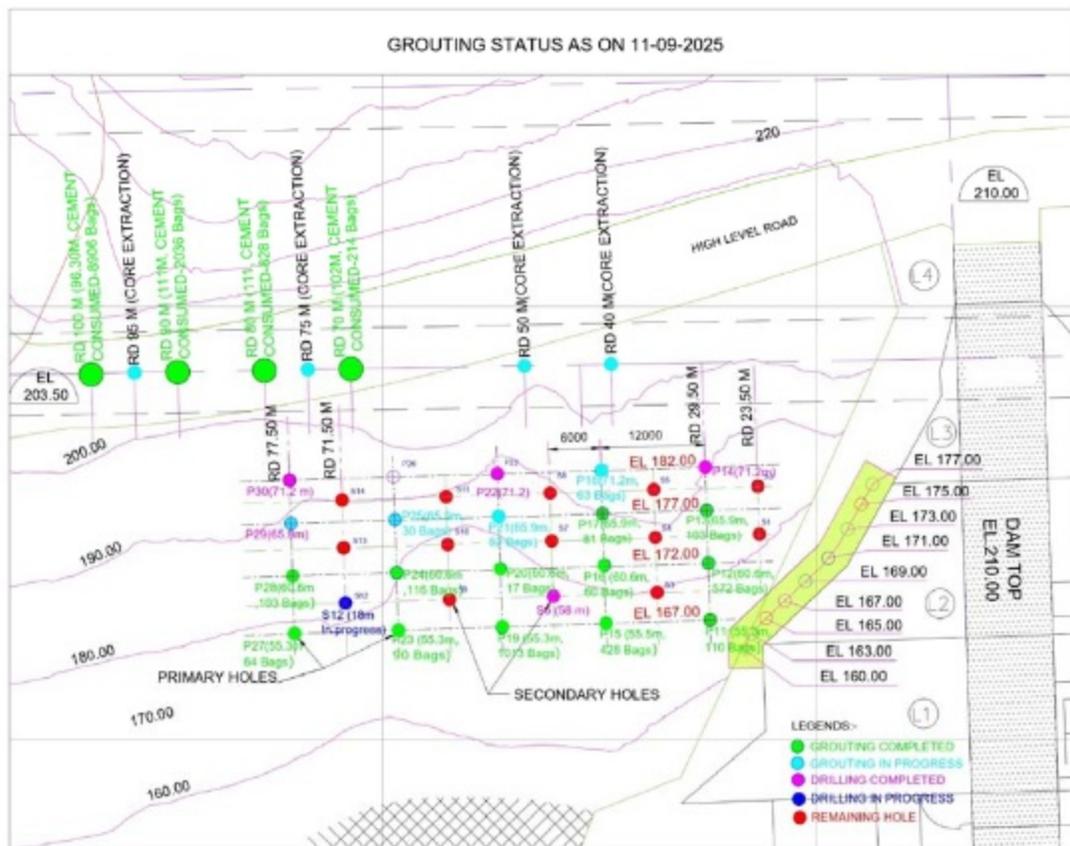
NDSA team inspected the concrete dam, foundation galleries, left slide area, concrete protection measures, core logging and instrumentation. Team also visited the underground surge tunnel, Adit plug of HRT and upper horizontal pressure shaft.

Following are the observations and recommendations:

2.1 Additional deep grout holes

- For grouting in the upstream of the dam in the left bank, around 20 no. primary holes and 14 no. secondary holes were proposed. Holes were to be drilled for around 60 m depth.
- Primary Holes have been proposed from El.167, El172, El177 m and El.182 m. Secondary holes have been proposed from El.169.5, 174.5, 179.5 m.
- Around 20 no. holes were observed to have been drilled and grouted during the site visit.
- Presently drilling and grouting from holes at El 167, 169.5 and 172 m was in progress during the site visit.

- Some holes have showed high grout intake of around 1000 bags in P19, 500 bags in P12 and P15. WPT was carried out in hole no. P16 which showed value of the permeability to be around 4 to 10 lugeon.
- High grout intake indicates presence of wide open joints / cavities in the area lying near the alignment of DT1. Therefore, this area needs special attention and to be effectively grouted. Additional holes, if required may be carried out for limiting the permeability. Check holes may also be carried out for ascertaining the efficacy of the grouting. WPT needs to be carried extensively in primary and secondary holes before grouting.
- At least 7 days shall be provided for achieving the required strength of the grout. Reservoir water level is required to be kept lower for fulfilling this criterion.
- All record of grouting, drilling, WPT, CST etc. shall be shared with NDSA.



Additional Deep Grout Holes : Status as on 11.09.2025

2.2 Installation of the dam instruments and instruments in the slide area

- Team visited dam foundation gallery for inspection of the dam instruments. It was observed uplift measuring standpipe are not working at most of the location. It was informed that only 14 no. uplift measuring standpipe show some release of water out of 42 no. installed in the dam foundation galleries. In some, pressure was showing negative value. It was advised to check and restore the nonfunctional uplift measuring standpipe. Their functioning is most important for observing the behaviour of the dam during reservoir filling. Agency needs to be called urgently for repairing / replacing the same before commencement of the reservoir filling.
- Pendulum in L1 and R1 block needs to be made functional. Direct and inverted pendulum to be made automatic so that the readings are taken regularly in the control room. It was informed that the automation of the pendulum is in process and shall be completed soon. It was advised to complete the same before commencement of the reservoir filling so that tilt, if any, is measured. Automatic functioning of all the pendulums is very important. The instruments needs to be calibrated for initial base reading.
- U-notch have been installed for measuring the discharge in the drainage sump. It was advised to install the V notch for measuring the realistic measurement of the seepage. Presently around 450 lpm in upstream and 450 lpm in downstream sump was observed. Total around 900 lpm has been observed with reservoir water level around El.154 m. The measurement of the seepage needs to validated by the actual time of pump operation. It was observed that pump was not found functional while the sump was filled upto its top level and water starting to enter the galleries.
- The remaining instruments in the slide area like piezometer / pore pressure meter, inclinometer, settlement gauge needs to installed and completed on priority.

2.3 Concrete filling of the upstream part of Diversion Tunnel - 1

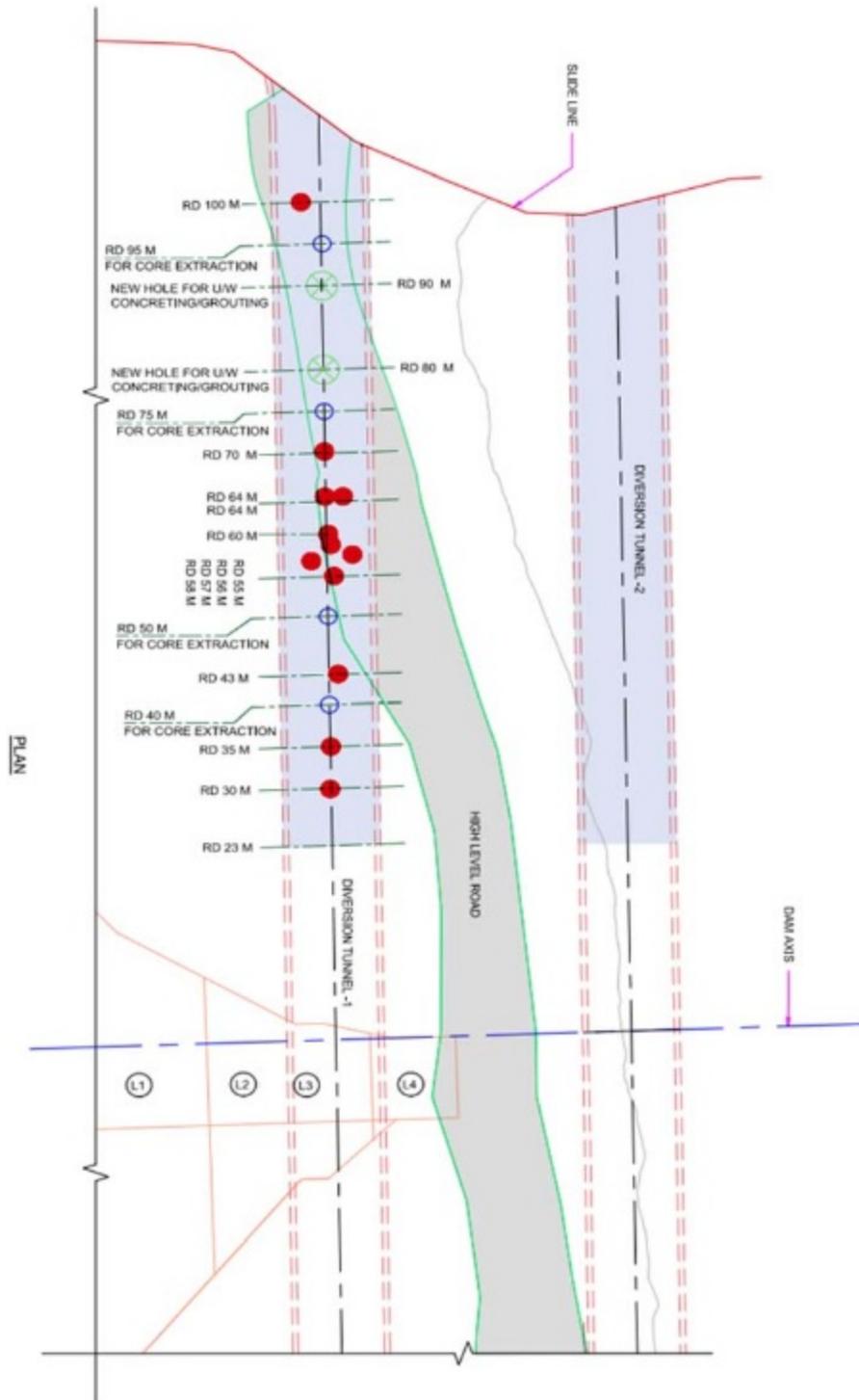
- Concreting / grouting of DT1 from drill holes located at high level road from RD 30 m to RD 100 m from dam axis was in progress. Holes at RD 90 m and 80 m had been drilled and grouted. Concreting / grouting shall be carried out to ensure complete filling as per the recommendations.
- Extraction of the core in DT1 at RD 50 m was in progress. It was informed around 25 m depth has been drilled so far. The drilled cores shall give the information about the efficacy of the concrete filling in the DT1 in upstream of the plug. The result of the cores shall be shared with NDSA.

2.4 Consolidation grouting between El.170 m to El.200 m

- Approach to different concrete benches have been constructed. It was informed that consolidation grouting in untreated area between El.170 m to El.200 m have been taken up. Presently grouting from El.190 m was in progress. It was advised to complete the consolidation

grouting upto required depth to consolidate the slide material in primary and secondary holes pattern. Primary holes to be spaced at 6 m c/c with secondary holes in-between such that effective spacing of 3 m c/c is achieved. Results of the grouting and WPT shall be shared with NDSA.

Upstream filling of Diversion Tunnel – 1 by underwater concrete / grouting



2.7 Monitoring of Seepage from DT1 outlet and concrete outlet wall

- Wooden logs have been deposited in the outlet area. Water was filled around El.106 m in the area which was being dewatered. It was informed that the concrete outlet wall shall be constructed during the lean season along with the balance works of diversion tunnel plugging. It is very important to closely monitor the seepage from Diversion tunnel area as the reservoir level is raised.



2.8 Spillway bay S6 bucket damage

- Damaged bucket and glacis of the spillway bay S6 was seen. The damages does not seem to have increased further since second visit of NDSA team. However, the damages of the surrounding bays (especially bay no 7) seem to have increased further. It was informed that the spillway bucket and glacis shall be repaired during the lean season. It was advised to inspect all the bays and repair the damages as soon as possible. It was also discussed to explore the feasibility of approach road on the existing downstream apron for repair of bucket by raising it further instead of constructing a downstream dyke.



3.0 Additional long term protection measures suggested by the NDSA team

- The left bank slope stabilization measures, including installation of SDA, cable tendon, concrete cladding and consolidation grouting may be continued up to the top level ($\pm 300\text{m}$) of the exposed rock surface. The topsoil cover should be removed/dressed in a planned way, and the remaining soil part should be protected with the bioengineering method of stabilization to avoid any failure in the near future.
- In order to release the pore water pressure, provision of weep holes/drainage holes (adequate length and diameter) may be provided concurrently with the progressive concrete cladding.
- The unlined section of the dam axis road tunnel shall be lined with adequate-strength concrete along with deep drainage holes.
- Periodic monitoring through instrumentation as well as through physical targets in and around the slide zone shall continue to check the performance of the treated slope. Any signs of movement must be brought to the knowledge of the NDSA for necessary treatment.
- Area /gap on right bank between S9 pier and abutment in the downstream may be filled to suitable level with concrete for providing additional toe support to the steep right bank.
- The space between S1 pier and near DT1 outlet cavity needs to be filled with concrete to avoid any retrogression of the scour towards S1 foundation. Similarly, the left out space of old plunge pool near S9 lock and right bank access road at El.120 m needs to be filled to avoid any erosion towards hill mass and S9 foundation.
- The area downstream of the concrete apron of dam needs to be inspected thoroughly and concreting may be carried out in the deep scour pits if observed during the inspection.
- Plunge pool construction needs to be expedited as early as possible. At higher reservoir levels during the operation of the project, the scour shall increase significantly. Therefore, operating the reservoir at higher level for long duration may be risky for the dam foundation and abutment slope. Project needs to make the planning of the construction of the plunge pool as per site condition.
- It was observed that the left bank slope at DT outlet channel shows some distress at higher level between old road tunnel and new road tunnel. Also, spillway water is hitting the left bank. It was advised to strengthen the area on the left bank from DT 5 outlet to the old road tunnel. It was informed that the toe of this slope has been excavated significantly around El.98 m during the construction of outlet channel. Therefore, the outlet area may be filled with suitable grade of concrete to suitable height to provide toe support to this long stretch and steep slope in long run.
- Slope protection measures may be taken in the form of additional rock supports, concrete cladding, pressure relief holes in this area where required. This is main access road to dam top on left bank and its stability is vital for the safety point of view.
- Both banks downstream of concrete dam and power house may be protected at toe with tetrapod along with underwater concreting to minimize the erosion and concrete cladding at exposed rock surface upto bridge location.

- Deo-nallah diversion may be seen as per site condition at higher level. Nallah may be provided with concrete to avoid seepage into the adjoining rock mass.
- Dam abutments and reservoir area in significant stretch shall be monitored by Synthetic Aperture Radar (SAR) imagery system satellite based for long term monitoring and behaviour.
- Erosion indicators can be installed near downstream concrete apron of dam spillway during the repair of S6 bay and erosion near the dam toe, if any.
- Inspection of the joint between old dam and extended part needs to be carried out during the lean season after closing the gates. Seepage in the drainage galleries near the joint location needs to be monitored regularly.
- Stable points / benchmark on both banks shall be used for measuring the readings of the survey targets and topographical markers.
- Core testing for strength, permeability shall be carried out of the samples from slide area, DT1 filling concrete.
- Regular ROV / bathymetry survey of the toe area of the DT inlet side protection measures in the upstream of dam shall be carried out pre and post monsoon for ascertain the behaviour of the toe measures and protection concrete.
- ROV / bathymetry survey of the downstream of the dam near the concrete apron and plunge pool location shall be carried out for assessment of the likely scour during pre and post monsoon season.
- Removal of ISMB supports and other misc. material lying in the radial gate area shall be removed from access gallery at El.173 m. lying of ISMB in the gate area may be dangerous for the safety of the hydraulic cylinders in case of seismic condition.

4.0 First Reservoir filling of Subansiri Lower HE Project (2000MW)

Construction of the Subansiri lower HE Project was started during year 2005. During year 2011 to 2019, project construction work was stopped due to local agitation. Work resumed in September, 2019 after getting clearance from NGT. During construction of the project, incidences of the land slide have occurred from time to time e.g. major slide at DT outlet channel during June, 2020, portal slope failure at DT5 during August, 2021, DT inlet slide during September 2022. A major slide occurred on 27th October, 2023 which stopped the flow from DT1.

NHPC has taken measures in the slide area by toe protection measures with tetrapods, underwater concreting, concrete benches at different elevation, consolidation grouting the slide mass etc. As informed by NHPC, presently there is no excessive settlement is reported in the slide area. However, it is apprehended that the protection measures are lying on the slide material, and during high reservoir water level and seismic conditions, material may behave differently. Therefore, it is recommended to have the slow filling rates considering the existing site condition and past events and geological seismological set up of the area. Slide material may behave like earthen dam subject to excessive pore pressure. Therefore strict monitoring of the slide area on the left bank, dam abutments and concrete

dam is required from the safety point of view having large storage reservoir lying in the upstream of the dam.

Based on the above considerations, NDSA team recommends the following filling rates of first reservoir.

5.0 First Reservoir Filling Schedule

The initial filling of a reservoir is the first test to ascertain the performance of the dam in meeting its intended functions. A carefully managed first filling is crucial for the safety of dam & associated structures. The first reservoir filling schedule is proposed as follows:

Table – 1

Stage	Date	Reservoir El.	Filling rate	No. of days	Remarks
Stage-1	22.09.2025 to 27.09.2025	El.154 to El.163 m	1.5 m / day	6	Initial reading to be taken for all instruments and pending works to be completed. Monitoring by installed instruments in the concrete dam, abutments & Slide area
Rest -1	28.09.2025	El.163	0	1 day	Monitoring
Stage-2	29.09.2025 to 3.10.2025	El.163 m to El.168 m	1 m / day	5 days	Monitoring by installed instruments in the concrete dam, abutments & Slide area
Rest -2	04.10.2025 to 06.10.2025	El.168	0	3 days	Monitoring
Stage-3	07.10.2025 to 10.10.2025	El.168 m to El.171 m	0.75 m /day	4 days	Monitoring by installed instruments in the concrete dam, abutments & Slide area
Rest -3	11.10.2025 to 13.10.2025	El.171	0	3 days	Monitoring
Stage-4	14.10.2025 to 19.10.2025	El.171 to El.174 m	0.5 m /day	6 days	Monitoring by installed instruments in the concrete dam, abutments & Slide area
Rest -4	20.10.2025 to 22.10.2025	El.174 m	0	3 days	Monitoring
Stage-5	23.10.2025 to 28.10.2025	El.174 to El.177 m	0.5 m /day	6 days	Monitoring by installed instruments in the concrete dam, abutments & Slide area
Rest -5	29.10.2025 to 1.11.2025	El.177 m	0	4 days	Monitoring & visit by NDSA
Stage-6	2.11.2025 to 7.11.2025	El.177 m to El.178.5 m	0.25 m /day	6 days	Monitoring by installed instruments in the

					concrete dam, abutments & Slide area
Rest -6	8.11.2025 to 11.11.2025	El.178.5 m	0	4 days	Monitoring
Stage-7	12.11.2025 to 17.11.2025	El.178.5 m to El.180 m	0.25 m /day	6 days	Monitoring by installed instruments in the concrete dam, abutments & Slide area
	18.11.2025 to 21.11.2025	El.180 m	0	4 days	Monitoring
Stage-8	22.11.2025 to 29.11.2025	El.180 m to El.182 m	0.25 m /day	8 days	Monitoring by installed instruments in the concrete dam, abutments & Slide area
<p>Total Days : 69 Filling Days : 47 Rest Days : 22</p> <p>Important Notes</p> <ul style="list-style-type: none"> • Filling schedule given above shall be reviewed as per the progress against compliances indicated under para 6.1 mentioned below and accordingly it may further be modified in consultation with NDSA. • A mandatory visit by NDSA shall be held in the rest period of stage 5 to assess the site conditions and behaviour of slide mass, abutment, seepage from DT outlet etc. • Water Conductor system shall be filled at EL 160 m onwards in parallel with reservoir filling in a controlled manner as per codal provisions in this regard. • Reservoir Level shall be held at El.181 m (MDDL) for long duration. Filling rates above El.181 m shall be finalised after observing the dam behaviour, abutments and slide area for long duration. Further raising shall be hold till the further recommendations of NDSA. 					

6.0 Conditions / compliances during reservoir filling in stages

6.1 Specific compliances / conditions

Following specific compliances / conditions shall be fulfilled during reservoir filling:

Stage-1 Filling from El. 154 m to El.163 m shall be started only after

- All uplift measuring standpipe and direct and inverted pendulum are functional. Their initial readings have been calibrated by the supplier / manufacture. V-notch have been installed and seepage quantity in upstream and downstream sump have been measured initially. (The seepage amount shall be verified with the record of the operating the drainage pumps

installed in the sump). The status of the same shall be communicated to NDSA along with pics and marked in plan and sections.

- Bathymetry survey in the upstream along with sections at 5 m c/c have been completed in the slide area toe for understanding the pre-monsoon and post monsoon effect on the build-up toe of the slide area by tetrapod and underwater concreting. The survey results shall be shared with NDSA along with interpretation.
- Drill Cores, WPT and seismic tomography in the slide area in new holes have been completed. The report shall be shared with NDSA along with interpretation.
- All instruments have been installed and their functionality has been checked. All instruments have been recalibrated to base reading and reading taken. The instrument reading shall be shared with NDSA along with interpretation.
- Downstream concrete between DT1 and abutment upto El.173 m has been completed.

Stage- 2 filling from El. 163 m to El.168 m shall be started only after

- The instruments in the slide area like, pore pressure meter and inclinometer have been installed as per our earlier recommendations.

Stage 3 filling from El.168 m to El.171 m shall be started only after

- Additional deep grouting of the intact part of the left abutment has been completed along with WPT result. The details of the grouting along with WPT results shall be shared with NDSA.
- Underwater concrete filling / grouting of Diversion tunnel -1 from drill holes located at high level road has been completed.
- Other instruments like automatic settlement gauge etc. has been completed.

Stage 4 filling from El.171 m to El.174 m shall be started only after

- Additional consolidation grouting holes in the untreated area between El.170 m and El.200 m have been completed in primary and secondary holes pattern with effective spacing of 3 m c/c. The plan showing the grouting details shall be shared with NDSA along with grout intake, pressure and WPT results etc.
- Approach to DT1 outlet has been made and seepage, if any from diversion tunnel 1 to 5 is being measured and monitored. The details of the seepage and condition at the outlet shall be shared with NDSA.

Stage 6 filling from El.177 m to El.178.5 m shall be started only after

- Visit by NDSA has been held to assess the site conditions and behaviour of slide mass, abutment, seepage from DT outlet etc

6.2 General compliance

Since the first filling of a reservoir is a critical phase in the life of the dam, it is vital for dam operators and engineers to have as much as possible control over the first filling and allowing significant time as needed for appropriate surveillance, including the observation and analysis of instrumentation data. Also, it helps in checking the design, construction, and/or material adequacy of a new dam to become apparent during the first filling. Therefore, following shall be complied during reservoir filling.

- Daily measurement after every 6 / 8 hour of all the instruments installed in dam, slide area and left bank and right upstream and downstream. Strict monitoring of the dam behaviour by pendulums, uplift measuring stand pipe, topographical marker, seepage measurement etc. The instruments readings duly verified along with interpretation on daily basis shall be shared with NDSA.
- In case any abnormal behaviour is reported by installed instruments like tilting of the dam, excessive settlement, excessive seepage, left bank, right bank and slide area movement etc. are observed, the filling shall be stopped and reservoir shall be lowered in controlled manner.
- Leakage from the Adit to HRT shall be monitored regularly. In case of excessive leakage is observed, the filling shall be stopped. Measures shall be taken for controlling seepage before start of further raising.
- Leakage from the intake gates of other units where MIV has not been installed shall be monitored and checked regularly from the gate seal. In case of excessive leakage from the gates, the filling shall be stopped immediately, and reservoir level shall be lowered. Measures shall be taken for controlling the seepage before raising further.
- Seepage from DT1 outlet shall be monitored in case of significant seepage is observed from DT1, the filling shall be stopped, and reservoir shall be lowered in controlled manner.
- Slope protection measures upto El.210 m shall be completed in the DT inlet slide area. Further measures above El.210 m shall be completed at the earliest.
- Provisions of dam safety act, 2021 shall be complied during the reservoir filling and operation of the reservoir.
- Disaster Management plan (DMP) shall be prepared and kept as per the provision of the dam safety act.
- Reservoir operation manual, gate operation manual shall be kept ready during reservoir filling and operation of the reservoir.
- Reservoir area in significant upstream stretch shall be monitored by Drone survey during reservoir filling and operation of the project.
- Measures suggested by the Expert group.
- Cores from 3-4 locations shall be extracted for assessment the efficacy. Core testing has been carried out for strength and permeability of the encountered material.

Annexure – I

List of participants

NDSA team

1. Sh. Shiv Kumar Sharma, Director, CMDD (E&NE), CWC
2. Sh. Rahul Kumar Singh, Director, Gates, Design (NW&S), CWC and Disaster &Resilience, NDSA
3. Shri D P Gangwal, Director, EG, NER, Geological Survey of India
4. Sh. Vibhor Bhagel, Assistant Director, Gates Design (NW&S), CWC and Disaster &Resilience, NDSA

NHPC team

1. Sh. Rajendra Prasad ,HOP , Subansiri Lower HE Project
2. Sh. R M A Khan , GM (Design &Engineering)
3. Sh. H S Ranga , GM (Civil)
4. Sh. Vachaspati Pandey ,GM(Geology)
5. Sh. Himanshu Nagpal ,DGM(Civil)

Annexure – II

Photographs



Photo 1. Concrete dam upstream area



Photo 2. Concrete dam downstream view



Photo 3. Left bank protection measures in slide area



Photo 4. Left bank protection measures in slide area



Photo 5. Downstream concrete filling



Photo 6. Uplift measuring stand pipe in the foundation gallery



Photo 7. Topographical markers



Photo 8. Direct and Inverted Pendulum

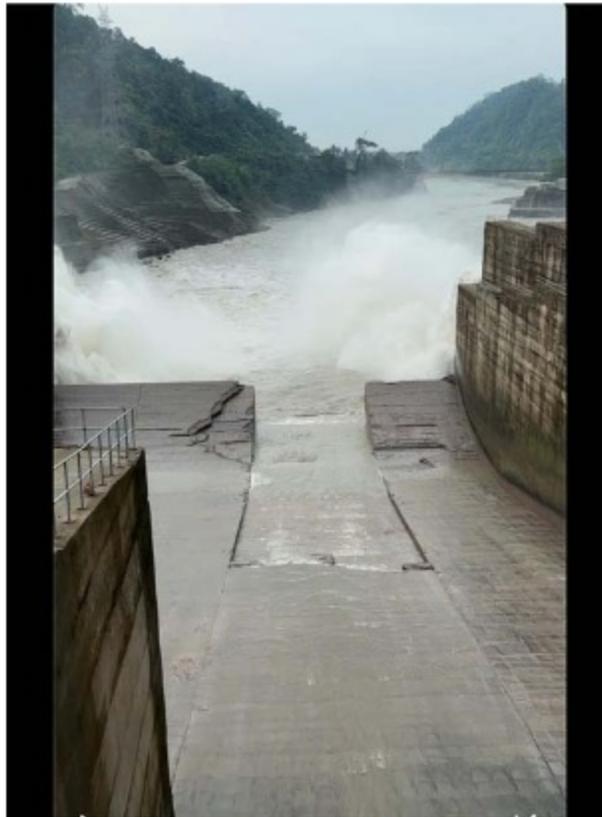


Photo 9. Damaged bucket of Spillway bay S6

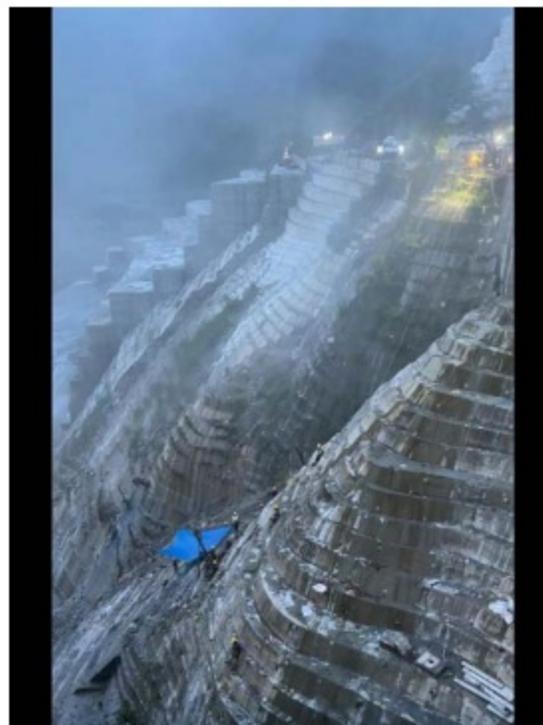


Photo 10. Upstream deep consolidation grouting in left abutment

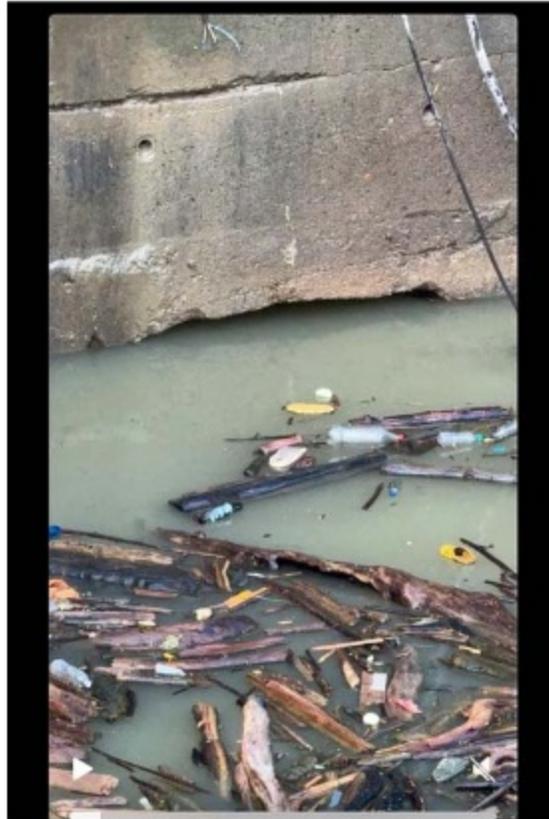


Photo 11. DT1 outlet filled with wooden logs



Photo 12. Diversion Tunnel outlet filled with wooden logs

Date :29-10-2023

Status report on Subansiri Lower HE Project (2000 MW) Assam & Arunachal Pradesh

A massive landslide in cavity area behind DT-1 & DT-2 occurred on 27.10.2023 causing damage and washing out of the DT-2 Inlet Structure & damaging of High Level Road towards downstream in a stretch of about 20 mtr.

The Project site was inspected by Director (Projects) , Director (Technical) and team from Design, CEPM and PMSG divisions of NHPC Corporate office on 28/29 October 2023. List of Officers is enclosed as Annexure-1. Presently the river is flowing over the spillway section at about 5 m above crest level (145 EL. m) at EL 150 m. It was observed that after slide of 27th Oct 2023 on DT inlet , the flow from DT-1 outlet completely stopped.

After detailed inspections, the following decisions were taken at site and accordingly the work activities have commenced

- a) In order to create concrete barrier in DT-1 , it was decided to drill a 8" (200 mm) dia Hole from High Level Road (HLR) in DT-1 at around 35 m upstream of dam axis on left bank. The concrete barrier shall be created placing concreting from the HLR using tremie pipe in u/s of main plug at dam axis. The Concrete barrier will help in stabilising the DT-1 for carrying out final plugging as per drawing at DT1 at dam axis safely. Further additional holes shall be drilled for filling DT1 tunnel in u/s completely. It was felt necessary and decided for plugging of DT-1 on top most priority by underwater concrete of M30A20 grade to avoid any further damages to left abutment.
- b) U/s deposited material at DT-1 inlet cavity may be treated/filled with cement grout and cement bentonite grout with the help of grout pumps to consolidate the slided mass on the surface for preventing any flow/seepage through slided mass to avoid breaching.
- c) Left abutment support and cavity treatment measures shall be worked out after filling the DT1 and plugging activities so that vehicle movement is started on HLR. Left abutment and cavity area needs to be treated on priority for the stability of dam left abutment.
- d) Double Twisted (DT) / Rolled cable Net (RCN) with Self drilling anchor (SDA) may be installed for protection from falling boulders and safe working in u/s of dam towards cavity. Rock supports at left abutment by self drilling anchors shall be installed in u/s of dam axis as well as d/s of dam axis as some loose boulder likely to fall was observed around El. 250 m above dam axis. Concrete cladding in D/s on both abutments may be extended up to EL 190/ 200 m
- e) Construction of upstream dyke from Intake -6 through HRT-6 to bay S-9 bay may be started . Precautions to be taken so that no damages occurs to its invert lining by filling the invert with muck /sand. Also, random material/sack gabion may be dropped from dam top near R1

block in u/s for raising the platform in u/s upto El. 152 m so that there is no flow through S9 bay . Simultaneously, approach from S-9 bay from downstream may also be explored for entering from bay S-9 /S-8for taking up the HM works and thereafter, dyke from S-9 shall be extended towards S8 ,S7 ,S6 initially . Based on the river discharge , the dyke shall be further extended upto S4 bay for passing the river discharge only from three bays S-1,S-2 and S-3.

- f) Construction of dyke for isolating DT-1 from river outlet for subsequent plugging of remaining length of plugs in DT-2 to DT-5 and start of plugging from DT-1 at specified location as per drawings.. Existing road near S-1 bay to DT-1 outlet may be extended in the river portion for carrying out the concrete plugging works of DT-1 . This activity of plugging to reach up to Dam axis from DT-1 outlet has to be started immediately after construction of dyke and completion of dewatering.
- g) Inspection of diversion tunnel may be carried out by Remote Operating vehicle (ROV) for assessment of damages in the tunnel to decide subsequent activities.
- h) Feasibility of extending TRC Dyke presently under construction towards dam spillway for alternate approach may be extended at later stage from bay S-7/S-6 as per the site condition.
- i) Extension of Access road from road towards D/s at DT outlet for taking up the concrete cladding , placement of tetra pods and repair works may be started from bottom for its strengthening .
- j) Cement grout may be used for filling the cracks on the HLR observed on the road surface.
- k) In Downstream of apron of Bay S1 , the area upto rock ledge may be filled with underwater concrete M30A20 , tetrapod , gabions to avoid any damages to S1 bay foundation.
- l) Help of divers may be taken for accessing seepage wherever required .
- m) Help of specialised agency may be taken for carrying out slope treatment measures for long term safety of dam left abutment.
- n) Required resources / machineries shall be deployed by project / contractor to complete the work in time frame.
- o) HM works /activities which can be taken up from dam top by jhula /other means shall be taken up on priority.

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 30/10/2023
 GM (Civil)
 Deshpande

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 30/10/23
 GM (CE/M)

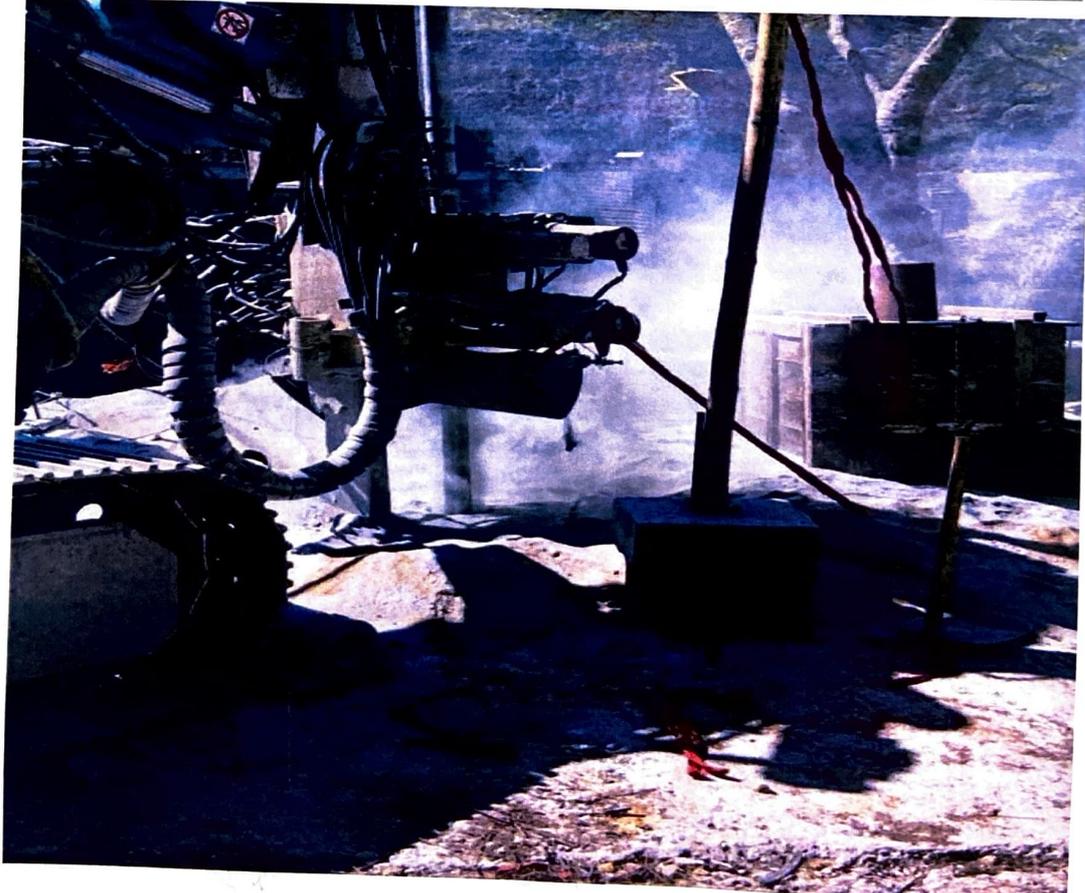
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 Deepak Singhal

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 (B. Basu)
 Div/ projects
 30.10.23

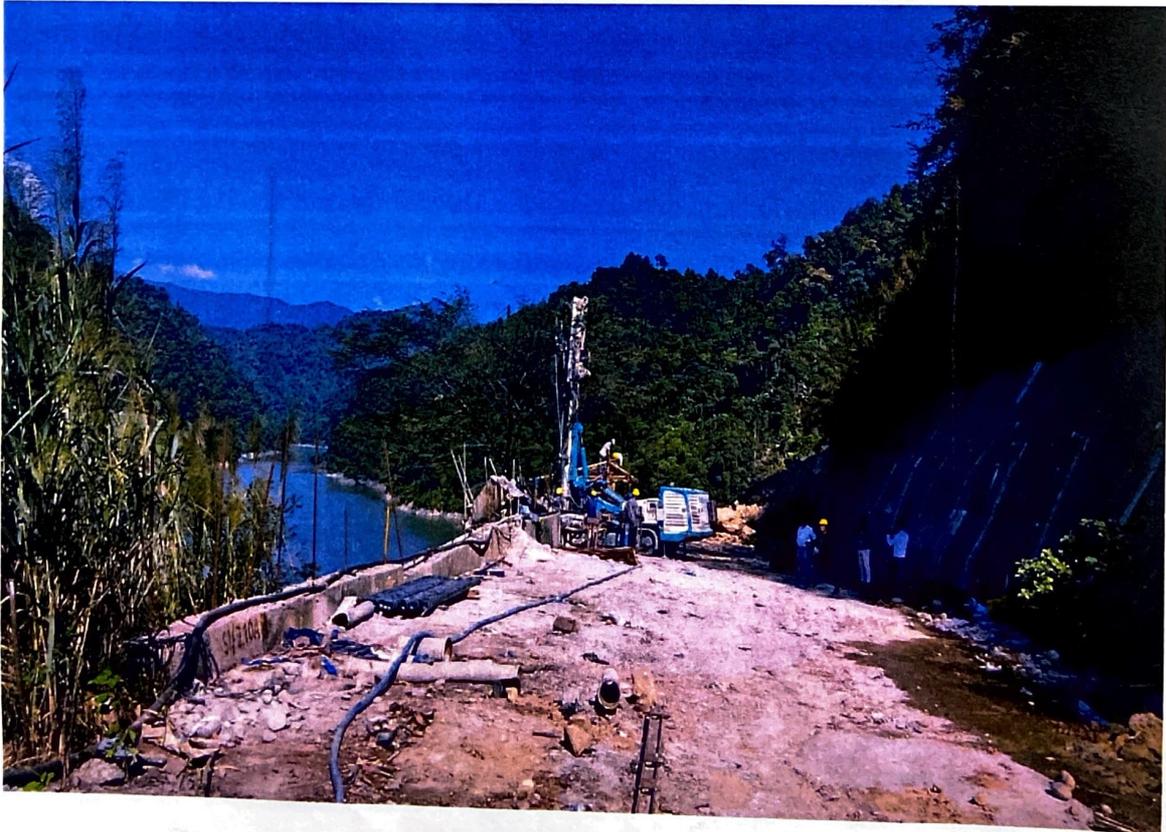
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List of Officers:

Corporate Office:

1. Sh. Biswajit Basu , Director (Projects)
2. Sh. Raj Kumar Chaudhary, Director (Technical)
3. Sh. Deepak Saigal, ED, (PMSG)
4. Sh. B.L Aswal, GM, (CEP)
5. Sh. Rao Mushraf Ali Khan, GM, (D&E)

Project:

1. Sh. Vipin Gupta, ED, (SLP)
2. Sh. Rajendra Prasad, Gr GM (Civil), (SLP)
3. Sh. Sanaka Luha , GM (Civil)-PH
4. Sh. Rajesh Ranjan, GM (Mech.)-HM


GM (Civil)
Deepak Saigal
20/10/2023

20/10/23
GM (CEP)




GM (Civil)

30/10/23
DB



Government of India
Ministry of Jal Shakti
Department of Water Resources, River Development & Ganga Rejuvenation

Site Visit Report of NDSA Team to Subansiri Lower HEP (2000 MW), Assam/ AP 10th – 12th September 2025



National Dam Safety Authority

**Site Visit report of the NDSA team to Subansiri Lower HE Project, Arunachal Pradesh /Assam from
10th September to 12th September, 2025**

As per clause 27(2) of the Dam Safety Act, 2021 and in response to the request made by NHPC vide letter no. NH/SLP/HoP/2025/04 dated 11.03.2025, NDSA constituted a team vide OM dated 4th April, 2025 to inspect the Dam of Subansiri Lower HEP (2000MW), Arunachal Pradesh of NHPC limited before initial filling and to review the initial filling plan prepared by the project authority. **The latest site visit by the team to Subansiri Lower HE Project, Arunachal Pradesh /Assam was held from 10th September to 12th September, 2025.**

1.0 Previous Site Visits by NDSA team

A brief description of sites visits previously conducted by the NDSA team is as follows

1.1 First visit of the NDSA team (10-12 April 2025)

The first visit of the NDSA team took place on 10-12 April, 2025. The team after inspection of the project, recommended certain activities to be completed to proceed ahead with first reservoir filling. For example:

- Consolidation grouting of the slide mass effectively up to required depth and in untreated area between El.170 m to El.200 m, bore holes and core testing, more geophysical tests to be carried out.
- Backfilling of the area with concrete immediately downstream of the dam where rock cover between DT1 and abutment is very less.
- Concrete retaining wall near DT outlet channel for monitoring the seepage during reservoir filling and later.
- Curtain grouting in the upstream near the heel of the dam for covering the area between DT1 and bottom of diaphragm wall
- Installation and functioning of all the requisite instrumentation
- Bathymetry survey in upstream and downstream of the dam specially at the slide mass
- Installation of the inclinometer, pore pressure meter /piezometer on the left bank hill slope in the slide zone
- Inclinometer, MPBX installation at El.155 m bench in the toe protection area
- Expert group visit
- Filling of large cavity observed in DT1 near its outlet yet to be taken up
- Plugging of diversion tunnel till outlet

NHPC provided the preliminary reply / compliance of the observations vide letter dated 25th April, 2025. Subsequently, in response to NDSA letter dated 09th May, 2025; NHPC further submitted compliance /reply vide email dated 22nd & 24th May, 2025.

1.2 Second visit of NDSA Committee (16th June 2025 to 18th June 2025)

Second visit of the NDSA committee took place on 16th -18th June, 2025. Upon inspection and discussion held with project authorities at project site, it was determined that many activities which were recommended in site visit note of first visit, are yet to be completed. For example:

- Completion of the consolidation grouting in untreated area between El.170 m to El.200 m were not fully completed.
- Installation and calibration of dam instruments, instruments in the left bank slide area like pore pressure meter /piezometer, settlement gauge and inclinometer etc. was not fully completed.
- Backfilling of the area with concrete immediately downstream of the dam where rock cover between DT1 and abutment was not completed upto El.173 m

Besides some other issues were also identified such as

- Additional deep grout holes in the intact part of the left abutment to be carried out
- Concrete filling of the upstream part of the Diversion Tunnel-1 from 23 m upstream of dam axis to 70 m upstream of dam axis by tremie pipe, after complete filling of the part of DT1, extraction of the cores at 3-4 locations for ascertain the efficacy of the underwater concrete.
- Repair of damaged S6 bucket
- Emergency action plan and dam break analysis to be updated

2.0 Present (Third) visit of the NDSA committee (10th to 12th September, 2025)

The Present (Third) visit of the NDSA committee took place from 10th September -12th September, 2025. The list of participants is enclosed as Annexure -I.

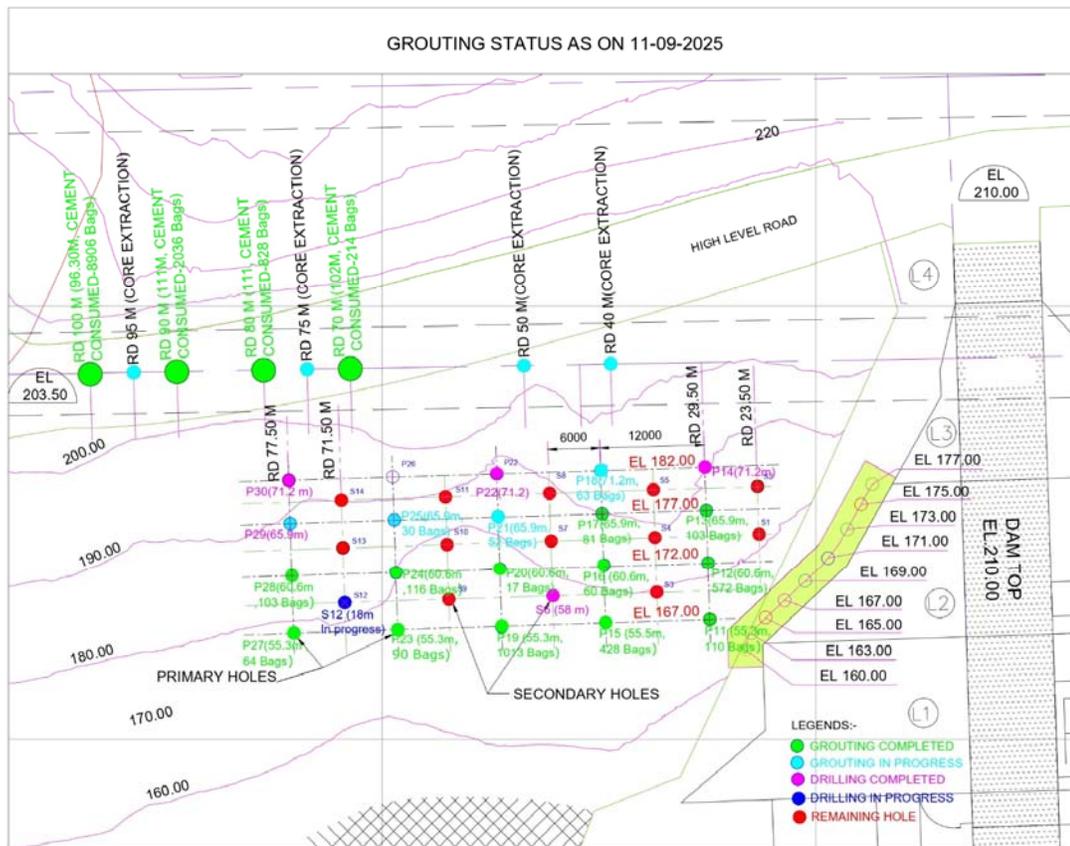
NDSA team inspected the concrete dam, foundation galleries, left slide area, concrete protection measures, core logging and instrumentation. Team also visited the underground surge tunnel, Adit plug of HRT and upper horizontal pressure shaft.

Following are the observations and recommendations:

2.1 Additional deep grout holes

- For grouting in the upstream of the dam in the left bank, around 20 no. primary holes and 14 no. secondary holes were proposed. Holes were to be drilled for around 60 m depth.
- Primary Holes have been proposed from El.167, El172, El177 m and El.182 m. Secondary holes have been proposed from El.169.5, 174.5, 179.5 m.
- Around 20 no. holes were observed to have been drilled and grouted during the site visit.
- Presently drilling and grouting from holes at El 167, 169.5 and 172 m was in progress during the site visit.

- Some holes have showed high grout intake of around 1000 bags in P19, 500 bags in P12 and P15. WPT was carried out in hole no. P16 which showed value of the permeability to be around 4 to 10 lugeon.
- High grout intake indicates presence of wide open joints / cavities in the area lying near the alignment of DT1. Therefore, this area needs special attention and to be effectively grouted. Additional holes, if required may be carried out for limiting the permeability. Check holes may also be carried out for ascertaining the efficacy of the grouting. WPT needs to be carried extensively in primary and secondary holes before grouting.
- At least 7 days shall be provided for achieving the required strength of the grout. Reservoir water level is required to be kept lower for fulfilling this criterion.
- All record of grouting, drilling, WPT, CST etc. shall be shared with NDSA.



Additional Deep Grout Holes : Status as on 11.09.2025

2.2 Installation of the dam instruments and instruments in the slide area

- Team visited dam foundation gallery for inspection of the dam instruments. It was observed uplift measuring standpipe are not working at most of the location. It was informed that only 14 no. uplift measuring standpipe show some release of water out of 42 no. installed in the dam foundation galleries. In some, pressure was showing negative value. It was advised to check and restore the nonfunctional uplift measuring standpipe. Their functioning is most important for observing the behaviour of the dam during reservoir filling. Agency needs to be called urgently for repairing / replacing the same before commencement of the reservoir filling.
- Pendulum in L1 and R1 block needs to be made functional. Direct and inverted pendulum to be made automatic so that the readings are taken regularly in the control room. It was informed that the automation of the pendulum is in process and shall be completed soon. It was advised to complete the same before commencement of the reservoir filling so that tilt, if any, is measured. Automatic functioning of all the pendulums is very important. The instruments needs to be calibrated for initial base reading.
- U-notch have been installed for measuring the discharge in the drainage sump. It was advised to install the V notch for measuring the realistic measurement of the seepage. Presently around 450 lpm in upstream and 450 lpm in downstream sump was observed. Total around 900 lpm has been observed with reservoir water level around El.154 m. The measurement of the seepage needs to validated by the actual time of pump operation. It was observed that pump was not found functional while the sump was filled upto its top level and water starting to enter the galleries.
- The remaining instruments in the slide area like piezometer / pore pressure meter, inclinometer, settlement gauge needs to installed and completed on priority.

2.3 Concrete filling of the upstream part of Diversion Tunnel - 1

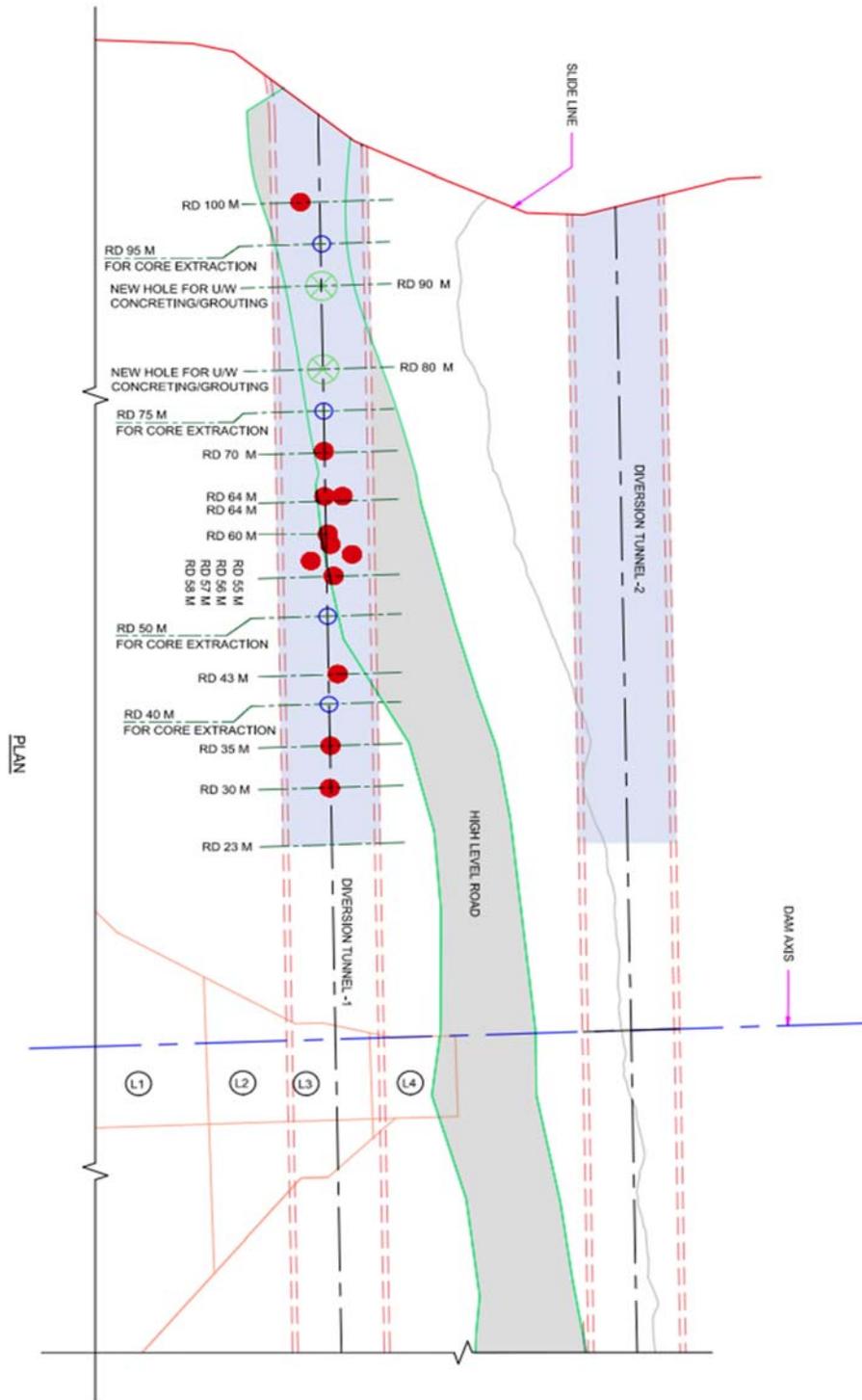
- Concreting / grouting of DT1 from drill holes located at high level road from RD 30 m to RD 100 m from dam axis was in progress. Holes at RD 90 m and 80 m had been drilled and grouted. Concreting / grouting shall be carried out to ensure complete filling as per the recommendations.
- Extraction of the core in DT1 at RD 50 m was in progress. It was informed around 25 m depth has been drilled so far. The drilled cores shall give the information about the efficacy of the concrete filling in the DT1 in upstream of the plug. The result of the cores shall be shared with NDSA.

2.4 Consolidation grouting between El.170 m to El.200 m

- Approach to different concrete benches have been constructed. It was informed that consolidation grouting in untreated area between El.170 m to El.200 m have been taken up. Presently grouting from El.190 m was in progress. It was advised to complete the consolidation

grouting upto required depth to consolidate the slide material in primary and secondary holes pattern. Primary holes to be spaced at 6 m c/c with secondary holes in-between such that effective spacing of 3 m c/c is achieved. Results of the grouting and WPT shall be shared with NDSA.

Upstream filling of Diversion Tunnel – 1 by underwater concrete / grouting



2.7 Monitoring of Seepage from DT1 outlet and concrete outlet wall

- Wooden logs have been deposited in the outlet area. Water was filled around El.106 m in the area which was being dewatered. It was informed that the concrete outlet wall shall be constructed during the lean season along with the balance works of diversion tunnel plugging. It is very important to closely monitor the seepage from Diversion tunnel area as the reservoir level is raised.



2.8 Spillway bay S6 bucket damage

- Damaged bucket and glacis of the spillway bay S6 was seen. The damages does not seem to have increased further since second visit of NDSA team. However, the damages of the surrounding bays (especially bay no 7) seem to have increased further. It was informed that the spillway bucket and glacis shall be repaired during the lean season. It was advised to inspect all the bays and repair the damages as soon as possible. It was also discussed to explore the feasibility of approach road on the existing downstream apron for repair of bucket by raising it further instead of constructing a downstream dyke.



3.0 Additional long term protection measures suggested by the NDSA team

- The left bank slope stabilization measures, including installation of SDA, cable tendon, concrete cladding and consolidation grouting may be continued up to the top level ($\pm 300\text{m}$) of the exposed rock surface. The topsoil cover should be removed/dressed in a planned way, and the remaining soil part should be protected with the bioengineering method of stabilization to avoid any failure in the near future.
- In order to release the pore water pressure, provision of weep holes/drainage holes (adequate length and diameter) may be provided concurrently with the progressive concrete cladding.
- The unlined section of the dam axis road tunnel shall be lined with adequate-strength concrete along with deep drainage holes.
- Periodic monitoring through instrumentation as well as through physical targets in and around the slide zone shall continue to check the performance of the treated slope. Any signs of movement must be brought to the knowledge of the NDSA for necessary treatment.
- Area /gap on right bank between S9 pier and abutment in the downstream may be filled to suitable level with concrete for providing additional toe support to the steep right bank.
- The space between S1 pier and near DT1 outlet cavity needs to be filled with concrete to avoid any retrogression of the scour towards S1 foundation. Similarly, the left out space of old plunge pool near S9 lock and right bank access road at El.120 m needs to be filled to avoid any erosion towards hill mass and S9 foundation.
- The area downstream of the concrete apron of dam needs to be inspected thoroughly and concreting may be carried out in the deep scour pits if observed during the inspection.
- Plunge pool construction needs to be expedited as early as possible. At higher reservoir levels during the operation of the project, the scour shall increase significantly. Therefore, operating the reservoir at higher level for long duration may be risky for the dam foundation and abutment slope. Project needs to make the planning of the construction of the plunge pool as per site condition.
- It was observed that the left bank slope at DT outlet channel shows some distress at higher level between old road tunnel and new road tunnel. Also, spillway water is hitting the left bank. It was advised to strengthen the area on the left bank from DT 5 outlet to the old road tunnel. It was informed that the toe of this slope has been excavated significantly around El.98 m during the construction of outlet channel. Therefore, the outlet area may be filled with suitable grade of concrete to suitable height to provide toe support to this long stretch and steep slope in long run.
- Slope protection measures may be taken in the form of additional rock supports, concrete cladding, pressure relief holes in this area where required. This is main access road to dam top on left bank and its stability is vital for the safety point of view.
- Both banks downstream of concrete dam and power house may be protected at toe with tetrapod along with underwater concreting to minimize the erosion and concrete cladding at exposed rock surface upto bridge location.

- Deo-nallah diversion may be seen as per site condition at higher level. Nallah may be provided with concrete to avoid seepage into the adjoining rock mass.
- Dam abutments and reservoir area in significant stretch shall be monitored by Synthetic Aperture Radar (SAR) imagery system satellite based for long term monitoring and behaviour.
- Erosion indicators can be installed near downstream concrete apron of dam spillway during the repair of S6 bay and erosion near the dam toe, if any.
- Inspection of the joint between old dam and extended part needs to be carried out during the lean season after closing the gates. Seepage in the drainage galleries near the joint location needs to be monitored regularly.
- Stable points / benchmark on both banks shall be used for measuring the readings of the survey targets and topographical markers.
- Core testing for strength, permeability shall be carried out of the samples from slide area, DT1 filling concrete.
- Regular ROV / bathymetry survey of the toe area of the DT inlet side protection measures in the upstream of dam shall be carried out pre and post monsoon for ascertain the behaviour of the toe measures and protection concrete.
- ROV / bathymetry survey of the downstream of the dam near the concrete apron and plunge pool location shall be carried out for assessment of the likely scour during pre and post monsoon season.
- Removal of ISMB supports and other misc. material lying in the radial gate area shall be removed from access gallery at El.173 m. Lying of ISMB in the gate area may be dangerous for the safety of the hydraulic cylinders in case of seismic condition.

4.0 First Reservoir filling of Subansiri Lower HE Project (2000MW)

Construction of the Subansiri lower HE Project was started during year 2005. During year 2011 to 2019, project construction work was stopped due to local agitation. Work resumed in September, 2019 after getting clearance from NGT. During construction of the project, incidences of the land slide have occurred from time to time e.g. major slide at DT outlet channel during June, 2020, portal slope failure at DT5 during August, 2021, DT inlet slide during September 2022. A major slide occurred on 27th October, 2023 which stopped the flow from DT1.

NHPC has taken measures in the slide area by toe protection measures with tetrapods, underwater concreting, concrete benches at different elevation, consolidation grouting the slide mass etc. As informed by NHPC, presently there is no excessive settlement is reported in the slide area. However, it is apprehended that the protection measures are lying on the slide material, and during high reservoir water level and seismic conditions, material may behave differently. Therefore, it is recommended to have the slow filling rates considering the existing site condition and past events and geological seismological set up of the area. Slide material may behave like earthen dam subject to excessive pore pressure. Therefore strict monitoring of the slide area on the left bank, dam abutments and concrete

dam is required from the safety point of view having large storage reservoir lying in the upstream of the dam.

Based on the above considerations, NDSA team recommends the following filling rates of first reservoir.

5.0 First Reservoir Filling Schedule

The initial filling of a reservoir is the first test to ascertain the performance of the dam in meeting its intended functions. A carefully managed first filling is crucial for the safety of dam & associated structures. The first reservoir filling schedule is proposed as follows:

Table – 1

Stage	Date	Reservoir El.	Filling rate	No. of days	Remarks
Stage-1	22.09.2025 to 27.09.2025	El.154 to El.163 m	1.5 m / day	6	Initial reading to be taken for all instruments and pending works to be completed. Monitoring by installed instruments in the concrete dam, abutments & Slide area
Rest -1	28.09.2025	El.163	0	1 day	Monitoring
Stage-2	29.09.2025 to 3.10.2025	El.163 m to El.168 m	1 m / day	5 days	Monitoring by installed instruments in the concrete dam, abutments & Slide area
Rest -2	04.10.2025 to 06.10.2025	El.168	0	3 days	Monitoring
Stage-3	07.10.2025 to 10.10.2025	El.168 m to El.171 m	0.75 m /day	4 days	Monitoring by installed instruments in the concrete dam, abutments & Slide area
Rest -3	11.10.2025 to 13.10.2025	El.171	0	3 days	Monitoring
Stage-4	14.10.2025 to 19.10.2025	El.171 to El.174 m	0.5 m /day	6 days	Monitoring by installed instruments in the concrete dam, abutments & Slide area
Rest -4	20.10.2025 to 22.10.2025	El.174 m	0	3 days	Monitoring
Stage-5	23.10.2025 to 28.10.2025	El.174 to El.177 m	0.5 m /day	6 days	Monitoring by installed instruments in the concrete dam, abutments & Slide area
Rest -5	29.10.2025 to 1.11.2025	El.177 m	0	4 days	Monitoring & visit by NDSA
Stage-6	2.11.2025 to 7.11.2025	El.177 m to El.178.5 m	0.25 m /day	6 days	Monitoring by installed instruments in the

					concrete dam, abutments & Slide area
Rest -6	8.11.2025 to 11.11.2025	El.178.5 m	0	4 days	Monitoring
Stage-7	12.11.2025 to 17.11.2025	El.178.5 m to El.180 m	0.25 m /day	6 days	Monitoring by installed instruments in the concrete dam, abutments & Slide area
	18.11.2025 to 21.11.2025	El.180 m	0	4 days	Monitoring
Stage-8	22.11.2025 to 29.11.2025	El.180 m to El.182 m	0.25 m /day	8 days	Monitoring by installed instruments in the concrete dam, abutments & Slide area
<p>Total Days : 69 Filling Days : 47 Rest Days : 22</p> <p>Important Notes</p> <ul style="list-style-type: none"> • Filling schedule given above shall be reviewed as per the progress against compliances indicated under para 6.1 mentioned below and accordingly it may further be modified in consultation with NDSA. • A mandatory visit by NDSA shall be held in the rest period of stage 5 to assess the site conditions and behaviour of slide mass, abutment, seepage from DT outlet etc. • Water Conductor system shall be filled at EL 160 m onwards in parallel with reservoir filling in a controlled manner as per codal provisions in this regard. • Reservoir Level shall be held at El.181 m (MDDL) for long duration. Filling rates above El.181 m shall be finalised after observing the dam behaviour, abutments and slide area for long duration. Further raising shall be hold till the further recommendations of NDSA. 					

6.0 Conditions / compliances during reservoir filling in stages

6.1 Specific compliances / conditions

Following specific compliances / conditions shall be fulfilled during reservoir filling:

Stage-1 Filling from El. 154 m to El.163 m shall be started only after

- All uplift measuring standpipe and direct and inverted pendulum are functional. Their initial readings have been calibrated by the supplier / manufacture. V-notch have been installed and seepage quantity in upstream and downstream sump have been measured initially. (The seepage amount shall be verified with the record of the operating the drainage pumps

installed in the sump). The status of the same shall be communicated to NDSA along with pics and marked in plan and sections.

- Bathymetry survey in the upstream along with sections at 5 m c/c have been completed in the slide area toe for understanding the pre-monsoon and post monsoon effect on the build-up toe of the slide area by tetrapod and underwater concreting. The survey results shall be shared with NDSA along with interpretation.
- Drill Cores, WPT and seismic tomography in the slide area in new holes have been completed. The report shall be shared with NDSA along with interpretation.
- All instruments have been installed and their functionality has been checked. All instruments have been recalibrated to base reading and reading taken. The instrument reading shall be shared with NDSA along with interpretation.
- Downstream concrete between DT1 and abutment upto El.173 m has been completed.

Stage- 2 filling from El. 163 m to El.168 m shall be started only after

- The instruments in the slide area like, pore pressure meter and inclinometer have been installed as per our earlier recommendations.

Stage 3 filling from El.168 m to El.171 m shall be started only after

- Additional deep grouting of the intact part of the left abutment has been completed along with WPT result. The details of the grouting along with WPT results shall be shared with NDSA.
- Underwater concrete filling / grouting of Diversion tunnel -1 from drill holes located at high level road has been completed.
- Other instruments like automatic settlement gauge etc. has been completed.

Stage 4 filling from El.171 m to El.174 m shall be started only after

- Additional consolidation grouting holes in the untreated area between El.170 m and El.200 m have been completed in primary and secondary holes pattern with effective spacing of 3 m c/c. The plan showing the grouting details shall be shared with NDSA along with grout intake, pressure and WPT results etc.
- Approach to DT1 outlet has been made and seepage, if any from diversion tunnel 1 to 5 is being measured and monitored. The details of the seepage and condition at the outlet shall be shared with NDSA.

Stage 6 filling from El.177 m to El.178.5 m shall be started only after

- **Visit by NDSA has been held to assess the site conditions and behaviour of slide mass, abutment, seepage from DT outlet etc**

6.2 General compliance

Since the first filling of a reservoir is a critical phase in the life of the dam, it is vital for dam operators and engineers to have as much as possible control over the first filling and allowing significant time as needed for appropriate surveillance, including the observation and analysis of instrumentation data. Also, it helps in checking the design, construction, and/or material adequacy of a new dam to become apparent during the first filling. Therefore, following shall be complied during reservoir filling.

- Daily measurement after every 6 / 8 hour of all the instruments installed in dam, slide area and left bank and right upstream and downstream. Strict monitoring of the dam behaviour by pendulums, uplift measuring stand pipe, topographical marker, seepage measurement etc. The instruments readings duly verified along with interpretation on daily basis shall be shared with NDSA.
- In case any abnormal behaviour is reported by installed instruments like tilting of the dam, excessive settlement, excessive seepage, left bank, right bank and slide area movement etc. are observed, the filling shall be stopped and reservoir shall be lowered in controlled manner.
- Leakage from the Adit to HRT shall be monitored regularly. In case of excessive leakage is observed, the filling shall be stopped. Measures shall be taken for controlling seepage before start of further raising.
- Leakage from the intake gates of other units where MIV has not been installed shall be monitored and checked regularly from the gate seal. In case of excessive leakage from the gates, the filling shall be stopped immediately, and reservoir level shall be lowered. Measures shall be taken for controlling the seepage before raising further.
- Seepage from DT1 outlet shall be monitored in case of significant seepage is observed from DT1, the filling shall be stopped, and reservoir shall be lowered in controlled manner.
- Slope protection measures upto El.210 m shall be completed in the DT inlet slide area. Further measures above El.210 m shall be completed at the earliest.
- Provisions of dam safety act, 2021 shall be complied during the reservoir filling and operation of the reservoir.
- Disaster Management plan (DMP) shall be prepared and kept as per the provision of the dam safety act.
- Reservoir operation manual, gate operation manual shall be kept ready during reservoir filling and operation of the reservoir.
- Reservoir area in significant upstream stretch shall be monitored by Drone survey during reservoir filling and operation of the project.
- Measures suggested by the Expert group.
- Cores from 3-4 locations shall be extracted for assessment the efficacy. Core testing has been carried out for strength and permeability of the encountered material.

Annexure – I

List of participants

NDSA team

1. Sh. Shiv Kumar Sharma, Director, CMDD (E&NE), CWC
2. Sh. Rahul Kumar Singh, Director, Gates, Design (NW&S), CWC and Disaster &Resilience, NDSA
3. Shri D P Gangwal, Director, EG, NER, Geological Survey of India
4. Sh. Vibhor Bhagel, Assistant Director, Gates Design (NW&S), CWC and Disaster &Resilience, NDSA

NHPC team

1. Sh. Rajendra Prasad ,HOP , Subansiri Lower HE Project
2. Sh. R M A Khan , GM (Design &Engineering)
3. Sh. H S Ranga , GM (Civil)
4. Sh. Vachaspati Pandey ,GM(Geology)
5. Sh. Himanshu Nagpal ,DGM(Civil)

Annexure – II

Photographs



Photo 1. Concrete dam upstream area



Photo 2. Concrete dam downstream view



Photo 3. Left bank protection measures in slide area



Photo 4. Left bank protection measures in slide area



Photo 5. Downstream concrete filling



Photo 6. Uplift measuring stand pipe in the foundation gallery



Photo 7. Topographical markers



Photo 8. Direct and Inverted Pendulum

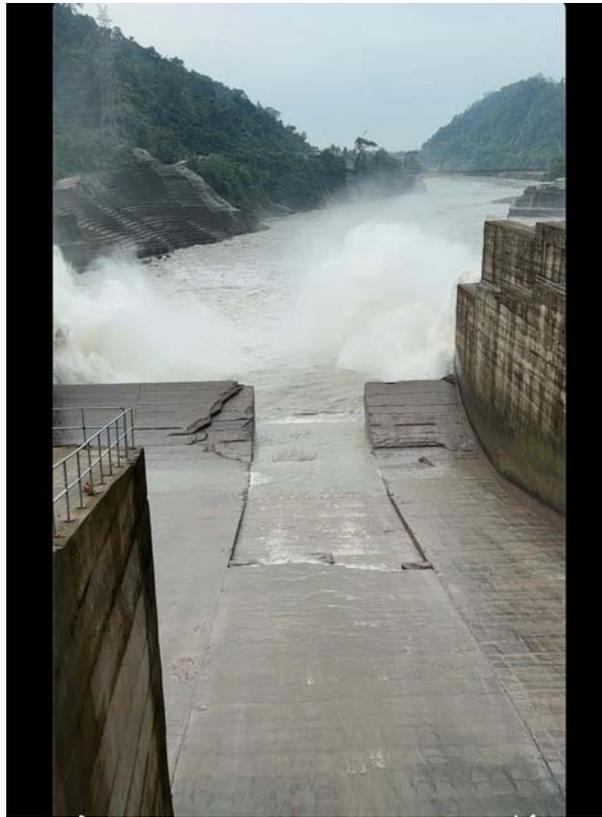


Photo 9. Damaged bucket of Spillway bay S6

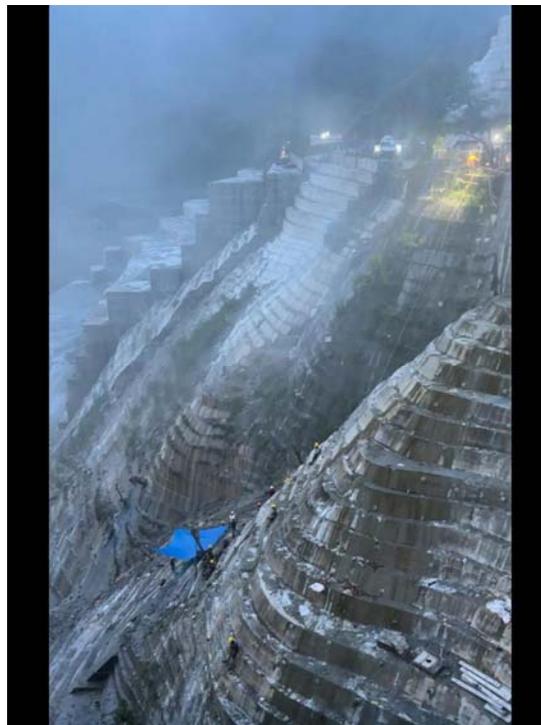


Photo 10. Upstream deep consolidation grouting in left abutment

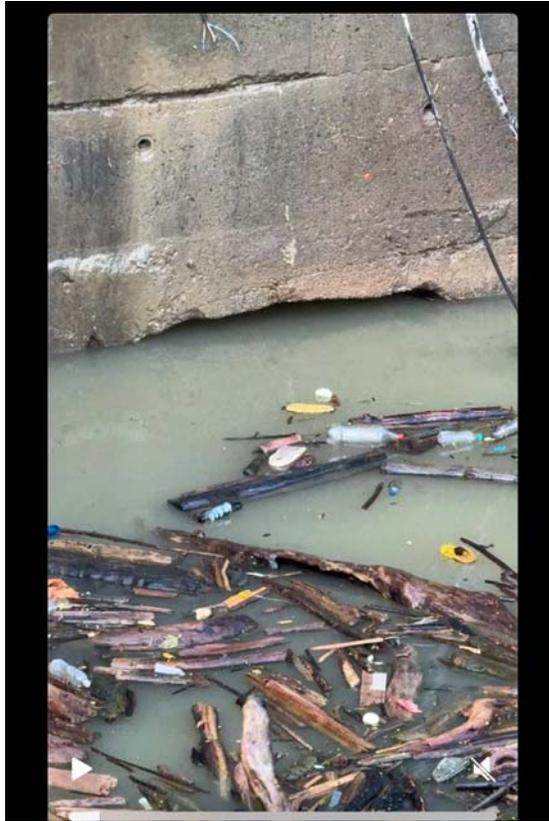


Photo 11. DT1 outlet filled with wooden logs



Photo 12. Diversion Tunnel outlet filled with wooden logs

**REPORT
OF
DAM DESIGN REVIEW PANEL (DDRP)
FOR
SUBANSIRI LOWER H.E. PROJECT
(ASSAM-ARUNACHAL PRADESH)**



**SUBMITTED
TO
MINISTRY OF POWER
GOVERNMENT OF INDIA
NEW DELHI**

MAY-2013

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राजेश कुमार
अध्यक्ष, के. ज. आयोग
RAJESH KUMAR
CHAIRMAN, CWC
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अर्द्ध शा. पत्र सं.
D.O. Letter No. _____

4th June, 2013

To,

The Secretary (Power),
Ministry of Power,
Government of India,
Shram Shakti Bhavan,
New Delhi.

Sub: Report of Dam Design Review Panel (DDRP) of Subansiri Lower H.E. Project.

Ref: Ministry of Power, Government of India Office Memorandum No. 2/4/2012-NHPC dated: 10.12.2012.

Sir,

At the outset, I would like to convey my sincere thanks to Ministry of Power (MOP) for showing confidence in the Panel Members under the Chairmanship of the undersigned to look into various issues raised by Technical Expert Committee (TEC) – constituted by Planning Commission, Govt. of India - in their report of July 2012.

I am glad to present the report on the Subansiri Lower Project as desired in the Office Memorandum referred above. DDRP members have made all-out efforts to address all the issues/concerns raised in the above OM. There has been some delay in preparation & submission of this report. This delay was inevitable as there were multidisciplinary issues involved viz. foundation competency, seismic aspect, dam design review and existing ground conditions. DDRP has been able to find solutions to the issues referred to it by pooling the collective wisdom of all the specialized agencies involved in these areas. DDRP hopes that with these measures put in place no doubts should be harboured about dam safety.

I would like to place my appreciation to all Panel Members & Sub-group Members for their contribution for evolving implementable technical solutions to the referred issues of Subansiri Project.

Yours sincerely,


(Rajesh Kumar)
Chairman CWC/DDRP

ACKNOWLEDEMENT

Preparing a multidisciplinary document on various issues/concerns of Subansiri Lower Project and interaction and co-ordination with different organizations was a challenging task. This was made possible only by whole hearted support by all the members of Dam Design Review Panel (DDRP) and sub-group members associated with the task.

I, on behalf of DDRP, would like to place on record my sincere gratitude to Shri Rajesh Kumar ji Chairman CWC/DDRP, Shri. A.B. Pandya ji Member (D&R), CWC and Shri D.P. Bhargava ji, Director (Technical), NHPC for the valuable guidance provided in evolving the technical solutions to the issues/concerns.

My sincere thanks are due to CWC, CEA, GSI, CWPRS Pune, DEQ, IIT, Roorkee, CSMRS, Project Authorities & NHPC for the total support extended in addressing the issues of concern to move the Project forward.

Last, but not the least, I must put on record that the efforts made by Shri. Ramesh Grover Chief Engineer (Design) CWC, Shri S.K. Sibal, Director CWC, Shri A.K. Jain, Chief Engineer (D&E) NHPC, Shri. R.M.A Khan Manager (D&E) NHPC and Shri Prashant Rai, Deputy Manager (Geology) NHPC for collation, compilation and bringing the report to the present shape.



(P.K. Gupta)
General Manager (Geo-Tech.)
Member Secretary (DDRP)

ACRONYMS

AASU	All Assam Student Union
BB	Brahmaputra Board
BIS	Bureau of Indian Standards
CEA	Central Electricity Authority
C_d	Coefficient of Discharge
C/L	Central Line
CSMRS	Central Soil and Material Research Station
CWC	Central Water Commission
CWPRS	Central Water and Power Research Station
DEQ	Department of Earthquake Engineering
DPR	Detailed Project Report
DT	Diversion Tunnel
d/s	Downstream
DDRP	Dam Design Review Panel
EAC	Expert Appraisal Committee
EDA	Energy Dissipation Arrangement
EG	Expert Group
El.	Elevation
FEM	Finite Element Method
GoA	Government of Assam
GoAr. P	Government of Arunachal Pradesh
GOI	Government of India
GSI	Geological Survey of India
HC	House Committee
H.E.	Hydroelectric
HFL	Highest Flood Level
HFT	Himalayan Frontal Thrust
IDC	Interest during Construction

IS	Indian Standard
IIT	Indian Institute of Technology
JSC	Joint Steering Committee
KMSS	Krishak Mukti Sangram Sangthan
MBT	Main Boundary Thrust
MCT	Main Central Thrust
MEQ	Micro Earthquake
MoE&F	Ministry of Environment & Forest
MoWR	Ministry of Water Resources
MOP	Ministry of Power
NCSDP	National Committee on Seismic Design Parameters
NE	North Eastern
NHPC	National Hydroelectric Power Corporation
NOF	Non-Overflow
OM	Office Memorandum
PMF	Probable Maximum Flood
PMO	Prime Minister's Office
RCC	Reinforced Concrete
SDC	Seismic Design Parameter
SG	Steering Group
SLP	Subansiri Lower Project
TEC	Techno Economic Clearance
TEC	Technical Expert Committee
ToR	Terms of Reference
WRD	Water Resources Department
WPT	Water Pressure Test

LIST OF FIGURES & APPENDIX

Figure No.	Description of Figures
1	Location Map of Project Area.
2	Plan showing Concreting status of the Dam.
3	Modified Layout Plan.
4	Typical Profile for S4, S5 S6 & S7 Spillway Blocks.
5	Typical Profile for S3 & S8 Spillway Blocks.
6	Typical Profile for S1, S2 & S9 Spillway Blocks.
7	Layout Plan of Extension of U/s Cut-Off Wall under NOF Blocks.
8	Elevation of Extension of U/s Cut-Off Wall under NOF Blocks.

Appendix No	Description of Appendix
1	Copy of Office Memorandum No.2/4/2012-NHPC, Government of India Ministry of Power.
2	Section-VII on Conclusions and Section-VIII on Recommendations & Way forward of the TEC report and NHPC Replies.
3	Copy of 1 st Minutes of Meeting of DDRP.
4	Copy of Report on Foundation Competency.
5	Recommendations of NCSDP of the 24 th Meeting held on 15 th March- 2013.
6	List of the Documents/Reports reviewed by DDRP.
7	Scope of Work of Model Studies at CWPRS Pune.
8	Inspection Report of the visit of DDRP to SLP.
9	Copy of Minutes of Final Meeting of DDRP held on 30 th May-2013.

REPORT OF DAM DESIGN REVIEW PANEL
SUBANSIRI LOWER H.E. PROJECT, ASSAM-ARUNACHAL PRADESH

1.0 INTRODUCTION

The Ministry of Power (MOP), Government of India (GOI) constituted a Dam Design Review Panel (DDRP) for Subansiri Lower H.E. Project (SLP) vide Office Memorandum (OM) no. 2/4/2012-NHPC dated 10th Dec-2012 to review design features of SLP dam and recommend measures/changes in the design to ensure its satisfactory performance keeping in view the foundation competency and other related issues. The DDRP is headed by Chairman CWC with representative/experts drawn from CEA, CWC, GSI, IIT-Roorkee, CWPRS Pune, and NHPC as under: -

1	Chairman, CWC	Chairman
2	Member (Hydro), CEA	Member
3	Shri. Ramesh Grover, Chief Engineer (Design), CWC	Member
4	Shri. L.A.V. Nathan, Chief Engineer (Hydrology), CWC	Member
5	Shri. M. Raju, Director (Engineering Geology), GSI	Member
6	Prof. M.L. Sharma, HOD (Earthquake Engineering), IIT-Roorkee	Member
7	Mrs. V.V. Bhosekar, Joint Director, CWPRS, Pune	Member
8	Director (Technical), NHPC Limited	Member
9	Shri. P.K. Gupta, Chief (Geology), NHPC Limited	Convener & Member Secretary

The panel was given the option to solicit advice of experts from other organizations/institutions and to co-opt additional members as deemed fit.

The Terms of Reference (ToR) of the Panel include the following: -

- Review of Energy Dissipation Arrangement (EDA).
- Examine the adequacy of single concrete diaphragm wall only under sluice blocks.
- Non-provision of concrete diaphragm wall under NOF blocks.

The order specified that DDRP while reviewing the above shall keep in view the foundation competency and other related issues. The panel was

given 3 months time to submit its report/recommendations. A copy of the MOP Office Memorandum is enclosed as **Appendix-1**.

2.0 BACKGROUND OF THE PROJECT

The Subansiri Lower H.E. Project (SLP) is located on the River Subansiri, a right bank tributary of the River Brahmaputra. The Subansiri River joins the River Brahmaputra at Majuli Island which is around 110km downstream of the project site. The project is located at Gerukamukh where the River Subansiri debouches into plains of Assam. At the dam site, the River defines the border between Assam & Arunachal Pradesh (Ar. P). The right bank of the river is in the Arunachal Pradesh (Ar. P.) whereas left bank is in Assam at the dam site. The location map of the project is enclosed as **Fig-1**. The project was conceived way back in the year 1955. However, survey & investigation works started only in the year 1976 by CWC & GSI. The Brahmaputra Board (BB) submitted the feasibility report of the project in April-1983. Initially, a 257m high Rockfill dam was proposed at this site. However, subsequent to the submission of the feasibility report, the dam height was reduced to 116m & instead of a single high dam, a cascade development of the Basin was proposed by BB envisaging construction of three dams viz. Lower, Middle & Upper Subansiri Projects.

The Project was transferred to NHPC in May-2000 for execution. NHPC submitted the Detailed Project Report (DPR) in June-2001 to CEA for 116m high concrete gravity dam at the same location as proposed by BB. The Techno Economic Clearance (TEC) of the project was accorded by CEA in Jan-2003. The other remaining statutory clearances were obtained subsequently and the construction of the project commenced from Jan-2005.

When the construction works at the project site were at its peak, an Expert Group (EG) comprising members from various disciplines of Gauhati University, Dibrugarh University, and IIT-Guwahati was constituted at the instance of Govt. of Assam (GoA) in May-2008 to assess the downstream

impact of the project. The Expert Group submitted a preliminary report in Feb-2009 & the draft report in June-2010 wherein they raised issues related to downstream impact as well as on the safety of the dam. On receipt of the report, NHPC held a number of meetings with the Expert Group members but the views could not be reconciled.

Subsequently, the recommendations of the Expert Group were also discussed in the Assam Legislative Assembly and later considered by the House Committee (HC) of Assam Legislative Assembly, who by and large supported the Expert Group's recommendations. NHPC also arranged a site visit for Hon'ble Members of House Committee of Assam Legislative Assembly to Salal and Uri Power Stations in J&K to impress upon them the fact that there has been zero damage to these structures even after experiencing Kashmir Earthquake of 7.6 Magnitude in Oct-2005.

Later on, a joint meeting was convened by the Environmental Appraisal Committee (EAC) of Ministry of Environment & Forest (MoE&F) in the presence of GoA, EG & NHPC's representatives on this issue but differences still could not be reconciled. Further, as desired by GoA, NHPC also constituted a Joint Steering Committee (JSC) comprising representatives from BB, CWC, WRD, GoA & Govt. of Ar. P., IIT-Roorkee and NHPC to examine Part-II recommendations of Expert Group's report and identify feasible measures to take care of possible downstream impacts, flood, erosion etc. and report on their physical/financial aspects. JSC submitted its report in Aug-2012 with recommendations on action & measures for flood mitigation, sediment management, bank erosion control & other downstream impacts. NHPC Board subsequently approved a proposal amounting to Rs. 470 crore for the implementation of the protection measures (Rs. 145 crore), development works (Rs. 320 crore) and social awareness & mass awakening (Rs. 5 crore) in downstream areas. However the fund release for these works was linked with the progress of works of SLP.

At the instance of Prime Minister Office (PMO), the Planning Commission constituted a Technical Expert Committee (TEC) with Dr. C.D. Thatte &

Dr. M.S. Reddy Ex. Chairman CWC & Ex. Secretary, Ministry of Water Resources (MoWR) to review the status of SLP and to recommend/report on how NHPC could move forward. TEC submitted the report in July-2012 to Planning Commission with recommendation to form an independent Dam Design Review Panel (DDRP) and/or CWC to review the design features of the dam keeping in view the suspected foundation competency, Energy Dissipation Arrangement (EDA) & adequacy of provision of Cut-off walls.

On the recommendations of TEC, MOP in Dec-2012 constituted a Dam Design Review Panel(DDRP) comprising members from CWC, CEA, GSI, CWPRS, IIT-Roorkee and NHPC under the Chairmanship of Chairman CWC to address the issues raised by TEC.

Presently the project's construction work stands suspended since Dec-2011 because of agitation by local groups led by AASU & KMSS. About 50% of the works in terms of cost has been completed, incurring an expenditure of around Rs. 6269 crore (March-2013) out of estimated cost of Rs. 10667crore (at Dec-2010 price level).

3.0 DESIGN REVIEW BY DDRP

DDRP commenced the review of SLP dam after its formation taking into account the background information, geological conditions of the dam foundation from available investigation data, design aspects of dam, spillway and other critical issues raised by the TEC. The section (chapter) on dam design review as given in the TEC report, related drawings, NHPC's replies on TEC recommendations and way forward were also considered. Section-VII on Conclusions and Section-VIII on Recommendations & Way forward of the TEC report and NHPC's replies are enclosed as **Appendix-2**. The review of energy dissipation arrangement (EDA), foundation competency and issues related to seismic design parameters (SDP) were undertaken after taking into account all these issues. Inputs provided by NHPC and information collected during site visits of Subansiri Lower Project helped in the process.

The first formal meeting of the DDRP was held on 06/02/2013 in CWC, R.K. Puram New Delhi under the chairmanship of Chairman CWC/DDRP. The following discussions/decisions were taken in the meeting (**Appendix-3**).

- Shri A.B. Pandya, Member (D&R), CWC, Shri. Y.K. Handa, Chief Engineer, CWC, Shri. S.K. Sibal, Director, CWC and Dr. Rajbal Singh, Joint Director, CSMRS were co-opted as members of the DDRP/Sub-Group.
- A presentation was made by Joint Director CWPRS Pune informing about the studies carried out by CWPRS till date on EDA (Plunge Pool & Stilling Basin).
- A Sub-Group comprising panel members from CWC, GSI, CSMRS (co-opted), & NHPC was formed under the chairmanship of Member (D&R) - to review the competency of foundation material for Dam & EDA, and to assess the behavior of foundation material particularly under saturated conditions w.r.t Slake Durability & Erodibility potential of the rock mass. The panel felt that the impacts of these rock parameters on dam need to be understood comprehensively before evolving the remedial measures.
- The seismicity aspect of the project was referred to the National Committee on Seismic Design Parameters (NCSDP), which is a national body for deciding Seismic Design Parameters (SDP) for dam design. The members of NCSDP are specialists in the field of Seismology, Geology, Dam design etc. The SDP of SLP were earlier approved by NCSDP only.
- A site visit was proposed to assess the competency of foundation material and to have a feel of the rock mass at the site.

3.1 Visit of Sub-Group of DDRP to Project Site

The Sub-Group of DDRP consisting of members from CWC, GSI, CSMRS, and NHPC visited the project site on 7th/8th March-2013, to observe the site conditions- particularly the rock conditions, its erodibility

potential, present construction status of the dam and other structures, with a view to evolve measures/changes for the dam foundation and EDA that would be appropriate for the present site conditions. The cardinal consideration for adopting the type of EDA has been the site conditions and rock material of the area, especially the possibility of retrogression of the scour profile towards the dam toe in the long run and causing dam instability. The plunge pool area filled with water and excavated rock slopes were also seen by the sub group. Attention of the Sub-Group was drawn to the fact that the rock mass of the river banks near Diversion Tunnel (DT) inlet and other places have not indicated any sign of erosion and instability after stabilization measures and confinement provided to the excavated rock slopes either by shotcrete or concrete. The deliberations of the Sub-Group are detailed in subsequent para and in its report. A report of the Sub-Group is attached as **Appendix-4**.

3.2 Seismic Design Parameters for SLP

The National Committee on Seismic Design Parameters (NCSDP) discussed the issues raised in respect of Seismic Parameters of SLP in its special meeting convened on March 15, 2013. The meeting was chaired by Member (D&R), CWC. The Committee during its meeting deliberated on the following: -

- Views of Expert Group (EG), Report on Paleo-Seismological studies and 2D Seismic Studies got done by NHPC at the suggestion of Expert Group (EG) (constituted to assess downstream impact of the project).
- Views & comments of DEQ, IIT Roorkee after submission of Expert Group's report.
- Views of Prof. J.R. Kayal Former Dy. DG. (GSI) on seismo-tectonics of the Himalayan region and also near the dam site.
- Views of Prof. A.S. Arya, Prof. Emeritus, Earthquake Engineering, IIT Roorkee on SDP for dam site.

- Views of Technical Expert Committee (TEC) expressed in their report on SDP for SLP.
- Comments of CWPRS, Pune on site specific design parameters for SLP.
- Review & comments of DEQ IIT-Roorkee on 2D seismic Reflection Survey & Paleo-Seismic Report.
- MEQ Studies- Discussion and conclusion part of MEQ data processing, interpretation and report preparation for MEQ data collected during Dec-2006 to Nov-2007 for study of seismic sources around the Subansiri Lower H.E. Project.

The following issues were brought to the notice of the committee.

- The plane of detachment, the interface between the Himalayan sedimentary wedge and the dipping Indian Shield basement, is at depth of 15-20km at the Main Boundary Thrust (MBT) –Main Central Thrust (MCT) zone. At the Himalayan Frontal Thrust (HFT) zone, to the south of MBT, the extrapolated plane of detachment depth may be ≥ 5.0 -6.0km. The project lies south of MBT and MCT. The epicenter of most of the large earthquakes that have occurred in the Himalaya lies between MBT and MCT.
- The plane of detachment lies about 5.0-6.0km below the dam site. This plane of detachment cannot be a source zone for large/great earthquake due to thin (5.0-6.0km) sedimentary crust over the detachment plane. Moreover, top 3km zone is considered a non-seismogenic depth. As such the thin sedimentary crust cannot accumulate enough strain for generating a large earthquake.
- None of the recorded great Himalayan earthquakes occurred on the plane of detachment. The 1905 (Kangra) and 1934 (Bihar-Nepal) great events occurred at a deeper (30-40km) source zone to the south of MBT, and most recently the 1988 large earthquake (near the 1934 Bihar-Nepal earthquake epicenter) occurred at much deeper depth (50-60km) to the south of MBT. The 1950 (Assam) great earthquake,

on the other hand occurred in the eastern syntaxis zone with a strike slip mechanism at 20km depth.

- GSI had made two micro-earthquake surveys in Arunachal Pradesh near the project site area (Kayal et. al. 1993) and it has been found that the earthquakes are not confined above the so called plane of detachment; the earthquakes occur at a much deeper zone (20-80km) to the south of MBT and below the trace of MBT.
- The 1897 great Shillong earthquake (M 8.7) is not a Himalayan earthquake, it is the Shillong Plateau intra-plate shield earthquake and the source zone was at a depth of 20-35km.
- The 1950 Assam earthquake and 1897 Shillong earthquake occurred in different tectonic province and are about 240 & 320km away from Subansiri Project site respectively.
- Recent local seismic network data in different parts of Himalaya show that at the HFT zone, to the south of MBT, earthquakes are of deeper origin in the lower crust down to 20-50km. The great events are not confined above the plane of detachment (Kayal 2001, 2008 & 2010).

The committee after taking into account the geotectonic setup of the project site and its potential for generating earthquakes decided that further revisions in the approved seismic design parameters (SDP) of SLP (as approved by NCSDP in its 14th meeting held on 29/04/2004) is not required as it adequately captures the seismic potential of the site and the SDP recommended for dam design are in accordance with the State of the art procedures and practices in vogue internationally (Appendix-5).

3.3 Foundation Competency

The Subansiri Lower Project is located in Middle Siwaliks Sandstone which is soft, weak & friable in nature. The strata also exhibit concretionary nodules (harder than Sandstone) at places.

During the 1st meeting of DDRP, it was decided that the assessment of dam foundation competency is of utmost importance for taking any decision on

dam design review. The assessment of the competency of foundation material necessitates understanding of its composition and its behaviour in saturated condition mainly Slake Durability and Erodibility of the rock mass before finalizing the required measures.

Overall the geo-mechanical properties of intact rock samples fall in low category. The rock is having very low compressive strength and varies from 4 to 44MPa & 2 to 10MPa in dry & saturated conditions respectively. Deformation modulus and elastic modulus of the rock is also low. Although the rock is porous in nature (around 10%) but has low permeability due to less jointing. The rock has a peculiar property of slakiness and loses its strength in saturated conditions.

The Sub-Group reviewed the available information for ascertaining the foundation competency and prepared an independent report on the subject. They examined the international practices and available rock test result data in this regard and also visited the site on 7th/8th March-2013. After detailed analysis, the sub-group concluded that though the rock mass is soft, weak and friable in nature but it behaves satisfactorily in undisturbed/confined/insitu conditions.

The Sub-Group viewed that the weak properties of the rock mass as appraised do not impede a Gravity Dam if the dam section is evolved based on these properties and simultaneously satisfying codal provisions on limits for stresses under different loading conditions prescribed by BIS IS: 6512. Obviously, the dam section so evolved would have to account for geo-technical set-up at the site and would thereafter have large base width comparable to that of embankment dams such as concrete faced Rock-fill Dams. Further, the stresses transferred to the dam foundation by the adopted section under different loading conditions would have to be validated by Finite Element Method (FEM) analysis for both static and dynamic loading conditions to ensure that they are within permissible limits. The Sub-Group opined that the homogeneity offered by the rockmass due to its weak strength properties throws out an advantage in the form of minimizing differential settlement.

The Sub-Group accordingly proposed that the following measures can be adopted for ensuring satisfactory behavior of the dam foundation taking into account the properties of rockmass (**Appendix-4**).

- Confining the dam foundation to prevent migration of particles. Though migration of particles can be prevented by keeping the exit gradient below the desired threshold value, confinement would yield an additional factor of safety by taking care of any unknown effects such as swelling pressure that usually gets generated during saturation of rocks exhibiting slaking. Confinement will additionally improve the compressibility characteristic of foundation rock mass.
- Planning the Energy Dissipation Arrangement (EDA) in such a way that the effects of energy dissipation do not have any ill effect on dam foundation on long term basis.

3.4 Dam Abutment Stability

An issue was raised as to whether the stripping made in the abutment was adequate for such a large dam, especially, when steep foundations on a continuous 70° slope between El. +120 and +210M on right abutment without providing any berms or benches in between for abutment blocks of the dam have been provided. NHPC on this issue furnished the following clarifications:

- The rock excavation close to the final excavated line was carried out with mechanized means in view of the relatively soft nature of rock so as to maintain its integrity.
- The rock excavation was done at 65° slope and around 10-15m thick top portion of the rock was stripped/excavated to reach fresh/sound rock/final excavated line of the abutment.
- The high quality bond between dam and abutment is ensured with 3m thick high grade concrete, cleaning of foundation/abutment, roughening of surface and removal of debris, fractured rock material and loose/foreign material after use of high velocity water jets, dental

treatment and with consolidation grouting of the foundation /abutment interface.

- The excavated rock slope has been standing for last 4-5 years during heavy rainy season. Dam concreting up to El.128M in R1 block abutting 100m length of abutment is providing toe support to the abutment which adds to the stability of the rock abutment.
- As per IS Code, if the slope of rock abutment is $> 45^\circ$, the contraction joint of higher block is started 5m away from the abutment rock surface and the same is being followed in case of Subansiri Lower H.E. Project dam construction.
- The right abutment slope just downstream of dam shall be protected with 1m thick RCC concrete cladding with grouted anchors, cable tendons for abutment protection.
- Although the right bank slope is steep between El.120-210M but further easing of this slope is not advisable in view of comprehensive support provided comprising of rock anchors, wiremesh & shotcrete, cable tendons etc. and existing of Road tunnel at El.210M which is the only access to Intake Structure. Any attempt to ease the slope would create further instability to the existing slope. As such no further easing of slope is considered advisable.

The DDRP taking into account the site conditions felt that any additional stripping would need huge cutting of the hill mass, which may make it vulnerable to sliding. The Panel feels that additional strengthening measures by means of deep cable anchoring (30-35m) having capacity of about 75-90 ton may be undertaken, if required. The following measures should be taken-up by NHPC

- The arrangement of construction joints in the NOF dam blocks may be reviewed to avoid development of any sort of gap between abutment and NOF blocks.
- Instrumentation may be installed in the abutments to monitor movement of the abutments.

- Pore pressures being the prime cause of slope instability, to control the same, exhaustive drainage arrangement may be provided in the rock mass to prevent such an event.
- Contour drains should be provided to prevent ingress of water in the slope from high reaches.

Suitable plan to this effect should be implemented during the recommencement of construction to keep a close watch. This support provided by the dam to the abutment will further improve with the raising of dam height. The stability of the abutments abutting with the dam is critical during the construction phase only. Thereafter the blocks provide support to these abutments preventing them from becoming unstable.

3.5 Energy Dissipation Arrangement (EDA)

3.5.1 Background

The TEC in its report submitted to Planning Commission in July-2012 recommended stilling basin type EDA, instead of Ski-jump type on the consideration that the energy dissipation can be controlled in a better manner here and also such type of EDA will limit progression of scour. In the case of plunge pool type EDA, it was apprehended by TEC that the scouring due to retrogression effect in the long run may progress near the dam toe and may affect the dam stability. TEC opined to have stilling basin type EDA in all 9 spillway bays or 3 part EDA with 6 central bays having stilling basin type EDA with apron level at El.85M and 3 side bays provided with a Chute beyond the spillway profile discharging the water beyond Diversion Tunnel (DT) outlet, through a Ski-jump bucket.

NHPC informed TEC that the present site conditions and construction status of the project do not permit provision of stilling basin type EDA. With the rock profile being at El. 94M in the central bays and El.120M in the side bays, the deep seated stilling basin with excavation level of El.80M in the central bays could pose dam stability problems. Moreover, the stilling basin provided in front of the 6 central bays would not be able to dissipate the energy corresponding to the outflow discharge of 50% of PMF

(recommended by TEC) through hydraulic jump formation as per the hydraulic design calculations carried out by NHPC. The calculations undertaken show that for stilling basin apron at El.85M and reservoir water at El.205M, hydraulic jump is possible for discharge up to 8500 cumec and beyond that the jump gets swept out. Further, with stilling basin end sill at El.102M and apron at El. 85M, would make it a 17m deep structure. The progressive silt deposition in the stilling basin, which is a distinct possibility, would reduce its capacity to dissipate energy to discharges below 8500 cumec.

The provision of stilling basin would necessitate huge excavation on the side abutments. This could destabilize the already excavated/stabilized slopes as the side abutments are very steep and have performed well so far with rock anchors, shotcrete with wire mesh and cable anchors.

The provision of stilling basin type EDA would require realignment and extension of the diversion tunnels to accommodate the length of stilling basin; relocation of associated structures and concrete placement system; dismantling of existing dam concrete and RCC apron for providing stilling basin in narrow river valley width. Study drawings, design calculations and construction limitations/difficulties and cost estimates of various alternatives of stilling basins as per their advice were submitted by NHPC to TEC.

3.5.2 Hydraulic Model Studies undertaken on Stilling Basin & Plunge Pool Type EDA (Year 2003-2012)

At the instance of TEC, hydraulic model studies of stilling basin type EDA for 9 bays having apron level at El.85M were conducted at CWPRS, Pune during 2012. NHPC while giving its observations on the hydraulic model studies report of CWPRS desired to study the performance of stilling basin filled with sediment deposits upto El. 94M (El. 94M is prevailing rock profile and El.99M is River Bed Level in the area) and having sill level at El. 102M i.e. 3m above the river bed level. CWPRS, Pune in their final report on stilling basin informed that the horizontal type stilling basin of 200m length with apron at EL. 85M performs satisfactorily for discharges

upto 26,250 cumec from all 9 bays. However, for the condition of stilling basin filled with sediment deposits due to high end sill, its efficiency gets drastically reduced and it performs satisfactorily only upto 8,750 cumec with all the 9 bays open. This reduction in performance may cause operational difficulties with stilling basin type EDA. It is pertinent to mention here that TEC in their report has recommended designing EDA for a flood discharge of 15,000 cumec.

As advised by TEC, additional hydraulic model studies of plunge pool with erodible bed of cohesionless sand were also conducted at CWPRS, Pune for finding the ultimate scour levels. CWPRS, Pune in their hydraulic model studies report has observed that the scour profile does not reach dam toe though the scour profile reaches upto El.58M for a discharge of 17500 cumec at central line (C/L) of plunge pool as compared to El.72M provided in the original design by NHPC as per the recommendations of CWPRS. The dimensions of the plunge pool proposed by CWPRS was 175.5m (W) X 84.5m (L) with upstream and downstream slopes of 20° and 26° respectively and bottom at El.72M. However, plunge pool of 167.5 m (W) X 63m (L) with bottom at El. 72.0M, steeper upstream slope for the left and right bays was proposed by NHPC due to site constraints and only central bay of three spillway spans had upstream slope of 20° . In view of this, the layout suggested by NHPC was studied by CWPRS, Pune on the existing 1:90 scale model. Model studies at CWPRS, Pune with this alternative indicated that the performance of the ski-jump bucket was found satisfactory as clear ski-jump was observed for entire range of discharges. However, the plunge pool was less effective, as the jet was impinging at the upstream end of plunge pool for the higher discharges. NHPC tried to impress upon the TEC that it will not be the case of erodible bed as the rock is exposed and the exposed rock in the plunge pool area shall be protected with 1m thick RCC anchored to foundation with anchors and cable anchors. However, TEC recommended to get the EDA reviewed from Dam Design Review Panel (DDRP)/CWC.

3.5.3 Review of EDA

The Dam Design Review Panel (DDRP) reviewed the issues and concerns raised by TEC related to the design features of EDA of SLP dam keeping in view the foundation competency and other related issues to ensure satisfactory performance of the dam. A list of the documents/reports reviewed by DDRP is enclosed as **Appendix-6**.

The Detailed Project Report (DPR) of SLP as prepared by NHPC envisaged ski-jump bucket with pre-formed plunge pool type energy dissipation arrangement (EDA). The DPR was submitted to CWC and was technically cleared conditionally in the year 2003 with one of the condition relating to EDA being that hydraulic model studies be carried out for both ski-jump bucket and stilling basin type EDA for finalization of EDA on the basis of performance on model studies and techno-economic considerations. The hydraulic model studies for spillway and Energy Dissipater have been in progress since 2002 at CWPRS, Pune on 1:90 scale 3D comprehensive models. The spillway discharging capacity has been found to be adequate for design flood. The location and design of plunge pool was evolved based on estimation of scour by empirical formulae and the model studies. The contract for the dam works was awarded in 2004 and the construction work has been in progress from Jan-2005 till stoppage of wok in Dec-2011.

NHPC submitted a technical note on ski jump type EDA detailing the basis of adoption of the EDA along with detailed construction drawings of Dam, Spillway and EDA. Various hydraulic model studies reports as prepared by CWPRS, Pune have also been submitted along with the design technical note. A drawing showing the present construction status of the dam has also been submitted by NHPC for reference (**Fig-2**). Drawings of ski-jump with Plunge pool type EDA adopted by BB in their feasibility report of SLP had also been presented by NHPC.

A preformed plunge pool type EDA was adopted by NHPC as it was considered most effective and economical type of EDA for high head and high discharges. Rock conditions being the only limitation which was proposed to be made good by covering it with reinforced concrete,

providing grouted anchors and cable anchors and giving significant cushion of water in the preformed plunge pool. Stilling basin type EDA was not considered suitable by NHPC due to high head & high discharges, narrow river valley width and limitation for space to accommodate stilling basin due to issues related to layout of diversion tunnels and coffer dams.

It is felt by the DDRP that in the present site conditions and operational diversion arrangement, providing stilling basin arrangement at this stage will involve across the board changes in the energy dissipation arrangement (EDA) and dismantling of already constructed structures like approach duct for cut-off wall and Rotec towers for Dam concrete placement. Beside the following major changes may have to be incorporated: -

- Dismantling of a part dam structure in some blocks and other associated structures.
- Huge excavation at dam toe and in the abutments which may destabilize the stable rock slopes and dam toe.
- Filling up of already excavated area in plunge pool with concrete.
- Provision of high side training walls which would require huge rock cutting because of lack of space.
- Realignment and extension of Diversion Tunnel arrangement and roads.

The additional excavation, concreting, rock slope cutting and stabilization needed for the stilling basin would require considerable additional time that would delay the project schedule entailing huge IDC cost. NHPC has assessed that provision of stilling basin type EDA would delay the project completion period by an additional 4-5years. Further, there could be significant contractual implications which may further delay the project. Besides, the performance of Stilling Basin EDA has not been satisfactory for the desired discharge range. Model studies undertaken shows that there is significant degradation in the performance if the basin gets filled with the sediment.

In view of the above, it is opined that the option of stilling basin type EDA may not be suitable on techno-economic considerations and a practical solution with other design innovations shall have to be evolved.

3.5.4 Proposed Spillway & Energy Dissipation Arrangement (As Recommended by DDRP)

DDRP discussed the issues related to foundation competency and type of energy dissipation arrangement (EDA) to be adopted in detail to ensure dam safety in the long run. The present construction status and site conditions, already constructed dam portion, approach roads and accessibility, concrete feeder system, report of the sub-group on “Foundation Competency” and other various limitations/difficulties brought out by project authorities (NHPC) were taken into consideration for working out a practical solution with design innovations which may not have any serious adverse effects on the construction schedule of the project.

The Panel based on the findings of the Sub-Group felt that the objective of preventing scouring near dam toe would be achieved if the present design of Ski-jump type EDA is modified in such a way that the spillway outflow is thrown away at a considerable distance from the dam toe. This would necessitate provision of a Chute extending beyond the present bucket and relocation of the bucket further downstream. The panel decided to extend the bucket location to the maximum possible distance away from the dam axis, limited by the condition that its throw may not destabilize the Power House and Tail Pool area. This modified EDA may not be an optimum solution from economic considerations but the solution is implementable in lesser time as compared to stilling basin type EDA. Also it would not entail any dismantling of the existing concrete and cutting of rock. The Spillway profile have been so evolved that it dovetails with existing profile avoiding any change in the Coefficient of discharge (C_d) value and gate sizes. It is essential to adopt this innovative solution, tailor made for this project, to allay the apprehensions expressed by some sections of the society on dam safety. The case of SLP has become exceptional not only due to geological aspects but also due to the concerns expressed by some sections of the

society related to the safety of the dam with issue coming out into public domain. In the present design of EDA with preformed plunge pool, the C/L of plunge pool shall be at around 120m from bucket toe. The performance of the proposed EDA would be studied on physical model and its finer details would be firmed up based on these studies. The salient details of the proposed EDA are as under:

- The length of the spillway glacis is increased so as to place the spillway ski-jump bucket at a distance considered safe from erosion condition. Though the spillway section would have extra-large base width but this can be accepted for this project because of the peculiar nature of the project site conditions. The additional spillway width would have a positive effect on the dam stability also both under static and dynamic conditions as the magnitude of stresses gets reduced considerably.
- The spillway bucket for central 4 bays (S4, S5, S6 and S7) and the remaining bays such as S3, S8 and S1, S2 and S9 would be placed at different elevations as per the prevailing rock profiles at site to avoid cutting of the already stabilized rock cut slopes. The C/L of the new proposed plunge pool will be at distance of around 120m from the dam toe of extended section for the central 6 bays (S3 to S8) in the river valley.
- The four central spillway bays (S4 to S7) will be having a base width of 270m. The base width of bays (S3 and S8) will be around 246m, and of bays S1, S2, & S9, it will be 230m. The bucket elevation of S4 to S7; S3 & S8 and S1, S2 & S9 will be at El. 108M, El. 118M & El. 125M respectively. The buckets of all the bays will end in a same line.
- The energy dissipation arrangement i.e. Plunge Pool would be designed for 50% of the spillway capacity i.e. 17,500 cumec. Since the six central bays shall have the capacity of around 18,000-19,000 cumec with reservoir water level at El.190M (reservoir elevation

during most part of the monsoon) in the reservoir, the plunge pool would be provided for six central bays only.

- A suitable curvature would be introduced in the chutes of S1, S2 & S9 blocks for deflection of the flow so that their jet falls in the main plunge pool provided in front of the central bays.
- NHPC would firm up the spillway operation plan based on site conditions for ensuring satisfactory operation of the project keeping reservoir at El.190M during most of monsoon period as per rule curve.
- The training walls/piers would be raised beyond HFL i.e. El.122M.
- The location of plunge pool now coming near the DT outlet, would necessitate construction of the plunge pool upon plugging of diversion tunnels and completion/commissioning of the project.
- This modification in the design would involve placement of an additional 5.5 lac cum of concrete (approximate as per preliminary estimates) without any cutting and removal of concrete from the already constructed dam. This would add to the safety and stability to the dam structure as the stresses on the foundation would be reduced significantly.
- The extra base width will further reduce the exit gradient which shall further minimize the possibility of migration of particles.
- Additional drainage gallery shall be provided in the extended part of the ski jump bucket so as to reduce the uplift near the toe of the spillway.

With the proposed design, the performance of the spillway and EDA shall be satisfactory with no possibility of erosion of the foundation near dam toe on long term basis. Plan & Sections of modified EDA are appended as **Fig-3 to Fig-6**. The scope of work of model studies is attached as **Appendix-7**.

3.6 Adequacy of U/S Concrete Cut-off Wall

An 800mm thick and 50m deep u/s cut-off wall has been proposed by NHPC beneath all spillway blocks and part NOF blocks near the heel. This

u/s cut-off wall covers about 80% of the length of the dam. However, at higher reaches in left bank above El.140M and above El.120M in right bank, provision of u/s cut-off was not planned by NHPC due to issues related to accessibility, geological conditions and rock slope stability, during the contract formulation stage. NHPC informed that since the u/s cut-off wall could not be provided in the upper reaches beneath NOF sections, cut-off wall was provided in the abutments along the flow to prevent seepage from abutment side. TEC in their report have raised concerns of not providing the cut-off wall under balance NOF part.

DDRP opines that the main objective of providing the u/s cut-off wall is to safeguard the dam foundation against erodibility hazards. In some standards, it has been linked with the limiting values of permeability for rock below dam for washout and hydraulic fracturing criteria. Generally, the limiting seepage value of 1 to 3 Lugeon is considered for rock below dam and any area of foundation having seepage in excess of 1-3 Lugeon indicate that the grouting is required there. Consolidation grouting has been done in the entire dam foundation area to seal joints/openings at the dam foundation interface and other places and other visible open joints to minimize the chances of migration of particles from the dam foundation. The water pressure tests (WPT) results before and after consolidation grouting confirms that the permeability with 42 Lugeon has come down to 2-3 Lugeon after grouting. The details are covered in the DDRP sub-group report.

The upstream concrete cut-off wall proves to be effective as, it not only provides a continuous and credible seepage cut-off but it is also more durable as it is constructed of concrete which is less prone to deterioration than grout curtains which have inherent drawback of deviation thereby leaving some gap un-grouted.

3.6.1 Upstream Cut-off Wall under Spillway Blocks

The 50m deep u/s cut-off wall to be provided beneath spillway blocks will increase the seepage path significantly, thereby reducing the exit gradient

and preventing the possibility of migration of particles. As the water seepage path shall be from upstream to downstream due to hydraulic gradient and the high head shall be acting on the u/s side, therefore, the cut-off wall has been proposed to be provided near heel (u/s) of the dam. Cut-off wall shall be constructed from galleries of size 7m X 7m in the dam monolith. The galleries have already been constructed at different elevations in the dam. The cut-off wall constructed from different elevation shall be joined by overlapping.

The exit gradient with 50m deep u/s cut-off wall and with extra-large base width of the spillway section (270m for central spillway) is on very lower side w.r.t critical exit gradient required for migration of particles. Therefore if any particle get detaches from the present rock due its inherent Slakiness property, the provision made in the project foundation will preclude its movement. This would prevent any reduction of the rock strength properties.

3.6.2 Upstream Cut-off Wall under NOF Sections

NHPC plans to provide upstream cut-off wall only under some portion of NOF sections i.e. L1 and R2 and R1, citing difficulties in providing the access roads at higher elevations due to steep abutments and other accessibility and slope stability issues.

The panel reviewed this issue and felt that the benefits of Cut-off wall under the present site conditions warrant their provision notwithstanding the difficulties encountered. The layout and alignment of u/s cut-off wall shall be worked out taking into consideration the diversion tunnels passing through the left abutment. The provision of upstream cut-off wall under the NOF blocks shall also fulfill one of the major recommendations of TEC made with regard to foundation competency. Though, there will be issues related to construction aspects, the same shall be addressed by NHPC through better construction planning/management.

The u/s cut-off wall under the NOF section shall have to be constructed at different elevations through access tunnels to be constructed in both the abutments. In view of the extension of the upstream cut-off wall in all the NOF blocks, longitudinal cut-off wall in blocks L1 and S9 shall no more be required and are not to be constructed now. However, grouting beneath NOF blocks at areas upstream of the cut-off wall shall be undertaken upto a depth of 20-25m using microfine/ultrafine cement. It was informed by NHPC that with the deletion of longitudinal cut-off walls and newly proposed extended u/s cut-off wall under NOF blocks, the cut off wall quantity remains unchanged, as per the preliminary estimates. The layout plan and long section of the u/s cut-off wall is shown as **Fig-7 & Fig-8**.

3.6.3 Downstream Cut-off Wall

The Panel deliberated on the issue of provision of downstream Cut-off wall considering the fact that the exit gradient has been reduced significantly due to increase in the dam base width. The Panel after weighing various options felt it prudent to provide an additional downstream cut-off wall to provide confinement to dam foundation that will act as a second line of defense against retrogression of the scour in the long run. The downstream cut-off wall may be constructed from the open surface at \pm El.97M in the 4 central blocks in the main River valley as shown in the drawing and shall be constructed upto at least 5-7m below the scour level of the plunge pool (El. 72M) i.e. upto El. 65M and should be extended at least 5m into the abutment beyond the 4 central blocks.

3.7 Dam Stability & Foundation Competency

The BIS Code IS: 6512 prescribes criteria for the safe design of the dam. For the design to be safe:

- The permissible stresses within the dam body shall remain within the prescribed limits.
- The dam should not slide under the action of imposed loads.

A number of loading conditions has been prescribed for which the safety of the dam has to be evaluated. Though the dam has been meeting all these criteria all along, doubts were raised on the stability of the dam particularly in view of the weak rock present and high seismicity. Though it is not difficult to design a dam on weak rock for any set of loading conditions as the weak strength properties would only make the section wider which in the present case was already done since from the very beginning. The panel was chiefly concerned with addressing the issues arising because of slakiness exhibited by the rock. All the measures that have been proposed aimed at addressing this issue only.

The Panel feels that the measures proposed are the best possible under the present circumstances and site conditions and provide added safety to the dam structure. The Sub-Group of this panel after examining this issue in detail concluded that the best possible option would be confine the foundation to prevent migration of any particle even if slakiness of rock takes place. This would preclude softening of rock and reduction in density, differential settlement, cracking of dam etc. Experience of projects constructed on such type of rocks and even the natural behaviour of rock exhibited at site shows that rock under confinement does not exhibit Slakiness. In the instant case, the rock would be confined from all the sides, including top.

The members of the DDRP visited project site on 4th-5th May-2013. An aerial recci of the project area upto the blockage location of Subansiri River during 1950 Assam Earthquake (about 9km u/s of Project for overall appreciation of the valley) was undertaken. The inspection report of the visit of DDRP to SLP is attached as **Appendix-8** along with photographs of the Project area (completed/partly completed).

4.0 FINAL MEETING OF DDRP

The final meeting of DDRP was held on May 30, 2013 at CWC Office, R.K. Puram, New Delhi. The meeting was chaired by Chairman

CWC/DDRP. Following discussions/ decisions were taken in the meeting (Appendix-9).

- Member (D&R), CWC informed the Panel about the decision of the NCSDP taken during the meeting held on 15th March, 2013 on the seismicity issue along with the underlying rationality.
- Spillway with extended ski jump bucket arrangement for EDA and extension of cutoff wall in NOF blocks and provision of downstream cut off wall in central blocks were agreed by the panel.
- It was agreed that disturbing the right abutment stable slopes at this stage may have serious consequences and may make the slope vulnerable. However, additional strengthening measures (if required), adequate drainage arrangements and installation of instruments should be provided on recommencement of works for stability of the abutment slope in long run.
- The conclusion & recommendations of DDRP report was discussed & finalized and the report was signed by Panel members.

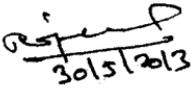
5.0 CONCLUSION & RECOMMENDATIONS

1. Though the sand stone has low compressive strength in saturated conditions and has the characteristics of slakiness, the rock mass behaves satisfactorily under undisturbed/confined conditions. Innovation in dam design process shall have to be undertaken to take care of these related aspects.
2. The seismic design parameters as approved by NCSDP earlier shall remain the same. The geotectonic setup of the SLP site and in its surroundings cannot generate earthquake greater than what has been approved, as sufficient conservatism has been built into the approved seismic design parameters (SDP), to take care of any subjectiveness in estimation of SDP.
3. The length of the conveyance structure of spillway shall be increased so as to place the plunge pool at a considerable distance that would not allow the scour to reach towards dam foundation on long term basis. With this design, though the spillway section would have extra-large base width it is considered acceptable on safety considerations. All the nine spillway buckets shall be kept in one line.
4. The spillway bucket elevations for central bays (S4, S5, and S6 & S7), side bays S3, S8 and extreme bays S1, S2 and S9 shall be kept at different elevations as per the prevailing rock profiles at site to avoid cutting in the already stabilized rock cut slopes. This provision would not have any effect on the hydraulic performance of the spillway.
5. The energy dissipation arrangement i.e. Plunge Pool shall be designed for 50% of spillway capacity which for SLP works out to be 17,500 cumecs. The construction of pre-formed plunge pool for 6 central bays shall be taken up after completion and commissioning of the project, as presently the temporary diversion arrangement is under operation.
6. The hydraulic model studies shall be undertaken for firming up of the location and size of preformed plunge pool in front of the 6 central Spillway bays i.e. S3 to S8, fine tuning of spillway profiles, study of spillway flow conditions for evolving the aeration arrangement; and to work out the dimensions of the deflector proposed in

- the chute/bucket of end spillway bays i.e. S1, S2 & S9 for deflecting the jet towards plunge pool proposed to be formed in front of the central bays. The structural design of the spillway bucket shall be undertaken based on the dimension and sizes worked out on the basis of physical hydraulic model studies.
7. The static and dynamic analysis of the modified dam spillway section shall be carried out by NHPC as per the current NCSDP Guidelines: 2011 based on the approved seismic design parameters.
 8. Provision of Downstream Drainage gallery in the extended ski-jump bucket type EDA u/s of the downstream concrete cut-off wall shall be made.
 9. CWC shall be associated during the hydraulic model studies of extended ski jump type EDA and aeration arrangement to be conducted at CWPRS, Pune. Further, CWC shall also be associated with the Project to ensure that the dam construction is being carried out as per recommendations of DDRP.
 10. The foundation and abutment treatment measures like downstream Reinforced Cement Concrete (RCC) apron, u/s and downstream RCC cladding of side abutments as shown in the enclosed drawings, installation of all rock support measures and drainage arrangements & instrumentation in the abutments shall be carried out before commissioning of the project.
 11. The u/s concrete cut-off wall shall be extended under the NOF blocks. Further, downstream concrete cut-off wall up to El.65M in the four central blocks as shown in the drawings shall be constructed to add to the confinement of the dam foundation rock mass for long term stability. The downstream cut-off wall shall be extended 5m inside the abutments on either side. Grouting beneath the NOF blocks upto a depth of 20-25m shall be undertaken using microfine/ultrafine cement.
 12. The longitudinal concrete cut-off walls proposed in the abutments in L1 and S9 blocks shall not be constructed in view of the extension of u/s cut-off wall under NOF sections.
 13. DDRP has firmed up a set of drawings after extensive discussions for the spillway blocks and u/s & downstream cut-off. These shall form the basis for further

design, construction & model studies (hydraulic). The drawings incorporate the philosophy enumerated in this report for addressing the weak rock features and its attendant problems.

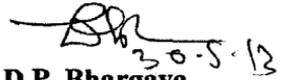
14. The proposed modifications and additional safety measures, would ensure satisfactory performance of the concrete dam and spillway on a long term basis for all the prescribed loading conditions (IS: 6512 code) in the present geo-seismological set-up.



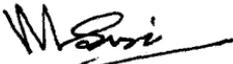
Rajesh Kumar
Chairman
CWC/DDR



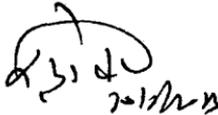
A. B. Pandya
Member (D&R), CWC
(Co-opted Member)



D.P. Bhargava
Director (Technical),
NHPC Limited, Member



Manjit Singh
Member (Hydro)
CEA, Member



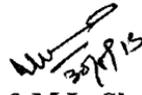
Ramesh Grover
Chief Engineer Design
(NW&S), CWC,
Member



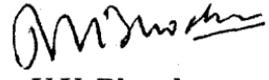
L.A.V. Nathan
Chief Engineer Design
(DSO), CWC, Member



M. Raju
Director GSI,
Member



Prof. M.L. Sharma
HOD (Earthquake
Engineering),
IIT Roorkee, Member



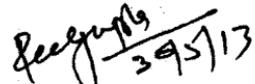
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Joint Director, CWPRS,
Member



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Chief Engineer
CWC,
(Co-opted Member)



S.K. Sibal
Director (Design),
CWC
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P.K. Gupta
GM (Geo-Tech),
NHPC Limited
/Member Secretary DDR
