भारत सरकार

Government of India

विद्युत मंत्रालय

Ministry of Power

केन्द्रीय विद्युत प्राधिकरण

Central Electricity Authority

जल विद्युत गृहों के निष्पादन का पुनर्विलोकन 2023-24

REVIEW OF PERFORMANCE OF HYDRO POWER STATIONS 2023-24

नई दिल्ली

NEW DELHI

फ़रवरी,2025

February, 2025

(विद्युत अधिनियम, 2003 की धारा 73 (आई) व (जे) के तहत के०वि०प्रा० के सांविधिक दायित्व का निर्वहन करते हुए प्रकाशित)

(PUBLISHED IN FULFILMENT OF CEA'S STATUTORY OBLIGATION UNDER SECTION 73(i) & (j) OF THE ELECTRICITY ACT, 2003)

FUNCTIONS AND DUTIES OF CEA AS PER SECTION-73 OF ELECTRICITY ACT-2003

The Authority shall perform such functions and duties as the Central Government may prescribe or direct, and in particular to –

a) Advise the Central Government on the matters relating to the national electricity policy, formulate short-term and perspective plans for development of the electricity system and coordinate the activities of the planning agencies for the optimal utilization of resources to sub serve the interests of the national economy and to provide reliable and affordable electricity to all consumers;

b) Specify the technical standards for construction of electrical plants, electric lines and connectivity to the grid;

c) Specify the safety requirements for construction, operation and maintenance of electrical plants and electric lines;

d) Specify the Grid Standards for operation and maintenance of transmission lines;

e) Specify the conditions for installation of meters for transmission and supply of electricity;

f) Promote and assist in the timely completion of schemes and projects for improving and augmenting the electricity system;

g) Promote measures for advancing the skills of persons engaged in electricity industry;

h) Advise the Central Government on any matter on which its advice is sought or make recommendation to that Government on any matter if, in the opinion of the Authority, the recommendation would help in improving the generation, transmission, trading, distribution and utilization of electricity;

i) Collect and record the data concerning the generation, transmission, trading, distribution and utilization of electricity and carry out studies relating to cost, efficiency, competitiveness and such like matters;

j) Make public from time to time the information secured under this Act, and provide for the publication of reports and investigations;

k) Promote research in matters affecting the generation, transmission, distribution and trading of electricity;

l) Carry out, or cause to be carried out, any investigation for the purpose of generating or transmitting or distributing electricity;

m) Advise any State Government, licensees or the generating companies on such matters which shall enable them to operate and maintain the electricity system under their ownership or control in an improved manner and where necessary, in coordination with any other Government, licensee or the generating company owning or having the control of another electricity system;

n) Advise the Appropriate Government and the Appropriate Commission on all technical matters relating to generation, transmission and distribution of electricity; and

o) Discharge such other functions as may be provided under this Act.

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जल विद्युत गृहों के निष्पादन का पुनर्विलोकन 2023-24

REVIEW OF PERFORMANCE OF HYDRO POWER STATIONS 2023-24

जल परियोजना आयोजन तथा अन्वेषण प्रभाग
HYDRO PROJECT PLANNING & INVESTIGATION DIVISION

नई दिल्ली
NEW DELHI
फ़रवरी, 2025
February, 2025

(विद्युत अधिनियम, 2003 की धारा 73 (आई) व (जे) के तहत के0वि0प्रा0 के सांविधिक दायित्व का निर्वहन करते हुए प्रकाशित)
(PUBLISHED IN FULFILMENT OF CEA'S STATUTORY OBLIGATION UNDER SECTION 73(i) & (j) OF THE ELECTRICITY ACT, 2003)

प्राक्कथन

जल विद्युत शक्ति हमारे देश में पिछले 100 वर्षों से नवीनीकरण ऊर्जा का सबसे विश्वसनीय स्त्रोत रहा है। जल विद्युत शक्ति केंद्रों की उपलब्धता में निरंतर सुधार के उद्देश्य से केन्द्रीय विद्युत प्राधिकरण (के. वि. प्रा.), केन्द्रीय सार्वजनिक क्षेत्र, राज्य व निजी क्षेत्र में विद्युत उपक्रमों के निकट सहयोग से उनके वार्षिक निष्पादन की समीक्षा के लिए अध्ययन करता है।

वर्ष 2023-24 के दौरान जल विद्युत शक्ति केन्द्रों के निष्पादन का समीक्षा संबंधी प्रतिवेदन विद्युत अधिनियम, 2003 के खंड 73 (आई) और (जे) के तहत संवैधानिक दायित्व को आंशिक रूप से पूरा करने में केन्द्रीय विद्युत प्राधिकरण द्वारा किए गए ऐसे प्रकाशनों की श्रृंखला में 37 वां प्रतिवेदन हैं। इस रिपोर्ट में 46928.17 मेगावाट की कुल संस्थापित क्षमता वाले 212 जल विद्युत केन्द्रों की 731 जल विद्युत इकाइयों के निष्पादन का व्यापक विश्लेषण किया गया है, जिसके लिए केन्द्रीय, राज्य और निजी क्षेत्रों में ऊर्जा उत्पादन संस्थाओँ द्वारा अनुपलब्धता संबंधी आंकड़े उपलब्ध कराए गए हैं।

प्रचालन उपलब्धता संबंधी सूचना पर्याप्त और विश्वसनीय विद्युत आपूर्ति सुनिश्चित करने में काफी महत्वपूर्ण है। अध्ययनों के अनुसार वर्ष 2023-24 के दौरान जल विद्युत केन्द्रों की औसत प्रचालन उपलब्धता 92.22 % थी। प्रणोदित (Forced) और योजनाबद्ध अनुपलब्धता (Planned Outages) के कारण जल विद्युत इकाइयों की औसत गैर-उपलब्धता क्रमश: 2.43 % और 5.35 % थी। वर्ष 2023-24 के दौरान जल विद्युत केन्द्रों से उत्पादन 134.05 बिलियन यूनिट था, जो वर्ष 2022-23 के उत्पादन 162.10 बिलियन यूनिट की तुलना में लगभग 17.30 % कम था।

मुझे विश्वास है कि यह समीक्षा विद्युत केन्द्र प्रबंधन को उपयुक्त प्रचालन एंव रखरखाव (ओ. एंड एम.) की नीति तैयार करके जल विद्युत संयंत्रों की उपलब्धता में और सुधार लाने में उपयोगी मार्गदर्शन प्रदान करेगा। प्रणोदित अनुपलब्धता के कारणों का भी व्यापक विश्लेषण करने की आवश्यकता है ताकि विनिर्माताओं/ओ. एंड एम. एजेंसियों द्वारा उचित उपाय किये जायें और इनकी पुनरावृत्ति को कम किया जा सके जिससे प्रचालन उपलब्धता में सुधार किया जा सके।

समीक्षा के लिए अनुपलब्धता आंकड़े/सूचना उपलब्ध कराने के लिए मैं सभी उर्जा उत्पादन उपक्रमों का हार्दिक धन्यवाद करता हूँ। मैं इस रिपोर्ट के लिए अपेक्षित निविष्ट आंकड़ों का विश्लेषण करने में सूचना प्रोद्योगिकी प्रभाग, के0वि0प्रा0 द्वारा प्रदान किए गए सहयोग तथा एच. पी. पी. & आई. के सभी अधिकारीयों (नेतृत्व श्री श्रवण कुमार, मुख्य अभियंता, सी. ई . ए.) के लिए उन्हें धन्यवाद देता हूँ।

नई दिल्ली
फ़रवरी, 2025

(एम. जी. गोखले)
सदस्य (जल विद्युत), के. वि.प्रा.

FOREWORD

Hydro Electric Power has been the most reliable source of renewable energy for the past over 100 years in our country. In the quest for continual improvement in availability of Hydro Power Stations, Central Electricity Authority (CEA) carries out studies to review their annual performance in close co-operation with Central PSUs and Power Utilities in State & Private Sector.

The report on 'Review of Performance of Hydro Power Stations during the year 2023-24' is 37th in the series of such publication by Central Electricity Authority in partial fulfilment of the statutory obligations under Section 73(i) & (j) of the Electricity Act, 2003. The report provides exhaustive analysis of performance of 731 hydro-electric units installed at 212 hydro-electric stations having total installed capacity of 46928.17 MW for which outage data has been provided by generation utilities in Central, State and Private sectors.

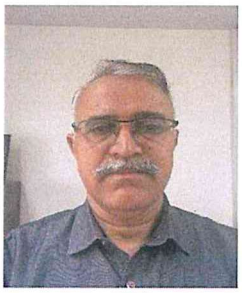
The information on operation availability is of vital importance in ensuring adequate and reliable power supply. According to the studies, the average operating availability of hydroelectric stations during the year 2023-24 was 92.22 %. The average non-availability of hydro units due to forced and planned outages was 2.43 % and 5.35 % respectively. The generation from hydro stations during 2023-24 was 134.05 Billion Units, which was about 17.30 % lower compared to the generation of 162.10 BU in the previous year viz. 2022-23.

I am confident that the review would provide useful guidance to power station authorities in making further improvement in the availability of hydel plants by chalking out suitable O&M strategies. There is also a need to undertake detailed analysis of the reasons of forced outages for devising necessary measures by the manufacturers/O&M agencies so as to minimize the recurrence of the same and to improve the operational availability.

I wish to express my sincere thanks to all the power generating utilities for providing outage data/information for the review. I would also like to put on record the co-operation extended by Information Technology Division, CEA for analysis of the input data required for this report and last but not the least the valiant efforts put in by HPP & I division under the guidance of Shri Sharvan Kumar, Chief Engineer, CEA.

New Delhi
February, 2025

(M. G. Gokhale)
Member (Hydro), CEA



प्रस्तावना

किसी भी देश के आर्थिक प्रगति के लिए विद्युत शक्ति महत्वपूर्ण बुनियादी आवश्यकताओं में से एक है। दिनांक 31.03.2024 को देश में कुल प्रतिष्ठापित विद्युत उत्पादन क्षमता 441969.55 मेगावाट थी जिसमें 25 मेगावाट से ज्यादा प्रतिष्ठापित क्षमता वाले स्टेशनों की जल विद्युत क्षमता 46928.17 मेगावाट (10.62 %) थी ।

केन्द्रीय विद्युत प्राधिकरण (के. वि. प्रा.) उत्पादन निष्पादन कड़ी निगरानी, ब्रेकडाउन के कारणों के विश्लेषण, नवीनीकरण तथा आधुनिकीकरण कार्यों आदि के द्वारा ऊर्जा उत्पादक उपक्रमों के साथ सहयोग से जल विद्युत केन्द्रों के निष्पादन में निरंतर सुधार के लिए सघन प्रयास कर रहा है। आगामी वर्षों में सौर एवं पवन स्रोतों से संभावित विशाल ऊर्जा क्षमता वृद्धि के कारण यह आवश्यक है कि मौजूदा जल विद्युत केन्द्रों को ग्रिड सुरक्षा और सुरक्षा के लिए उनके प्रदर्शन और उपलब्धता में सुधार करना चाहिए ताकि पीर्किंग और संतुलन शक्ति प्रदान करने के लिए उनका उपयोग किया जा सके ।

वर्ष 2023-24 के दौरान देश में 212 जल विद्युत केन्द्रों (731 यूनिटों) के निष्पादन के आधार पर प्रणोदित (2.43%) और योजनाबद्ध अनुपलब्धता (5.35%) के कारण जल विद्युत इकाइयों की औसत प्रचालन उपलब्धता 92.22% थी। वर्ष 2023-24 के दौरान जल विद्युत केन्द्रों से ऊर्जा उत्पादन 134.05 बिलियन यूनिट था, जो कि पिछले वर्ष (2022-23) के उत्पादन 162.10 बिलियन यूनिट की तुलना में लगभग 17.30 % कम था ।

जल विद्युत केन्द्रों के संचालन प्रदर्शन को प्रभावित करने वाले कई पहलू हैं जिनमें नियोजित रखरखाव, अनुसूचित/ आंशिक अनुपलब्धता, वास्तविक प्रवाह का पैटर्न इत्यादि शामिल हैं। इसलिए प्रणोदित अनुपलब्धता के कारणों के विस्तृत विश्लेषण करने तथा अत्याधुनिक रखरखाव प्रथाओं को अपनाकर उनके पुनरावृत्ति को कम करने के लिए उपयुक्त उपायों से स्टेशन की परिचालन उपलब्धता में सुधार करने की आवश्यकता है ।

जल विद्युत परियोजनाओं के विकास में सुस्त वृद्धि तथा सौर एवं पवन ऊर्जा संसाधनों में बड़ी वृद्धि के कारण हाइड्रो की बढ़ती मांग के चलते इस समीक्षा में मौजूदा जलविद्युत क्षमता को बनाए रखने के लिए आर.एम. और यू. पर अधिक जोर देने की जरूरत पर भी बल दिया गया है ।

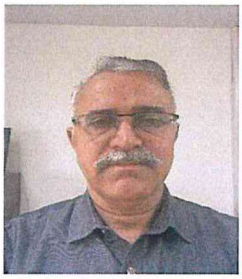
इस प्रकाशन के लिए आवश्यक अध्ययन श्री बलवान कुमार, निदेशक के सराहनीय मार्गदर्शन के तहत जल परियोजना आयोजन एंव अन्वेषण (एच.पी.पी.& आई.) प्रभाग, के. वि. प्रा. के अधिकारियों की टीम द्वारा किया गया है। के. वि. प्रा. रिपोर्ट की सामग्री और प्रस्तुति में सुधार करने के लिए ठोस प्रयास कर रहा है । इस संबंध में रचनात्मक सुझावों का स्वागत है और उनकी सराहना की जाएगी ।

मैं सभी सरकारी एवं निजी क्षेत्र के विद्युत उपक्रमों और विद्युत केंद्र के अधिकारियों का भी पुनर्विलोकन के लिए जरूरी आंकड़े उपलब्ध कराने के लिए हार्दिक धन्यवाद देता हूँ ।

श्रवण कुमार 6.2.25

नई दिल्ली
फ़रवरी, 2025

(श्रवण कुमार)
मुख्य अभियन्ता, के. वि. प्रा.



PREFACE

Electric power is one of the most important infrastructure requirements for the overall economic development of the country. As on 31.03.2024, the overall installed generating capacity of the country was 441969.55 MW and hydro power stations (above 25 MW capacity) with capacity of 46928.17 MW constituting a share of 10.62 % in the total Installed Capacity.

Central Electricity Authority (CEA) is making concerted efforts for improving the performance of Hydro Power Stations in close co-ordination with respective Hydro Power Generating Utilities in the Central, State & Private Sector through close monitoring of generation performance, analysis of reasons for breakdowns, Renovation & Modernization works etc. In light of huge capacity additions envisaged from Solar and Wind sources of renewable power in the coming years, it is imperative that the existing power stations must improve their performance and availability in order to supply peaking and balancing power for grid safety and security.

Based on an exhaustive analysis of generation performance and operating availability of 212 H.E. Stations comprising 731 units in the country, the average operating availability of hydro-electric stations during the year 2023-24 was 92.22% with average non-availability of hydro units due to forced and planned outages being 2.43 % and 5.35 % respectively. The generation from hydro stations during 2023-24 was 134.05 Billion Units, which was about 17.30 % lower compared to the generation of 162.10 Billion Units in the previous year (2022-23).

A number of factors influence the operating performance of hydro power stations which include planned maintenance, unscheduled total/partial outages, pattern of actual inflows, etc. There is, thus, need for undertaking detailed analysis of the reasons of forced outages and taking suitable measures to minimize their recurrence and, thereby, improving the operating availability of the station by adopting state-of-the-art maintenance practices.

The Review also emphasizes the need for greater thrust on RM&U for maintaining existing hydro capacity mainly due to sluggish growth in their development of new hydro projects and ever increasing demand for hydro especially due to large capacity addition from Solar and Wind which are source of variable and intermittent power.

Studies for this publication have commendably been carried out by the team of officers in HPP&I Division of CEA under the overall guidance of Shri Balwan Kumar, Director. CEA has been making concerted efforts to improve the contents and presentation of the report. Constructive suggestions in this regard are welcome and will be appreciated.

I wish to express my sincere thanks to all the Hydro Power Sector Utilities and Power Station Authorities for making available the necessary data for the review.

6.2.25

New Delhi
February, 2025

(Sharvan Kumar)
Chief Engineer, CEA

आभार

मैं, सदस्य (जल विद्युत), के. वि. प्रा. का इस पुनर्विलोकन को इस स्वरूप में लाने में उनके अमूल्य सुझावों तथा मार्गदर्शन के लिये आभारी हूँ।

मैं, मुख्य अभियन्ता (एच. ई. & टी. डी. प्रभाग) के. वि. प्रा. का जल विद्युत यूनिटों के नवीनीकरण एंव आधुनिकीकरण एंव उन्नयन पर अध्याय तैयार करने के लिए धन्यवाद देता हूँ।

मैं, श्री सुमित गोएल, उप निदेशक, श्री वैभव कुमार, सहायक निदेशक, श्री बासुदेब बिस्वास, समूह वरिष्ठ प्रबंधक (सिविल), श्रीमती सुनीता भंडारी, डी.ई.ओ व अन्य अधिकारियों तथा कर्मचारियों का भी इस पुनर्विलोकन के प्रकाशन में सहयोग के लिये धन्यवाद देता हूँ।

(बलवान कुमार)
निदेशक, के.वि.प्रा.

ACKNOWLEDGEMENT

I am grateful to Member (Hydro), CEA for their valuable suggestions and guidance in preparation of this Review.

I would also like to express my sincere thanks to Chief Engineer (HE&TD), CEA for preparing the chapter on Renovation Modernisation & Uprating of Hydro generating units.

I would also like to express my appreciation and thanks to my team of officers comprising Sh. Sumit Goel, Deputy Director, Sh. Vaibhav Kumar, Assistant Director, Sh. Basudeb Biswas, Group Senior Manager (Civil), Smt. Sunita Bhandari, DEO and other officers/ officials for their untiring efforts and support in bringing out this Review.

(Balwan Kumar)
Director, CEA

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SUMMARY

1.0 General

1.1 This review covers the performance of Hydro-Electric (HE) Stations having installed capacity of more than 25 MW. As on 31st March, 2024 there were 731 HE generating units installed in 212 Hydro-Electric Stations with an aggregate installed capacity of 46928.15 MW in operation. Performance of 44 important Reservoir based schemes has also been discussed separately in the report.

1.2 Region-wise summary of the existing HE Stations in operation with installed capacity above 25 MW as on 31.3.2024 in the country vis-à-vis that on 31.3.2023 is given below in Table S-1.

TABLE S-1

REGION-WISE SUMMARY OF HYDRO-ELECTRIC STATIONS 2023-24 VIS-A-VIS 2022-23

Region	No. of Stations as on		No. of Units as on		Capacity (MW) as on	
	31.03.24	**31.03.23**	**31.03.24**	**31.03.23**	**31.03.24**	**31.03.23**
Northern	77	76	260	258	19774.27	19696.25
Western	28	28	101	101	7392.00	7392.00
Southern	69	69	246	246	11747.15	11747.15
Eastern	24	24	86	86	5987.75	5988
North Eastern	14	14	38	38	2027.00	2027.00
All India	**212**	**211**	**731**	**729**	**46928.17**	**46850.15**

1.3 Growth of Installed Capacity and Generation

The installed capacity of Hydro-Electric Stations viz-à-viz total capacity, the contribution in generation by hydro-electric plants and trend of hydro capacity & generation over the years are indicated in **Table-S-2**. From **Table S-2**, it may be observed that the overall share of hydro in terms of installed capacity in the country rose from 37.3% at the end of 1947 to 50.6% during 1962-63. However, thereafter, the share of hydro progressively increased and is presently 10.81% at the end of 2023-24. The generation from hydro stations during the year 2023-24 accounted for 8.89% of the total energy generation in the country.

TABLE S-2
HYDRO-ELECTRIC CAPACITY & GENERATION
VIS-À-VIS TOTAL CAPACITY & GENERATION

Year	Installed Capacity			Generation		
	Total (MW)	Hydro (MW)	Hydro as % of Total	Total (MU)	Hydro (MU)	Hydro as % of Total
1950	1713	560	32.63	5106	2519	49.33
1955-56	2886	1061	36.76	9145	4295	46.97
1960-61	4653	1917	41.20	16937	7837	46.27
1962-63	5801	2936	50.61	22365	11805	52.78
1965-66	9027	4124	45.68	32890	15225	46.29
1968-69	12957	5907	45.59	47434	20723	43.69
1973-74	16664	6966	41.80	66689	28972	43.44
1978-79	26680	10833	40.60	102523	47159	46.00
1979-80	28448	11384	40.02	104627	45478	43.47
1984-85	42585	14460	33.96	156859	53948	34.39
1989-90	63636	18307	28.77	245437	62116	25.31
1991-92	69065	19194	27.79	287028	72757	25.35
1996-97	85795	21658	25.24	395889	68901	17.40
1997-98	89203	21904	24.58	421748	74582	17.68
1998-99	92269	22479	24.10	447464	82923	18.53
1999-00	97837	23857	24.37	481128	80755	16.78
2000-01	101450	25153	24.75	499429	74362	14.89
2001-02	105046	26269	25.01	515066	73759	14.32
2002-03	107877	26767	24.81	531607	63834	12.01
2003-04	112684	29507	26.19	558113	73775	13.22
2004-05	118419	30936	26.12	587416	84495	14.38
2005-06	124287	32326	26.01	624631	101293	16.22
2006-07	132321	34662	26.19	659513	113359	17.19
2007-08	143061	37002	25.86	704469	123424	17.52
2008-09*	147917	36846	24.91	714653	109840	15.37
2009-10*	159398	36863	23.13	763429	103916	13.61
2010-11*	173626	37567	21.64	805532	114257	14.18
2011-12*	199877	38990	19.51	871602	130510	14.97
2012-13*	223344	39491	17.68	907262	113720	12.53
2013-14*	243029	40531	16.68	961552	134848	14.02
2014-15*	267637	41267	15.42	1043665	129244	12.38
2015-16*	302088	42783	14.16	1102578	121377	11.01
2016-17*	326849	44478	13.61	1154524	122378	10.60
2017-18*	344002	45293	13.17	1201528	126123	10.50
2018-19*	356100	45399	12.75	1244930	134894	10.84
2019-20*	370106.46	45699.2	12.34	1244989.43	155769.12	12.51
2020-21*	382151.22	46209.20	12.09	1225842.14	150299.52	12.26
2021-22*	399496.61	46722.50	11.69	1313453.87	151627.33	11.54
2022-23*	416058.89	46850.17	11.26	1414171	162099	11.46
2023-24*	434195.13	46928.17	10.81	1508277**	134053.90	8.89

* Capacity above 25 MW only has been considered.
** Actual generation is excluding Bhutan IMP – 4716.10 MU

1.4 The report contains outage data of 212 H.E. Stations (above 25 MW) covering 731 units and having an aggregate installed capacity of 46928.25 MW which was made available by various utilities for the purpose of this Review.

1.5 The performance review also analyses year-wise generation, planned maintenance, forced outages and operating availability for the last 10 years (viz 2013-14 to 2024-25).

1.6 This review covers information in respect of renovation & modernization, uprating and life extension of HE stations in the country for the year 2023-24, achievements during the year 2023-24 and programme for renovation, modernization, life extension and uprating of HE Stations for the year 2023-24.

1.7 The report comprises ten chapters as under

Chapter No.	Particulars
1	Hydro-Electric Potential and Development
2	Generation Performance
3	Major Reservoir Based H.E. Schemes
4	Planned Maintenance of H.E. Units
5	Forced Outage of H.E. Units
6	Operating Availability of H.E. Units
7	Miscellaneous Outages of H.E. Units
8	Generation Programme for the year 2019-20
9	Renovation & Modernisation of Hydro-Electric Power Projects
10	Definitions and Abbreviations

2.0 Generation Performance

The generation from the hydroelectric power stations in the country during 2023-24 was 134053.92 MU (excluding import from Bhutan),which was about 17.30% lower than the generation during 2022-23 and about 14.5 % lower than the generation targets for 2023 24.

2.1 Utility-wise/ Sector-wise Performance of H.E. Stations

The utility-wise/ sector-wise target of energy generation vis-à-vis actual generation and surplus / shortfall in respect of Hydro Electric stations are given below in Table S-3.

TABLE S-3

UTILITY-WISE PERFORMANCE OF HYDRO ELECTRIC STATIONS (2023-24 VIS-A-VIS 2022-23)

Utilities	Installed Capacity (MW) (As on 31.03.2024)	Generation					
		Target (MU)		Actual (MU)		Surplus (+)/ Shortfall (-) in %	
		2023-24	2022-23	2023-24	2022-23	2023-24	2022-23
CENTRAL SECTOR							
BBMB	2956.3	9700	9644	11583.17	10824.72	19.41	12.24

NHPC LTD	5451.2	25628	26868	21585.84	24450.81	-15.77	-9.00
SJVN LTD	1972.02	9080	8888	8088.21	9130.48	-10.92	2.73
NTPC LTD	800	3100	3100	2952.05	3132.81	-4.77	1.06
THDC LTD	1400	4160	4162	4441.69	4539.97	6.77	9.08
NHDC	1520	3265	3265	4470.5	5443.49	36.92	66.72
DVC	143.2	286	290	176.28	236.61	-38.36	-18.41
NEEPCO LTD	1500	10366	5151	4848.09	5202.44	-53.23	1.00
TOTAL CENTRAL	**15742.72**	**65585.00**	**61368.0**	**58145.83**	**62961.33**	**-11.34**	**2.60**
PRIVATE SECTOR							
MPCL	86	332	336	249.06	320.86	-24.98	-4.51
EPPL	100	348	348	140.74	343.54	-59.56	-1.28
ADHPL	192	653	658	587.67	640.14	-10.00	-2.71
GBHPPL	70	293	293	256.33	274.22	-12.52	-6.41
HBPCL	300	1213	1300	1162.78	1351.93	-4.14	3.99
JSW ENERGY	1045	4132	4131	3786.39	4284.87	-8.36	3.72
IAEPL	36	158	158	154.99	140.03	-1.91	-11.37
AHPC LTD	330	1310	1310	1306.39	1514.06	-0.28	15.58
JPVL	400	1750	1590	1627.52	1910.82	-7.00	20.18
DLHP	34	36	36	23.48	19.28	-34.78	-46.44
GIPL	110	537	537	473.07	503.92	-11.91	-6.16
TPCL	447	1470	1470	1557.6	1568.79	5.96	6.72
DEPL	96	412	412	356.93	433.47	-13.37	5.21
SEPL	97	436	421	433.19	445.94	-0.64	5.92
SNEHA KINETIC	96	463	460	394.08	535.9	-14.89	16.50
NTPGPL	0	50	50	0	0	0.00	0.00
HSPPL	100	402	392	231.57	318.29	-42.40	-18.80
L&T	99	439	402	393.66	465.95	-10.33	15.91
GMR	180	770	500	708.17	421.51	-8.03	-15.70
MBPC	113	442	442	396.83	434.84	-10.22	-1.62
TOTAL PRIVATE	**3931**	**15646**	**15246**	**14240**	**15928**	**-8.98**	**4.48**
STATE SECTOR							
JKSPDCL	1110	5551	4866	4781.78	5056.98	-13.86	3.92
HPPCL	406	874	771.5	846.26	904.16	-3.17	17.20
HPSEBL	372	1653	1628	1278.95	1779.35	-22.63	9.30
BVPC	0	0	0	0	0	0.00	0.00
RRVUNL	411	672	480	1013.97	967.43	50.89	101.55
PSPCL	1051	3665	3780	3956.85	3702.06	7.96	-2.06
UPJVNL	501.6	1324	1519	850.64	974.04	-35.75	-35.88
UJVNL	1372.15	5135	5035	4722.42	5177.21	-8.03	2.82
SSNNL	1450	3100	3099	3699.72	4792.29	19.35	54.64
GSECL	540	1051	965	856.61	1340.85	-18.50	38.95
MAHAGENCO	2406	3888	3963	3316.2	3941.02	-14.71	-0.55
MPPGCL	875	2407	2389	2341.49	2230.78	-2.72	-6.62
CSPGCL	120	274	274	321.76	237.37	17.43	-13.37

APGENCO	1796.75	3605	3600	2334.98	4484.61	-35.23	24.57
TSGENCO	2405.6	3969	3852	1243.29	6010.07	-68.67	56.02
KPCL	3617.2	12242	12337	8874.4	12964.04	-27.51	5.08
KSEBL	1864.15	7668	7414	5155.72	7989	-32.76	7.76
TANGEDCO	2178.2	4220	3913	3563.28	5965.77	-15.56	52.46
JUUNL	130	110	110	96.84	168.99	-11.96	53.63
OHPC	2039.8	5363	5363	5299.18	4919.08	-1.19	-8.28
TUL	1200	5652	5652	4292.76	6152.57	-24.05	8.86
WBSEDCL	986	1560	1550	1683.07	1989.56	7.89	28.36
APGCL	100	380	380	328.89	481.6	-13.45	26.74
MePGCL	322	1106	1106	808.58	980.25	-26.89	-11.37
TOTAL STATE	**27254.45**	**75469**	**74046.5**	**61667.64**	**83209.08**	**-18.29**	**12.37**
TOTAL ALL INDIA	**46928.17**	**156700.0**	**150660.5**	**134053.92**	**162099**	**-14.45**	**7.59**

During the year 2023-24, overall hydro generation was more than the target in respect of BBMB, THDC LTD & NHDC in Central Sector and TPCL. in Private Sector. As regards, generation by State Electricity Boards/Corporations / Departments, hydro generation was more than the target in respect of WBSEDCL, RRVUNL, PSPCL, SSNNL and CSPGCL.

2.2 Sector-wise and Region Wise Performance of H. E. Stations

Sector-wise and Region-wise generation performance of H. E. Stations during 2022-23 is given in Table S-4 & S-5.Itisseenthat there was excess generation as compared to target in State Sector & Private Sector. The overall generation of Central Sector hydro stations remained below the targets.

TABLE S-4

SECTOR-WISE GENERATION PERFORMANCE OF HYDRO STATIONS (2023-24 VIS-À-VIS 2022-23)

Sl. No.	Sector	Installed Capacity as on 31.03.2024 (MW)	Generation		
			Target (MU)	Actual (MU)	Shortfall (-) Surplus (+) Over Target (%)
1	Central	15742.72	65585.00	58145.82	-11.34
2	State	27254.45	75469.00	61667.62	-18.29
3	Private	3931	15646.00	14240.46	-8.98
	Total	**46928.17**	**156700**	**134053.90**	**-14.45**

TABLE S-5

GENERATION PERFORMANCE – REGION-WISE
(2023-24 VIS-À-VIS 2022-23)

S. No.	Region	Installed Capacity as on 31.03.2024 (MW)	Generation During 2023-24		
			Target (MU)	Actual (MU)	Shortfall (-)/ Surplus (+) Over Target (%)
1	Northern	19774.27	77797.00	73088.83	-6.05
2	Western	7392.00	15491.00	16587.34	7.08
3	Southern	11747.15	31078.00	20308.64	-34.65
4	Eastern	5987.75	20178.00	17785.35	-11.86
5	North-Eastern	2027.00	12156.00	6283.74	-48.31
	Total (All India)	**46928.17**	**157600.00**	**134053.90**	**-14.45**

3.0 Outage Analysis

For outage data analysis during 2023-24, outage data of 212 H.E. Stations (above 25 MW capacity) covering 731 units and having an aggregate installed capacity of 46928.17 MW made available by various utilities have been considered for the purpose of this Review. Region-wise details of these 212 hydro power stations are given below in Table S-6.

TABLE S-6
REGION-WISE SUMMARY OF HYDRO-ELECTRIC STATIONS ANALYSED
(2023-24 VIS-A-VIS-2022-23)

Region	No. of Stations		No. of Units		Capacity (MW)	
	2023-24	2022-23	2023-24	2022-23	2023-24	2022-23
Northern	77	76	260	258	19774.27	19696.25
Western	28	28	101	101	7392.00	7392.00
Southern	69	69	246	246	11747.15	11747.15
Eastern	24	24	86	86	5987.75	5988
North Eastern	14	14	38	38	2027.00	2027.00
All India	**212**	**211**	**731**	**729**	**46928.17**	**46850.15**

3.1 Planned Maintenance

The number of H.E. Stations falling under various ranges of non-availability due to planned maintenance during the year 2023-24 VIS-A-VIS 2022-23 is summarized below in Table S-7.

TABLE S-7

NON-AVAILABILITY OF HE STATIONS DUE TO PLANNED OUTAGES (2023-24 VIS-A-VIS 2022-23)

% Non-Availability due to planned maintenance	2023-24				2022-23			
	Stations		Capacity		Stations		Capacity	
	No.	% of Total	MW	% of Total	No.	% of Total	MW	% of Total
≤ 5	125	58.96	29204.07	62.23	141	66.82	32446.12	69.26
>5 to 10	45	21.23	7524.10	16.03	42	19.91	8482.40	18.11
>10 to 15	22	10.38	6211.00	13.24	14	6.64	2670.65	5.70
>15 to 20	8	3.77	1679.00	3.58	6	2.84	1570.00	3.35
>20 to 25	4	1.89	265.00	0.56	3	1.42	1066.00	2.28
>25 to 30	4	1.89	1562.00	3.33	0	0.00	0.00	0.00
above 30	4	1.89	483.00	1.03	5	2.37	615.00	1.31
Total	**212**	**100**	**46928.17**	**100**	**211**	**100**	**46850.17**	**100**

It could be seen from above that 125 nos. (58.96% of total) hydro-electric stations had non-availability factor less than or equal to 5% due to planned maintenance during 2023-24 as compared to 141 nos. (66.82% of total) during 2022-23.

Non-availability due to planned maintenance was more than 30% at 4 nos. (1.89% of total) H.E. Stations during 2023-24 and which was 5 nos. (2.37% of total) in 2022-23. The details of these stations for 2023-24 is given below in Table S-8.

TABLE S-8

H.E. STATIONS HAVING HIGH PLANNED MAINTENANCE FOR THE PERIOD: (2023-24)

Sl. No	Name of Station/Utility	Capacity (MW)	N.A. due to P.M.* (%)	Reasons
1	KHONDONG HPS / NEEPCO.	50.00	91.17	R AND M WORKS
2	KHOPOLI HPS / TATA MAH.	72.00	36.85	ANNUAL MAINTENANCE
3	PERIYAR HPS / TANGEDCO	161.00	38.68	PLANNED MAINTENANCE

*** N.A. -**Non availability, **P.M.-** Planned Maintenance

41.04% of stations had operational availability lower than 95% on account of planned maintenance. These utilities, therefore, need to improve their O&M practices to bring down their total outages.

It is observed from above that stations may be having high planned maintenance outages on account of ageing, O&M management issues, etc. Further, those stations which are having

continuously high planned maintenance/forced outages over past few years may be requiring major repair & maintenance works or Renovation & Modernisation (R&M) works for improving the availability, reliability & security of the plant besides providing life extension where the assets have outlived their useful life.

The duration of various types of periodic planned maintenance varied considerably from station to station. Details of average time taken for various types of maintenance are given in Table S-9.

TABLE S-9

AVERAGE DURATION OF VARIOUS TYPES OF PLANNED MAINTENANCE FOR THE PERIOD: (2023-24)

S.NO	Type of Planned Maintenance	Average duration at any unit (hrs.)
1	ANNUAL MAINTENANCE	702.76
2	AUXILIARY SYSTEM	4.79
3	B.F.VALVE	59.53
4	CAPITAL/3 YEARLY MTCE.	790.25
5	CAPITAL MAINTENANCE	1400.30
6	CIVI STRUCTURE	3.62
7	DESILING CHAMBER	467.63
8	FIREBAY/RESERVOIR	104.97
9	GENERATOR	90.21
10	GENERATOR TRANSFORMER	63.11
11	HRI/HRC/POWER CHANNEL	158.17
12	INSPECTION /MTCE	58.90
13	MISCELLANEOUS	37.70
14	MONTHLY MAINTENANCE	90.84
15	OTHER EQUIPMENT	307.57
16	OTHER PLANNED MAINTENANCE WORKS	118.20
17	PAINTING OTHERS	426.73
18	PLANNED MAINTENANCE	708.92
19	PRESSURE SHAFT/PENSTOCK	99.54
20	R AND M WORKS	2996.87
21	RENOVATION/MODERNISATION	191.50

22	ROUTINE MAINTENANCE	9.51
23	RUNNER INSPECTION /REPAIR	9.65
24	STATOR	1921.42
25	SURGE SHAFT	3046.43
26	SWITCHING EQUIPMENT	182.52
27	TESTING/CHECKING	10.32
28	TRI/TRC/DRAFT TUBE	125.88
29	TURBINE	659.31
30	TURBINE MISC/GOVERNOR	139.25

It has been observed that there were wide variations in the time taken at different hydro units for the same type of periodic maintenance. The reasons for this can be attributed to following factors.

- The nature and the extent of work involved may vary from unit to unit.
- Availability of spare parts could be a constraint at some units.
- The working of the agency entrusted with the maintenance work could be different.
- Administrative and procedural difficulties may be faced at some of the stations

However, the analysis of outage data indicates there is enough scope of considerable reduction in outage duration of units by adopting best management practices including planning and contract management.

Summary of planned maintenance carried out on various equipments like generators, turbine and other equipments during 2022-23 vis-à-vis 2021-22 is given below in Table S-10.

TABLE S-10

DURATION OF PLANNED MAINTENANCE FOR GENERATOR, TURBINE & OTHER EQUIPMENTS
FOR THE PERIOD (2023-24 VIS-A-VIS 2022-23)

Sl. No.	Equipment	Duration (Hours)			
		Maximum Hours for any unit		Average Hours	
		2023-24	2022-23	2023-24	2022-23
1	GENERATOR	867.58	1220.43	90.21	79.35
2	TURBINE	7401.17	408.25	659.31	183.14
4	OTHER EQUIPMENT	2333.83	4881.61	307.57	417.9

It is observed that forced outages in 2023-24 vis-a-vis 2022-23 have increased on account of turbine whereas the same have decreased on account of generator and other equipment.

3.2 Forced Outage

The summary of forced outages caused due to break-down of generator, turbine and other equipment during 2023-24 VIS-A-VIS 2022-23 is given below in Table S-11.

TABLE S-11

FORCED OUTAGES DUE TO GENERATOR, TURBINE & OTHER EQUIPMENT FAULTS
(2023-24 VIS-A-VIS 2022-23)

Sl. No.	Equipment	Forced Outage (Hours)		% of total Forced Outage		Increase/ Decrease viz-z-viz 2022-23
		2023-24	2022-23	2023-24	2022-23	
1	GENERATOR	38428.21	35713.87	29.30	28.16	-7.60
2	TURBINE	48240.64	45341.17	36.78	35.75	-6.39
3	CIVIL STRUCTURE	31294.60	41510.94	23.86	32.73	24.61
4	OTHER EQUIPMENT	13203.02	4273.08	10.07	3.37	-208.98
	Total	**131166.46**	**126839.06**	**100.00**	**100.00**	**-3.41**

It is observed that forced outages in 2023-24 vis-a-vis 2022-23 have increased on account of turbine, generator and other equipment whereas the same have decreased on account of civil structures.

3.3 Operational Availability

The number of H.E. Stations falling under various ranges of operating availability during the year 2023-24 is summarized below in Table S-12.

TABLE S-12

OPERATING AVAILABILITY OF H.E. STATIONS
(PERIOD: 2023-24)

Operating Availability (%)	No. of Stations	% of total Stations	Installed Capacity (MW)	% of total Installed Capacity
>=95%	101	47.64	23807.67	50.73
>=90 to 95	51	24.06	9313.65	19.85
>=85 to 90	28	13.21	7585.65	16.16
>=80 to 85	11	5.19	2234.00	4.76
<80	22	10.38	4787.20	10.20
Total	**212**	**100.00**	**46928.17**	**100.00**

Operating availability of 33 nos. HE stations (15.54% of total HE Stations) was below 85% (8029 MW) due to planned maintenance (capital overhauling, R&MU works, annual maintenance etc.) carried out for long duration and forced outages (turbine vibration, repair of runner/underwater parts, fire at cable gallery etc.) in these HE Stations.

Region-wise planned maintenance, forced outages and operating availability of H.E. units for 2023-24 is indicated below in Table S-13.

TABLE S-13

AVAILABILITY OF UNITS - REGION-WISE
PERIOD: 2023-24

Sl. No.	Region	No. of Units	Installed Capacity (MW)	Planned Maintenance %	Forced Outage %	Operating Availability (%)
1	Northern	260	19774.27	5.61	1.14	93.28
2	Western	101	7392.00	4.61	1.87	93.52
3	Southern	246	11747.15	5.26	3.27	91.47
4	Eastern	86	5987.75	6.17	1.85	91.98
5	N- Eastern	38	2027.00	10.05	8.53	81.42
	All India	**731**	**46928.17**	**5.35**	**2.43**	**92.22**

On analyzing various types of planned shutdowns, it may be concluded that: Generating units installed in North-Eastern Region accounted for maximum non-availability due to planned maintenance (10.05%) whereas generating units installed in Western Region accounted for the least non-availability due to planned maintenance (4.61%) as indicated in Table S-13 above.

CHAPTER-1

HYDRO-ELECTRIC POTENTIAL AND DEVELOPMENT

CHAPTER-1

HYDRO-ELECTRIC POTENTIAL AND DEVELOPMENT

1.1 Hydro-electric Potential

Reassessment studies of Hydro-electric Potential in various river basins of the country were carried out by Central Electricity Authority during the period 2017-23. As per these studies, total Hydro-electric Power potential in the country was assessed as 84044 MW (at 60% load factor) from a total of 845 number of identified H.E. Schemes which when fully developed would result in an installed capacity of about 148701 MW on the basis of probable average load factor. The total energy potential is assessed as 600 billion units per year. The identified potential of H.E. schemes above 25 MW installed capacity works out to be 133410 MW from a total of 592 H.E. schemes.

As on 31.03.2024, H.E. Schemes having total installed capacity of 42182.55 MW (29.03%) excluding pumped storage stations of capacity of 4745.60 MW have already been developed and the schemes under construction account for capacity of 11337.5 MW (7.80%), (excluding PSS of 2700 MW). As such, about 60.52% identified capacity is yet to be harnessed. Summary of the status of Hydro-electric Potential development in the country is indicated in **Tables 1.1, and 1.2** respectively as well as shown in **Exhibits 1.1 and 1.2.**

TABLE 1.1

REGION-WISE/STATE-WISE STATUS OF HYDRO-ELECTRIC CAPACITY
(In terms of Installed Capacity-above 25 MW as on 31.03.2024)

Region/ State	Identified Capacity as per reassessment study (MW)		Capacity Developed		Capacity Under construction		Capacity yet to be developed	
	Total (MW)	Above 25 MW	(MW)	(%)	(MW)	(%)	(MW)	(%)
NORTHERN								
Jammu & Kashmir	14146	12264.5	3360.0	27.40	3099.5	25.27	5805.0	47.33
Ladhak	2377	707.0	89.0	12.59	0.0	0.00	618.0	87.41
Himachal Pradesh	18820	18305.0	10281.0	56.16	2490.0	13.60	5552.0	30.33
Punjab	971	1300.73	1096.30	84.28	206.0	15.84	0.0	0.00
Haryana	64	0.0	0.0	0	0.0	0.00	0.0	0.0
Rajasthan	496	411.0	411.0	100.00	0.0	0.00	0.0	0.0
Uttarakhand	18175	13481.3	4035.35	29.93	1511.0	11.65	7935.0	58.86
Uttar Pradesh	723	501.6	501.60	100.00	0.0	0.00	0.0	0.0
Sub Total(NR)	**53395**	**46971.18**	**19774.25**	**42.10**	**7306.5**	**15.55**	**19890.43**	**42.34**
WESTERN								
Madhya Pradesh	2243	2819.0	2235.0	79.28	400.0	14.19	184.0	6.53
Chhattisgarh	2242	1311.0	120.0	9.15	0.0	0.00	1191.0	90.85
Gujarat	619	550.0	550.0	100.00	0.0	0.00	0.0	0.0
Maharashtra	3769	3144.0	2647.0	84.19	0.0	0.00	497.0	15.81

Region/ State	Identified Capacity as per reassessment study (MW)		Capacity Developed		Capacity Under construction		Capacity yet to be developed	
	Total (MW)	Above 25 MW	(MW)	(%)	(MW)	(%)	(MW)	(%)
Goa	55	0.0	0.0	0.00	0.0	0.00	0.0	0.0
Sub Total (WR)	**8928**	**7824**	**5552.0**	**70.96**	**400.0**	**5.11**	**1872.0**	**23.93**
SOUTHERN								
Andhra Pradesh	2366	2596.0	1610.0	62.02	1190.0	45.84	204.0	7.86
Telangana	2058	1302.0	800.0	61.44	0.0	0.00	502.0	38.56
Karnataka	6602	4414.4	3689.20	83.57	0.0	0.00	725.2	16.43
Kerala	3514	2472.75	1864.15	75.39	140.0	5.66	468.6	18.95
Tamil Nadu	1918	1785.2	1778.20	99.61	0.0	0.00	7.0	0.39
Sub Total (SR)	**16458**	**12570.4**	**9741.55**	**61.31**	**1330.0**	**10.58**	**1498.85**	**11.92**
EASTERN								
Jharkhand	753	300.0	210.0	70.00	0.0	0.00	90.0	30.0
Bihar	70	130.1	0.0	0.00	0.0	0.00	130.1	100.00
Odisha	2999	2824.50	2154.55	76.28	0.0	0.00	669.95	23.72
West Bengal	2841	809.2	441.20	54.52	120.0	14.83	248.0	30.65
Sikkim	4286	6051.0	2282.0	37.71	1037	17.14	2730.0	45.15
Sub Total (ER)	**10949**	**10114.8**	**5087.75**	**47.64**	**1157.0**	**19.12**	**3868.05**	**38.24**
NORTH EASTERN								
Meghalaya	2394	2026.0	322.0	15.89	0.0	0.00	1904.0	93.98
Tripura	15	0.0	0.0	0.00	0.0	0.00	0.0	0.00
Manipur	1784	615.0	105.0	17.07	0.0	0.00	510.0	82.93
Assam	680	643.0	350.0	54.43	120.0	18.66	173.0	26.91
Nagaland	1574	325.0	75.0	23.08	0.0	0.00	250.0	76.92
Arunachal Pradesh	50328	50394.0	1115.0	2.21	4880.0	9.68	44399.0	88.10
Mizoram	2196	1926.7	60.0	3.11	0.0	0.00	1866.7	96.88
Sub Total (NER)	**58971**	**55929.7**	**2027.0**	**3.62**	**5000.0**	**8.94**	**48102.7**	**87.79**
ALL INDIA	**148701**	**133410**	**42182.55**	**31.62**	**15193.5**	**11.39**	**76033.95**	**56.99**

Note:- In addition to above 8 PSS (4745.6 MW) are under operation, 3 PSS (2700 MW) are under active construction, 1 PSS (80 MW) on which construction is held up, 2 PSS (2350 MW) is Concurred by CEA, 44 PSS (60050 MW) are under S&I & 8 PSS (9500 MW) are under S&I Held Up.

TABLE 1.2

STATUS OF H.E. POTENTIAL DEVELOPMENT - BASIN-WISE

(In terms of Installed Capacity-above 25 MW as on 31.03.2024)

River Basin	Identified Capacity as per Reassessment Study (MW)		Capacity Developed		Capacity Under Construction		Capacity Yet to be Developed	
	Total	Above 25	(MW)	(%)	(MW)	(%)	(MW)	(%)
Indus	33832	32322.23	14655.3	45.34	5751.5	17.79	11915.43	38.86
Ganga	20711	15591.25	5747.15	36.86	1555.0	9.97	8289.10	53.16
Central Indian River System	4152	4498.5	3159.80	70.24	400.0	8.89	938.7	20.87
West Flowing Rivers System	9430	7001.95	5684.35	81.18	140.0	2.00	1177.6	16.82
East Flowing Rivers System	14511	11269.4	8248.95	73.20	1190.0	10.56	1830.45	16.24
Brahmaputra	66065	62726.7	4687.00	7.47	6157.0	9.82	51882.7	82.71
Total	**148701**	**133410**	**42182.55**	**31.62**	**15193.5**	**11.39**	**76033.95**	**56.99**

Note:- In addition to above 8 PSS (4745.6 MW) are under operation, 3 PSS (2700 MW) are under active construction, 1 PSS (80 MW) on which construction is held up, 2 PSS (2350 MW) is Concurred by CEA, 44 PSS (60050 MW) are under S&I & 8 PSS (9500 MW) are under S&I Held Up.

1.2 Growth of Installed Capacity

A small Hydro-Electric Plant (130 KW) established near Darjeeling in 1897 ushered the beginning of hydro-electric power development in the country. Since then, development of hydro-electric power in the country has made rapid strides. The hydel installed capacity which was only 508 MW in 1947 with 12 H.E. Stations, 51 units and the maximum unit size of 22 MW at Bhira H.E. station under Tata, has risen to 46928.17 MW (as on 31.03.2024) from H.E. stations above 25 MW capacity. The maximum unit size now is 250 MW at Koyna Stage-IV under MAHAGENCO, Nathpa Jhakri under SJVNL, Tehri Stage-I under THDC and Karcham Wangtoo of JSW Energy.

Contribution of electricity generation from Hydro Electric Power Stations has risen from 2.2 BU during 1947 to about 134.05 BU in 2023-24. Hydro generation during 2023-24 was about 27.96 BU (i.e. 17.26%) less than the generation of 162.01 BU during 2022-23.

1.3 Share of Hydro-electric Installed Capacity & Generation

The installed capacity of Hydro-Electric Stations viz-à-viz total capacity, the contribution in generation by hydro-electric plants and trend of hydro capacity & generation over the years are indicated in **Table-1.3** and at **Exhibits 1.3, 1.4 and 1.5**. From **Table 1.3**, it may be observed that the overall share of hydro in terms of installed capacity in the country rose from 37.3% at the end of 1947 to 50.6% during 1962-63. However, thereafter, the share of hydro progressively increased and is presently 10.81% at the end of 2023-24. The generation from hydro stations during the year 2023-24 accounted for 8.89% of the total energy generation in the country.

TABLE 1.3

HYDRO-ELECTRIC CAPACITY & GENERATION VIS-À-VIS TOTAL CAPACITY & GENERATION

Year	Installed Capacity			Generation		
	Total (MW)	Hydro (MW)	Hydro as % of Total	Total (MU)	Hydro (MU)	Hydro as % of Total
1950	1713	560	32.63	5106	2519	49.33
1955-56	2886	1061	36.76	9145	4295	46.97
1960-61	4653	1917	41.20	16937	7837	46.27
1962-63	5801	2936	50.61	22365	11805	52.78
1965-66	9027	4124	45.68	32890	15225	46.29
1968-69	12957	5907	45.59	47434	20723	43.69
1973-74	16664	6966	41.80	66689	28972	43.44
1978-79	26680	10833	40.60	102523	47159	46.00
1979-80	28448	11384	40.02	104627	45478	43.47
1984-85	42585	14460	33.96	156859	53948	34.39
1989-90	63636	18307	28.77	245437	62116	25.31
1991-92	69065	19194	27.79	287028	72757	25.35
1996-97	85795	21658	25.24	395889	68901	17.40
1997-98	89203	21904	24.58	421748	74582	17.68
1998-99	92269	22479	24.10	447464	82923	18.53
1999-00	97837	23857	24.37	481128	80755	16.78
2000-01	101450	25153	24.75	499429	74362	14.89
2001-02	105046	26269	25.01	515066	73759	14.32
2002-03	107877	26767	24.81	531607	63834	12.01
2003-04	112684	29507	26.19	558113	73775	13.22
2004-05	118419	30936	26.12	587416	84495	14.38
2005-06	124287	32326	26.01	624631	101293	16.22
2006-07	132321	34662	26.19	659513	113359	17.19
2007-08	143061	37002	25.86	704469	123424	17.52
2008-09*	147917	36846	24.91	714653	109840	15.37
2009-10*	159398	36863	23.13	763429	103916	13.61
2010-11*	173626	37567	21.64	805532	114257	14.18
2011-12*	199877	38990	19.51	871602	130510	14.97
2012-13*	223344	39491	17.68	907262	113720	12.53
2013-14*	243029	40531	16.68	961552	134848	14.02
2014-15*	267637	41267	15.42	1043665	129244	12.38
2015-16*	302088	42783	14.16	1102578	121377	11.01
2016-17*	326849	44478	13.61	1154524	122378	10.60
2017-18*	344002	45293	13.17	1201528	126123	10.50
2018-19*	356100	45399	12.75	1244930	134894	10.84
2019-20*	370106.46	45699.2	12.34	1244989.43	155769.12	12.51
2020-21*	382151.22	46209.20	12.09	1225842.14	150299.52	12.26
2021-22*	399496.61	46722.50	11.69	1313453.87	151627.33	11.54
2022-23*	416058.89	46850.17	11.26	1414171	162099	11.46
2023-24*	434195.13	46928.17	10.81	1508277**	134053.90	8.89

* Capacity above 25 MW only has been considered.
** Actual generation is excluding Bhutan IMP – 4716.10 MU

1.4 Monitored Hydro Installed Capacity

For generation performance, the monitored hydro-electric installed capacity in the country as on 31.03.2024 was 46928.15 MW (above 25 MW capacity). Region-wise summary of the hydel installed capacity is given in **Table 1.4**. Region-wise, type-wise and construction-wise categorization of stations is given in **Annex-1.1** while Sector-wise/Utility-wise and Station-wise/State-wise details of installed capacity are given in **Annex 1.2 to 1.4**.

TABLE 1.4

REGION-WISE SUMMARY OF HYDRO-ELECTRIC INSTALLED CAPACITY
(Above 25 MW capacity as on 31.03.2024)

S.No.	Region	No. of Units	Installed Capacity (MW)
1.	Northern	260	19774.25
2.	Western	101	7392.00
3.	Southern	246	11747.15
4.	Eastern	86	5987.75
5.	North-Eastern	38	2027.00
Total		**731**	**46928.17**

Capacity-wise grouping of H.E. Stations as on 31.03.2024 is given in **Annex- 1.5**. It is observed that 106 stations with installed capacity above 100 MW constitute more than 86.76% of the overall hydro capacity.

2 H.E. Generating units having installed capacity of 60 MW were added and installed capacity of One generating unit of Bhakra Left Power Station were upgraded from 108 MW to 126 MW during the year 2023-24. Details of these units are given in **Annex-1.6**.

Share of hydro installed capacity and hydro generation viz-a-viz total installed capacity and total generation in the country as on 31.03.2024 was 10.81% and 8.89% respectively. These details are indicated in **Exhibits 1.6 and 1.7.** Sector-wise distribution of hydro installed capacity (MW) in Central, Private and State Sectors was 34.0%, 8.0% and 58.0% respectively. Sector-wise distribution of hydro generation (MU) in Central, Private and State sectors was 43.0%, 11.0% and 46.0% respectively. These details are illustrated in **Exhibits 1.8 & 1.9**.

1.5 Hydro Generating Units : Indigenous and imported

As on 31.03.2024, there were 731 hydro generating units in operation at 212 stations comprising of indigenous and imported units as per details given in **Table 1.5** below. The domestic supplier, BHEL, has a share of about 42.68% of total capacity for both turbines & generators whereas other domestic suppliers together have a meagre share of about 7.39% of total capacity.

Among the imported turbines and generators, Japan, UK and Canada are the top three suppliers of turbines and generators in term of numbers but capacity-wise, Japan, Canada and USSR are the top three suppliers.

TABLE 1.5

HYDRO GENERATING UNITS INDIGENOUS/IMPORTED FROM VARIOUS COUNTRIES AS ON 31-03-2024

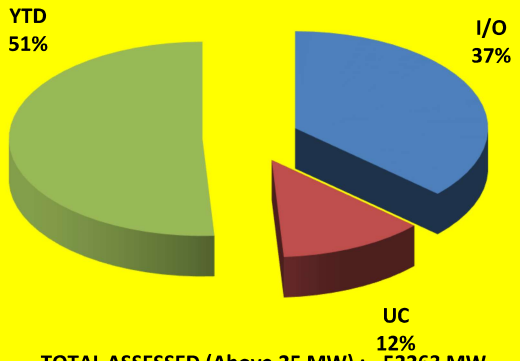
Name of the Country	Turbines supplied				Generators supplied			
	Units		Capacity		Units		Capacity	
	No.	% of Total	MW	% of Total	No.	% of Total	MW	% of Total
A-Indigenous								
BHEL	312	42.68	20150.30	42.94	312	42.68	20150.30	42.94
Others	54	7.39	3395.50	7.24	54	7.39	3395.50	7.24
Sub Total	**366**	**50.07**	**23545.80**	**50.17**	**366**	**50.07**	**23545.80**	**50.17**
B-Imported								
USA	21	2.87	797.85	1.70	21	2.87	797.85	1.70
U.K.	44	6.02	3132.00	6.67	44	6.02	3132.00	6.67
France	9	1.23	351.00	0.75	6	0.82	351.00	0.75
Canada	26	3.56	2804.00	5.98	26	3.56	2804.00	5.98
USSR	31	4.24	2179.20	4.64	15	2.05	2179.20	4.64
Switzerland	63	8.62	1242.10	2.65	63	8.62	1242.10	2.65
Japan	76	10.40	6416.20	13.67	76	10.40	6416.20	13.67
Other	95	13.00	6460.00	13.77	114	15.60	6460.00	13.77
Sub Total	**365**	**49.93**	**23382.35**	**49.83**	**365**	**49.93**	**23382.35**	**49.83**
Total	**731**	**100.0**	**46928.15**	**100**	**731**	**100.0**	**46928.15**	**100**

REGION-WISE STATUS OF HYDRO-ELECTRIC CAPACITY AS ON 31.03.2024

EXHIBIT 1.1

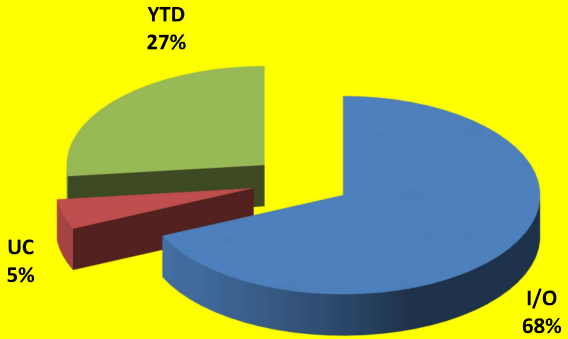
I/O=In Operation UC=Under Construction YTD= Yet to be Developed

NORTHERN REGION



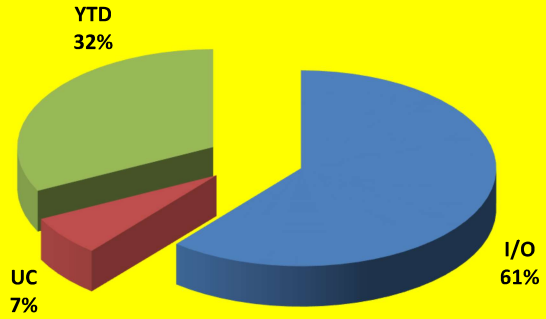
TOTAL ASSESSED (Above 25 MW) : - 52263 MW

WESTERN REGION



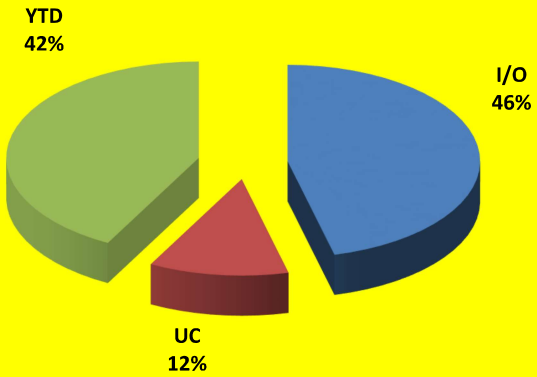
TOTAL ASSESSED (Above 25 MW) : - 8131 MW

SOUTHERN REGION



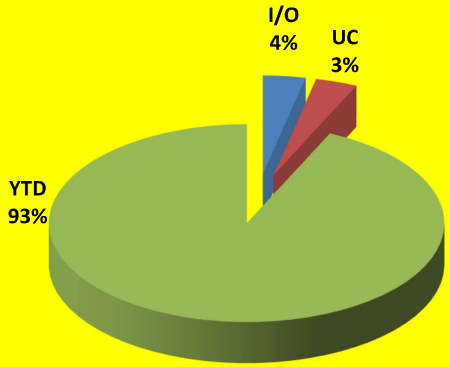
TOTAL ASSESSED (Above 25 MW): - 15890 M

EASTERN REGION



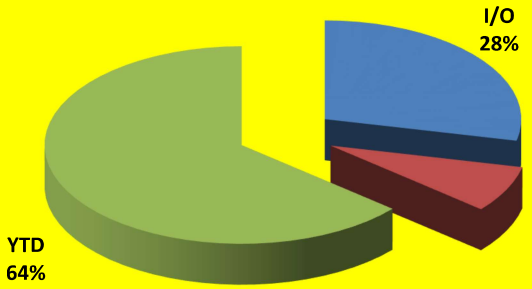
TOTAL ASSESSED (Above 25 MW) : - 10680 MW

NORTH EASTERN



TOTAL ASSESSED (Above 25 MW : - 58356 MW

ALL INDIA



TOTAL ASSESSED (Above 25 MW) : - 145320 MW

EXHIBIT 1.2

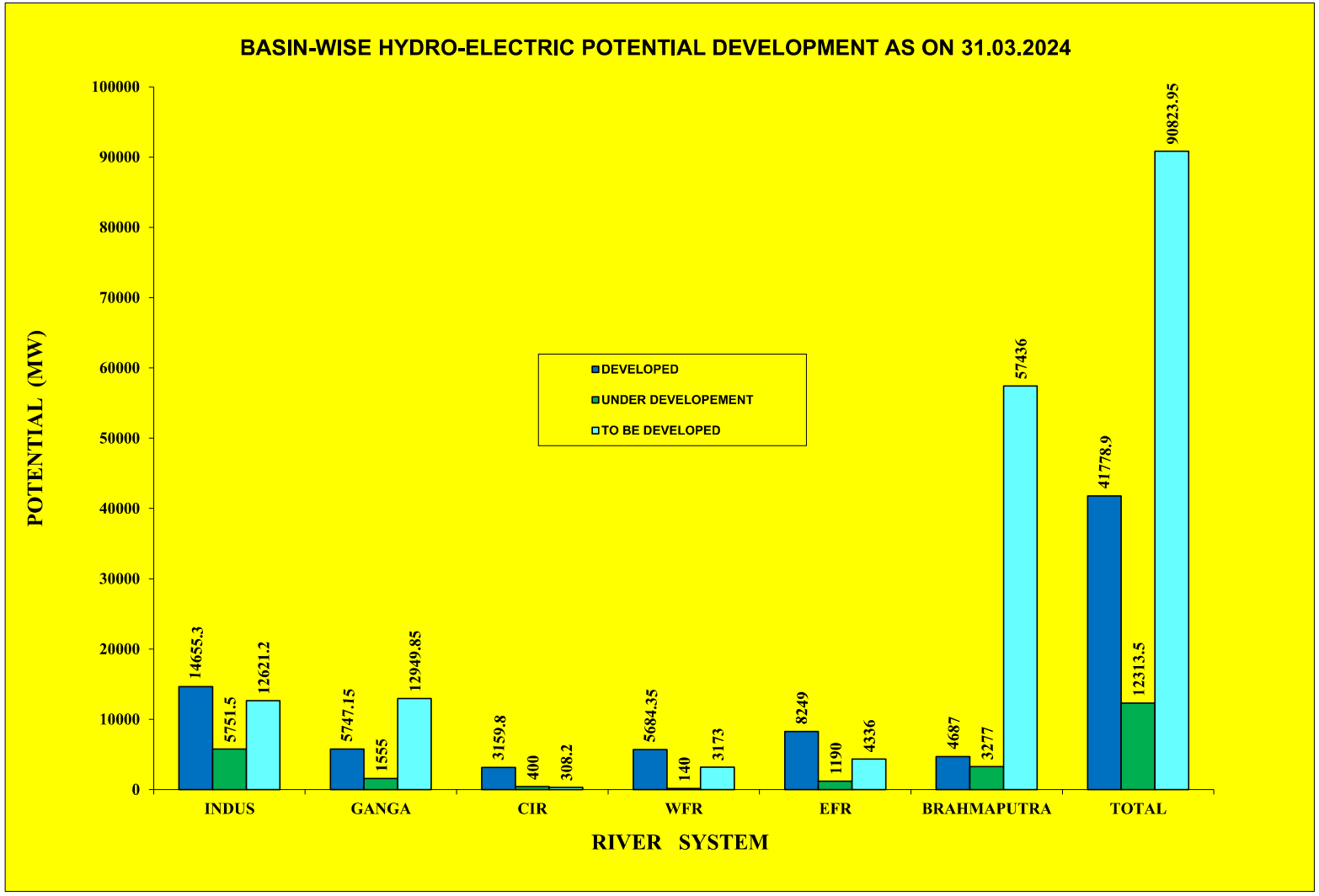

BASIN-WISE HYDRO-ELECTRIC POTENTIAL DEVELOPMENT AS ON 31.03.2024
POTENTIAL (MW)
100000
90000
80000
70000
60000
50000
40000
30000
20000
10000
0
DEVELOPED
UNDER DEVELOPEMENT
TO BE DEVELOPED
14655.3
5751.5
12621.2
5747.15
1555
12949.85
3159.8
400
308.2
5684.35
140
3173
8249
1190
4336
4687
3277
57436
41778.9
12313.5
90823.95
INDUS
GANGA
CIR
WFR
EFR
BRAHMAPUTRA
TOTAL
RIVER SYSTEM

EXHIBIT 1.3

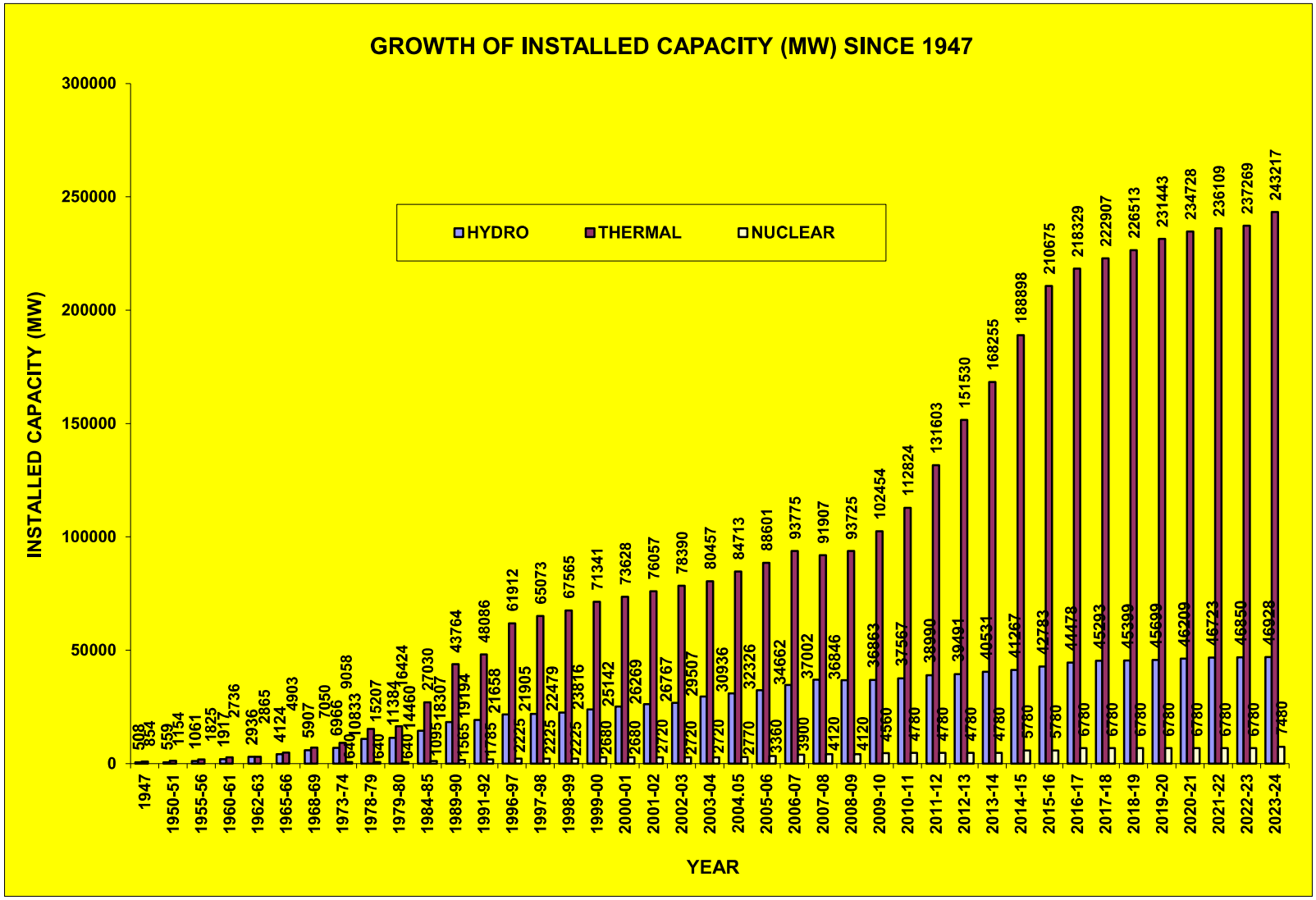

GROWTH OF INSTALLED CAPACITY (MW) SINCE 1947
INSTALLED CAPACITY (MW)
YEAR
HYDRO
THERMAL
NUCLEAR
300000
250000
200000
150000
100000
50000
0
1947 508 854
1950-51 559 1154
1955-56 1061 1825
1960-61 1917 2736
1962-63 2936 2865
1965-66 4124 4903
1968-69 5907 7050
1973-74 6966 9058
1978-79 10833 15207
1979-80 11384 16424
1984-85 14460 27030
1989-90 18307 43764
1991-92 19194 48086
1996-97 21658 61912
1997-98 21905 65073
1998-99 22479 67565
1999-00 23816 71341
2000-01 25142 73628
2001-02 26269 76057
2002-03 26767 78390
2003-04 29507 80457
2004.05 30936 84713
2005-06 32326 88601
2006-07 34662 93775
2007-08 37002 91907
2008-09 36846 93725
2009-10 36863 102454
2010-11 37567 112824
2011-12 38990 131603
2012-13 39491 151530
2013-14 40531 168255
2014-15 41267 188898
2015-16 42783 210675
2016-17 44478 218329
2017-18 45293 222907
2018-19 45399 226513
2019-20 45699 231443
2020-21 46209 234728
2021-22 46723 236109
2022-23 46850 237269
2023-24 46928 243217
640 2225 2680 2720 2770 3360 3900 4120 4360 4780 5780 6780 7480

EXHIBIT 1.4

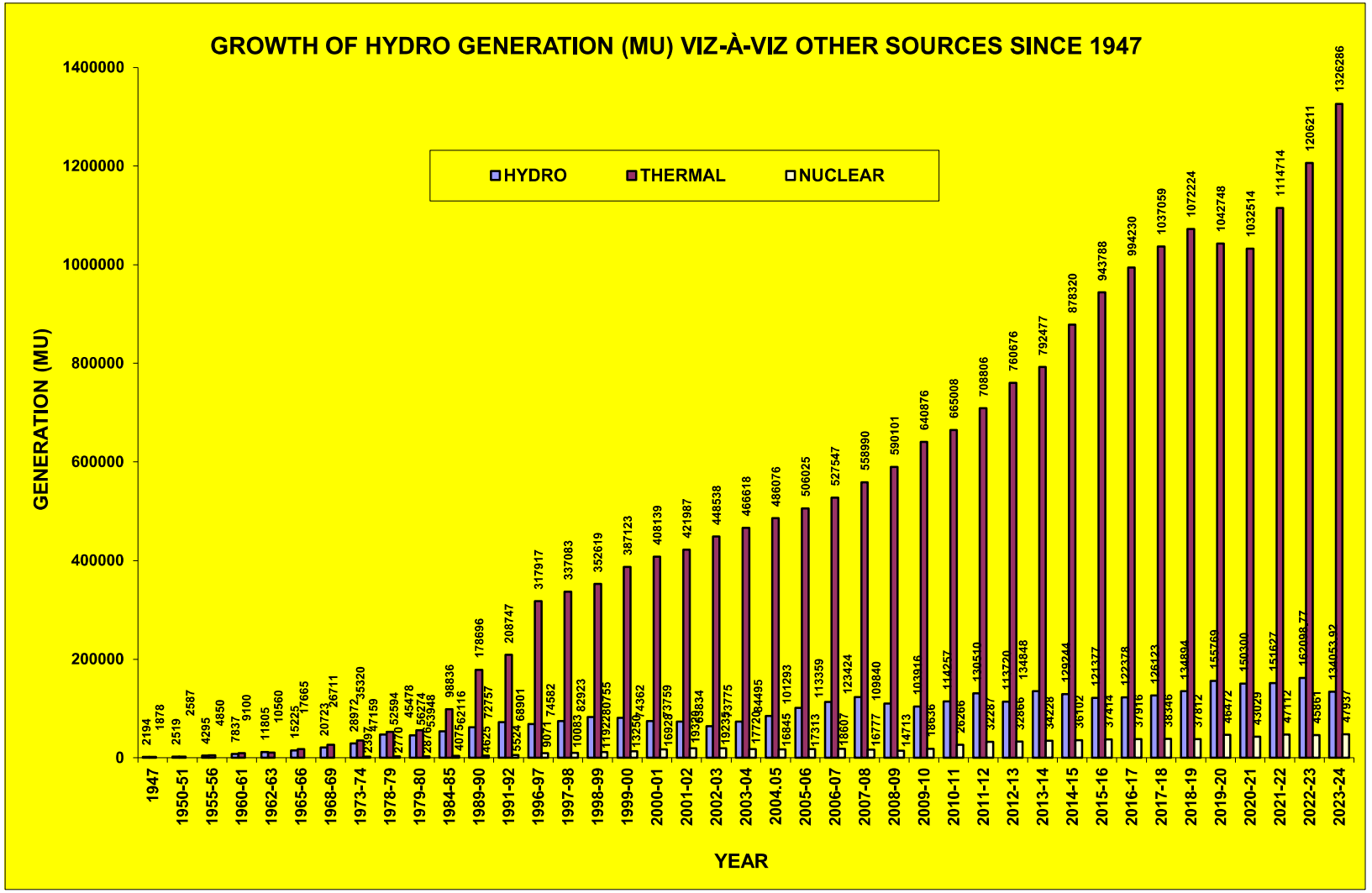

GROWTH OF HYDRO GENERATION (MU) VIZ-À-VIZ OTHER SOURCES SINCE 1947
HYDRO
THERMAL
NUCLEAR
GENERATION (MU)
YEAR
1400000
1200000
1000000
800000
600000
400000
200000
0
1947 2194 1878
1950-51 2519 2587
1955-56 4295 4850
1960-61 7837 9100
1962-63 11805 10560
1965-66 15225 17665
1968-69 20723 26711
1973-74 28972 35320 2397 47159
1978-79 2770 5594 45478
1979-80 28763 56274 53948
1984-85 98836 40756 2116
1989-90 4625 72757 178696
1991-92 5524 68901 208747
1996-97 9071 74582 317917
1997-98 10083 82923 337083
1998-99 11922 80755 352619
1999-00 13259 4362 387123
2000-01 16928 3759 408139
2001-02 19368 34 421987
2002-03 19234 3775 448538
2003-04 17720 4495 466618
2004.05 16845 101293 486076
2005-06 17313 113359 506025
2006-07 18607 123424 527547
2007-08 16777 109840 558990
2008-09 14713 103916 590101
2009-10 18636 114257 640876
2010-11 28266 130510 665008
2011-12 32287 113220 708806
2012-13 32865 134848 760676
2013-14 34228 129244 792477
2014-15 36102 121377 878320
2015-16 37414 122378 943788
2016-17 37916 126123 994230
2017-18 38346 134804 1037059
2018-19 37612 155769 1072224
2019-20 46472 150300 1042748
2020-21 43029 151627 1032514
2021-22 47112 162098.77 1114714
2022-23 43861 134053.92 1206211
2023-24 47937 1326286

EXHIBIT-1.5

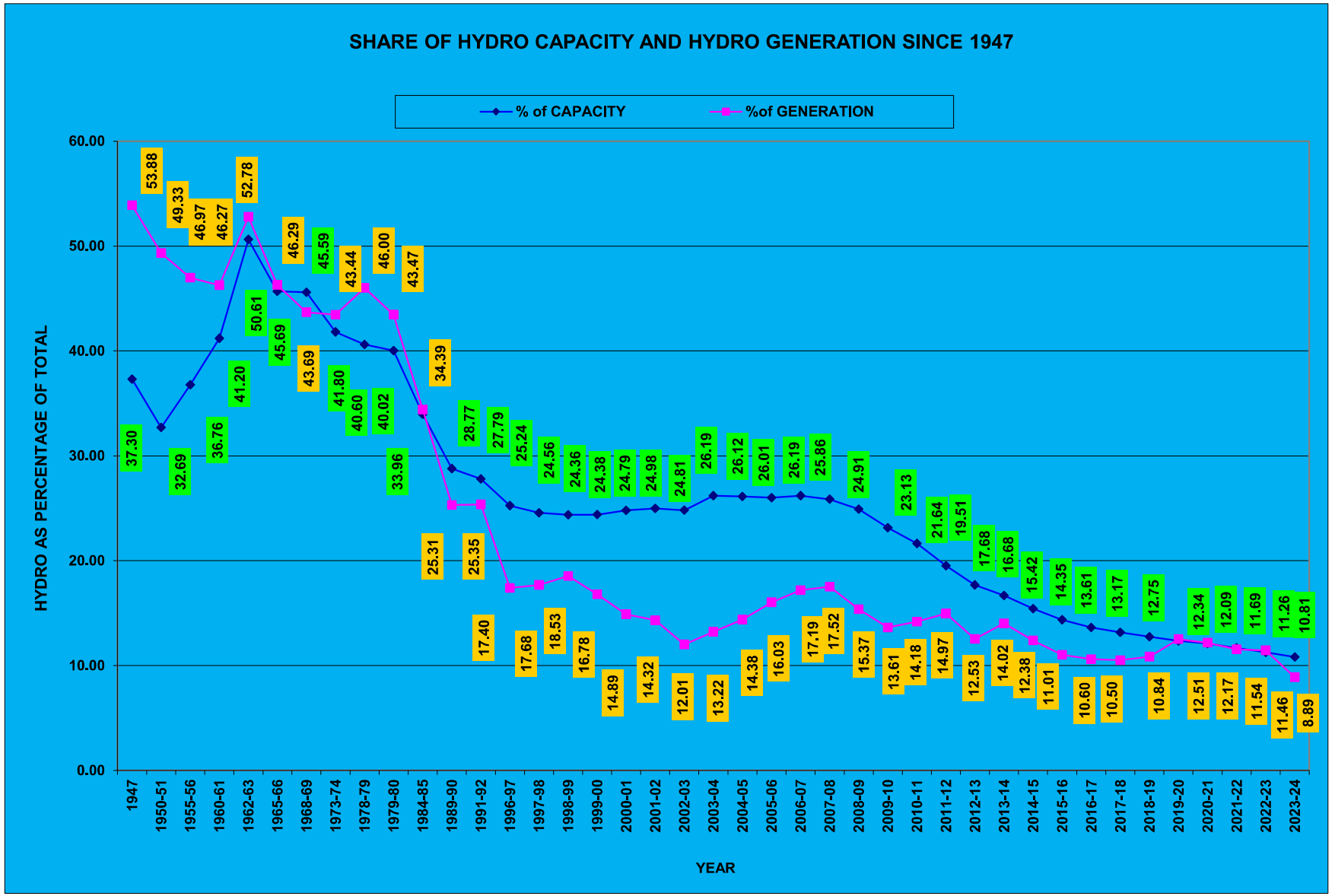

SHARE OF HYDRO CAPACITY AND HYDRO GENERATION SINCE 1947
% of CAPACITY
%of GENERATION
HYDRO AS PERCENTAGE OF TOTAL
YEAR
60.00
50.00
40.00
30.00
20.00
10.00
0.00
1947 37.30 53.88
1950-51 32.69 49.33
1955-56 36.76 46.97
1960-61 41.20 46.27
1962-63 50.61 52.78
1965-66 45.69 46.29
1968-69 43.69 45.59
1973-74 41.80 43.44
1978-79 40.60 46.00
1979-80 40.02 43.47
1984-85 33.96 34.39
1989-90 25.31 28.77
1991-92 25.35 27.79
1996-97 17.40 25.24
1997-98 17.68 24.56
1998-99 18.53 24.36
1999-00 16.78 24.38
2000-01 14.89 24.79
2001-02 14.32 24.98
2002-03 12.01 24.81
2003-04 13.22 26.19
2004-05 14.38 26.12
2005-06 16.03 26.01
2006-07 17.19 26.19
2007-08 17.52 25.86
2008-09 15.37 24.91
2009-10 13.61 23.13
2010-11 14.18 21.64
2011-12 14.97 19.51
2012-13 12.53 17.68
2013-14 14.02 16.68
2014-15 12.38 15.42
2015-16 11.01 14.35
2016-17 10.60 13.61
2017-18 10.50 13.17
2018-19 10.84 12.75
2019-20 12.51 12.34
2020-21 12.17 12.09
2021-22 11.54 11.69
2022-23 11.46 11.26
2023-24 8.89 10.81

EXHIBIT-1.6

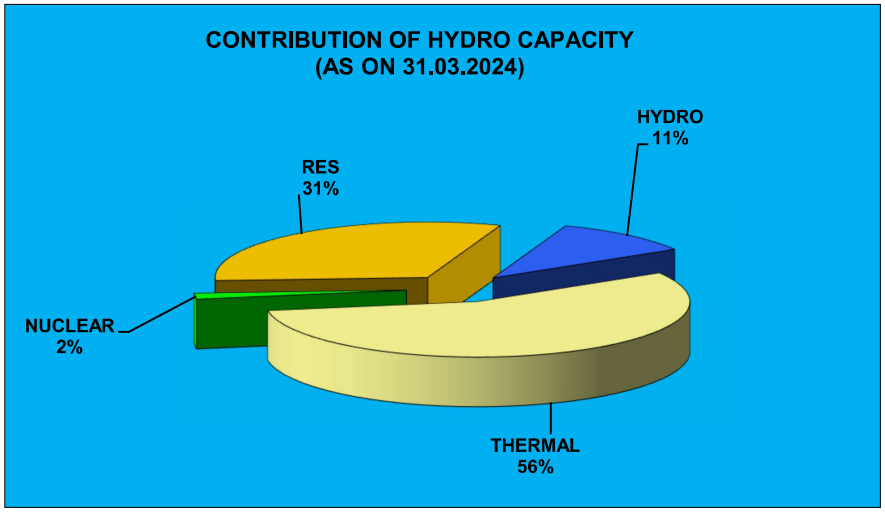


EXHIBIT-1.7

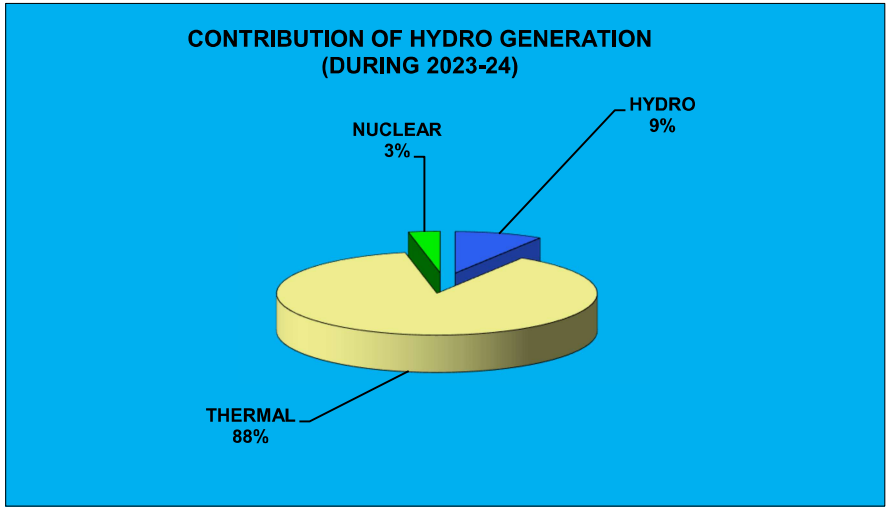


EXHIBIT-1.8

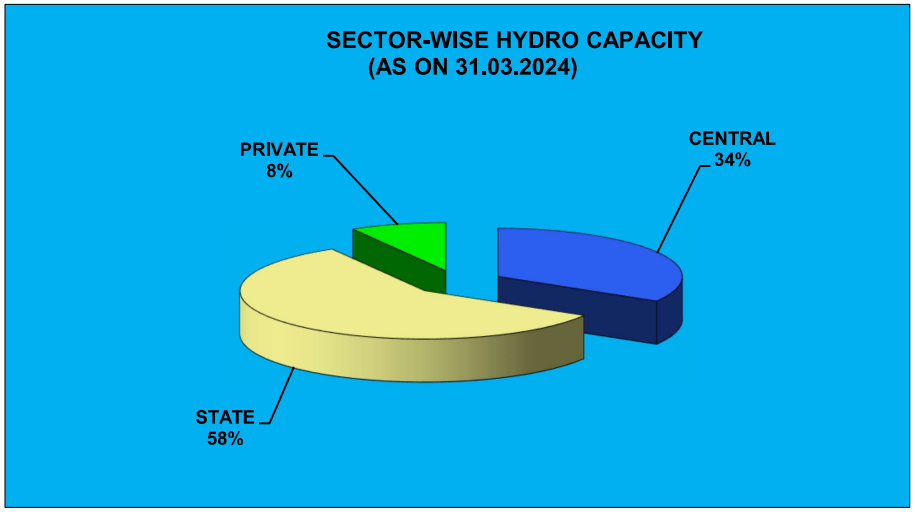
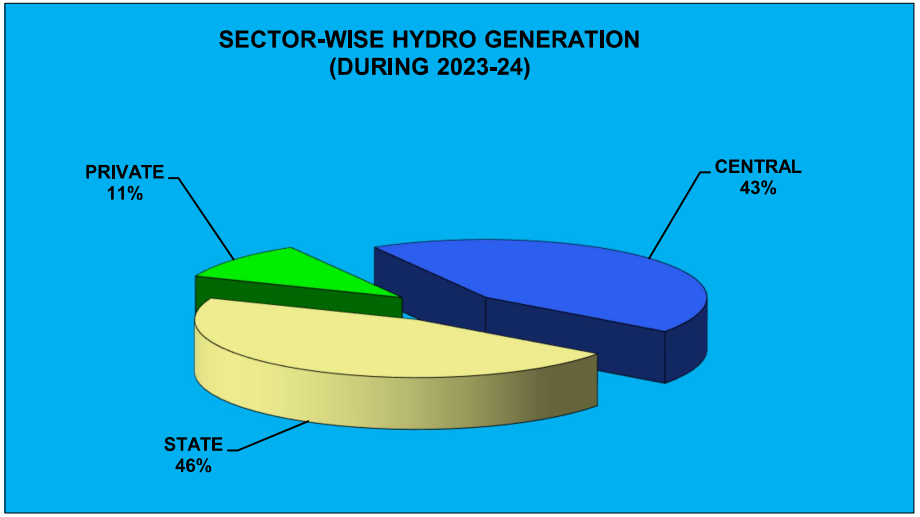


EXHIBIT-1.9



REGION-WISE / SECTOR-WISE INSTALLED CAPACITY OF H.E. STATIONS IN THE COUNTRY

(ABOVE 25 MW CAPACITY)

(As on 31.03.2024)

REGION	DESIGN ENERGY (MU)	CONVENTIONAL HE STATIONS			PUMPED STORAGE SCHEMES (PSS)			CONVENTIONAL + PUMPED STORAGE SCHEMES (PSS)		
		NO. OF STATIONS	NO. OF UNITS	INSTALLED CAPACITY (MW)	NO. OF STATIONS	NO. OF UNITS	INSTALLED CAPACITY (MW)	NO. OF STATIONS	TOTAL UNITS	TOTAL INSTALLED CAPACITY (MW)
NORTHERN	77131.39	77	260	19774.25	0	0	0.00	77	260	19774.25
WESTERN	16607.21	24	88	5552.00	4	13	1840.00	28	101	7392.00
SOUTHERN	33900.85	67	229	9741.55	3	17	2006	70	246	11747.15
EASTERN	20204.86	23	82	5087.75	1	4	900.00	24	86	5987.75
NORTH EASTERN	9412.73	14	38	2027.00	0	0	0.00	14	38	2027.00
TOTAL	**157257.04**	**205**	**697**	**42182.55**	**8**	**34**	**4745.6**	**212***	**731**	**46928.15**

*** Total number of HE stations are 212 as NJ Sagar HE Station (Sothern Region) is having one conventional unit and remaining seven units are PSS**

Note: Following Hydro Stations have conventional as well as PSS capacity:

Sl. No.	Station	State/Region	Installed Capacity (MW)	
			Conventional	PSS
1	N J Sagar	Telangana/ Southern	1X110 =110	7X100.8=705.60

SECTOR-WISE INSTALLED CAPACITY OF H.E. STATIONS IN THE COUNTRY
(ABOVE 25 MW CAPACITY)

SECTOR	NO. OF UTILITIES	NO. OF STATION	NO. OF UNITS	INSTALLED CAPACITY (MW)
CENTRAL	8	43	165	15742.70
STATE	24	148	506	27254.45
PRIVATE	17	22	60	3931.00
TOTAL	**49**	**212***	**731**	**46928.15**

*** Total number of HE stations are 212 as N J Sagar HE Station (Southern region) is having one conventional unit and remaining seven units are PSS**

Categorisation of HE Stations (Installed Capacity)

1. Operation-wise

(As on 31.03.2024)

Sector	RoR		RoR (P)		Storage (S)						Total*	
					S(P)		S(MPP)		PSS			
	No.	MW	No.	MW	No.	MW	No.	MW	No.	MW	No.	MW
Central	9	2193.50	19	7263.00	6	1725.00	9	4561.20	0	0.00	43	15742.70
State	15	892.15	51	7710.00	32	6487.30	43	7569.40	7	4595.60	148	27254.45
Private	5	892.00	13	2592.00	3	297.00	0	0.00	1	150.00	22	3931.00
Total (Nos./ MW Capacity)*	**29**	**3977.65**	**83**	**17565.00**	**41**	**8509.30**	**52**	**12130.60**	**8**	**4745.60**	**212**	**46928.15**
% of Total	**13.679**	**8.48**	**39.15**	**37.43**	**19.34**	**18.13**	**24.53**	**25.85**	**3.77**	**10.11**	**100**	**100**

2. Power House Construction-wise

Sector	Surface		Underground		Total	
	No.	MW	No.	MW	No.	MW
Central	26	7454.5	17	8288.2	**43**	**15742.7**
State	128	19282.45	20	7972	**147**	**27254.45**
Private	14	1673	8	2258	**22**	**3931**
Total (Nos./MW Capacity)*	**168**	**28409.95**	**45**	**18518.20**	**212**	**46928.15**
% of Total	**79.25**	**60.54**	**21.23**	**39.46**	**100**	**100**

* Total number of HE stations are 212 as NJ Sagar HE Station (Sothern Region) is having one conventional unit and remaining seven units are PSS.

Abbreviations:

RoR - Run-of-River type

RoR(P) – Run-of-River with Pondage

S(P) – Storage (Conventional) for Power Generation purpose only

S(MPP) – Storage (Conventional) for Multipurpose Project

PSS – Pumped Storage Scheme

SECTOR-WISE/UTILITY-WISE INSTALLED CAPACITY OF H.E. STATIONS IN THE COUNTRY
(ABOVE 25 MW CAPACITY)

(As on 31.03.2024)

Sl. No.	NAME OF THE SECTOR/ UTILITY	NO. OF STATIONS	NO. OF UNITS	INSTALLED CAPACITY (MW)	DESIGN ENERGY (MU)
	CENTRAL SECTOR				
1	BBMB	6	28	2956.30	9515.00
2	NHPC	20	70	5451.20	24680.34
3	SJVNL	3	14	1972.02	8755.58
4	NTPC	1	4	800.00	3054.79
5	THDC	2	8	1400.00	3952.00
6	NHDC	2	16	1520.00	3146.57
7	DVC	2	5	143.20	374.00
8	NEEPCO	7	20	1500.00	7397.04
	SUB-TOTAL CENTRAL	**43**	**165**	**15742.72**	**60875.32**
	PRIVATE SECTOR				
1	MPCL	1	2	86	370.93
2	EPPL	1	2	100	403.00
3	GBHPPL	1	2	70	291.73
4	ADHPL	1	2	192	678.18
5	HBPCL	2	7	1345	5344.06
6	JPPVL	1	4	400	1774.42
7	AHPC	1	4	330	1396.84
8	IAEPL	1	3	36	157.82
9	TPCL	4	15	447	1220.00
10	GIPL	1	2	110	537.81
11	DEPL	1	2	96	459.02
12	DLHP	1	1	34	50.00
13	SKPPPL	1	2	96	431.00
14	SEPL	1	2	97	425.05
15	RENEW POWER PVT LTD.	1	3	99	473.00
16	MBPCL	1	2	113	434.00
17	HSPPL	1	2	100	524.00
18	GMR	1	3	180	769.39
	SUB-TOTAL PRIVATE	**22**	**60**	**3931.00**	**15740.25**

	STATE SECTOR				
1	HPSEBL	4	12	372.00	1691.62
2	HPPCL	3	8	406.00	955.03
3	JKSPDCL	4	12	1110.00	4833.30
4	PSPCL	8	25	1051.00	4207.00
5	RRVUNL	4	11	411.00	1046.00
6	UPJVNL	4	15	501.60	1707.00
7	UJVNL	11	36	1372.15	5223.34
8	GSECL	2	8	540.00	1598.00
9	SSNNL	2	11	1450.00	3848.00
10	MPPGCL	8	23	875.00	2561.64
11	CSPGC	1	3	120.00	245.00
12	MAHAGENCO	8	24	2406.00	3938.00
13	APGENCO	8	34	1796.75	5738.00
14	TSGENCO	7	36	2405.60	5045.85
15	KPCL	14	66	3617.20	12981.00
16	KSEB	14	47	1864.15	6458.00
17	TANGEDCO	27	69	2178.20	4348.00
18	JUUNL	2	2	130.00	149.00
19	OHPC	6	31	2039.80	5676.00
20	WBSEDCL	3	12	986.00	1610.00
21	TUL	1	6	1200.00	5214.00
22	APGCL	1	2	100.00	390.00
23	MePGCL	5	13	322.00	1177.69
	SUB-TOTAL STATE	**147**	**506**	**27254.45**	**80641.47**
	TOTAL	**212**	**731**	**46928.15**	**157257.04**

State-wise/Station-wise Installed Capacity of H.E. Stations in the Country

(Above 25 MW Capacity)

Sl No.	Utilities/Stations	No. of Stations	No. of Units	Type of Project	No. of Units X Capacity(MW)	Capacity (MW)	Design Energy (MU)	Year of Commissioning
	Conventional H E Stations							
	Northern Region							
	BBMB							
	HIMACHAL PRADESH							
1	Bhakra Left	1	5	MP	(1X126+4X126)	630.00	3924.00	1960 (108 MW) 1961 (486 MW)
2	Bhakra Right	1	5	MP	(5X157)	785.00		1966 (314 MW) 1967 (314 MW) 1968 (157 MW)
3	Dehar	1	6	R(P)	(6X165)	990.00	3110.00	1977 (165 MW) 1978 (165 MW) 1979 (330 MW) 1983 (330 MW)
4	Pong	1	6	MP	(6X66)	396.00	1123.00	1978 (198 MW) 1979 (66 MW) 1982 (66 MW) 1983 (66 MW)
	Sub-Total BBMB (HP)	**4**	**22**			**2801.00**	**8157.00**	
	NHPC							
5	Baira Siul	1	3	R(P)	(3X60)	180.00	779.28	1980 (132 MW) 1981 (66 MW)
6	Chamera-I	1	3	S	(3X180)	540.00	1664.56	1994 (540 MW)
7	Chamera-II	1	3	R(P)	(3X100)	300.00	1499.89	2003 (200 MW) 2004 (100 MW)
8	Chamera-III	1	3	R(P)	(3X77)	231.00	1108.00	2012 (231 MW)
9	Parbati-III	1	4	R(P)	(4X130)	520.00	1977.23	2014 (520 MW)
	Sub-Total HP	**5**	**16**			**1771.00**	**7028.96**	
	SJVNL							
10	Nathpa Jhakri	1	6	R(P)	(6X250)	1500.00	6612.00	2003 (500 MW) 2004 (1000 MW)
11	Rampur	1	6	R	(6X68.67)	412.00	1878.08	2014 (412 MW)
	Total SJVNL	**2**	**12**			**1912.00**	**8490.08**	
	NTPC LTD.							
12	Koldam	1	4	S	(4X200)	800.00	3054.79	2015 (800 MW)
	Total NTPC LTD.	**1**	**4**			**800.00**	**3054.79**	
	Total Central Sector-HP	**12**	**54**			**7284.00**	**26730.83**	
	HPSEBL							
13	Bassi	1	4	R(P)	(4X16.5)	66.00	346.77	1970 (33 MW) 1971 (16.5 MW) 1981 (16.5 MW)
14	Giri Bata	1	2	R(P)	(2X30)	60.00	240.00	1978 (60 MW)
15	Larji'	1	3	R(P)	(3X42)	126.00	586.85	2006 (126 MW)
16	Sanjay	1	3	R(P)	(3X40)	120.00	518.00	1989 (120 MW)
	Total HPSEBL	**4**	**12**			**372.00**	**1691.62**	

State-wise/Station-wise Installed Capacity of H.E. Stations in the Country

(Above 25 MW Capacity)

Sl No.	Utilities/Stations	No. of Stations	No. of Units	Type of Project	No. of Units X Capacity(MW)	Capacity (MW)	Design Energy (MU)	Year of Commissioning
	HPPCL							
17	Integrated Kashang	1	3	R (P)	(3X65)	195	245.80	2016 (130 MW) 2017 (65 MW)
18	Sainj	1	2	R(P)	(2X50)	100	323.23	2017 (100 MW)
19	Sawra Kuddu	1	3	R	(3X37)	111	386.00	2020 (111 MW)
	Total HPPCL	**3**	**8**			**406**	**955.03**	
	PSPCL							
20	Shanan	1	5	R(P)	(1X50)+(4X15)	110.00	585.00	1932 (60 MW) 1982 (50 MW)
	Sub Total PSPCL-HP	**1**	**5**			**110.00**	**585.00**	
	Total State Sector	**8**	**25**			**888.00**	**3231.65**	
	Private Sector							
	MPCL							
21	Malana	1	2	R(P)	(2X43)	86.00	370.93	2001 (86 MW)
	Total MPCL	**1**	**2**			**86.00**	**370.93**	
	GBHPPL							
22	Budhil	1	2	R(P)	(2X35)	70.00	291.73	2012 (70 MW)
	Total GBHPPL	**1**	**2**			**70.00**	**291.73**	
	EPPL							
23	Malana-II	1	2	R(P)	(2X50)	100.00	403.00	2011 (100 MW)
	Total EPPL	**1**	**2**			**100.00**	**403.00**	
	IA Energy							
24	Chanju-I	1	3	R(P)	(3X12)	36.00	157.82	2017 (12 MW)
	Total IA Energy	**1**	**3**			**36.00**	**157.82**	
25	Allain Duhangan	1	2	R(P)	(2X96)	192.00	678.18	2010 (192 MW)
	Total ADHPL	**1**	**2**			**192.00**	**678.18**	
	HBPCL							
26	Baspa	1	3	R(P)	(3X100)	300.00	1213.00	2003 (300 MW)
	Total HBPCL	**1**	**3**			**300.00**	**1213.00**	
	JSW							
27	Karcham Wangtoo	1	4	R(P)	(4X261.25)	1045.00	4131.06	2011 (1000 MW)
	Total JSW	**1**	**4**			**1045.00**	**4131.06**	
	HSPPL							
28	Sorang	**1**	**2**	R	(2x50)	100.00	524.00	2021 (100 MW)
	Total HSPPL	**1**	**2**			**100.00**	**524.00**	
	GMR							
29	Bajoli Holi	**1**	**3**	R	(3x60)	180.00	**769.39**	Mar 2022 (180)
	Total GMR	**1**	**3**			**180.00**	**769.39**	
	Total PVT	**9**	**23**			**2109**	**8539**	
	Total Himachal Pradesh	**29**	**102**			**10281.00**	**38501.59**	

State-wise/Station-wise Installed Capacity of H.E. Stations in the Country

(Above 25 MW Capacity)

Sl No.	Utilities/Stations	No. of Stations	No. of Units	Type of Project	No. of Units X Capacity(MW)	Capacity (MW)	Design Energy (MU)	Year of Commissioning
	JAMMU & KASHMIR							
	JKSPDC							
30	Baglihar-I	1	3	R(P)	(3X150)	450.00	2643.00	2008 (450 MW)
31	Baglihar-II	1	3	R(P)	(3X150)	450.00	1302.30	2015 (450 MW)
32	Lower Jhelum	1	3	R(P)	(3X35)	105.00	533.00	1978 (35 MW) 1979 (70 MW)
33	Upper Sindh-II	1	3	R(P)	(3X35)	105.00	355.00	2000 (35 MW) 2001 (35 MW) 2002 (35 MW)
	Total JKSPDC	**4**	**12**			**1110.00**	**4833.30**	
	NHPC							
34	Dulhasti	1	3	R(P)	(3X130)	390.00	1907.00	2007 (390 MW)
35	Salal-I&II	1	6	R	(3X115)	690.00	3082.00	1987 (345 MW) 1993 (115 MW) 1994 (115 MW) 1995 (115 MW)
36	Uri-I	1	4	R	(4X120)	480.00	2587.38	1996 (120 MW) 1997 (360 MW)
37	Uri-II	1	4	R	(4X60)	240.00	1124.00	2013 (180 MW) 2014 (60 MW)
38	Sewa-II	1	3	R(P)	(3X40)	120.00	533.52	2010 (120 MW)
39	Keshanganga	1	3	R(P)	(3X110)	330.00	1705.62	2018 (330 MW)
	Sub-Total NHPC	**6**	**23**			**2250.00**	**10939.52**	
	Total Jammu & Kashmir	**10**	**35**			**3360**	**15772.82**	
	LADAKH							
	NHPC							
40	Chutak	1	4	R	(4X11)	44.00	213.00	2012 (33 MW) 2013 (11 MW)
41	Nimoo Bazgo	1	3	R(P)	(3X15)	45.00	239.00	2013 (45 MW)
	Sub-Total NHPC	**2**	**7**			**89.00**	**452.00**	
	Total Ladakh	**2**	**7**			**89**	**452**	
	PUNJAB							
	PSPCL							
42	Anandpur Sahib-I	1	2	R	(2X33.5)	67.00	909.00	1985 (67 MW)
43	Anandpur Sahib-I	1	2	R	(2X33.5)	67.00		1985 (67 MW)
44	Mukerian-I	1	3	R	(3X15)	45.00	1206.00	1983 (45 MW)
45	Mukerian-II	1	3	R	(3X15)	45.00		1988 (30 MW) 1989 (15 MW)
46	Mukerian-III	1	3	R	(3X19.5)	58.50		1989 (58.50 MW)
47	Mukerian-IV	1	3	R	(3X19.5)	58.50		1989 (58.50 MW)
48	Ranjit Sagar	1	4	S	(4X150)	600.00	1507.00	2000 (600 MW)
	Total PSPCL	**7**	**20**			**941.00**	**3622.00**	

State-wise/Station-wise Installed Capacity of H.E. Stations in the Country

(Above 25 MW Capacity)

Sl No.	Utilities/Stations	No. of Stations	No. of Units	Type of Project	No. of Units X Capacity(MW)	Capacity (MW)	Design Energy (MU)	Year of Commissioning
	BBMB							
49	Ganguwal	1	3	R	(2X24.2)+(1X29.25)	77.65	1358	1955 (48.4 MW) 1962 (29.25 MW)
50	Kotla	1	3	R	(2X24.2)+(1X29.25)	77.65		1956 (48.4 MW) 1961 (29.25 MW)
	Sub-Total BBMB (Punjab)	**2**	**6**			**155.30**	**1358.00**	
	Total Punjab	**9**	**26**			**1096.30**	**4980.00**	
	Rajasthan							
	RRVUNL							
51	Jawahar Sagar	1	3	R(P)	(3X33)	99.00	298.00	1973 (99 MW)
52	Mahi Bajaj-I	1	2	MP	(2X25)	50.00	289.00	1986 (50 MW)
53	Mahi Bajaj-II	1	2	R(P)	(2X45)	90.00		1989 (90 MW)
54	R P Sagar	1	4	MP	(4X43)	172.00	459.00	1968 (129 MW) 1969 (43 MW)
	Total RRVUNL	**4**	**11**			**411.00**	**1046.00**	
	Total Rajasthan	**4**	**11**			**411.00**	**1046.00**	
	UTTARAKHAND							
	NHPC							
55	Dhauli Ganga	1	4	R(P)	(4X70)	280.00	1134.69	2005 (280 MW)
56	Tanakpur	1	3	R	(3X31.4)	94.20	452.19	1992 (94.2 MW)
	Sub-Total NHPC	**2**	**7**			**374.20**	**1586.88**	
	THDC							
57	Tehri St-I	1	4	MP	(4X250)	1000.00	2797.00	2006 (500 MW) 2007 (500 MW)
58	Koteshwar	1	4	R(P)	(4X100)	400.00	1155.00	2011 (200 MW) 2012 (200 MW)
	Total THDC	**2**	**8**			**1400.00**	**3952.00**	
	SJVNL							
59	Naitwar Mori	**1**	**2**	R	(4X30)	60.00	265.50	**2023 (60 MW)**
	Total SJVNL	**1**	**2**			**60.00**	**265.5**	
	Sub Total Central	**5**	**17**			**1834.20**	**5804.38**	
	State Sector							
	UJVNL							
60	Chibro (Yamuna)	1	4	R(P)	(4X60)	240.00	750.00	1975 (180 MW) 1976 (60 MW)
61	Chilla	1	4	R	(4X36)	144.00	725.00	1980 (108 MW) 1981 (36 MW)
62	Dhakrani	1	3	R	(3X11.25)	33.75	169.00	1965 (11.25 MW) 1966 (11.25 MW) 1970 (11.25 MW)
63	Dhalipur	1	3	R	(3X17)	51.00	192.00	1965 (17 MW) 1966 (17 MW) 1970 (17 MW)
64	Khatima	1	3	R	(3X13.8)	41.40	208.00	1955 (13.8 MW) 1956 (27.6 MW)
65	Khodri	1	4	R(P)	(4X30)	120.00	345.00	1984 (120 MW)
66	Kulhal	1	3	R	(3X10)	30.00	164.00	1975 (30 MW)
67	Maneri Bhali-I	1	3	R(P)	(3X30)	90.00	395.00	1984 (90 MW)
68	Maneri Bhali-II	1	4	R(P)	(4X76)	304.00	1566.10	2008 (304 MW)
69	Ramganga	1	3	MP	(3X66)	198.00	334.00	1975 (66 MW) 1976 (66 MW) 1977 (66 MW)

State-wise/Station-wise Installed Capacity of H.E. Stations in the Country

(Above 25 MW Capacity)

Sl No.	Utilities/Stations	No. of Stations	No. of Units	Type of Project	No. of Units X Capacity(MW)	Capacity (MW)	Design Energy (MU)	Year of Commissioning
70	Vyasi	1	2	R(P)	(2x60)	120.00	375.24	22.04.2022 (U#2) 24.05.2022 (U#1)
	Total UJVNL	**11**	**36**			**1372.15**	**5223.34**	
	Private Sector							
	AHPC							
71	Shrinagar	1	4	R(P)	(4X82.50)	330.00	1396.84	2015 (330 MW)
.	**JPPVL**							
72	Vishnu Prayag	1	4	R	(4X100)	400.00	1774.42	2006 (400 MW)
	ReNew Power Private Limited							
73	Singoli Bhatwari	1	3	R	(3x33)	99.00	473.00	2020 (33 MW)
	Sub Total Private	**3**	**11**			**829.00**	**3644.26**	
	Total Uttarakhand	**19**	**64**			**4035.35**	**14671.98**	
	UPJVNL							
	UTTAR PRADESH							
74	Khara	1	3	R(P)	(3X24)	72.00	385.00	1992 (72 MW)
75	Matatila	1	3	MP	(3X10.2)	30.60	123.00	1965 (30.6 MW)
76	Obra	1	3	MP	(3X33)	99.00	279.00	1970 (66 MW) 1971 (33 MW)
77	Rihand	1	6	MP	(6X50)	300.00	920.00	1962 (250 MW) 1966 (50 MW)
	Total UPJVNL	**4**	**15**			**501.60**	**1707.00**	
	Total Northern Region	**77**	**260**			**19774.25**	**77131.39**	
	Western Region							
	MADHYA PRADESH							
	NHDC							
78	Indira Sagar	1	8	MP	(8X125)	1000.00	1980.00	2004 (875 MW) 2005 (125 MW)
79	Omkareshwar	1	8	MP	(8X65)	520.00	1166.57	2007 (520 MW)
	Sub-Total NHDC	**2**	**16**			**1520.00**	**3146.57**	
	Total Central	**2**	**16**			**1520.00**	**3146.57**	
	MPPGCL							
80	Bansagar Tons-I	1	3	R(P)	(3X105)	315.00	900.00	1991 (105 MW) 1992 (210 MW)
81	Bansagar Tons-III	1	2	R	(2X15)	30.00	113.00	2002 (30 MW)
82	Bansagar Tons-II	1	3	MP	(3X20)	60.00	143.00	2000 (20 MW) 2001 (20 MW) 2002 (20 MW)
83	Bargi	1	2	MP	(2X45)	90.00	508.08	1988 (90 MW)
84	Gandhi Sagar	1	5	MP	(5X23)	115.00	420.48	1960 (69 MW) 1963 (23 MW) 1966 (23 MW)
85	Madhikhera	1	3	MP	(3X20)	60.00	74.12	2006 (40 MW) 2007 (20 MW)
86	Rajghat	1	3	MP	(3X15)	45.00	87.60	1999 (45 MW)
	Sub-Total MPPGCL	**7**	**21**			**715.00**	**2246.28**	
	Total Madhya Pradesh	**9**	**37**			**2235.00**	**5392.85**	
	MAHARASHTRA							

State-wise/Station-wise Installed Capacity of H.E. Stations in the Country

(Above 25 MW Capacity)

Sl No.	Utilities/Stations	No. of Stations	No. of Units	Type of Project	No. of Units X Capacity(MW)	Capacity (MW)	Design Energy (MU)	Year of Commissioning
	MAHAGENCO							
87	Bhira Tail Race	1	2	R(P)	(2X40)	80.00	75.00	1987 (40 MW) 1988 (40 MW)
88	Koyna DPH	1	2	S	(2X18)	36.00	146.00	1980 (18 MW) 1981 (18 MW)
89	Koyna-I&II	1	8	S	(4X70)+(4X80)	600.00	3030.00	1962 (140 MW) 1963 (140 MW) 1966 (240 MW) 1967 (80 MW)
90	Koyna-III	1	4	R(P)	(4X80)	320.00		1975 (160 MW) 1977 (80 MW) 1978 (80 MW)
91	Koyna-IV	1	4	S	(4X250)	1000.00		1999 (500 MW) 2000 (500 MW)
92	Tillari	1	1	R(P)	(1X60)	60.00	133.00	1986 (60 MW)
93	Vaitarna	1	1	S	(1X60)	60.00	144.00	1976 (60 MW)
	Sub-Total MAHAGENCO	**7**	**22**			**2156.00**	**3528.00**	
	MPPGCL							
94	Pench	1	2	MP	(2X80)	160.00	315.36	1986 (80 MW) 1987 (80 MW)
	Sub-Total MPPGCL	**1**	**2**			**160.00**	**315.36**	
	Total State SECTOR	**8**	**24**			**2316.00**	**3843.36**	
	Private Sector							
	Dodson-Lindblom Hydro Power Pvt. Ltd.(DLHP)							
95	Bhandardhara St-II	1	1	R(P)	(1X34)	34.00	50.00	1996 (34 MW)
	Sub-Total DLHP	**1**	**1**			**34.00**	**50.00**	
	Tata Power Company							
96	Bhira	1	6	S	(6X25)	150.00	775.00	1927 (125 MW) 1949 (25 MW)
97	Bhivpuri	1	5	S	(3X24) + (2X1.5)	75.00	220.00	1997 (3 MW) 1998 (48 MW) 1999 (24 MW)
98	Khopoli	1	3	S	(3X24)	72.00	225.00	2001 (24 MW) 2002 (24 MW) 2003 (24 MW)
	Sub-Total TPCL	**3**	**14**			**297.00**	**1220.00**	
	Total Pvt. (Maharashtra)	**4**	**15**			**331.00**	**1270.00**	
	Total Maharashtra	**12**	**39**			**2647.00**	**5113.36**	

State-wise/Station-wise Installed Capacity of H.E. Stations in the Country

(Above 25 MW Capacity)

Sl No.	Utilities/Stations	No. of Stations	No. of Units	Type of Project	No. of Units X Capacity(MW)	Capacity (MW)	Design Energy (MU)	Year of Commissioning
	CHHATISGARG							
	CSPGCL							
	State Sector							
99	Hasdeobango	1	3	MP	(3X40)	120.00	245.00	1994 (80 MW) 1995 (40 MW)
	Total CSPGCL	**1**	**3**			**120.00**	**245.00**	
	Total Chhatisgarh	**1**	**3**			**120.00**	**245.00**	
	GUJARAT							
	State Sector							
	GSECL							
100	Ukai	1	4	MP	(4X75)	300.00	1080.00	1974 (150 MW) 1975 (75 MW) 1976 (75 MW)
	Sub-Total GSECL	**1**	**4**			**300.00**	**1080.00**	
	SSNNL							
101	Sardar Sarovar CHPH	1	5	R(P)	(5X50)	250.00	213.00	2004 (250 MW)
	Sub-Total SSNNL	**1**	**5**			**250.00**	**213.00**	
	Total Gujarat	**2**	**9**			**550.00**	**1293.00**	
	Total Western Region	**24**	**88**			**5552.00**	**12044.21**	
	Southern Region							
	ANDHRA PRADESH							
	APGENCO							
	State Sector							
102	Lower Sileru	1	4	S	(4X115)	460.00	1070.00	1976 (230 MW) 1977 (115 MW) 1978 (115 MW)
103	N J Sagar RBC & EXT.	1	3	MP	(3X30)	90.00	156.00	1990 (30 MW) 1992 (60 MW)
104	Srisailam	1	7	MP	(7X110)	770.00	2900.00	1982 (220 MW) 1983 (110 MW) 1984 (110 MW) 1986 (220 MW) 1987 (110 MW)
105	Upper Sileru-I&II	1	4	S	(4X60)	240.00	529.00	1994 (60 MW) 1995 (60 MW)
106	N J Sagar TPD	1	2	R(P)	(2X25)	50.00	177.00	2017 (50 MW)
	Total APGENCO	**5**	**20**			**1610.00**	**4832.00**	
	Total Andhra Pradesh	**5**	**20**			**1610.00**	**4832.00**	
	TELANGANA							
	TSGENCO							
	State Sector							
107	Priyadarshni Jurala	1	6	R(P)	(6X39)	234.00	404.00	2008 (78 MW) 2009 (39 MW) 2010 (78 MW) 2011 (39 MW)
108	Pochampad	1	4	MP	(4X9)	36.00	147.00	1987-1988, 2010
109	N J Sagar	1	1	MP	(1X110)	110.00		1978 (110 MW)
110	N J Sagar LBC	1	2	R	(2X30)	60.00	104.00	1983 (60 MW)
111	Lower Jurala	1	6	R(P)	(6X40)	240.00	534.43	2015 (80 MW) 2016 (160 MW)

State-wise/Station-wise Installed Capacity of H.E. Stations in the Country

(Above 25 MW Capacity)

Sl No.	Utilities/Stations	No. of Stations	No. of Units	Type of Project	No. of Units X Capacity(MW)	Capacity (MW)	Design Energy (MU)	Year of Commissioning
112	Pulinchinthala	1	4	R(P)	(4X30)	120.00	219.42	2016 (60 MW) 2017 (60 MW)
	Total TSGENCO	**6**	**23**			**800.00**	**1408.85**	
	Total Telangana	**6**	**23**			**800.00**	**1408.85**	
	KARNATAKA							
	KPCL							
	State Sector							
113	Almatti	1	6	MP	(5X55)+(1X15)	290.00	483.00	2004 (70 MW) 2005 (220 MW)
114	Gerusoppa(Sharavathy Tail Race)	1	4	R(P)	(4X60)	240.00	622.00	2001 (180 MW) 2002 (60 MW)
115	Ghat Prabha	1	2	MP	(2X16)	32.00	131.00	1992 (32 MW)
116	Mahatma Gandhi (Jog)	1	8	S	(4X21.6)+(4X13.2)	139.20	118.00	1949 (26.4 MW) 1950 (13.2 MW) 1952 (65 MW) 2001 (13.2 MW) 2002 (21.6 MW)
117	Kadra	1	3	S	(3X50)	150.00	570.00	1997 (50 MW) 1999 (100 MW)
118	Kalinadi (Nagjhari)	1	6	S	(6X150)	900.00	3385.00	1979 (135 MW) 1980 (135 MW) 1981 (135 MW) 1982 (135 MW) 1983 (135 MW) 1984 (135 MW)
119	Kalinadi (Supa)	1	2	S	(2X50)	100.00	542.00	1985 (100 MW)
120	Kodasali	1	3	S	(3X40)	120.00	512.00	1998 (40 MW) 1999 (80 MW)
121	Lingnamakki	1	2	S	(2X27.5)	55.00	254.00	1979 (27.5 MW) 1980 (27.5 MW)
122	Munirabad	1	3	MP	(2X9)+(1X10)	28.00	66.00	1962 (18 MW) 1965 (10 MW)
123	Sharavathy	1	10	S	(10X103.5)	1035.00	4932.00	1964 (103.5 MW) 1965 (103.5 MW) 1967 (207 MW) 1968 (311 MW) 1971 (103.5 MW) 1976 (103.5 MW) 1977 (103.5 MW)
124	Sivasamundrum	1	10	R(P)	(4X6)+(6X3)	42.00	183.00	1922 (3 MW) 1923 (3 MW) 1924 (9 MW) 1925 (3 MW) 1928 (18 MW) 1934 (6 MW)
125	Varahi	1	4	R(P)	(4X115)	460.00	1060.00	1989 (115 MW) 1990 (115 MW) 2009 (230 MW)

State-wise/Station-wise Installed Capacity of H.E. Stations in the Country

(Above 25 MW Capacity)

Sl No.	Utilities/Stations	No. of Stations	No. of Units	Type of Project	No. of Units X Capacity(MW)	Capacity (MW)	Design Energy (MU)	Year of Commissioning
126	Bhadra	1	3	MP	(2x12)+(1x2)	26.00	123.00	1965 (26 MW)
	Total KPCL	**14**	**66**			**3617.20**	**12981.00**	
	APGENCO							
127	T B Dam	1	4	MP	(4X9)	36.00	236.00	1957 (18 MW) 1964 (18 MW)
128	Hampi	1	4	MP	(4X9)	36.00		1958 (18 MW) 1964 (18 MW)
	Sub-Total APGENCO	**2**	**8**			**72.00**	**236.00**	
	Total Karnataka	**16**	**74**			**3689.20**	**13217.00**	
	KERALA							
	KSEB							
	State Sector							
129	Idamalayar	1	2	MP	(2X37.5)	75.00	380.00	1987 (75 MW)
130	Idukki	1	6	MP	(6X130)	780.00	2398.00	1976 (390 MW) 1985 (130 MW) 1986 (260 MW)
131	Kakkad	1	2	R(P)	(2X25)	50.00	262.00	1999 (50 MW)
132	Kuttiyadi	1	3	MP	(3X25)	75.00	323.00	1972 (75 MW)
133	Kuttiyadi Extn.	1	1	MP	(1X50)	50.00		2001 (50 MW)
134	Kuttiyadi Additional Extn.	1	2	MP	(2X50)	100.00		2010 (100 MW)
135	Lower Periyar	1	3	R(P)	(3X60)	180.00	493.00	1997 (180 MW)
136	Nariamangalam	1	3	S	(3X17.55)	52.65	237.00	1961 (30 MW) 1963 (15 MW)
137	Pallivasal	1	6	S	(3X5)+(3X7.5)	37.50	284.00	1948 (7.5 MW) 1949 (7.5 MW) 1951 (7.5 MW) 2001 (15 MW)
138	Panniar	1	2	S	(2X15)	30.00	158.00	1963 (15 MW) 2001 (15 MW)
139	Poringalkuttu	1	4	S	(4X8)	32.00	170.00	1957 (8 MW) 1958 (8 MW) 1959 (8 MW) 1960 (8 MW)
140	Sabirigiri	1	6	S	(6X50)	300.00	1338.00	1960 (150 MW) 1967 (150 MW)
141	Sengulam	1	4	S	(4X12)	48.00	182.00	1954 (24 MW) 2001 (24 MW)
142	Sholayar	1	3	S	(3X18)	54.00	233.00	1956 (18 MW) 1968 (36 MW)
	Total KSEB	**14**	**47**			**1864.15**	**6458.00**	
	Total Kerala	**14**	**47**			**1864.15**	**6458.00**	
	TAMILNADU							
	TANGEDCO							
143	Aliyar	1	1	MP	(1X60)	60.00	175.00	1970 (60 MW)
144	Bhavani Kattalai Barrage-I	1	2	R(P)	(2X15)	30.00	90.00	2006 (30 MW)
145	Bhavani Kattalai Barrage-II	1	2	R(P)	(2X15)	30.00	100.00	2013 (30 MW)

State-wise/Station-wise Installed Capacity of H.E. Stations in the Country

(Above 25 MW Capacity)

Sl No.	Utilities/Stations	No. of Stations	No. of Units	Type of Project	No. of Units X Capacity(MW)	Capacity (MW)	Design Energy (MU)	Year of Commissioning
146	Bhavani Kattalai Barrage-III	1	2	R(P)	(2X15)	30.00	80.00	2012 (15 MW) 2013 (15 MW)
147	Kodayar-I	1	1	MP	(1X60)	60.00	165.00	1970 (60 MW)
148	Kodayar-I	1	1	MP	(1X40)	40.00		1971 (40 MW)
149	Kundah-I	1	3	S	(3X20)	60.00	1387.00	1960 (40 MW) 1964 (20 MW)
150	Kundah-II	1	5	S	(5X35)	175.00		1960 (35 MW) 1961 (105 MW) 1964 (35 MW)
151	Kundah-III	1	3	S	(3X60)	180.00		1965 (120 MW) 1978 (60 MW)
152	Kundah-IV	1	2	S	(2X50)	100.00		1966 (50 MW) 1978 (50 MW)
153	Kundah-V	1	2	S	(2X20)	40.00		1964 (20 MW) 1988 (20 MW)
154	Lower Mettur-I	1	2	R(P)	(2X15)	30.00	252.00	1988 (30 MW)
155	Lower Mettur-II	1	2	R(P)	(2X15)	30.00		1988 (30 MW)
156	Lower Mettur-III	1	2	R(P)	(2X15)	30.00		1987 (15 MW) 1988 (15 MW)
157	Lower Mettur-IV	1	2	R(P)	(2X15)	30.00		1989 (15 MW) 1988 (15 MW)
158	Mettur Dam	1	4	MP	(4X12.5)	50.00	541.00	1937 (25 MW) 1938 (12.5 MW) 1946 (12.5 MW)
159	Mettur Tunnel	1	4	MP	(4X50)	200.00		1965 (50 MW) 1966 (150 MW)
160	Moyar	1	3	S	(3X12)	36.00	115.00	1952 (24 MW) 1953 (12 MW)
161	Papanasam	1	4	MP	(4X8)	32.00	105.00	1944 (16 MW) 1945 (8 MW) 1951 (8 MW)
162	Parson's Valley	1	1	S	(1X30)	30.00	53.00	2000 (30 MW)
163	Periyar	1	4	MP	(3X42)+(1X35)	161.00	409.00	1958 (35 MW) 1959 (70 MW) 1965 (35 MW)
164	Pykara	1	6	S	(3X7)+(2X13.6)+(1X11)	59.20	274.00	1932 (14 MW) 1933 (7 MW) 1939 (11 MW) 1954 (27.2 MW)
165	Pykara Ultimate	1	3	S	(3X50)	150.00	30.00	2005 (150 MW)
166	Sarakarpathy	1	1	R(P)	(1X30)	30.00	162.00	1966 (30 MW)
167	Sholayar-I	1	2	S	(2X35)	70.00	254.00	1971 (70 MW)
168	Suruliyar	1	1	S	(1X35)	35.00	79.00	1978 (35 MW)
	Total TANGEDCO	**26**	**65**			**1778.20**	**4271.00**	
	Total Tamilnadu	**26**	**65**			**1778.20**	**4271.00**	
	Total Southern Region	**67**	**229**			**9741.55**	**30186.85**	
	Eastern Region							
	WEST BENGAL							
	DVC							

State-wise/Station-wise Installed Capacity of H.E. Stations in the Country

(Above 25 MW Capacity)

Sl No.	Utilities/Stations	No. of Stations	No. of Units	Type of Project	No. of Units X Capacity(MW)	Capacity (MW)	Design Energy (MU)	Year of Commissioning
169	Maithon	1	3	MP	(1X23.2)+(2X20)	63.20	137.00	1957 (20 MW) 1958 (43.2 MW)
	Sub-Total DVC	**1**	**3**			**63.20**	**137.00**	
	NHPC							
170	Teesta Low Dam-III	1	4	R(P)	(4X33)	132.00	594.00	2013 (132 MW)
171	Teesta Low Dam-IV	1	4	R(P)	(4X40)	160.00	719.67	2016 (120 MW)
	Sub Total NHPC	**2**	**8**			**292.00**	**1313.67**	
	Sub-Total Central	**3**	**11**			**355.20**	**1450.67**	
	WBSEDCL							
172	Jaldhaka	1	4	R(P)	(4X9)	36.00	165.00	1967 (18 MW) 1972 (9 MW)
173	Rammam	1	4	R	(4X12.5)	50.00	210.00	1995 (25 MW) 1996 (25 MW)
	Sub-Total WBSEDCL	**2**	**8**			**86.00**	**375.00**	
	Total West Bengal	**5**	**19**			**441.20**	**1825.67**	
	SIKKIM							
	NHPC							
174	Rangit	1	3	R(P)	(3X20)	60.00	338.61	2000 (60 MW)
175	Teesta-V	1	3	R(P)	(3X170)	510.00	2572.70	2008 (510 MW)
	Sub-Total NHPC	**2**	**6**			**570.00**	**2911.31**	
	State Sector							
	Sikkim Urja Ltd.							
176	Teesta-III	1	6	R(P)	(6X200)	1200.00	5214.00	2017 (1200 MW)
	Sub-Total SUL	**1**	**6**			**1200.00**	**5214.00**	
	Private							
	GIPL (Gati Infra Pvt. Ltd.)							
177	Chujachen	1	2	R(P)	(2*55)	110.00	537.81	2013 (110 MW)
	Sneha Kinetic Power Projects Pvt. Ltd.(SKPPPL)							
178	Dikchu	1	2	R(P)	(2*48)	96.00	431.00	2017 (96 MW)

State-wise/Station-wise Installed Capacity of H.E. Stations in the Country

(Above 25 MW Capacity)

Sl No.	Utilities/Stations	No. of Stations	No. of Units	Type of Project	No. of Units X Capacity(MW)	Capacity (MW)	Design Energy (MU)	Year of Commissioning
	Shiga Energy Pvt. Ltd.(SEPL)							
179	Tashiding	1	2	R(P)	(2*48.50)	97.00	425.05	2017 (97 MW)
	DANS Energy Pvt. Ltd. (DEPL)							
180	Jorethang Loop	1	2	R(P)	(2*48)	96.00	459.02	2015 (96 MW)
	MBPC							
181	Rongnichu	1	2	R	(2*56.5)	113.00	434.00	June 2021 (113 MW)
	Sub-Total Private	**5**	**10**			**512.00**	**2286.88**	
	Total Sikkim	**8**	**22**			**2282.00**	**10412.19**	
	JAHARKHAND							
182	Panchet	1	2	MP	(2X40)	80.00	237.00	1959 (40 MW) 1991 (40 MW)
	Sub-Total DVC	**1**	**2**			**80.00**	**237.00**	
	JUUNL							
183	Subernrekha-I	1	1	MP	(1X65)	65.00	149.00	1977 (65 MW)
184	Subernrekha-II	1	1	R(P)	(1X65)	65.00		1980 (65 MW)
	Total JUUNL	**2**	**2**			**130.00**	**149.00**	
	Total Jharkhand	**3**	**4**			**210.00**	**386.00**	
	ODISHA							
	OHPC							
185	Balimela	1	8	MP	(6X60)+(2X75)	510.00	1183.00	1973 (60 MW) 1974 (120 MW) 1975 (60 MW) 1976 (60 MW) 1977 (60 MW) 2008 (150 MW)
186	Hirakud (Burla)	1	7	MP	(2X43.65)+ (1X37.5)+(2X49.5)+(2X32)	287.80	684.00	1956 (32 MW) 1957 (81.5 MW) 1958 (49.5 MW) 1962 (37.5 MW) 1963 (37.5 MW) 1990 (37.5 MW)
187	Hirakud (Chiplima)	1	3	R(P)	(3X24)	72.00	490.00	1962 (48 MW) 1964 (24 MW)
188	Rengali	1	5	MP	(5X50)	250.00	525.00	1985 (50 MW) 1986 (50 MW) 1989 (50 MW) 1990 (50 MW) 1992 (50 MW)
189	Upper Indravati	1	4	MP	(4X150)	600.00	1962.00	1999 (300 MW) 2000 (150 MW) 2001 (150 MW)
190	Upper Kolab	1	4	MP	(4X80)	320.00	832.00	1988 (160 MW) 1990 (80 MW) 1993 (80 MW)
	Total OHPC	**6**	**31**			**2039.80**	**5676.00**	

State-wise/Station-wise Installed Capacity of H.E. Stations in the Country

(Above 25 MW Capacity)

Sl No.	Utilities/Stations	No. of Stations	No. of Units	Type of Project	No. of Units X Capacity(MW)	Capacity (MW)	Design Energy (MU)	Year of Commissioning
	APGENCO							
191	Machkund	1	6	S	(3X17)+(3X21.25)	114.75	670.00	1955 (34 MW) 1956 (17 MW) 1959 (63.75 MW)
	Sub-Total APGENCO	**1**	**6**			**114.75**	**670**	
	Total Odisha	**7**	**37**			**2154.55**	**6346**	
	Total Eastern Region	**23**	**82**			**5087.75**	**18969.86**	
	North Eastern Region							
	ARUNACHAL PRADESH							
	NEEPCO							
192	Ranganadi	1	3	R(P)	(3X135)	405.00	1509.66	2002 (405 MW)
193	Pare	1	2	R (P)	(2X55)	110.00	506.42	2018 (110 MW)
194	Kameng	1	4	R (P)	(4X150)	600.00	3353.00	June 2020 (150 MW) July 2020 (150 MW) Jan 2021 (150 MW) Feb 2021 (150 MW)
	Sub-Total NEEPCO Ar.P	**3**	**9**			**1115.00**	**5369.08**	
	Total Arunachal Pradesh	**3**	**9**			**1115.00**	**5369.08**	
	ASSAM							
	NEEPCO							
195	Kopoli	1	4	S	(4X50)	200.00	1186.14	1988 (100 MW) 1996 (50 MW) 1997 (50 MW)
196	Khandong	1	2	S	(2X25)	50.00	363.95	1984 (50 MW)
	Sub-Total NEEPCO Assam	**2**	**6**			**250.00**	**1550.09**	
	APGCL							
197	Karbi Langpi	1	2	R(P)	(2X50)	100.00	390.00	2007 (100 MW)
	Sub-Total APGCL	**1**	**2**			**100.00**	**390.00**	
	Total Assam	**3**	**8**			**350.00**	**1940.09**	
	MIZORAM							
	NEEPCO							
198	Tuirial	1	2	S	(2X30)	60.00	250.63	2017 (60 MW)
	Total NEEPCO Mizoram	**1**	**2**			**60.00**	**250.63**	
	Total Mizoram	**1**	**2**			**60.00**	**250.63**	
	NAGALAND							
	NEEPCO							
199	Doyang	1	3	S	(3X25)	75.00	227.24	2000 (75 MW)
	Total-NEEPCO Nagaland	**1**	**3**			**75.00**	**227.24**	
	Total Nagaland	**1**	**3**			**75.000**	**227.240**	
	MANIPUR							
	NHPC							
200	Loktak	1	3	MP	(3X35)	105.00	448.00	1983 (105 MW)
	Sub-Total NHPC	**1**	**3**			**105.00**	**448.00**	
	Total Manipur	**1**	**3**			**105.000**	**448.000**	
	MEGHALAYA							
	MePGCL							
201	Kyrdemkulai	1	2	R(P)	(2X30)	60.00	118.00	1979 (60 MW)

State-wise/Station-wise Installed Capacity of H.E. Stations in the Country

(Above 25 MW Capacity)

Sl No.	Utilities/Stations	No. of Stations	No. of Units	Type of Project	No. of Units X Capacity(MW)	Capacity (MW)	Design Energy (MU)	Year of Commissioning
202	Umiam St. I	1	4	S	(4X9)	36.00	128.00	1965 (36 MW)
203	New Umtru	1	2	R(P)	(2X20)	40.00	235.00	2017 (20 MW)
204	Umiam St. IV	1	2	R(P)	(2X30)	60.00	324.00	1992 (60 MW)
205	Myntdu St-I	1	3	R(P)	(3X42)	126.00	372.69	2011 (84 MW) 2013 (42 MW)
	Total MePGCL	**5**	**13**			**322.00**	**1177.69**	
	Total Mehghalaya	**5**	**13**			**322.00**	**1177.69**	
	Total NE Region	**14**	**38**			**2027.00**	**9412.73**	
	Total	**205**	**697**			**42182.55**	**147745.04**	
	Pumped Storage Schemes							
	Western Region							
	GUJARAT							
	State Sector							
	GSECL							
1	Kadana	1	4	PSS	(4X60)	240.00	518.00	1990 (120 MW) 1998 (120 MW)
	SSNNL							
2	Sardar Sarovar RBPH	1	6	PSS	(6X200)	1200.00	3635.00	2005 (800 MW) 2006 (400 MW)
	Total Gujarat	**2**	**10**			**1440.00**	**4153.00**	
	MAHARASHTRA							
	State Sector							
	MAHAGENCO							
3	Ghatgarh	1	2	PSS	(2X125)	250.00	410.00	2008 (250 MW)
	Private Sector							
	Tata Power Company							
4	Bhira	1	1	PSS	(1X150)	150.00		1927 (125 MW) 1949 (25 MW)
	Sub-Total Maharashtra	**2**	**3**			**400.00**	**410.00**	
	Total Western Region	**4**	**13**			**1840.00**	**4563.00**	
	Southern Region							
	TELANGANA							
	State Sector							
	TSGENCO							
5	N J Sagar	1	7	PSS	(7X100.8)	705.60	2237.00	08.04.1980 (100.8 MW) 11.01.1981 (100.8 MW) 22.06.1982 (100.8 MW) 31.03.1983 (100.8 MW) 26.10.1984 (100.8 MW) 31.03.1985 (100.8 MW) 31.03.1985 (100.8 MW)
6	Srisailam LBPH	1	6	PSS	(6X150)	900.00	1400.00	26.04.2001 (150 MW) 12.11.2001 (150 MW 19.04.2002 (150 MW) 29.11.2002 (150 MW) 28.03.2003 (150 MW) 04.09.2003 (150 MW)
	Sub-Total TELANGANA	**2**	**13**			**1605.60**	**3637.00**	
	TAMIL NADU							
	State Sector							

State-wise/Station-wise Installed Capacity of H.E. Stations in the Country

(Above 25 MW Capacity)

Sl No.	Utilities/Stations	No. of Stations	No. of Units	Type of Project	No. of Units X Capacity(MW)	Capacity (MW)	Design Energy (MU)	Year of Commissioning
	TANGEDCO							
7	Kadamparai	1	4	PSS	(4X100)	400.00	77.00	1987 (100 MW) 1988 (200 MW) 1989 (100 MW)
	Sub-Total TAMIL NADU	**1**	**4**			**400.00**	**77.00**	
	Total Southern Region	**3**	**17**			**2005.60**	**3714.00**	
	Eastern Region							
	WEST BENGAL							
	State Sector							
	WBSEDCL							
8	Purulia	1	4	PSS	(4X225)	900.00	1235.00	1995 (25 MW) 1996 (25 MW)
	Sub-Total	**1**	**4**			**900.00**	**1235.00**	
	Total- PSS	**8**	**34**			**4745.60**	**9512.00**	
	Total (Conventional+PSS)	**212**	**731**			**46928.15**	**157257.04**	

NOTE: a. R-Runof river, R(P)-Run of river with Pondage, MP-Multipurpose and S-Storage

b. The Total No. of HE Stations are 212 as following One Hydro Station have conventional as well as PSS capacity.

Sl. No.	Station	State/Region		Installed Capacity (MW)	
				Conventional	PSS
1	N J Sagar	Telangana/ Southern		1X110 =110 (07.03.1978)	7X100.8=705.60

Capacity-wise grouping of Hydro-electric Stations

(As on 31.03.2024)

Station Capacity	Number of Stations		Number of Units		Total Capacity	
RANGE (MW)	**No**	**%**	**No**	**%**	**MW**	**%**
> 25 - 100	107	50.47	280	38.30	6213.8	13.24
>100 - 500	78	36.79	295	40.36	17883.75	38.11
>500 - 1000	23	10.85	124	16.96	16850.6	35.91
>1000	5	2.36	32	4.38	5980.0	12.74
TOTAL	**212***	**100**	**731**	**100**	**46928.15**	**100**

* Total number of HE stations are 212 as NJ Sagar HE Station (Sothern Region) is having one conventional unit and remaining seven units are PSS.

Hydro Generating Units added during 2023-24

(As on 31.03.2024)

SL. NO.	Name of the Station	Utility	State	Unit No.	Capacity (MW)	Date of Commissioning
Central Sector						
1	Naitwar Mori	SJVNL	Uttakhand	1	30	24.11.23
				2	30	04.12.23
ALL INDIA TOTAL					**60**	

Note : One Unit of Bhakra Left HEP (Himachal Pradesh) of BBMB uprated from 108 MW to 126 MW in January 2024

CHAPTER-2

GENERATION PERFORMANCE

CHAPTER-2

GENERATION PERFORMANCE

2.1 Generation from hydro-electric power stations (above 25 MW capacity) in the country during 2023-24 was 134.05 BU against the target of 156.7 BU which was 14.45% less than the target. The generation during 2023-24 was 17.3 % lower than the generation in 2022-23 i.e. 162.1 BU.

2.2 The month-wise and cumulative generation from hydro stations in the country viz-a-viz targets have been shown at **Exhibit-2.1** and are given in **Table 2.1** below.

TABLE 2.1

MONTH-WISE & CUMULATIVE GENERATION VIS-À-VIS TARGET IN MU PERIOD: 2023-24

Month	APR	MAY	JUN	JULY	AUG	SEP	OCT	NOV	DEC	JAN	FEB	MAR
Target	10669	13638	15621	18743	21849	19525	14118	9360	8285	8187	7588	9117
Generation	8729	11459	14334	17924	21960	16323	11240	6621	6167	6352	5928	7016
Cum. Tar	10669	24307	39928	58671	80520	100045	114163	123523	131808	139995	147583	156700
Cum. Gen	8729	20188	34522	52446	74406	90729	101969	108591	114758	121110	127038	134054

2.3 Utility-wise/ Sector-wise Performance of H.E. Stations

The utility-wise/ sector-wise target of energy generation viz-a-viz actual generation and surplus /shortfall in respect of Hydro-electric stations during 2023-24 & 2022-23 are given below in **Table 2.2.**

TABLE 2.2

UTILITY-WISE PERFORMANCE OF HYDRO ELECTRIC STATIONS (2023-24 VIS-A-VIS 2022-23)

Utilities	**Installed Capacity (MW) (As on 31.03.2024)**	**Generation**					
		Target (MU)		**Actual (MU)**		**Surplus (+)/ Shortfall (-) in %**	
		2023-24	**2022-23**	**2023-24**	**2022-23**	**2023-24**	**2022-23**
CENTRAL SECTOR							
BBMB	2956.3	9700	9644	11583.17	10824.72	19.41	12.24
NHPC LTD	5451.2	25628	26868	21585.84	24450.81	-15.77	-9.00
SJVN LTD	1972.02	9080	8888	8088.21	9130.48	-10.92	2.73
NTPC LTD	800	3100	3100	2952.05	3132.81	-4.77	1.06

THDC LTD	1400	4160	4162	4441.69	4539.97	6.77	9.08
NHDC	1520	3265	3265	4470.5	5443.49	36.92	66.72
DVC	143.2	286	290	176.28	236.61	-38.36	-18.41
NEEPCO LTD	1500	10366	5151	4848.09	5202.44	-53.23	1.00
TOTAL CENTRAL	**15742.72**	**65585.00**	**61368.0**	**58145.83**	**62961.33**	**-11.34**	**2.60**
PRIVATE SECTOR							
MPCL	86	332	336	249.06	320.86	-24.98	-4.51
EPPL	100	348	348	140.74	343.54	-59.56	-1.28
ADHPL	192	653	658	587.67	640.14	-10.00	-2.71
GBHPPL	70	293	293	256.33	274.22	-12.52	-6.41
HBPCL	300	1213	1300	1162.78	1351.93	-4.14	3.99
JSW ENERGY	1045	4132	4131	3786.39	4284.87	-8.36	3.72
IAEPL	36	158	158	154.99	140.03	-1.91	-11.37
AHPC LTD	330	1310	1310	1306.39	1514.06	-0.28	15.58
JPVL	400	1750	1590	1627.52	1910.82	-7.00	20.18
DLHP	34	36	36	23.48	19.28	-34.78	-46.44
GIPL	110	537	537	473.07	503.92	-11.91	-6.16
TPCL	447	1470	1470	1557.6	1568.79	5.96	6.72
DEPL	96	412	412	356.93	433.47	-13.37	5.21
SEPL	97	436	421	433.19	445.94	-0.64	5.92
SNEHA KINETIC	96	463	460	394.08	535.9	-14.89	16.50
NTPGPL	0	50	50	0	0	0.00	0.00
HSPPL	100	402	392	231.57	318.29	-42.40	-18.80
L&T	99	439	402	393.66	465.95	-10.33	15.91
GMR	180	770	500	708.17	421.51	-8.03	-15.70
MBPC	113	442	442	396.83	434.84	-10.22	-1.62
TOTAL PRIVATE	**3931**	**15646**	**15246**	**14240**	**15928**	**-8.98**	**4.48**
STATE SECTOR							
JKSPDCL	1110	5551	4866	4781.78	5056.98	-13.86	3.92
HPPCL	406	874	771.5	846.26	904.16	-3.17	17.20
HPSEBL	372	1653	1628	1278.95	1779.35	-22.63	9.30
BVPC	0	0	0	0	0	0.00	0.00
RRVUNL	411	672	480	1013.97	967.43	50.89	101.55
PSPCL	1051	3665	3780	3956.85	3702.06	7.96	-2.06
UPJVNL	501.6	1324	1519	850.64	974.04	-35.75	-35.88
UJVNL	1372.15	5135	5035	4722.42	5177.21	-8.03	2.82
SSNNL	1450	3100	3099	3699.72	4792.29	19.35	54.64

GSECL	540	1051	965	856.61	1340.85	-18.50	38.95
MAHAGENCO	2406	3888	3963	3316.2	3941.02	-14.71	-0.55
MPPGCL	875	2407	2389	2341.49	2230.78	-2.72	-6.62
CSPGCL	120	274	274	321.76	237.37	17.43	-13.37
APGENCO	1796.75	3605	3600	2334.98	4484.61	-35.23	24.57
TSGENCO	2405.6	3969	3852	1243.29	6010.07	-68.67	56.02
KPCL	3617.2	12242	12337	8874.4	12964.04	-27.51	5.08
KSEBL	1864.15	7668	7414	5155.72	7989	-32.76	7.76
TANGEDCO	2178.2	4220	3913	3563.28	5965.77	-15.56	52.46
JUUNL	130	110	110	96.84	168.99	-11.96	53.63
OHPC	2039.8	5363	5363	5299.18	4919.08	-1.19	-8.28
TUL	1200	5652	5652	4292.76	6152.57	-24.05	8.86
WBSEDCL	986	1560	1550	1683.07	1989.56	7.89	28.36
APGCL	100	380	380	328.89	481.6	-13.45	26.74
MePGCL	322	1106	1106	808.58	980.25	-26.89	-11.37
TOTAL STATE	**27254.45**	**75469**	**74046.5**	**61667.64**	**83209.08**	**-18.29**	**12.37**
TOTAL ALL INDIA	**46928.17**	**156700.0**	**150660.5**	**134053.92**	**162099**	**-14.45**	**7.59**

During the year 2023-24, overall hydro generation was more than the target in respect of BBMB, THDC LTD & NHDC in Central Sector and TPCL in Private Sector. As regards, generation by State Electricity Boards/Corporations / Departments, hydro generation was more than the target in respect of WBSEDCL, RRVUNL, PSPCL, SSNNL and CSPGCL.

2.4 Region-wise Performance of H.E. Stations

Region-wise generation performance of hydroelectric stations during 2023-24 is indicated in **Table 2.3.**

TABLE 2.3

GENERATION PERFORMANCE – REGION-WISE
(2023-24)

S. No.	Region	Installed Capacity as on 31.03.2024 (MW)	Generation During 2023-24		
			Target (MU)	Actual (MU)	Shortfall (-)/ Surplus (+) Over Target (%)
1	Northern	19774.27	77797.00	73088.83	-6.05
2	Western	7392	15491.00	16587.34	7.08
3	Southern	11747.15	31078.00	20308.64	-34.65

4	Eastern	5987.75	20178.00	17785.35	-11.86
5	North-Eastern	2027	12156.00	6283.74	-48.31
	Total (All India)	**46928.17**	**157600.00**	**134053.90**	**-14.45**

- Hydel generation during 2023-24 has exceeded the target in Western Region whereas it was lower than the target in Northern, Southern, Eastern Region & North-Eastern Region of the country primarily on account of lower inflows/rainfall in project catchment area**.**
- Hydel generation during 2023-24 was 134053.90 MU against the target of 157600 MU viz. lower in generation by 22646.1 MU (14.45%). However, actual hydel generation during 2023-24 is less than previous year generation of 162098.77 MU by 17.30%.

Region-wise generation targets viz-a-viz achievements are indicated at **Exhibit-2.2**.

2.5 Sector-wise generation performance during the year 2023-24 viz-a-viz targets is given in **Table 2.4**.

Generation from H.E. Stations under Central Sector, State Sector & Private Sector has been more than the target.

TABLE 2.4

SECTOR-WISE GENERATION PERFORMANCE
PERIOD: 2023-24

Sl. No.	Sector	Installed Capacity as on 31.03.2024 (MW)	Generation		
			Target (MU)	Actual (MU)	Shortfall (-) Surplus (+) Over Target (%)
1	Central	15742.72	65585.00	58145.82	-11.34
2	State	27254.45	75469.00	61667.62	-18.29
3	Private	3931	15646.00	14240.46	-8.98
	Total	**46928.17**	**156700**	**134053.90**	**-14.45**

2.6 Details of actual generation during 2023-24 for all the hydro stations (above 25 MW capacity) in the country are given in **Annex 2.1**. It is observed that 45 Nos. of stations have exceeded the target level of generation while the generation has been less than targets in

case of 167 stations. List of stations where generation exceeded the target during 2023-24 is given in **Table 2.5.**

TABLE 2.5

H.E. STATIONS ACHIEVING HIGHER GENERATION VIS-A-VIS TARGET PERIOD: 2023-24

S. No.	Actual Generation as % of Target	Hydro Electric Stations		
		No. of Stations	% of total No. of Stations	Name of the Station
1	150 & above	9	4.27	BHAWANI KATTAL, BANSAGAR-III HPS, KUNDAH-V HPS, PONG HPS, R P SAGAR HPS, JAWAHAR SAGAR HPS, KODAYAR-I HPS, HIRAKUD HPS, MAHI BAJAJ-II HPS
2	140 - 150	1	0.47	INDIRA SAGAR HPS
3	130 - 140	4	1.90	OMKARESHWAR HPS, BHAKRA LEFT HPS, MACHKUND HPS, KOYNA DPH HPS
4	120 - 130	7	3.32	SARDAR SAROVAR CHPH HPS, GANGUWAL HPS, POCHAMPAD HPS, KOYNA-I&II HPS, GIRI BATA HPS, RAMGANGA HPS, KOTLA HPS
5	110 - 120	16	7.58	SARDAR SAROVAR RBPH HPS, MAHI BAJAJ-I HPS, BHIVPURI HPS, KUNDAH-III HPS, MUKERIAN-I HPS, PENCH HPS, PURULIA PSS HPS, MUKERIAN-II HPS, BANSAGAR-II HPS, BHIRA PSS HPS, HASDEOBANGO HPS, KUNDAH-II HPS, MOYAR HPS, RANJIT SAGAR HPS, BHAKRA RIGHT HPS, RAJGHAT HPS
6	100 - 110	18	8.53	MANERI BHALI-I HPS, SEWA-II HPS, GANDHI SAGAR HPS, UPPER INDRAVATI HPS, TEHRI ST-1 HPS, JALDHAKA HPS ST-I, BARGI HPS, MUKERIAN-III HPS, KAMENG HPS, SHOLAYAR HPS, KUNDAH-I HPS, KALINADI SUPA HPS, SHANAN HPS, SAWRA KUDDU HPS, KOTESHWAR HPS, PYKARA ULTMATE HPS, NIMMO BAZGO HPS, SHRINAGAR HPS

H.E. Stations where generation was lower than the target have been listed in **Table 2.6** below:

TABLE 2.6

H.E. STATIONS HAVING SHORTFALL IN GENERATION VIS-A-VIS TARGETS PERIOD: 2023-24

S. No.	Actual Generation as % of Target	Hydro Electric Stations		
		No. of Stations	% of total No. of Stations	Name of the Station
1	90 - 100	104	21.10	ALLAIN DUHANGAN HPS, VEDANTA TPP, TARAPUR, SINGRAULI STPS, SHRINAGAR HPS, SASAN UMTPP, MANERI BHALI-I HPS, KUNDARKI TPS, KOTHAGUDEM TPS (STAGE-7), KORBA-WEST TPS, TASHIDING HPS, RAJPURA TPP, KHOPOLI HPS, BINA TPS, BANDAKHAR TPP, BALCO TPS, SIPAT STPS, SINGARENI TPP, SANJAY HPS, PARICHHA TPS, LOKTAK HPS, LARA TPP, KHATIMA HPS, JOG HPS, JALIPA KAPURDI TPP, CHANJU-I HPS , CHAMERA-I HPS,
2	80-90	58	11.76	KOPILI HPS, BANSAGAR TONS-I HPS, BHAWANI BARRAGE-II HPS, KYRDEMKULAI HPS, UKAI HPS, UNCHAHAR TPS, LOWER METTUR-II HPS, LOWER METTUR-III HPS, SABARIGIRI HPS, TANDA TPS, DHUVARAN CCPP, GOINDWAL SAHIB TPP, KHARA HPS, RENGALI HPS, HAMPI HPS, MATATILA HPS, OBRA TPS, CHAMERA-II HPS, DHAULI GANGA HPS, KADANA HPS, LOWER METTUR-I HPS, RAMAGUNDEM STPS, URAN CCPP, YAMUNA NAGAR TPS, BARH
3	70-80	33	6.69	KADRA HPS, LOWER JHELUM HPS, DADRI (NCTPP), CHAMERA-III HPS, BARAMURA GT, NTPL TUTICORIN TPP, LOWER PERIYAR HPS, CHUTAK HPS, BAIRA SIUL HPS, UPPER SILERU HPS, DOYANG HPS, DHAKRANI HPS, TEESTA-III HPS, KOYNA-IV HPS, ALIYAR HPS, TEESTA LOW DAM-III HPS, RAMMAM HPS, MALANA HPS, UMIAM HPS ST-I, LAKWA GT, KISHANGANGA HPS, TEESTA V HPS, SENGULAM HPS, RAMGARH CCPP, SIVASAMUNDRUM HPS, RAJIV
4	60-70	20	4.06	NALCO IMP, DHALIPUR HPS, SHOLAYAR HPS (TN), MANGDECHHU, KURICHU, SARKARPATHY HPS, OBRA HPS, MYNTDU(LESHKA) St-1 HPS, LOWER METTUR-IV HPS, PRAGATI CCGT-III, BHANDARDHARA HPS ST-II, METTUR DAM HPS, AGARTALA GT, NEYVELI TPS-II, GERUSUPPA HPS, RAMAGUNDEM-B TPS, IDUKKI HPS, VARAHI HPS, PARSON`S VALLEY HPS, CHUKHA
5	50-60	11	2.23	LIGANAMAKKI HPS, GHAT PRABHA HPS, KUNDAH-IV HPS, SORANG HPS, PRAGATI CCPP, MAITHON HPS, NARIAMANGLAM HPS, IDAMALAYAR HPS, TALA, RIHAND HPS,

				PULICHINTALA HPS
6	40-50	13	2.64	BHADRA HPS, BHAWANI BARRAGE-III HPS, METTUR TUNNEL HPS, CHIPLIMA HPS, ALMATTI DPH HPS, SIKKA REP. TPS, PIPAVAV CCPP, KUTCH LIG. TPS, AKRIMOTA LIG TPS, TILLARI HPS, MADHIKHERA HPS, T B DAM HPS, MALANA-II HPS
7	30-40	10	2.03	NAGARJUN SGR HPS, LARJI HPS, MUNIRABAD HPS, UPPER SINDH-II HPS, PRIYADARSHNI JURALA HPS, SURULIYAR HPS, PORINGALKUTTU HPS, PARBATI-III HPS, LOWER JURALA HPS, KADAMPARI HPS
8	10-30	7	1.42	DHOLPUR CCPP, HAZIRA CCPP EXT, KUTTIYADI HPS, KODAYAR-II HPS, KOVIKALPAL CCPP, SRISAILAM LB HPS, GHATGHAR PSS HPS
9	0-10	12	2.43	VIJJESWARAM CCPP, GODAVARI CCPP, NAGARJUN SGR RBC HPS, JAWAHARPUR STPP, KARUPPUR CCPP, PYKARA HPS, SRISAILAM HPS, NAGARJUN SGR TPD, NAGARJUN SGR LBC HPS, JEGURUPADU CCPP PH I, HAZIRA CCPP, P.NALLUR CCPP

The Utilities showing excess/shortfall in generation over the target are indicated in **Exhibit- 2.3**.

2.7 Hydro Generation is a function of availability of Water and that of Generating units. Rainfall is the primary source of water, which is highly variable in time and space. However, there could be no direct comparison between the rainfall and the energy generation during these years of data due to different installed capacities. While the rainfall has definite impact on the level of generation, it could also be impacted by the duration of forced and planned outages especially in the case of ROR projects. Region-wise Hydel generation during last five years is given below in **Table 2.7**

TABLE-2.7

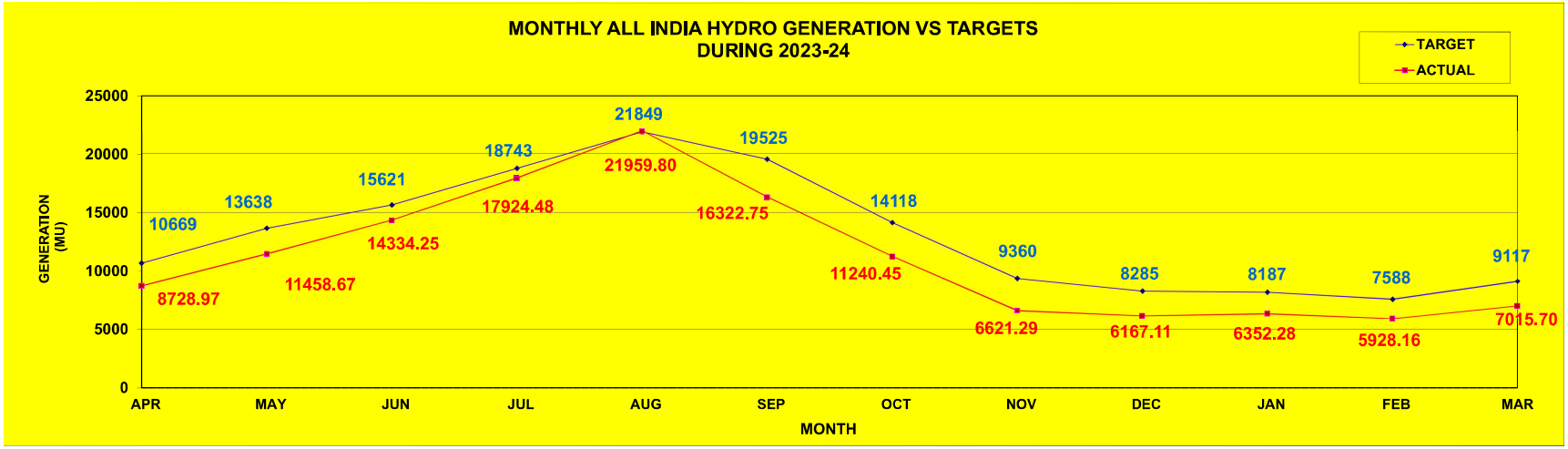
REGION-WISE HYDEL GENERATION AND RAINFALL DURING 2018-19 TO 2023-24

Region	**Installed Capacity as on 31.03.2024 (MW)**	**Generation (BU)**					
		2018-19	**2019-20**	**2020-21**	**2021-22**	**2022-23**	**2023-24**
Northern	19774.27	72.4	80.56	75.23	73.86	77.62	73.09
Western	7392	9.76	17.81	16.67	13.71	19.57	16.59

Southern	11747.15	28.81	31.75	31.35	37.2	36.87	20.31
Eastern	5987.75	18.9	20.82	21.17	20.46	20.89	17.79
North Eastern	2027	5.02	4.82	5.86	6.37	7.14	6.28
Total	**46928.15**	**134.90**	**155.76**	**150.29**	**151.62**	**162.10**	**134.05**
Rainfall		**2018-19 (mm)**	**2019-20 (mm)**	**2020-21 (mm)**	**2021-22 (mm)**	**2022-23 (mm)**	**2023-24 (mm)**
All-India		1020.8	968.3				820.0

It can be observed from the above table that maximum hydro generation of 162.09 BU was achieved during the year 2022-23 as compared previous four years mainly due to better rainfall in the catchment areas of hydro power stations besides increase in installed capacity.

EXHIBIT- 2.1


MONTHLY ALL INDIA HYDRO GENERATION VS TARGETS
DURING 2023-24
TARGET
ACTUAL
GENERATION (MU)
25000
20000
15000
10000
5000
0
10669
13638
15621
18743
21849
19525
14118
9360
8285
8187
7588
9117
8728.97
11458.67
14334.25
17924.48
21959.80
16322.75
11240.45
6621.29
6167.11
6352.28
5928.16
7015.70
APR
MAY
JUN
JUL
AUG
SEP
OCT
NOV
DEC
JAN
FEB
MAR
MONTH

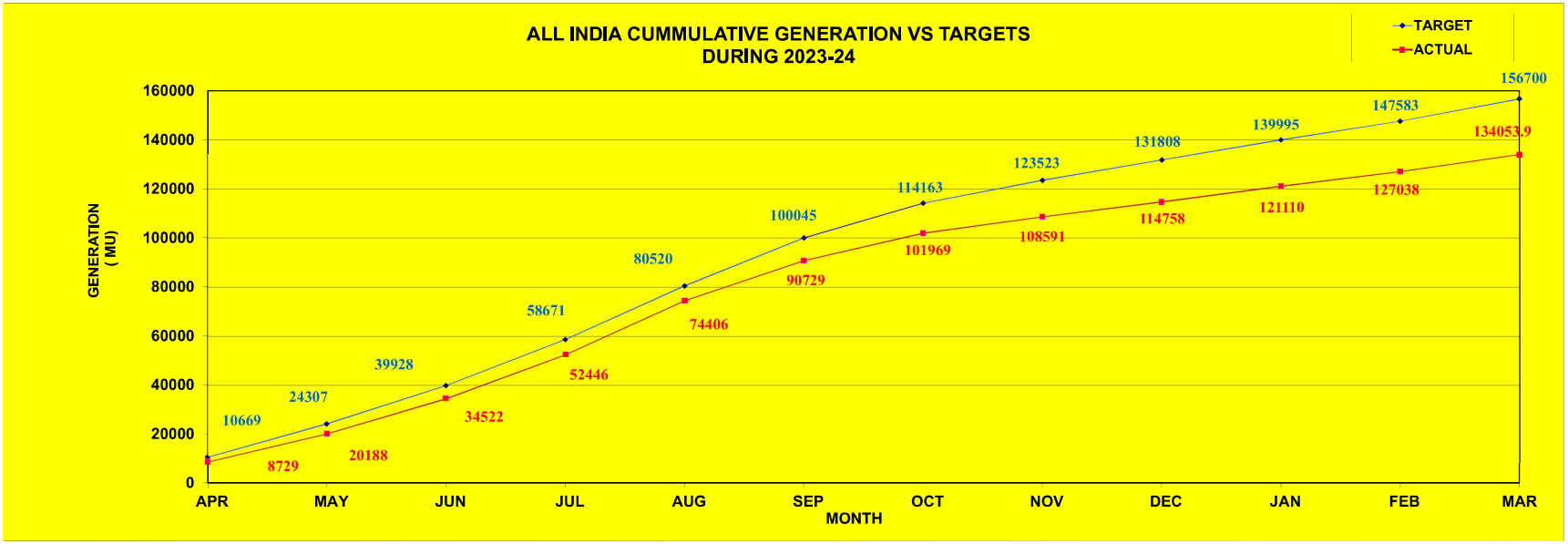

ALL INDIA CUMMULATIVE GENERATION VS TARGETS
DURING 2023-24
TARGET
ACTUAL
GENERATION (MU)
160000
140000
120000
100000
80000
60000
40000
20000
0
10669
24307
39928
58671
80520
100045
114163
123523
131808
139995
147583
156700
8729
20188
34522
52446
74406
90729
101969
108591
114758
121110
127038
134053.9
APR
MAY
JUN
JUL
AUG
SEP
OCT
NOV
DEC
JAN
FEB
MAR
MONTH

EXHIBIT-2.2

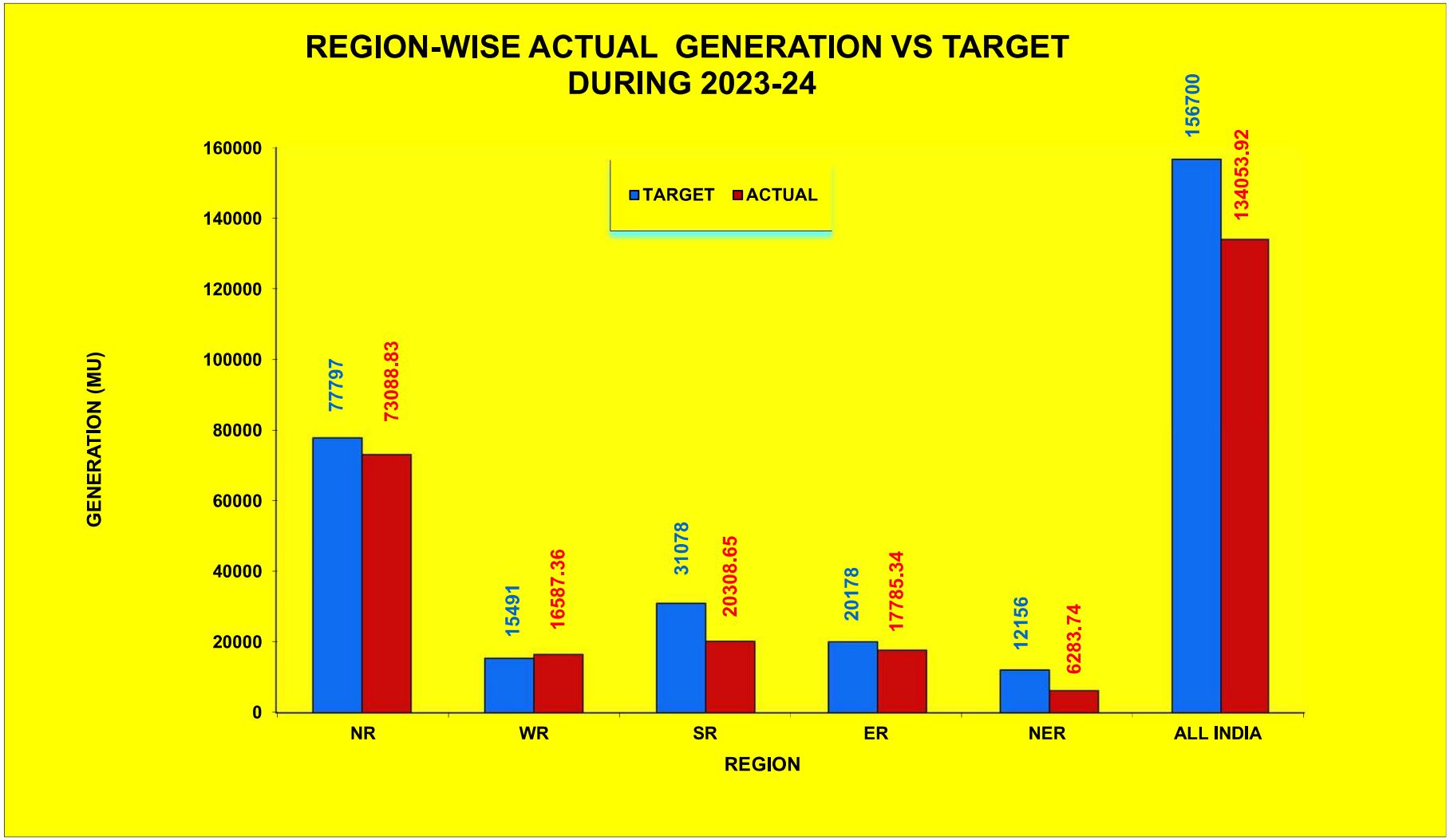
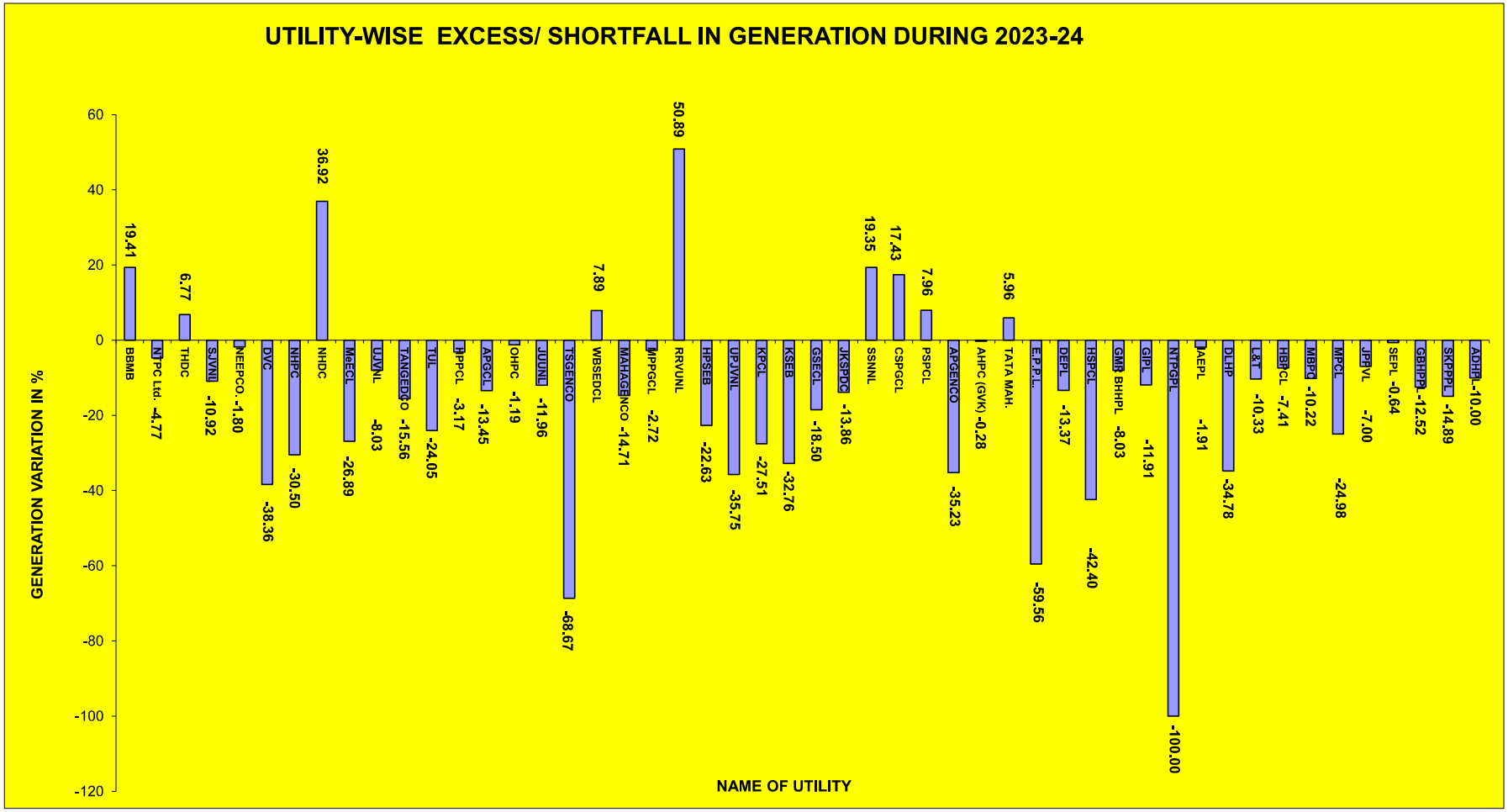

REGION-WISE ACTUAL GENERATION VS TARGET
DURING 2023-24
GENERATION (MU)
160000
140000
120000
100000
80000
60000
40000
20000
0
TARGET
ACTUAL
77797
73088.83
15491
16587.36
31078
20308.65
20178
17785.34
12156
6283.74
156700
134053.92
NR
WR
SR
ER
NER
ALL INDIA
REGION

EXHIBIT 2.3


UTILITY-WISE EXCESS/ SHORTFALL IN GENERATION DURING 2023-24
GENERATION VARIATION IN %
NAME OF UTILITY
60
40
20
0
-20
-40
-60
-80
-100
-120
BBMB 19.41
NTPC Ltd. -4.77
THDC 6.77
SJVNL -10.92
NEEPCO. -1.80
DVC -38.36
NHPC -30.50
NHDC 36.92
MeECL -26.89
UJVNL -8.03
TANGEDCO -15.56
TUL -24.05
PPCL -3.17
APGCL -13.45
OHPC -1.19
JUUNL -11.96
TSGENCO -68.67
WBSEDCL 7.89
MAHAGENCO -14.71
PPGCL -2.72
RRVUNL 50.89
HPSEB -22.63
UPJVNL -35.75
KPCL -27.51
KSEB -32.76
GSECL -18.50
UKSPDC -13.86
SSNNL 19.35
CSPGCL 17.43
PSPCL 7.96
APGENCO -35.23
AHPC (GVK) -0.28
TATA MAH. 5.96
E.P.P.L. -59.56
HSPCL -42.40
GMR BHHPL -8.03
DEPL -13.37
GIPL -11.91
NTPCPL -100.00
AEPL -1.91
DLHP -34.78
L&T -10.33
HBPCL -7.41
MBPG -10.22
MPCL -24.98
JPPVL -7.00
SEPL -0.64
GBHPPL -12.52
SKPPPL -14.89
ADHPL -10.00

Annex-2.1

REGION/SECTOR/STATION-WISE ACTUAL GENERATION VIS-A-VIS TARGET OF H.E.STATIONS (I. C. ABOVE 25 MW) IN THE COUNTRY DURING THE YEAR 2023-24

REGION/ UTILITY/ STATION	INSTALLED CAPACITY AS ON 31.03.2024 (MW)	DESIGN ENERGY (MU)	2023-24		
			TARGET	ACTUAL	% OF ACTUAL OVER TARGET
NORTHERN	19774.27	75721.26	77797.00	73088.83	93.95
WESTERN	7392.00	16636.21	15491.00	16587.36	107.08
SOUTHERN	11747.15	33900.85	31078.00	20308.65	65.35
EASTERN	5987.75	20204.84	20178.00	17785.34	88.14
NORTH EASTERN	2027.00	9412.73	12156.00	6283.74	51.69
ALL INDIA	**46928.17**	**155875.89**	**156700.00**	**134053.92**	**85.55**
IMPORT FROM BHUTAN			**8000.00**	**6742**	**84.28**
ALL INDIA (INCLUDING IMPORT FROM BHUTAN)	**46928.17**	**155875.89**	**164700.00**	**138770**	**84.26**
CENTRAL					
BBMB	2956.30	9515.00	9700.00	11583.17	119.41
NHPC LTD	5451.2	24680.3	25628.00	21585.84	84.23
SJVN LTD	1972.02	8490.08	9080.00	8088.21	89.08
NTPC LTD	800.00	3054.79	3100.00	2952.05	95.23
THDC LTD	1400.00	3952.00	4160.00	4441.69	106.77
NHDC	1520.00	3146.57	3265.00	4470.50	136.92
DVC	143.20	374.00	286.00	176.28	61.64
NEEPCO LTD	1500.00	7397.04	10366	4848.09	46.77
TOTAL CENTRAL	**15742.72**	**60609.82**	**65585.00**	**58145.83**	**88.66**
STATE					
JKSPDCL	1110.00	4833.30	5551	4781.78	86.14

Annex-2.1

REGION/SECTOR/STATION-WISE ACTUAL GENERATION VIS-A-VIS TARGET OF H.E.STATIONS (I. C. ABOVE 25 MW) IN THE COUNTRY DURING THE YEAR 2023-24

REGION/ UTILITY/ STATION	INSTALLED CAPACITY AS ON 31.03.2024 (MW)	DESIGN ENERGY (MU)	2023-24		
			TARGET	ACTUAL	% OF ACTUAL OVER TARGET
HPPCL	406.00	955.03	874.00	846.26	96.83
HPSEBL	372.00	1691.62	1653	1278.95	77.37
BVPC	0.00	0.00	0.00	0.00	0.00
RRVUNL	411.00	1046.00	672	1013.97	150.89
PSPCL	1051.00	4207.00	3665	3956.85	107.96
UPJVNL	501.60	1707.00	1324	850.64	64.25
UJVNL	1372.15	4848.10	5135	4722.42	91.97
SSNNL	1450.00	3848.00	3100	3699.72	119.35
GSECL	540.00	1598.00	1051	856.61	81.50
MAHAGENCO	2406.00	3938.00	3888	3316.20	85.29
MPPGCL	875.00	2561.64	2407	2341.49	97.28
CSPGCL	120.00	274.00	274	321.76	117.43
APGENCO	1796.75	5738.00	3605	2334.98	64.77
TSGENCO	2405.60	5045.85	3969	1243.29	31.33
KPCL	3617.20	12981.00	12242	8874.40	72.49
KSEBL	1864.15	6458.00	7668	5155.72	67.24
TANGEDCO	2178.20	4348.00	4220	3563.28	84.44
JUUNL	130.00	149.00	110	96.84	88.04
OHPC	2039.80	5676.00	5363	5299.18	98.81
TUL	1200.00	5214.00	5652	4292.76	75.95
WBSEDCL	986.00	1610.00	1560	1683.07	107.89
APGCL	100.00	390.00	380	328.89	86.55
MePGCL	322.00	1177.69	1106	808.58	73.11
TOTAL STATE	**27254.45**	**80295.23**	**75469.00**	**61667.64**	**81.71**
PRIVATE					
MPCL	86.00	370.93	332	249.06	75.02
EPPL	100.00	403.00	348	140.74	40.44
ADHPL	192.00	678.18	653.00	587.67	90.00
GBHPPL	70.00	291.73	293	256.33	87.48
HBPCL	300.00	1213.00	1213.00	1162.78	95.86

Annex-2.1

REGION/SECTOR/STATION-WISE ACTUAL GENERATION VIS-A-VIS TARGET OF H.E.STATIONS (I. C. ABOVE 25 MW) IN THE COUNTRY DURING THE YEAR 2023-24

REGION/ UTILITY/ STATION	INSTALLED CAPACITY AS ON 31.03.2024 (MW)	DESIGN ENERGY (MU)	2023-24		
			TARGET	ACTUAL	% OF ACTUAL OVER TARGET
JSW ENERGY	1045.00	4131.06	4132.00	3786.39	91.64
IAEPL	36.00	157.82	158.00	154.99	98.09
AHPC LTD	330.00	1396.84	1310	1306.39	99.72
JPVL	400.00	1774.42	1750	1627.52	93.00
DLHP	34.00	50.00	36	23.48	65.22
GIPL	110.00	537.81	537	473.07	88.09
TPCL	447.00	1220.00	1470.00	1557.60	105.96
DEPL	96.00	459.00	412	356.93	86.63
SEPL	97.00	425.05	436	433.19	99.36
SNEHA KINETIC	96.00	431.00	463	394.08	85.11
NTPGPL	0.00	0.00	50	0.00	0.00
HSPPL	100.00	524.00	402	231.57	0.00
L&T	99.00	473.00	439	394	0.00
GMR	180.00	0.00	770	708	0.00
MBPC	113.00	434.00	442	397	89.78
TOTAL PRIVATE	**3931.00**	**14970.84**	**15646**	**14240**	**91.02**
TOTAL ALL INDIA	**46928.17**	**155875.89**	**156700**	**134053.92**	**85.55**
NORTHERN REGION					
HIMACHAL PRADESH					
CENTRAL SECTOR					
BBMB					
Bhakra L&R	1415.00	3924.00	4600	5749.25	124.98
Dehar	990.00	3110.00	3000	2815.01	93.83
Pong	396.00	1123.00	1100	1807.06	164.28
Total BBMB-HP	**2801.00**	**8157.00**	**8700.00**	**10371.32**	**119.21**
NHPC					
Baira Siul	180.00	779.28	692	542.11	78.34
Chamera-I	540.00	1664.56	2224	2169.72	97.56

Annex-2.1

REGION/SECTOR/STATION-WISE ACTUAL GENERATION VIS-A-VIS TARGET OF H.E.STATIONS (I. C. ABOVE 25 MW) IN THE COUNTRY DURING THE YEAR 2023-24

REGION/ UTILITY/ STATION	INSTALLED CAPACITY AS ON 31.03.2024 (MW)	DESIGN ENERGY (MU)	2023-24		
			TARGET	ACTUAL	% OF ACTUAL OVER TARGET
Chamera-II	300.00	1499.89	1433	1208.73	84.35
Chamera-III	231.00	1108.00	1063	845.09	79.50
Parbati III	520.00	1977.23	809	293.43	36.27
Parbati II*			285	0	0.00
Total NHPC -HP	**1771.00**	**7028.96**	**6506.00**	**5059.08**	**77.76**
SJVN					
Naptha Jhakri	1500.00	6612.00	6925	6310.14	91.12
Rampur	412.02	1878.08	1940	1778.07	91.65
Total SJVN	**1972.02**	**8490.08**	**8865.00**	**8088.2**	**91.24**
NTPC					
Kol Dam	800.00	3054.79	3100	2952.05	95.23
Total NTPC	**800.00**	**3054.79**	**3100.00**	**2952.05**	**95.23**
Total Central-HP	**7344.02**	**26730.83**	**27171.00**	**26470.66**	**97.42**
STATE SECTOR					
HPPCL					
Kashang I	65.00	245.80	185	176.58	95.45
Kashang II & III	130.00				
Sainj	100.00	323.23	389	362.2	102.49
Swara Kuddu	111.00	386.00	300	307.48	96.83
Total HPPCL	**406.00**	**955.03**	**874.00**	**846.26**	**96.83**
HPSEB LTD					
Bassi	66.00	346.77	304	295.67	97.26
Giri Bata	60.00	240.00	180	232.82	129.34
Larji	126.00	586.85	619	213.47	34.49
Sanjay	120.00	518.00	550	536.99	97.63
Total HPSEB LTD	**372.00**	**1691.62**	**1653.00**	**1278.95**	**77.37**
Beas Valley Power. Corp. Ltd. (BVPC)					
Uhl-III*			0	0	
Total BVPC			0.00	0	0
PSPCL					

Annex-2.1

REGION/SECTOR/STATION-WISE ACTUAL GENERATION VIS-A-VIS TARGET OF H.E.STATIONS (I. C. ABOVE 25 MW) IN THE COUNTRY DURING THE YEAR 2023-24

REGION/ UTILITY/ STATION	INSTALLED CAPACITY AS ON 31.03.2024 (MW)	DESIGN ENERGY (MU)	2023-24		
			TARGET	ACTUAL	% OF ACTUAL OVER TARGET
Shanan	110.00	585.00	475	492.28	103.64
Total PSPCL-HP	**110.00**	**585.00**	**475.00**	**492.28**	**103.64**
Total State Sector-HP	**888.00**	**3231.65**	**3002.00**	**2617.49**	**87.19**
PRIVATE					
Allain Duhangan Power Power Ltd.					
Allain Duhangan	192.00	678.18	653	587.67	90.00
Everest Power Private Ltd.					
Malana-II	100.00	403.00	348	140.74	40.44
HBPCL					
Baspa-II	300.00	1213.00	1213	1162.78	95.86
JSW					
Karcham Wangtoo	1045.00	4131.06	4132	3786.39	91.64
GBHPPL					
Budhil	70.00	291.73	293	256.33	87.48
IA Energy Pvt. Ltd.					
Chanju I	36.00	157.82	158	154.99	98.09
Malana Power Company Ltd.					
Malana	86.00	370.93	332	249.06	75.02
NSL Tidond Power Generation Pvt. Ltd.					
Tidong*			50	0	
Himachal Sorang Power Limited (HSPL)					
Sorang	100	524	402	231.57	57.60
GMR					
Bajoli Holi	180		770	708.17	91.97
Total Private-HP	**2109.00**	**7769.72**	**8351.00**	**7277.70**	87.15
Total H.P.	**10341.02**	**37732.20**	**38524.00**	**36365.85**	**94.40**
JAMMU & KASHMIR					
CENTRAL SECTOR					
NHPC					

Annex-2.1

REGION/SECTOR/STATION-WISE ACTUAL GENERATION VIS-A-VIS TARGET OF H.E.STATIONS (I. C. ABOVE 25 MW) IN THE COUNTRY DURING THE YEAR 2023-24

REGION/ UTILITY/ STATION	INSTALLED CAPACITY AS ON 31.03.2024 (MW)	DESIGN ENERGY (MU)	2023-24		
			TARGET	ACTUAL	% OF ACTUAL OVER TARGET
Dulhasti	390.00	1907.00	2267	2087.25	92.07
Salal-I	345.00	3082.00	3503	3366.72	96.11
Salal-II	345.00		0	0	
Sewa-II	120.00	533.52	507	551.87	108.85
Uri	480.00	2587.38	2821	2426.91	86.03
Uri -II	240.00	1124.00	1623	1389.34	85.60
Kishenganga	330.00	1705.62	1712	1270.37	74.20
Total NHPC -J&K	**2250.00**	**10939.52**	**12433.00**	**11092.46**	**89.22**
Total Central Sector - J&K	**2250.00**	**10939.52**	**12433.00**	**11092.46**	**89.22**
STATE SECTOR					
JKSPDC					
Baglihar	450.00	2643.00	2751	2574.28	93.58
Baglihar II	450.00	1302.30	1700	1554.5	91.44
Lower Jhelum	105.00	533.00	650	511.17	78.64
Upper Sindh II	105.00	355.00	450	141.83	31.52
Total JKSPDC	**1110.00**	**4833.30**	**5551.00**	**4781.78**	**86.14**
Total State Sector-J&K	**1110.00**	**4833.30**	**5551.00**	**4781.78**	**86.14**
Total Jammu & Kashmir	**3360.00**	**15772.82**	**17984.00**	**15874.24**	**88.27**
LADHAK					
CENTRAL SECTOR					
NHPC					
Chutak	44.00	213.00	204	158.56	77.73
Nimoo Bazgo	45.00	239.00	226	229.92	101.73
Total Central Sector-Ladhak	**89.00**	**452.00**	**430.00**	**388.48**	**90.34**
Total Ladhak	**89.00**	**452.00**	**430.00**	**388.48**	**90.34**
PUNJAB					
CENTRAL SECTOR					
BBMB					

Annex-2.1

REGION/SECTOR/STATION-WISE ACTUAL GENERATION VIS-A-VIS TARGET OF H.E.STATIONS (I. C. ABOVE 25 MW) IN THE COUNTRY DURING THE YEAR 2023-24

REGION/ UTILITY/ STATION	INSTALLED CAPACITY AS ON 31.03.2024 (MW)	DESIGN ENERGY (MU)	2023-24		
			TARGET	ACTUAL	% OF ACTUAL OVER TARGET
Ganguwal	77.65	1358.00	500	610.75	122.15
Kotla	77.65		500	601.1	120.22
Total BBMB-Punjab	**155.30**	**1358.00**	**1000.00**	**1211.85**	**121.19**
STATE SECTOR					
PSPCL					
A.P.Sahib I & II	134.00	909.00	530	474.46	89.52
Mukerian I - IV	207.00	1206.00	1080	1147.09	106.21
Ranjit Sagar	600.00	1507.00	1580	1843.02	116.65
Total PSPCL	**941.00**	**3622.00**	**3190.00**	**3464.57**	**108.61**
Total State Sector-Punjab	**941.00**	**3622.00**	**3190.0**	**3464.57**	**108.61**
Total Punjab	**1096.30**	**4980.00**	**4190.00**	**4676.42**	**111.61**
RAJASTHAN					
STATE SECTOR					
RRVUNL					
Jawahar Sagar	99.00	298.00	200	310.46	155.23
Mahi Bajaj I & II	140.00	289.00	160	212.71	132.94
R.P. Sagar	172.00	459.00	312	490.8	157.31
Total RRVUNL	**411.00**	**1046.00**	**672.00**	**1013.97**	**150.89**
Total State sector-Rajasthan	**411.00**	**1046.00**	**672.00**	**1013.97**	**150.89**
Total Rajasthan	**411.00**	**1046.00**	**672.00**	**1013.97**	**150.89**
UTTAR PRADESH					
STATE SECTOR					
UPJVNL					
Khara	72.00	385.00	334	273.64	81.93
Matatilla	30.60	123.00	120	99.31	82.76
Obra	99.00	279.00	220	145.41	66.10
Rihand	300.00	920.00	650	332.28	51.12
Total UPJVNL	**501.60**	**1707.00**	**1324.00**	**850.64**	**64.25**

Annex-2.1

REGION/SECTOR/STATION-WISE ACTUAL GENERATION VIS-A-VIS TARGET OF H.E.STATIONS (I. C. ABOVE 25 MW) IN THE COUNTRY DURING THE YEAR 2023-24

REGION/ UTILITY/ STATION	INSTALLED CAPACITY AS ON 31.03.2024 (MW)	DESIGN ENERGY (MU)	2023-24		
			TARGET	ACTUAL	% OF ACTUAL OVER TARGET
Total State Sector-UP	**501.60**	**1707.00**	**1324.00**	**850.64**	**64.25**
Total Uttar Pradesh	**501.60**	**1707.00**	**1324.00**	**850.64**	**64.25**
UTTARAKHAND					
CENTRAL SECTOR					
NHPC					
Dhauliganga	280.00	1134.69	1165	974.11	83.61
Tanakpur	94.20	452.19	499	453.44	90.87
Total NHPC-UK	**374.20**	**1586.88**	**1664.00**	**1428**	85.79
NTPC					
Tapovan Vishnugad			0	0	
Total NTPC-UK			**0.00**	**0**	
THDC LTD					
Tehri	1000.00	2797.00	3000	3248.56	108.29
Koteshwar	400.00	1155.00	1160	1193.13	102.86
Total THDC LTD	**1400.00**	**3952.00**	**4160.00**	**4441.69**	**106.77**
SJVN					
Naitwar Mori	60.00		215	0	
Total SJVN					
Total Central Sector - UK	**1774.20**	**5538.88**	**6039.00**	**5869.24**	**97.19**
STATE SECTOR					
UJVNL					
Chibro (Y.St.II)	240.00	750.00	857	757.04	88.34
Chilla	144.00	725.00	780	706.47	90.57
Dhakrani (Y.St.I)	33.75	169.00	150	115.39	76.93
Dhalipur (Y.St.I)	51.00	192.00	223	152.81	68.52
Khatima	41.40	208.00	210	204.74	97.50
Khodri (Y.St.II)	120.00	345.00	390	366.22	93.90
Kulhal (Y.St.IV)	30.00	164.00	140	127.59	91.14
Maneri Bhali-I	90.00	395.00	462	464.1	100.45

Annex-2.1

REGION/SECTOR/STATION-WISE ACTUAL GENERATION VIS-A-VIS TARGET OF H.E.STATIONS (I. C. ABOVE 25 MW) IN THE COUNTRY DURING THE YEAR 2023-24

REGION/ UTILITY/ STATION	INSTALLED CAPACITY AS ON 31.03.2024 (MW)	DESIGN ENERGY (MU)	2023-24		
			TARGET	ACTUAL	% OF ACTUAL OVER TARGET
Maneri Bhali-II	304.00	1566.10	1310	1200.79	91.66
Ram Ganga	198.00	334.00	260	317.84	122.25
Vyasi	120.00		353	309.43	87.66
Total UJVNL	**1372.15**	**4848.10**	**5135.00**	**4722.42**	**91.97**
Total State Sector-Uttarakhand	**1372.15**	**4848.10**	**5135.00**	**4722.42**	**91.97**
PRIVATE SECTOR					
AHPC LTD					
Srinagar	330.00	1396.84	1310	1306.39	99.72
Jaiprakash Power Venture Ltd.					
Vishnu Prayag	400.00	1774.42	1750	1627.52	93.00
L&T					
Singoli Bhatwari	99.00	473	439	393.66	89.67
Total Private Sector - UK	**829.00**	**3644.26**	**3499.00**	**3327.57**	**95.10**
Total Uttarakhand	**3975.35**	**14031.24**	**14673.00**	**13919.23**	**94.86**
Total N. REGION	**19774.27**	**75721.26**	**77797.00**	**73088.83**	**93.95**
WESTERN REGION					
CHHATISGARH					
STATE SECTOR					
CSPGC					
Hasdeo Bango	120.00	274.00	274	321.76	117.43
Total CSPGC	**120.00**	**274.00**	**274.00**	**321.76**	**117.43**
Total State Sector-Chhatisgarh	**120.00**	**274.00**	**274.00**	**321.76**	**117.43**
Total Chhatisgarh	**120.00**	**274.00**	**274.00**	**321.76**	**117.43**
GUJARAT					
STATE SECTOR					
GSECL					
Kadana PSS	240.00	518.00	330.00	276.35	83.74
Ukai	300.00	1080.00	721.00	580.26	80.48

Annex-2.1

REGION/SECTOR/STATION-WISE ACTUAL GENERATION VIS-A-VIS TARGET OF H.E.STATIONS (I. C. ABOVE 25 MW) IN THE COUNTRY DURING THE YEAR 2023-24

REGION/ UTILITY/ STATION	INSTALLED CAPACITY AS ON 31.03.2024 (MW)	DESIGN ENERGY (MU)	2023-24		
			TARGET	ACTUAL	% OF ACTUAL OVER TARGET
Total GSECL	**540.00**	**1598.00**	**1051.00**	**856.61**	**81.50**
SSNNL					
Sardar Sarovar CHPH	250.00	213.00	986.00	1189.52	120.64
Sardar Sarovar RBPH	1200.00	3635.00	2114.00	2510.20	118.74
Total SSNNL	**1450.00**	**3848.00**	**3100.00**	**3699.72**	**119.35**
Total State Sector -Gujarat	**1990.00**	**5446.00**	**4151.00**	**4556.33**	**109.76**
Total Gujarat	**1990.00**	**5446.00**	**4151.00**	**4556.33**	**109.76**
MADHYA PRADESH					
CENTRAL					
NHDC					
Indira Sagar	1000.00	1980.00	2150	2999.74	139.52
Omkareshwar	520.00	1166.57	1115	1470.76	131.91
Total NHDC	**1520.00**	**3146.57**	**3265.00**	**4470.50**	**136.92**
Total Central Sector-MP			**3265.00**	**4470.50**	**136.92**
STATE SECTOR					
MPPGCL					
Bansagar Tons-I	315.00	900.00	1000	798.81	79.88
Bansagar Tons-II	30.00	113.00	90	105.56	117.29
Bansagar Tons-III	60.00	143.00	98	165.35	168.72
Bargi	90.00	508.08	420	455.09	108.35
Gandhi Sagar	115.00	420.48	270	295.45	109.43
Madhikheda	60.00	74.12	116	49.47	42.65
Rajghat	45.00	87.60	88	104.55	118.81
Total MPPGPCL	**715.00**	**2246.28**	**2082.00**	**1974.28**	**94.83**
Total State-MP	**715.00**	**2246.28**	**2082.00**	**1974.28**	**94.83**
SMHPCL(PVT.)					
Maheshwar*			0	0	
Total M.P.	**2235.00**	**5392.85**	**5347.00**	**6444.78**	**120.53**
MAHARASHTRA					
STATE SECTOR					

Annex-2.1

REGION/SECTOR/STATION-WISE ACTUAL GENERATION VIS-A-VIS TARGET OF H.E.STATIONS (I. C. ABOVE 25 MW) IN THE COUNTRY DURING THE YEAR 2023-24

REGION/ UTILITY/ STATION	INSTALLED CAPACITY AS ON 31.03.2024 (MW)	DESIGN ENERGY (MU)	2023-24		
			TARGET	ACTUAL	% OF ACTUAL OVER TARGET
MAHAGENCO					
Bhira Tail Race	80.00	75.00	85	75.31	88.60
Ghatghar PSS	250.00	146.00	384	100.49	26.17
Koyna DPH	36.00	410.00	130	175.27	134.82
Koyna St.I&II	600.00	3030.00	800	985.68	123.21
Koyna St.III	320.00		568	528.63	93.07
Koyna IV	1000.00		1667	1264.12	75.83
Tillari	60.00	133.00	110	47.22	42.93
Vaitarna	60.00	144.00	144	139.48	96.86
Total MAHAGENCO	**2406.00**	**3938.00**	**3888.00**	**3316.20**	**85.29**
MPPGPCL					
Pench	160.00	315.36	325	367.21	112.99
Total MPPGPCL-Maha.	**160.00**	**315.36**	**325.00**	**367.21**	**112.99**
Total State Sector-Maha.	**2566.00**	**4253.36**	**4213.00**	**3683.41**	**87.43**
PRIVATE SECTOR					
Dodson-Lindblom Hydro Power Pvt. Ltd. (DLHPPL)					
Bhandardhara - II	34.00	50.00	36	23.48	65.22
Total DLHP	**34.00**	**50.00**	**36.00**	**23.48**	**65.22**
Tata Power Company Ltd.					
Bhira	150.00	775.00	452	432.27	95.63
Bhira PSS	150.00		448	526.19	117.45
Bhivpuri	75.00	220.00	285	316.07	110.90
Khopoli	72.00	225.00	285	283.07	99.32
Total TPCL	**447.00**	**1220.00**	**1470.00**	**1557.60**	**105.96**
Total Private Sector-Maharashtra	**481.00**	**1270.00**	**1506.00**	**1581.08**	**104.99**
Total Maharashtra	**3047.00**	**5523.36**	**5719.00**	**5264.49**	**92.05**
Total Western	**7392.00**	**16636.21**	**15491.00**	**16587.36**	**107.08**
SOUTHERN REGION					
ANDHRA PRADESH					

Annex-2.1

REGION/SECTOR/STATION-WISE ACTUAL GENERATION VIS-A-VIS TARGET OF H.E.STATIONS (I. C. ABOVE 25 MW) IN THE COUNTRY DURING THE YEAR 2023-24

REGION/ UTILITY/ STATION	INSTALLED CAPACITY AS ON 31.03.2024 (MW)	DESIGN ENERGY (MU)	2023-24		
			TARGET	ACTUAL	% OF ACTUAL OVER TARGET
STATE SECTOR					
APGENCO					
N.J.Sagar TPD	50.00	177.00	90	0.71	0.79
N.J.Sagar RBC	90.00	156.00	128	0.09	0.07
Srisailam RB	770.00	2900.00	1047	6.07	0.58
Upper sileru I & II	240.00	529.00	470	361.67	76.95
Lower Sileru	460.00	1070.00	1084	1004.65	92.68
Total APGENCO	**1610.00**	**4832.00**	**2819.00**	**1373.19**	**48.71**
Total State Sector-AP	**1610.00**	**4832.00**	**2819.00**	**1373.19**	**48.71**
Total Andhra Pradesh	**1610.00**	**4832.00**	**2819.00**	**1373.19**	**48.71**
KARNATAKA					
STATE SECTOR					
KPCL					
Almatti Dam	290.00	483.00	510	242.06	47.46
Bhadra	26.00	123.00	60	26.73	44.55
Gerusoppa	240.00	622.00	548	347.86	63.48
Ghatprabha	32.00	131.00	86	42.74	49.70
Jog	139.20	118.00	350	342.73	97.92
Kadra	150.00	570.00	400	278.75	69.69
Kalinadi	900.00	3385.00	3000	2536.32	84.54
Supa DPH	100.00	542.00	406	425.71	104.85
Kodasali	120.00	512.00	400	283.12	70.78
Lingnamakki	55.00	254.00	301	150.07	49.86
Munirabad	28.00	66.00	96	31.65	32.97
Sharavathy	1035.00	4932.00	4800	3358.25	69.96
Shivasamudram	42.00	183.00	225	160.54	71.35
Varahi	460.00	1060.00	1060	647.87	61.12
Total KPCL	**3617.20**	**12981.00**	**12242.00**	**8874.40**	**72.49**

Annex-2.1

REGION/SECTOR/STATION-WISE ACTUAL GENERATION VIS-A-VIS TARGET OF H.E.STATIONS (I. C. ABOVE 25 MW) IN THE COUNTRY DURING THE YEAR 2023-24

REGION/ UTILITY/ STATION	INSTALLED CAPACITY AS ON 31.03.2024 (MW)	DESIGN ENERGY (MU)	2023-24		
			TARGET	ACTUAL	% OF ACTUAL OVER TARGET
APGENCO					
T.B.Dam & Hampi	72.00	236.00	160	98.77	61.73
Total APGENCO-Karnataka	**72.00**	**236.00**	**160.00**	**98.77**	**61.73**
Total State Sector-Karnataka	**3689.20**	**13217.00**	**12402.00**	**8973.17**	**72.35**
Total Karnataka	**3689.20**	**13217.00**	**12402.00**	**8973.17**	**72.35**
KERALA					
STATE SECTOR					
KSEB Ltd.					
Idamalayar	75.00	380.00	380	198.2	52.16
Idukki	780.00	2398.00	2632	1644.53	62.48
Kakkad	50.00	262.00	271	188.92	69.71
Kuttiadi & Kuttiady Addl.	225.00	323.00	752	522.57	69.49
Lower Periyar	180.00	493.00	624	489.07	78.38
Neriamangalam	52.65	237.00	351	182.62	52.03
Pallivasal	37.50	284.00	162	157.29	97.09
Pallivasal New			86	0	0.00
Panniar	30.00	158.00	172	164.75	95.78
Poringalkuthu	32.00	170.00	319	96.23	30.17
Sabarigiri	300.00	1338.00	1401	1129.52	80.62
Sengulam	48.00	182.00	182	132.24	72.66
Sholayar	54.00	233.00	237	249.78	105.39
Thottiyar			99	0	0.00
Total KSEB LTD.	**1864.15**	**6458.00**	**7668.00**	**5155.72**	**67.24**
Total State Sector-Kerala	**1864.15**	**6458.00**	**7668.00**	**5155.72**	**67.24**
Total Kerala	**1864.15**	**6458.00**	**7668.00**	**5155.72**	**67.24**
TAMIL NADU					
STATE SECTOR					
TANGEDCO					
Aliyar	60.00	175.00	130	98.37	75.67

Annex-2.1

REGION/SECTOR/STATION-WISE ACTUAL GENERATION VIS-A-VIS TARGET OF H.E.STATIONS (I. C. ABOVE 25 MW) IN THE COUNTRY DURING THE YEAR 2023-24

REGION/ UTILITY/ STATION	INSTALLED CAPACITY AS ON 31.03.2024 (MW)	DESIGN ENERGY (MU)	2023-24		
			TARGET	ACTUAL	% OF ACTUAL OVER TARGET
Bhawani K Barrage-III	30.00	90.00	68	33.45	49.19
Bhawani K Barrage-II	30.00	100.00	68	54.67	80.40
Bhawani K Barrage-I	30.00	80.00	36	78.1	216.94
Kadamparai PSS	400.00	77.00	378	132.36	35.02
Kodayar I&II	100.00	165.00	75	136.32	181.76
Kundah I-V	555.00	1387.00	1233	1329.08	107.79
Lower Mettur I-IV	120.00	252.00	248	192.65	77.68
Mettur Dam	50.00	541.00	130	83.44	64.18
Mettur Tunnel	200.00		301	144.65	48.06
Moyar	36.00	115.00	79	92.22	116.73
Papanasam	32.00	105.00	120	105.46	87.88
Parson's Valley	30.00	53.00	40	24.1	60.25
Periyar	161.00	409.00	475	440.08	92.65
Pykara	59.20	274.00	35	3.07	8.77
Pykara Ultimate	150.00	30.00	301	308.29	102.42
Sarkarpathy	30.00	162.00	117	77.61	66.33
Sholayar I	70.00	254.00	300	202.87	67.62
Suruliyar	35.00	79.00	86	26.49	30.80
Total TANGEDCO	**2178.20**	**4348.00**	**4220.00**	**3563.28**	**84.44**
Total State Sector-TN	**2178.20**	**4348.00**	**4220.00**	**3563.28**	**84.44**
Total Tamilnadu	**2178.20**	**4348.00**	**4220.00**	**3563.28**	**84.44**
TELANGANA					
STATE SECTOR					
TSGENCO					
Lower Jurala	240.00	534.43	320	111.61	34.88
N.J.Sagar PSS	815.60	2237.00	1400	540.7	38.62
N.J.Sagar LBC	60.00	104.00	69	0	0.00
Pochampad	36.00	147.00	60	76.02	126.70
Priyadarshni Jurala	234.00	404.00	320	101.15	31.61

Annex-2.1

REGION/SECTOR/STATION-WISE ACTUAL GENERATION VIS-A-VIS TARGET OF H.E.STATIONS (I. C. ABOVE 25 MW) IN THE COUNTRY DURING THE YEAR 2023-24

REGION/ UTILITY/ STATION	INSTALLED CAPACITY AS ON 31.03.2024 (MW)	DESIGN ENERGY (MU)	2023-24		
			TARGET	ACTUAL	% OF ACTUAL OVER TARGET
Pulichinthala	120.00	219.42	200	101.98	50.99
Srisailam LB	900.00	1400.00	1600	311.83	19.49
Total TSGENCO	**2405.60**	**5045.85**	**3969.00**	**1243.29**	**31.33**
Total State Sector-Telangana	**2405.60**	**5045.85**	**3969.00**	**1243.29**	**31.33**
Total Telangana	**2405.60**	**5045.85**	**3969.00**	**1243.29**	**31.33**
Total Southern	**11747.15**	**33900.85**	**31078.00**	**20309**	**65.35**
EASTERN REGION					
JHARKHAND					
CENTRAL SECTOR					
DVC					
Panchet	80.00	237.00	142	99.96	70.39
Total DVC	**80.00**	**237.00**	**142.00**	**99.96**	70.39
Total Central Sector-Jharkhand	**80.00**	**237.00**	**142.00**	**99.96**	70.39
STATE SECTOR					
JUUNL					
Subernarekha I&II	130.00	149.00	110	96.84	88.04
Total Jharkhand	**130.00**	**149.00**	**110.00**	**96.84**	**88.04**
Total State Sector-Jharkhand	**130.00**	**149.00**	**110.00**	**96.84**	**88.04**
Total Jharkhand	**210.00**	**386.00**	**252.00**	**196.80**	**78.10**
ODISHA					
STATE SECTOR					
OHPC					
Balimela	510.00	1183.00	1183	1035.25	87.51
Hirakud I&II	359.80	1174.00	980	1177.05	120.11
Rengali	250.00	525.00	950	779.51	82.05
Upper Indravati	600.00	1962.00	1600	1726.1	107.88
Upper Kolab	320.00	832.00	650	581.27	89.43
Total OHPC	**2039.80**	**5676.00**	**5363.00**	**5299.18**	**98.81**

Annex-2.1

REGION/SECTOR/STATION-WISE ACTUAL GENERATION VIS-A-VIS TARGET OF H.E.STATIONS (I. C. ABOVE 25 MW) IN THE COUNTRY DURING THE YEAR 2023-24

REGION/ UTILITY/ STATION	INSTALLED CAPACITY AS ON 31.03.2024 (MW)	DESIGN ENERGY (MU)	2023-24		
			TARGET	ACTUAL	% OF ACTUAL OVER TARGET
APGENCO					
Machkund	114.75	670.00	626	863.02	137.86
Total APGENCO-Odisha	**114.75**	**670.00**	**626.00**	**863.02**	**137.86**
Total State Sector-Odisha	**2154.55**	**6346.00**	**5989.00**	**6162.20**	**102.89**
Total Odisha	**2154.55**	**6346.00**	**5989.00**	**6162.20**	**102.89**
SIKKIM					
CENTRAL SECTOR					
NHPC					
Rangit	60.00	338.61	318	297.01	93.40
Teesta-V	510.00	2572.70	2694	1965.98	72.98
Total NHPC	**570.00**	**2911.31**	**3012.00**	**2262.99**	**75.13**
Total Central Sector-Sikkim	**570.00**	**2911.31**	**3012.00**	**2262.99**	**75.13**
STATE SECTOR					
Sikkim Urja Ltd. (SUL)					
Teesta III	1200.00	5214.00	5652	4292.76	75.95
Total TUL	**1200.00**	**5214.00**	**5652.00**	**4292.76**	**75.95**
Total State Sector-Sikkim	**1200.00**	**5214.00**	**5652.00**	**4292.76**	**75.95**
PRIVATE SECTOR					
DANS Energy Pvt. Ltd. (DEPL)					
Jorethang Loop	96.00	459.00	412	356.93	86.63
Shiga Energy Pvt. Ltd.(SEPL)					
Tashiding	97.00	425.05	436	433.19	99.36
Gati Infrastructure Pvt. Ltd. (GIPL)					
Chuzachen HEP	110.00	537.81	537	473.07	88.09
Sneha Kinetic					
Dikchu	96.00	431.00	463	394.08	85.11

Annex-2.1

REGION/SECTOR/STATION-WISE ACTUAL GENERATION VIS-A-VIS TARGET OF H.E.STATIONS (I. C. ABOVE 25 MW) IN THE COUNTRY DURING THE YEAR 2023-24

REGION/ UTILITY/ STATION	INSTALLED CAPACITY AS ON 31.03.2024 (MW)	DESIGN ENERGY (MU)	2023-24		
			TARGET	ACTUAL	% OF ACTUAL OVER TARGET
MBPC					
Rongnichu	113.00	434.00	442	396.83	89.78
Total Private-Sikkim	**512.00**	**2286.86**	**2290.00**	**2054**	**89.70**
Total Sikkim	**2282.00**	**10412.17**	**10954.00**	**8609.85**	**78.60**
WEST BENGAL					
CENTRAL SECTOR					
NHPC					
Teesta Low Dam-III	132.00	594.00	559	418.91	74.94
Teesta Low Dam-IV	160.00	719.67	720	638.19	88.64
Total NHPC	**292.00**	**1313.67**	**1279.00**	**1057.10**	82.65
DVC					
Maithon	63.20	137.00	144	76.32	53.00
Total DVC-WB	**63.20**	**137.00**	**144.00**	**76.32**	**53.00**
Total Central Sector-WB	**355.20**	**1450.67**	**1423.00**	**1133.42**	**79.65**
STATE SECTOR					
WBSEDCL					
Jaldhaka I	36.00	165.00	142	153.21	107.89
Purulia PSS	900.00	1235.00	1200	1366.95	113.91
Rammam II	50.00	210.00	218	162.91	74.73
Total WBSEDCL	**986.00**	**1610.00**	**1560.00**	**1683.07**	107.89
Total State Sector -WB	**986.00**	**1610.00**	**1560.00**	**1683.07**	107.89
Total West Bengal	**1341.20**	**3060.67**	**2983.00**	**2816.49**	94.42
Total Eastern	**5987.75**	**20204.84**	**20178.00**	**17785.34**	88.14
NORTH EASTERN REGION					
ARUNACHAL PRADESH					
CENTRAL SECTOR					
NHPC					
Lower Subansiri			5429	0	0.00

Annex-2.1

REGION/SECTOR/STATION-WISE ACTUAL GENERATION VIS-A-VIS TARGET OF H.E.STATIONS (I. C. ABOVE 25 MW) IN THE COUNTRY DURING THE YEAR 2023-24

REGION/ UTILITY/ STATION	INSTALLED CAPACITY AS ON 31.03.2024 (MW)	DESIGN ENERGY (MU)	2023-24		
			TARGET	ACTUAL	% OF ACTUAL OVER TARGET
Total NHPC-Ar. Pradesh			**5429.00**	**0**	**0**
NEEPCO					
Kameng	600.00	3353.00	2500	2652.13	106.09
Pare	110.00	506.42	480	448.66	93.47
Ranganadi	405.00	1509.66	1233	1177.39	95.49
Total NEEPCO-Arunachal Pradesh	**1115.00**	**5369.08**	**4213.00**	**4278.18**	**101.55**
Total Central Sector-Arunachal Pradesh			**4213.00**	**4278.18**	**101.55**
Total Arunachal Pradesh	**1115.00**	**5369.08**	**9642.00**	**4278.18**	**44.37**
ASSAM					
CENTRAL SECTOR					
NEEPCO					
Kopili	200.00	1186.14	338	285.81	84.56
Khandong	50.00	363.95	0	0	
Total NEEPCO-Aassm	**250.00**	**1550.09**	**338.00**	**285.81**	**84.56**
Total Central Sector-Assam	**250.00**	**1550.09**	**338.00**	**285.81**	**84.56**
STATE SECTOR					
APGCL					
Karbi Langpi	100.00	390.00	380	328.89	86.55
Total APGCL	**100.00**	**390.00**	**380.00**	**328.89**	**86.55**
Total State Sector-Assam	**100.00**	**390.00**	**380.00**	**328.89**	**86.55**
Total Assam	**350.00**	**1940.09**	**718.00**	**614.70**	**85.61**
NAGALAND					
CENTRAL SECTOR					
NEEPCO					
Doyang	75.00	227.24	216	165.47	76.61

Annex-2.1

REGION/SECTOR/STATION-WISE ACTUAL GENERATION VIS-A-VIS TARGET OF H.E.STATIONS (I. C. ABOVE 25 MW) IN THE COUNTRY DURING THE YEAR 2023-24

REGION/ UTILITY/ STATION	INSTALLED CAPACITY AS ON 31.03.2024 (MW)	DESIGN ENERGY (MU)	2023-24		
			TARGET	ACTUAL	% OF ACTUAL OVER TARGET
Total NEEPCO-Nagaland	**75.00**	**227.24**	**216.00**	**165.47**	**76.61**
Total Central Sector-Nagaland	**75.00**	**227.24**	**216.00**	**165.47**	**76.61**
Total Nagaland	**75.00**	**227.24**	**216.00**	**165.47**	**76.61**
MANIPUR					
CENTRAL SECTOR					
NHPC					
Loktak (Manipur)	105.00	448.00	304	298.18	98.09
Total NHPC-Manipur	**105.00**	**448.00**	**304.00**	**298.18**	**98.09**
Total Central Sector-Manipur	**105.00**	**448.00**	**304.00**	**298.18**	**98.09**
Total Manipur	**105.00**	**448.00**	**304.00**	**298.18**	**98.09**
MEGHALAYA					
STATE SECTOR					
MePGCL					
Kyrdemkulai	60.00	118.00	139	111.32	80.09
Myntdu	126.00	128.00	461	304.05	65.95
New Umtru	40.00	235.00	183	163.59	89.39
Umium St.I	36.00	324.00	116	85.45	73.66
Umium St.IV	60.00	372.69	207	144.17	69.65
Total MePGCL	**322.00**	**1177.69**	**1106.00**	**808.58**	**73.11**
Total State Sector-Meghalaya	**322.00**	**1177.69**	**1106.00**	**808.58**	**73.11**
Total Meghalaya	**322.00**	**1177.69**	**1106.00**	**808.58**	**73.11**
MIZORAM					
CENTRAL SECTOR					
Tuirial	60.00	250.63	170	118.63	69.78
Total NEEPCO-Mizoram	**60.00**	**250.63**	**170.00**	**118.63**	**69.78**
Total Central Sector-Mizoram	**60.00**	**250.63**	**170.00**	**118.63**	**69.78**

Annex-2.1

REGION/SECTOR/STATION-WISE ACTUAL GENERATION VIS-A-VIS TARGET OF H.E.STATIONS (I. C. ABOVE 25 MW) IN THE COUNTRY DURING THE YEAR 2023-24

REGION/ UTILITY/ STATION	INSTALLED CAPACITY AS ON 31.03.2024 (MW)	DESIGN ENERGY (MU)	2023-24		
			TARGET	ACTUAL	% OF ACTUAL OVER TARGET
Total Mizoram	60.00	250.63	170.00	118.63	69.78
Total N.Eastern	2027.00	9412.73	12156.00	6283.74	51.69
Total All India	46928.17	155875.89	156700.00	134053.92	85.55
IMPORT FROM BHUTAN			8000.00	4716.10	58.95
Total All India (Including Bhutan Imports)	46928.17	155875.89	164700.00	138770.02	84.26

CHAPTER-3

MAJOR RESERVOIR BASED HE STATIONS

CHAPTER – 3

MAJOR RESERVOIR/ STORAGE BASED H.E. STATIONS

3.1 Introduction

Some of the hydro-electric schemes are provided with storage reservoirs. The excess water during monsoon period after generation is stored in these reservoirs which are utilized to augment flows during non-monsoon period. The regulated discharges from reservoirs are utilized for power generation, irrigation and other purposes. Reservoir based schemes are of two types i.e. single purpose and multipurpose. Single purpose schemes are operated in the interest of power generation while the mmultipurpose storage schemes are operated for more than one purpose with irrigation, water supply, flood control, pisciculture, navigation, etc. as primary objectives and power generation as incidental. Reservoir based schemes afford greater utilization of the available inflows approaching to long term average inflows resulting in greater firm power benefits. These schemes are the source of flexible generation and can be operated as base load or peaking station depending upon the requirement of the Grid System.

3.2 Major Reservoir Based Stations

CEA is presently monitoring 44 H.E. Stations of aggregate installed capacity of 18295.65 MW in the country on 37 major reservoirs as listed below:

S. No.	H.E. Stations	Installed Capacity (MW)	Utility	State	Reservoirs	
					Name	Multipurpose (MP)/ Storage (S) for Power Only
	Northern Region					
1	Bhakra (L)	630	BBMB	Himachal Pradesh	Bhakra	MP
2	Bhakra (R)	785	BBMB			
3	Pong	396	BBMB		Pong	MP
4	Chamera-I	540	NHPC	Himachal Pradesh	Chamera	S
5	Ranjit Sagar	600	PSPCL	Punjab	Ranjit Sagar	MP
6	Tehri	1000	THDC	Uttarakhand	Tehri	MP
7	Ram Ganga	198	UJVNL	Uttarakhand	Ram Ganga	MP
8	Rihand	300	UPJVNL	Uttar Pradesh	Rihand	MP
9	RP Sagar	172	RRVUNL	Rajasthan	RP Sagar	MP
Sub-Total (NR)		**4621**				

S. No.	H.E. Stations	Installed Capacity (MW)	Utility	State	Reservoirs	
					Name	Multipurpose (MP)/ Storage for Power Only
	Western Region					
10	Ukai	300	GSECL	Gujarat	Ukai	MP
11	Sardar Sarovar (RBPH)	1200	SSNNL	Gujarat	Sardar Sarovar	MP
12	Gandhi Sagar	115	MPPGCL	Madhya Pradesh	Gandhi Sagar	MP
13	Bansagar-III	30	MPPGCL	Madhya Pradesh	Bansagar	MP
14	Indira Sagar	1000	NHDC	Madhya Pradesh	Indira Sagar	MP
15	Koyna-I&II	600	MAHAGENCO	Maharashtra	Koyna	MP
16	Koyna-IV	1000	MAHAGENCO	Maharashtra		
17	Koyna DPH	36	MAHAGENCO	Maharashtra		
18	Pench	160	MPPGCL	Maharashtra	Pench	MP
19	Bhira	150	TPCL	Maharashtra	Bhira	MP
20	Bhira PSS	150				
Sub-Total (WR)		**4741**				
	Southern Region					
21	Upper Sileru	240	APGENCO	Andhra Pradesh	Sileru	S
22	Lower Sileru	460	APGENCO	Andhra Pradesh		
23	Srisailam RB	770	APGENCO	Andhra Pradesh	Srisailam	MP
24	NJ Sagar + NJ Sagar PSS	815.6	TSGENCO	Telangana	Nagarjuna Sagar	MP
25	Sharavathy	1035	KPCL	Karnataka	Sharavathy	S
26	Kalinadi (Nagjhari)	900	KPCL	Karnataka	Supa	S
27	Supa DPH	100	KPCL	Karnataka		
28	Almatti	290	KPCL	Karnataka	Almatti	MP
29	Varahi	460	KPCL	Karnataka	Varahi	S
30	Idukki	780	KSEB	Kerala	Idukki	MP
31	Sabarigiri	300	KSEB	Kerala	Sabarigiri	MP
32	Pallivasal	37.5	KSEB	Kerala	Madupetty	S
33	Idamalayar	75	KSEB	Kerala	Idamalayar	MP
34	Mettur Dam	50	TANGEDCO	Tamil Nadu	Mettur	MP

S. No.	H.E. Stations	Installed Capacity (MW)	Utility	State	Reservoirs	
					Name	Multipurpose (MP)/ Storage for Power Only
35	Mettur Tunnel	200	TANGEDCO	Tamil Nadu	Mettur	MP
36	Periyar	161	TANGEDCO	Tamil Nadu	Periyar	MP
Sub-Total (SR)		**6674.10**				
	Eastern and North Eastern Region					
37	Machkund	114.75	APGENCO	Odisha	Machkund	MP
38	Hirakud I (Burla)	287.8	OHPC	Odisha	Hirakud	MP
39	Hirakud II (Chiplima)	72				
40	Balimela	510	OHPC	Odisha	Balimela	MP
41	Indravati	600	OHPC	Odisha	Indravati	MP
42	Upper Kolab	320	OHPC	Odisha	Upper Kolab	MP
43	Rengali	250	OHPC	Odisha	Rengali	MP
44	Loktak	105	NHPC	Manipur	Loktak	MP
Sub-Total (ER/NER)		**2259.55**				
Total (All India)		**18295.65**				

Salient details of 37 Nos. Major reservoirs are indicated in **Annex-3.1**. These stations constitute about 33.35% (30.93% Multipurpose & 2.42% Storage for power only) of the total hydel installed capacity and generated about 29.17% (26.35% Multipurpose & 2.82% Storage for power only) of the total Hydel generation during 2023-24 as briefly indicated in **Table-3.1.**

TABLE - 3.1

CONTRIBUTION BY IMPORTANT RESERVOIR (STORAGE) BASED H.E. STATIONS

S. No.	Description	Major Reservoir Based Stations		Other Stations	Total
		Multipurpose (MP)	Storage for Power only		
1.	Installed Capacity (MW)	14517.15	1135	31276.02	46928.17
	Percentage of Total (%)	30.93	2.42	66.65	100
2.	Energy Generation (MU)	35319.66	3783.96	94950.30	134054
	Percentage of Total (%)	26.35	2.82	70.83	100

3.3 Inflows

Inflows to the reservoirs are primarily dependent on rainfall during monsoon in the catchment area of the reservoirs. However, in case of the hydro projects in Himalayan Region including Bhakra, Pong, Ranjit Sagar and Tehri projects etc., snow melt in the catchment area during summer also contributes to their inflows. The inflows into the reservoirs during 2023-24 vis-à-vis 2022-23 are given at **Exhibit 3.1**. Inflows into the reservoirs and generation during the year 2023-24 vis-à-vis 2022-23 and 10 years average is given below at **Table-3.2.**

TABLE 3.2

HYDRO RESERVOIRS (STORAGE TYPE) - INFLOW & ENERGY GENERATION

S. No.	STATION	Inflows				Generation			
		10 years Average (MCM)	2022-23 (MCM)	2023-24 (MCM)	2023-24 Inflow as % of 2022-23 inflow	10 years Average (MU)	2022-23 (MU)	2023-24 (MU)	2023-24 generation as compared to 2022-23 (%)
1	2	3	4	5	6=(5/4*100)	7	8	9	10=(9/8*100)
Northern Region									
1	Bhakra	1662	15885	17775	89	5240	5025	5749	114
2	Pong	8808	8607	12841	67	1525	1564	1807	116
3	Ranjit Sagar	84014	74329	90794	82	1650	1508	1843	122
4	Chamera-I*	6694	5244	6830	77	2311	1889	2170	115
5	Tehri	7080	7390	7263	102	3124	3285	3249	99
6	Ram Ganga	509182	45594	65502	70	276	387	318	82
7	RP Sagar	0.059	0.082	0.051	0	311	409	491	120
8	Rihand	5032	3287	3727	88	550	359	332	93
Sub Total (NR)		**622473**	**160336**	**204732**	78	**14986**	**14426**	**15959**	**111**
Western Region									
9	Ukai	8954	17093	8182	209	572	977	580	59
10	Sardar Sarovar	26218	41978	31512	133	1886	3551	2510	71
11	Gandhi Sagar	5773	7275	5336	136	259	289	295	102
12	Bansagar*	5261	6229	5375	116	97	138	165	120
13	Pench*	1637	2991	1614	185	309	365	367	101
14	Indira Sagar	23676	42728	30006	142	2408	3661	3000	82
15	Koyna	3379	4222	3038	139	3020	3305	2778	84
16	Bhira	997	1258	881	143	894	940	958	102
Sub Total (WR)		**75894**	**123774**	**85943**	**144**	**9444**	**13226**	**10655**	**81**

	Southern Region								
S. No.	STATION	Inflows				Generation			
		10 years Average (MCM)	2022-23 (MCM)	2023-24 (MCM)	2023-24 Inflow as % of 2022-23 inflow	10 years Average (MU)	2022-23 (MU)	2023-24 (MU)	2023-24 generation as compared to 2022-22 (%)
1	2	3	4	5	6= (5/4*100)	7	8	9	10= (9/8*100)
17	Srisailam	23359	45579	3828	1191	895	1883	6	0.3
18	Upper Sileru	2218	1796	1726	104	466	390	362	93
19	Lower Sileru	3458	3034	2847	107	1068	1079	1005	93
20	N.J. Sagar	-	48691	4107	1186	975	2355	541	23
21	Sharavathy	0	18554	6359	292	4143	5221	3358	64
22	Supa	2745	2934	2304	127	3109	3220	2962	92
23	Almatti	0	18554	6359	292	453	627	242	39
24	Varahi	628	687	427	161	992	1231	648	53
25	Idukki	1799	2196	1243	177	2375	3262	1645	50
26	Sabarigiri	701	1147	1367	84	1273	1532	1130	74
27	Madupetty	-	153	64	239	171	148	157	107
28	Idamalayar	1234	1591	827	192	295	409	198	48
29	Mettur	6884	20039	2084	962	420	1024	228	22
30	Periyar	650	734	523	140	479	662	440	66
Sub Total (SR)		**43675**	**165688**	**34064**	486	**17115**	**23043**	**12921**	**56**
Eastern Region									
31	Machkund	1462	1406	1376	102	622	544	863	159
32	Hirakud	26133	34112	31463	108	883	1231	1177	96
33	Balimela	3960	3035	3716	82	1245	1005	1035	103
34	Indravati	3519	2277	9152	25	1814	1380	1726	125
35	Upper Kolab	1391	1338	1598	84	697	544	581	107
36	Rengali	11075	8810	14606	60	758	759	780	103
Sub Total (ER)		**47540**	**50979**	**61912**	82	**6019**	**5463**	**6162**	**113**
North Eastern Region									
37	Loktak	2174	1934	869	223	531	478	298	62
Sub Total (NER)		**2242**	**2242**	**1934**	**869**	223	**531**	**478**	**298**
Total (All India)		**314492**	**791825**	**502711**	**387520**	130	**48095**	**56635**	**45995**

3.4 Reservoir Levels

The maximum reservoir level attained during the year depends on the depleted reservoir level in the preceding year, besides the inflows during the current year. Water level touched FRL at Tehri, Ukai, Sardar Sarovar, Pench, Bhira, Almatti, Rengali and Loktak reservoirs during 2023-24. Month-wise maximum levels of major reservoirs during 2023-24 vis-à-vis 2022-23 are indicated at **Exhibits 3.2** to **Exhibits 3.11**.

3.5 Generation

Generation from reservoir (storage) based H.E. Stations during the year, apart from priorities of releases for other purposes like irrigation, drinking water etc., depends on various factors such as water level of the reservoir at the end of the preceding year, inflows during the year, draw down level by the end of the year, availability of generating units etc. In 18 Nos. out of 44 Nos. reservoir based hydel stations, annual generation during the year 2023-24 was more than the annual generation targets. Generation from 44 H.E. Stations on 37 major reservoirs during the year 2022-23 has been 45995.02 MU, showing decrease by 18.79 % over the 2022-23 generation of 56635.24 MU. Station-wise generation of reservoir stations during the year 2023-24 as compared to that of last year 2022-23 is shown in **Table 3.2** above. The reservoir based stations have been grouped in terms of percentage achievement of generation over targets in **Table 3.3** below:

TABLE 3.3

GENERATION PERFORMANCE OF MAJOR RESERVOIR BASED STATIONS

S. No.	% of Actual Generation over Target	Reservoir based Stations		
		No.	% of total Reservoir based Stations	Name
1	120 & Above	10	22.73	Bhakra, Pong, R. P. Sagar, Ramganga, Ban Sagar, Indira Sagar, Machkund & Hirakund
2	110 - 120	3	6.82	Ranjit Sagar, Sardar Sarovar (RBPH) & Pench
3	100 - 110	5	11.36	Tehri, Gandhi Sagar, Bhira & Upper Indravati
4	Below 100	26	59.09	Chamera-I, Rihand, Ukai, Koyna, Upper Sileru, Lower Sileru, Ngarjuna Sagar, Srisailam, Sharavathy, Kalinadi Supa, Almatti, Varahi, Idukki, Sabirigiri, Madupetty / Pallivasal, Idamalayar, Mettur Tunnel, Periyar, Balimela, Rengali, Upper Kolab & Loktak

Generation of major reservoir based H.E. stations during 2023-24 as compared to the generation during last year i.e. 2022-23 is also depicted at **Exhibit-3.12**.

EXHIBIT-3.1

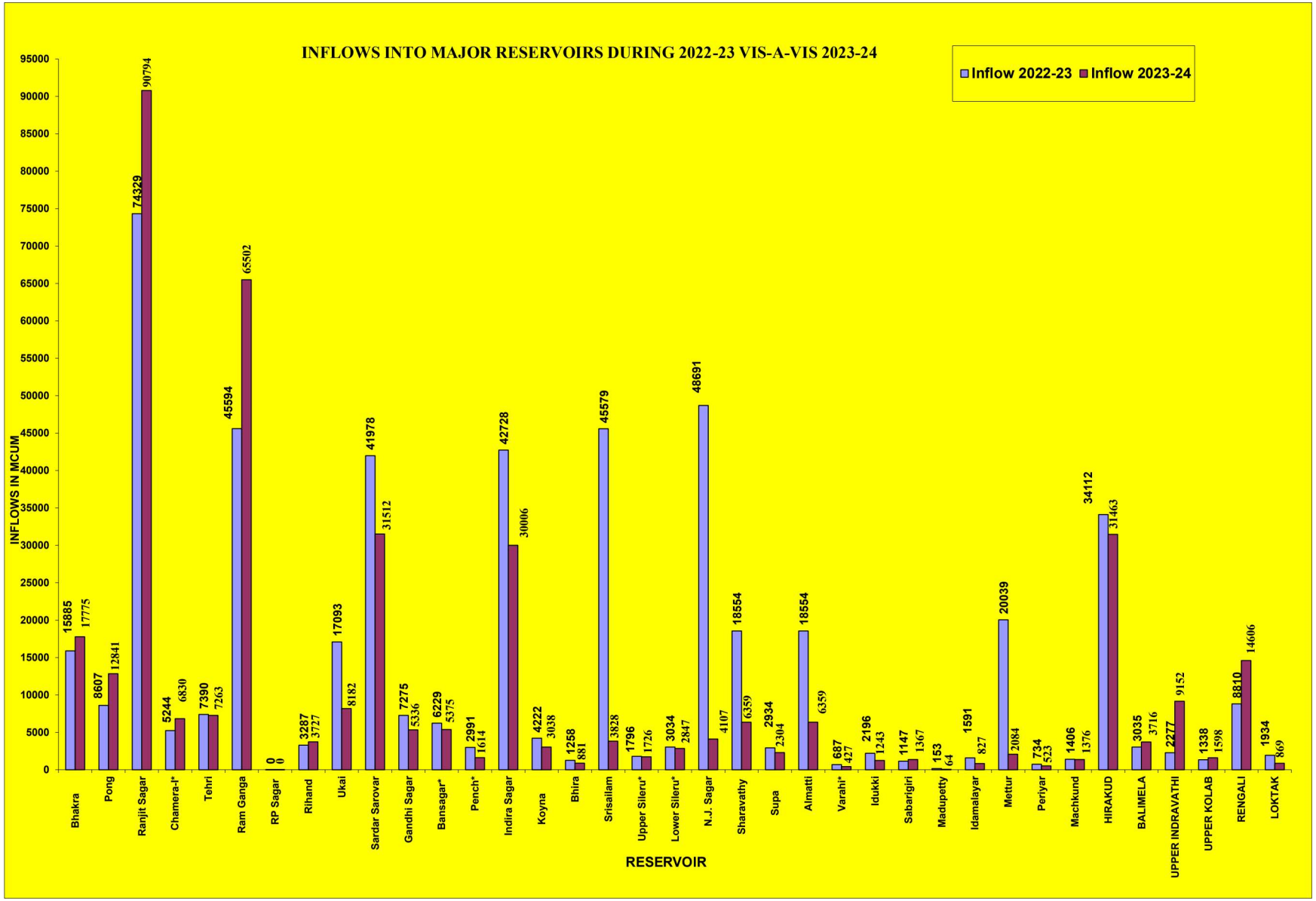
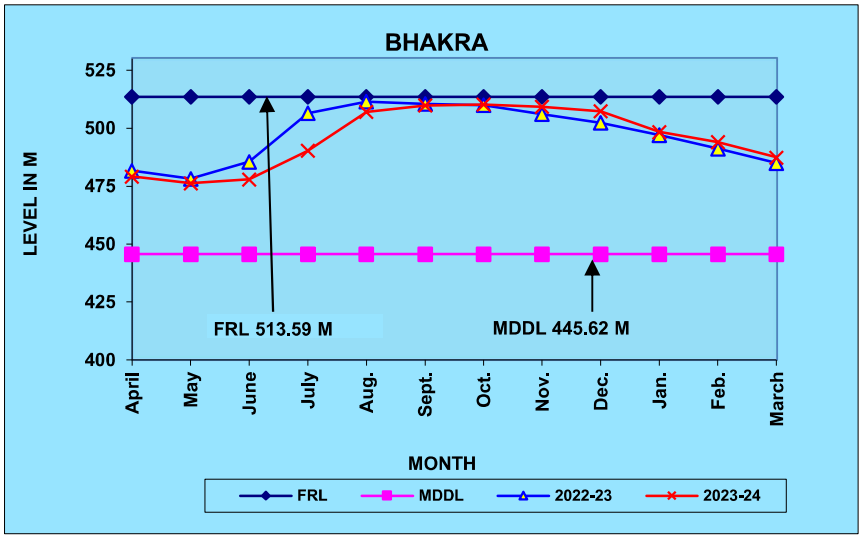
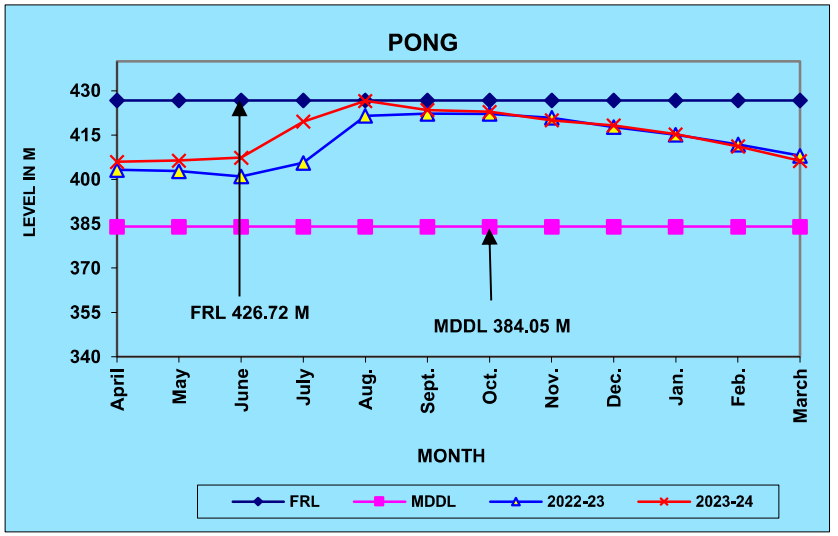
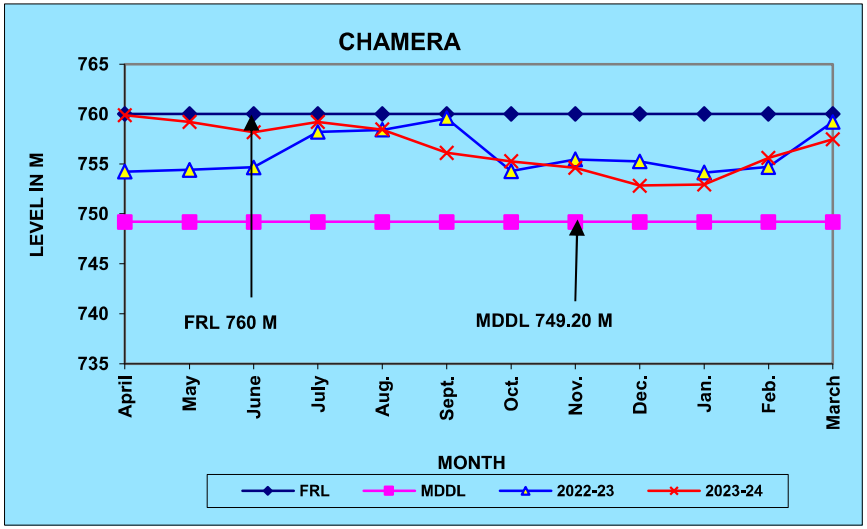

INFLOWS INTO MAJOR RESERVOIRS DURING 2022-23 VIS-A-VIS 2023-24
Inflow 2022-23
Inflow 2023-24
INFLOWS IN MCUM
RESERVOIR
Bhakra 15885 17775
Pong 8607 12841
Ranjit Sagar 74329 90794
Chamera-I* 5244 6830
Tehri 7390 7263
Ram Ganga 45594 65502
RP Sagar 0 0
Rihand 3287 3727
Ukai 17093 8182
Sardar Sarovar 41978 31512
Gandhi Sagar 7275 5336
Bansagar* 6229 5375
Pench* 2991 1614
Indira Sagar 42728 30006
Koyna 4222 3038
Bhira 1258 881
Srisailam 45579 3828
Upper Sileru* 1796 1726
Lower Sileru* 3034 2847
N.J. Sagar 48691 4107
Sharavathy 18554 6359
Supa 2934 2304
Almatti 18554 6359
Varahi* 687 427
Idukki 2196 1243
Sabarigiri 1147 1367
Madupetty 153 64
Idamalayar 1591 827
Mettur 20039 2084
Periyar 734 523
Machkund 1406 1376
HIRAKUD 34112 31463
BALIMELA 3035 3716
UPPER INDRAVATHI 2277 9152
UPPER KOLAB 1338 1598
RENGALI 8810 14606
LOKTAK 1934 869

EXHIBIT 3.2

MONTH-WISE MAXIMUM LEVEL OF IMPORTANT RESERVOIRS







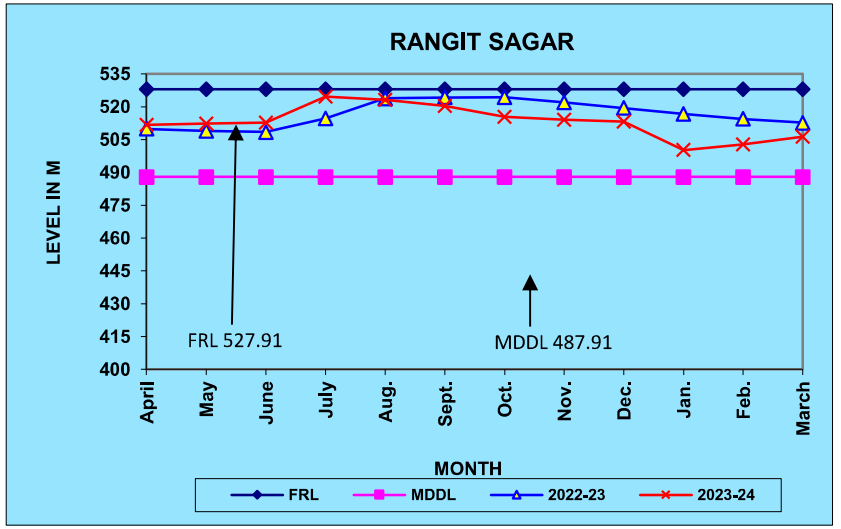
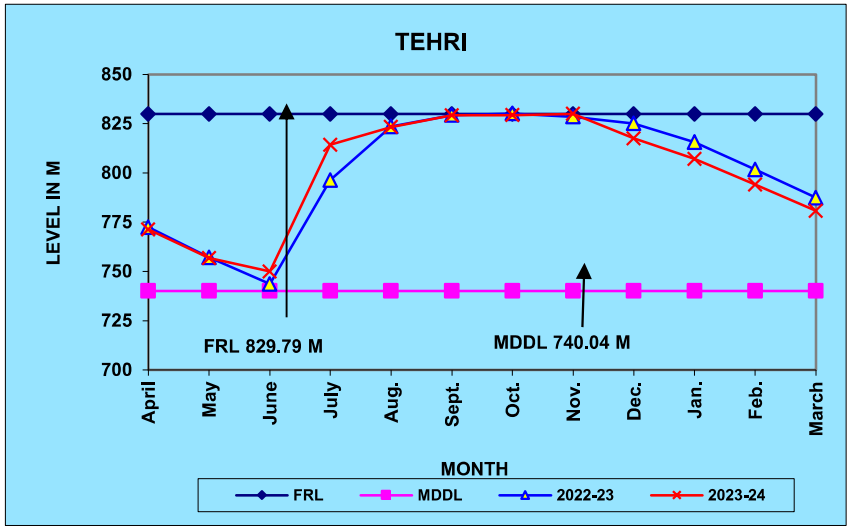
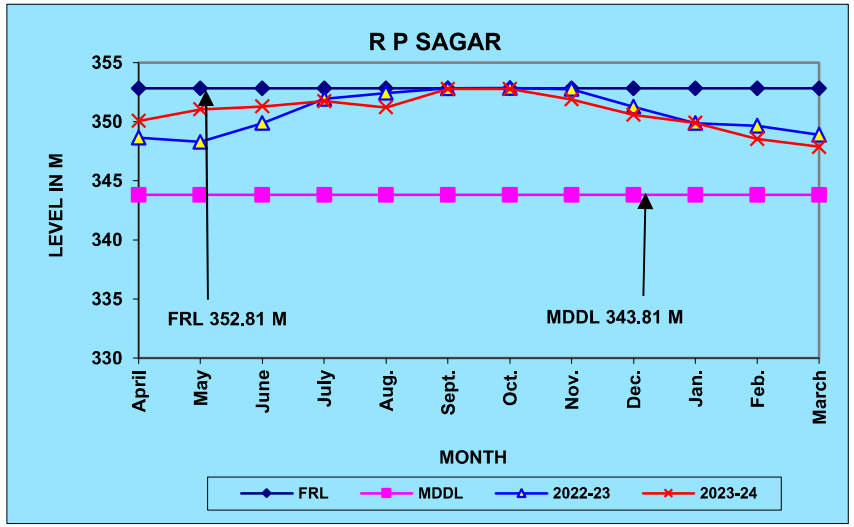
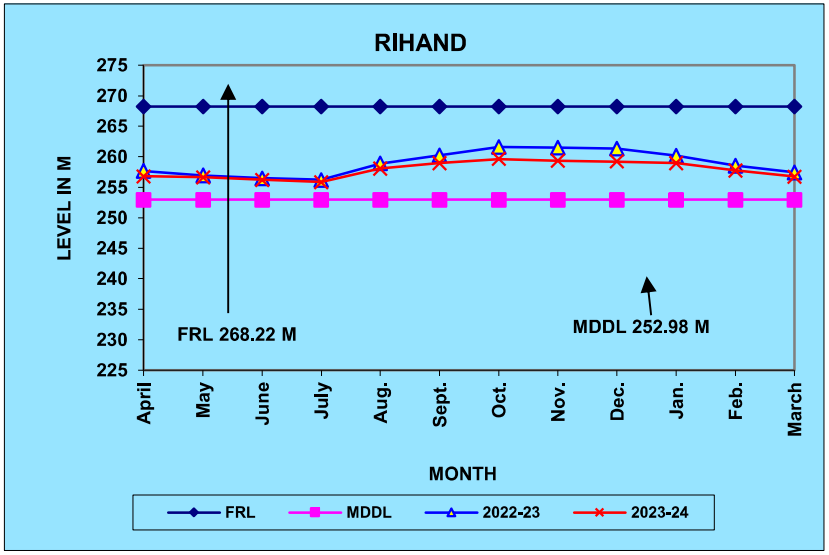


EXHIBIT 3.3

MONTH-WISE MAXIMUM LEVEL OF IMPORTANT RESERVOIRS







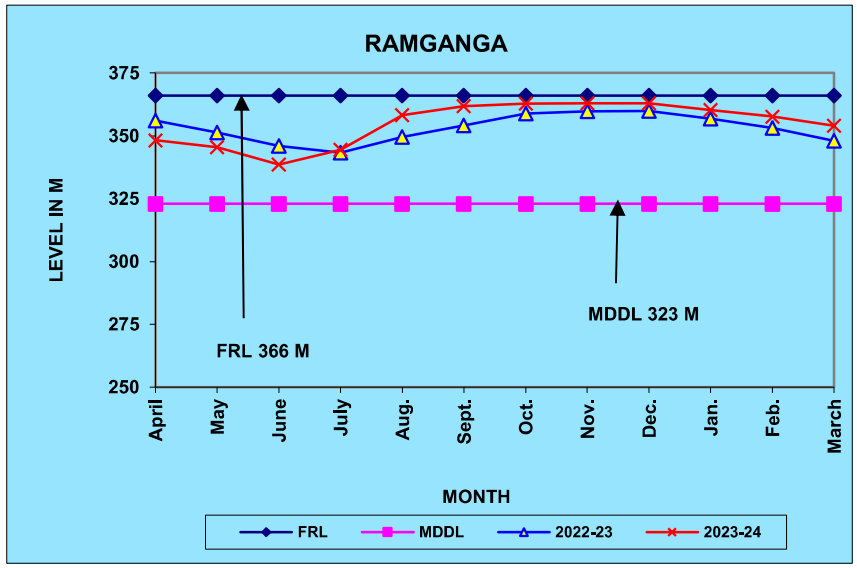
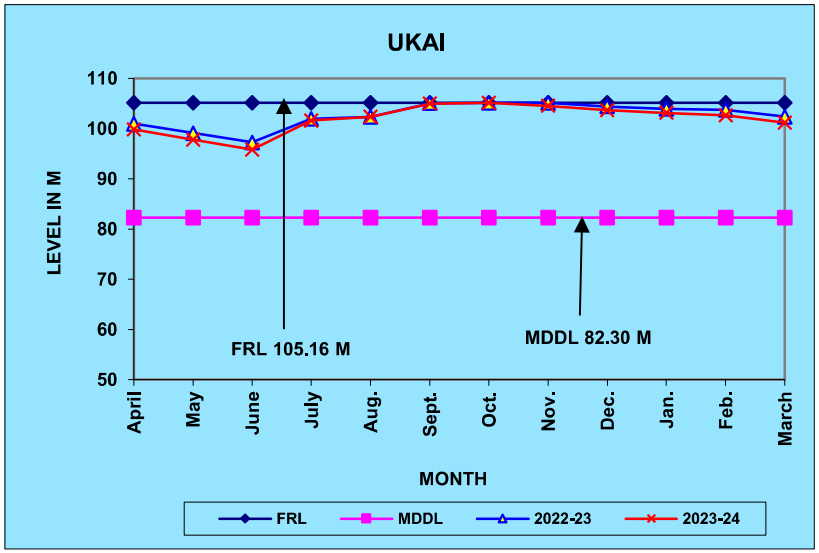
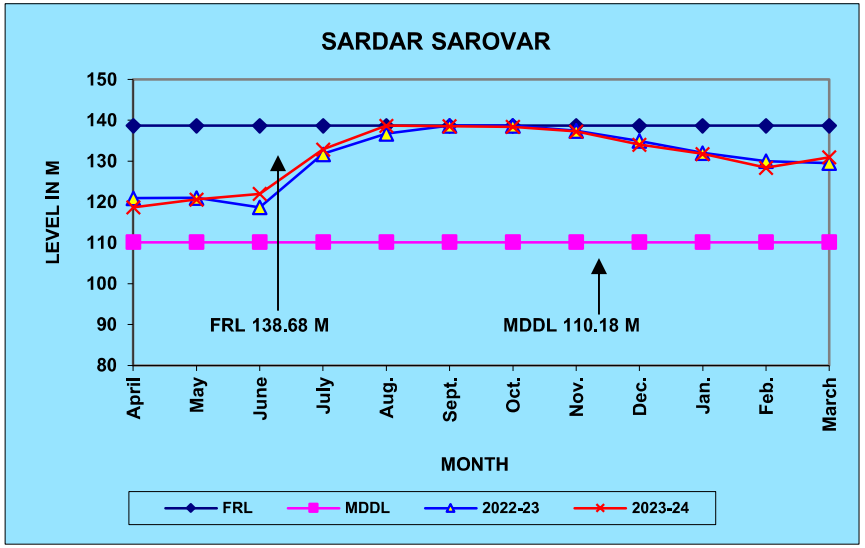
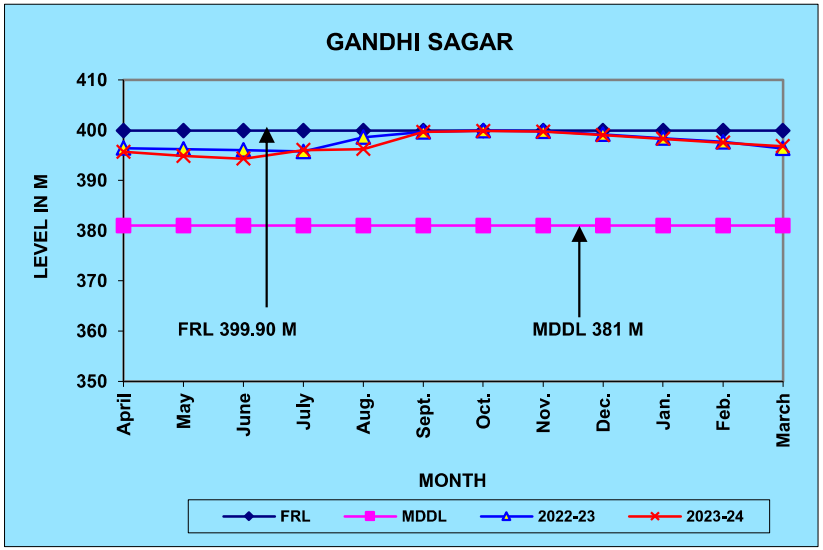


EXHIBIT 3.4

MONTH-WISE MAXIMUM LEVEL OF IMPORTANT RESERVOIRS







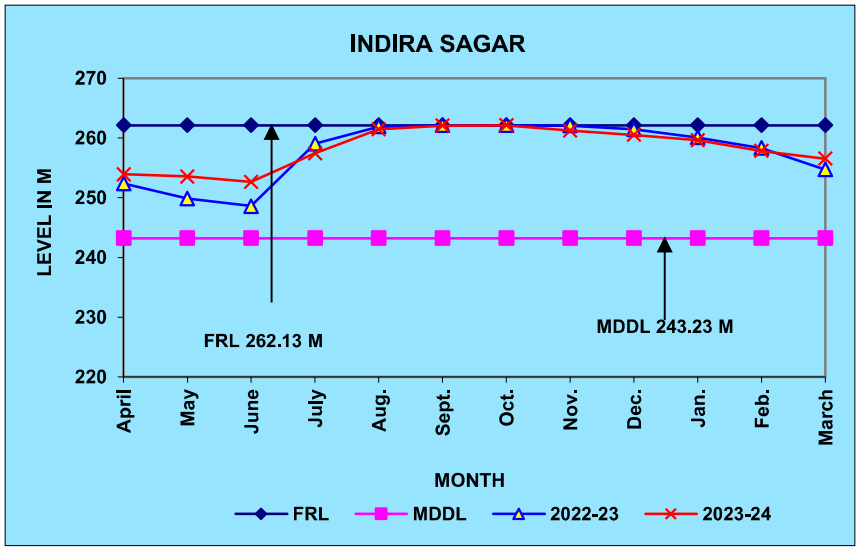
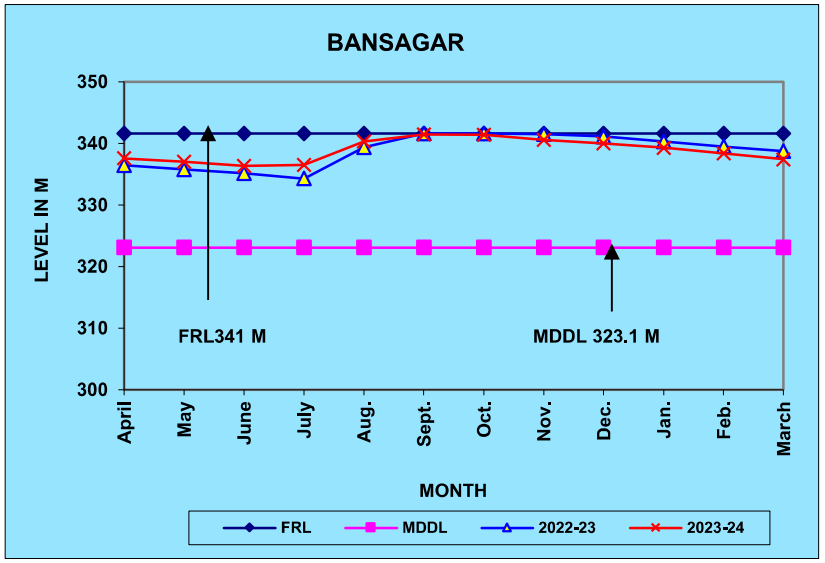
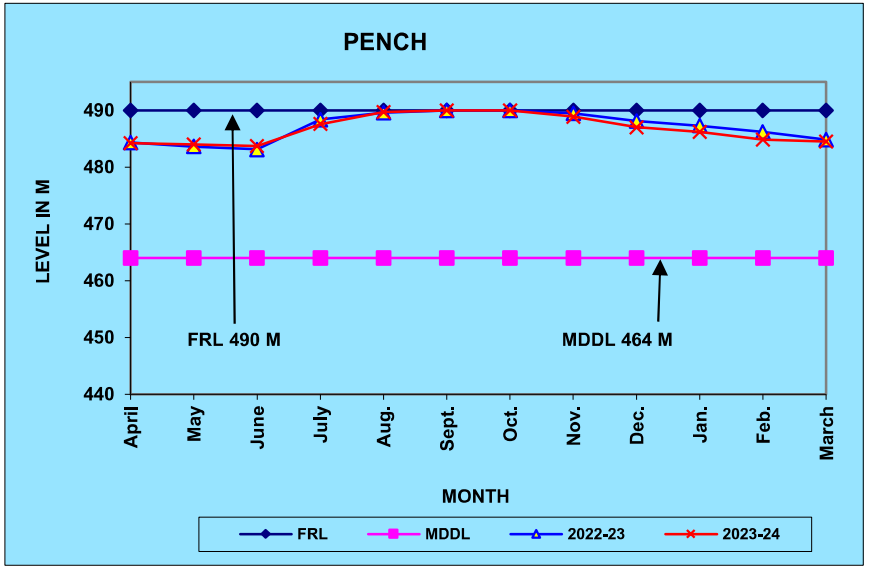
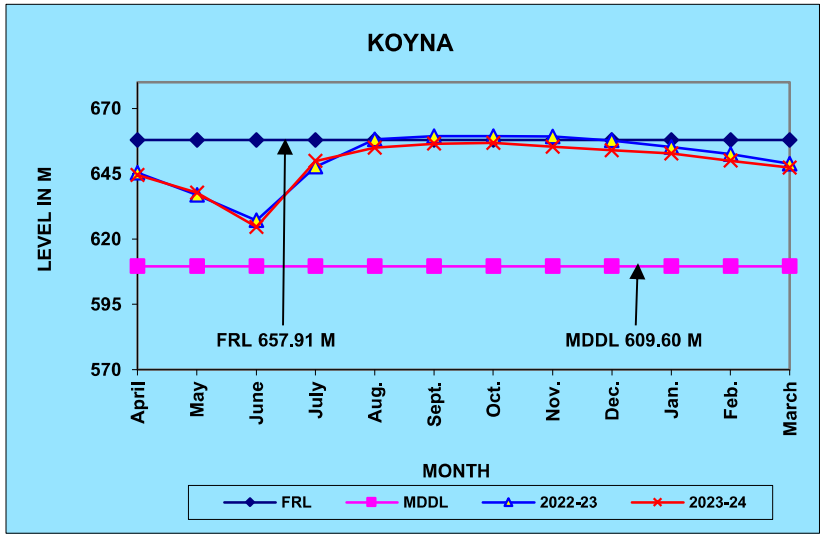


EXHIBIT 3.5

MONTH-WISE MAXIMUM LEVEL OF IMPORTANT RESERVOIRS







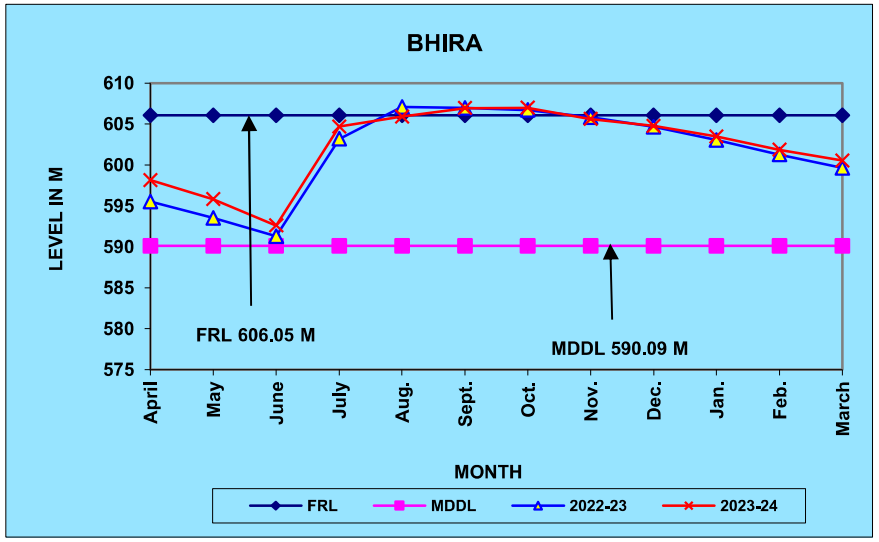
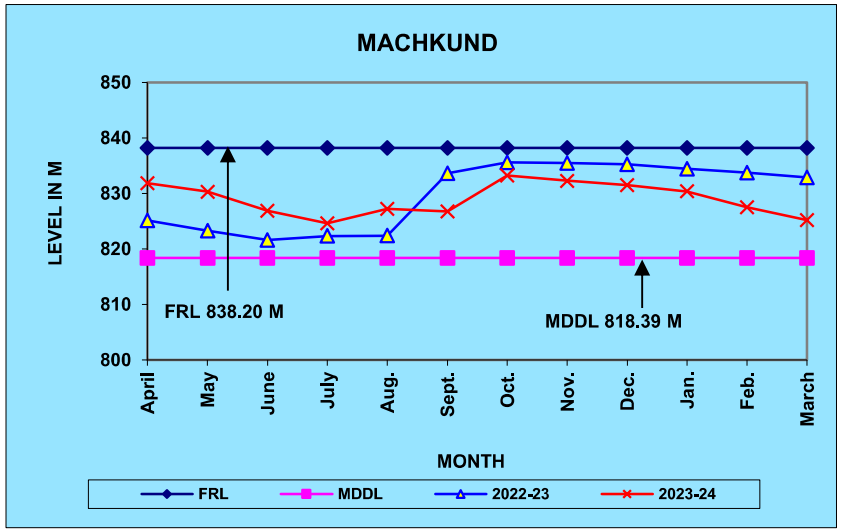
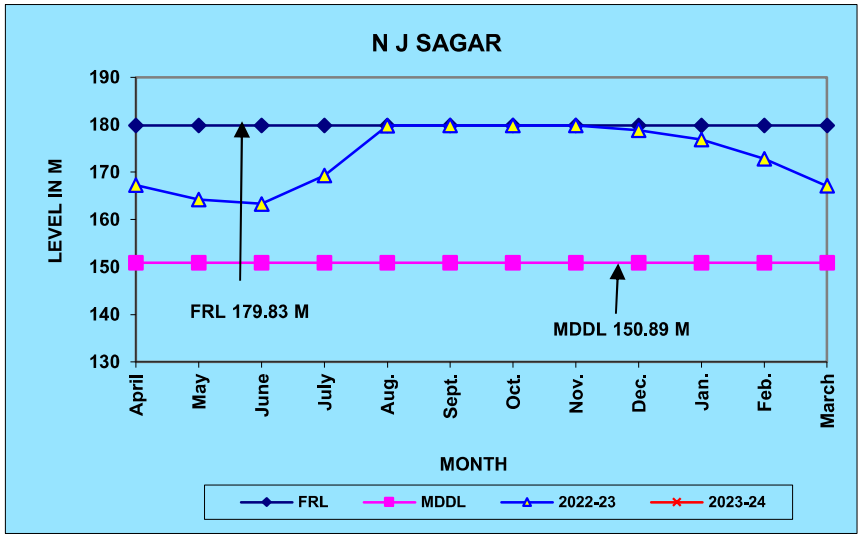
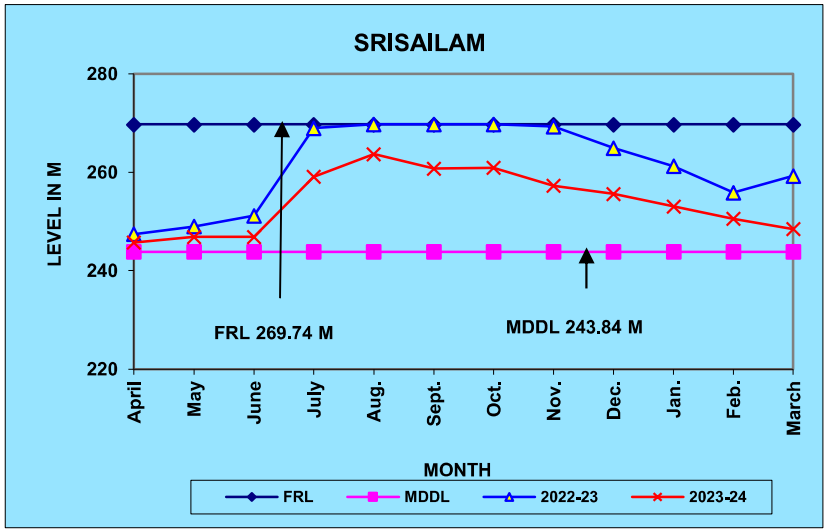


EXHIBIT 3.6

MONTH-WISE MAXIMUM LEVEL OF IMPORTANT RESERVOIRS







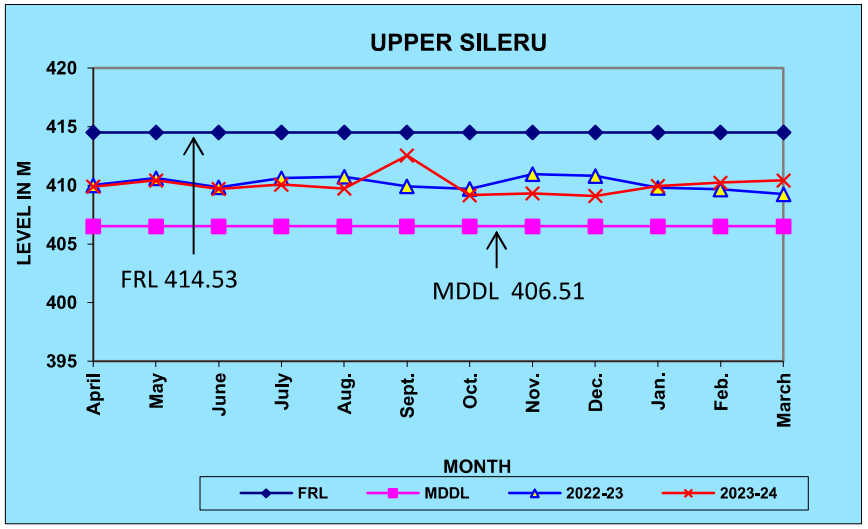
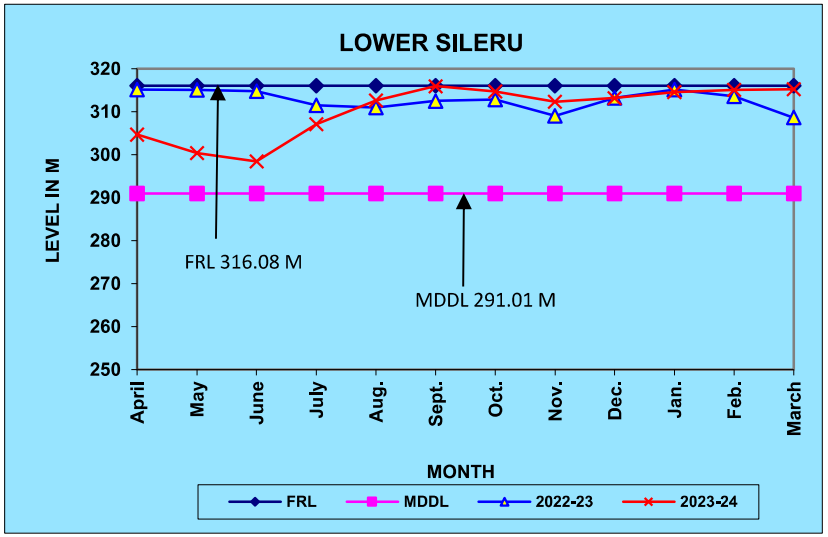
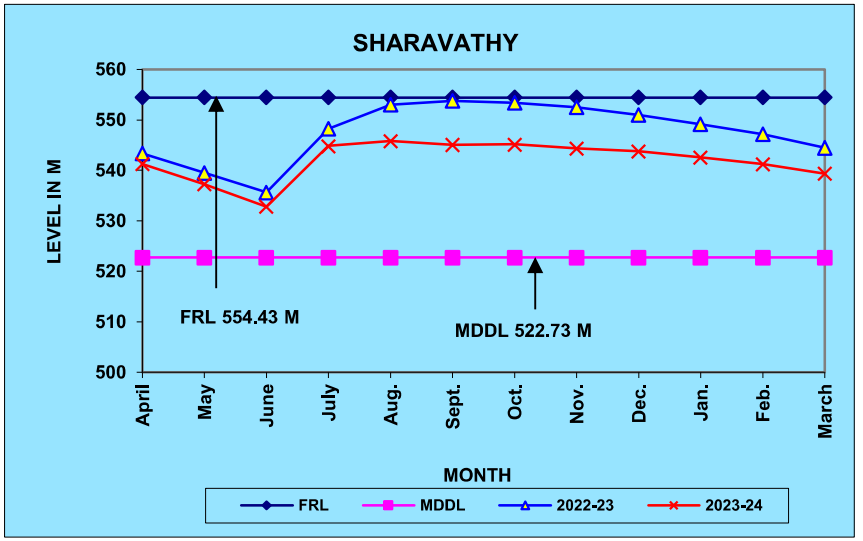
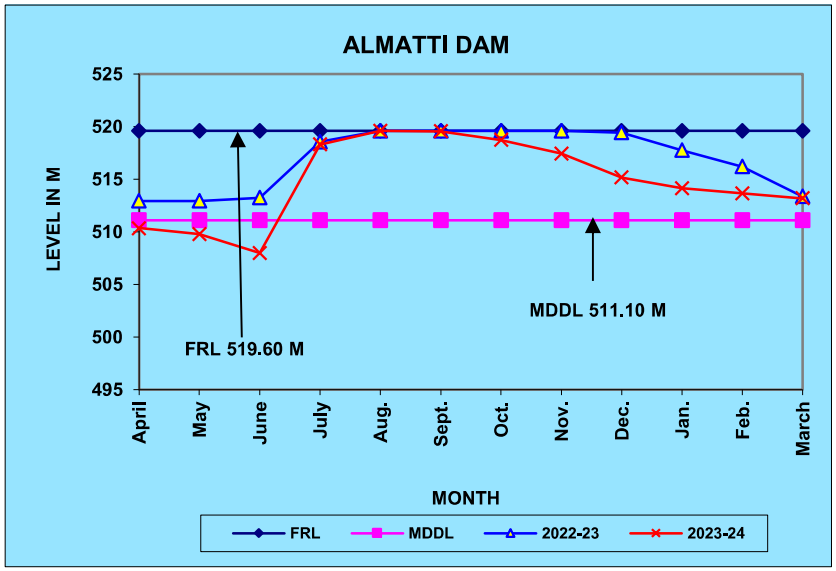


EXHIBIT 3.7

MONTH-WISE MAXIMUM LEVEL OF IMPORTANT RESERVOIRS







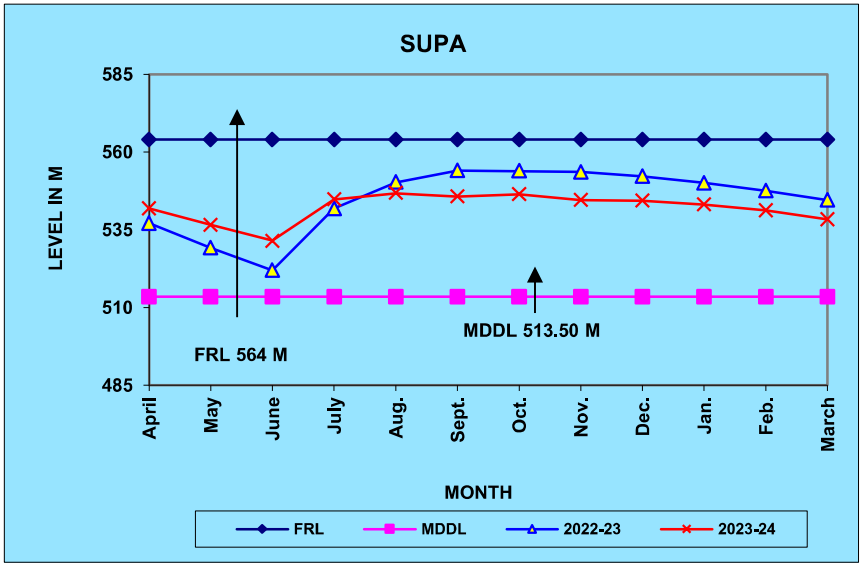
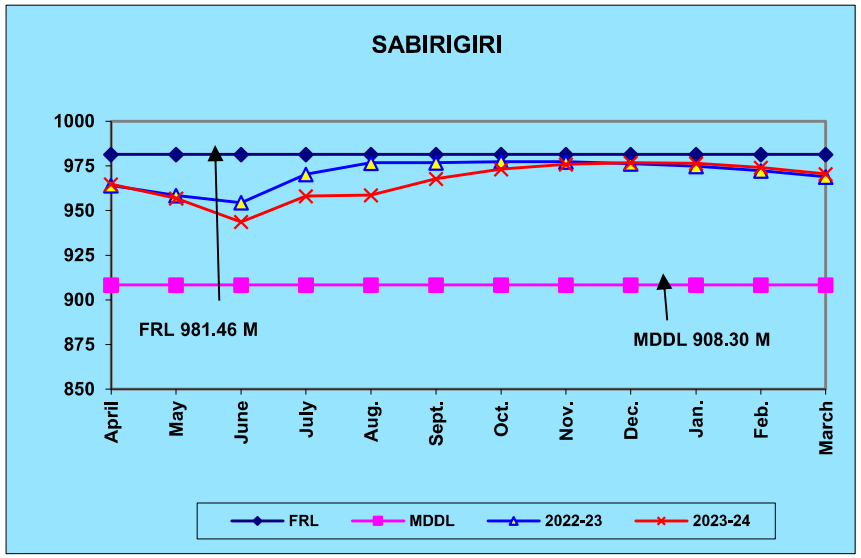
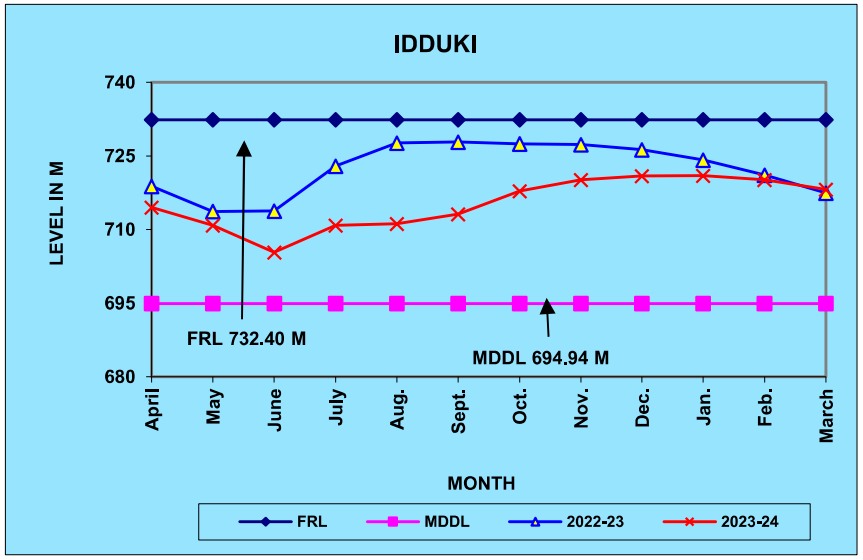
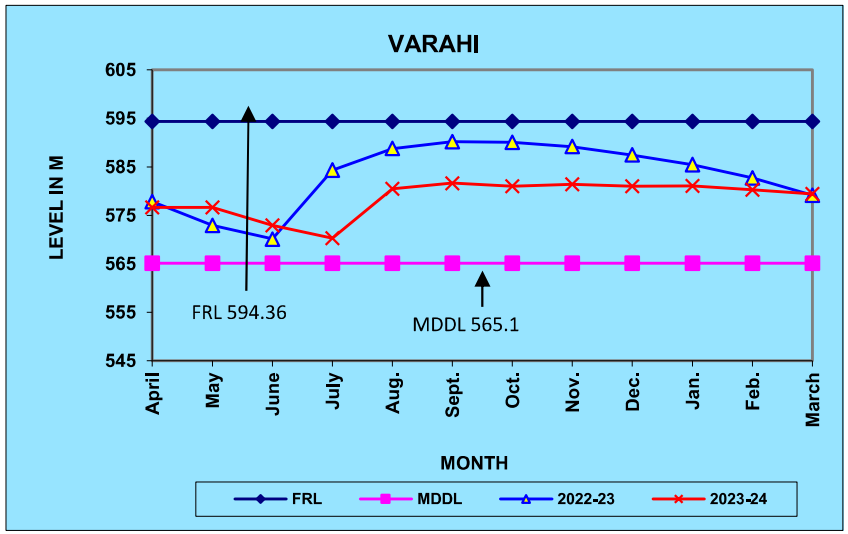


EXHIBIT 3.8

MONTH-WISE MAXIMUM LEVEL OF IMPORTANT RESERVOIRS







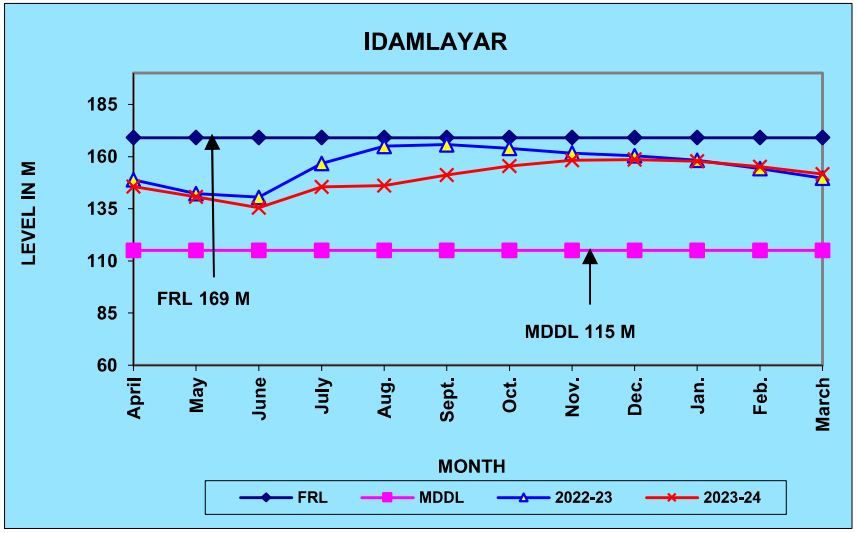
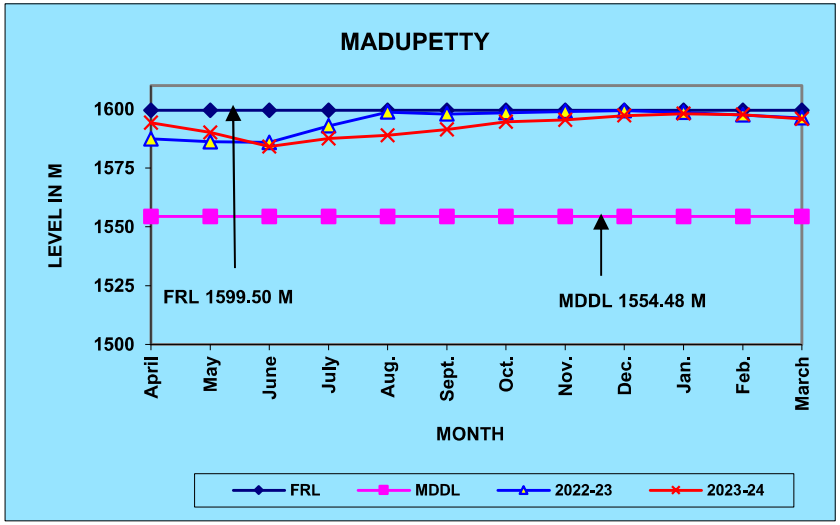
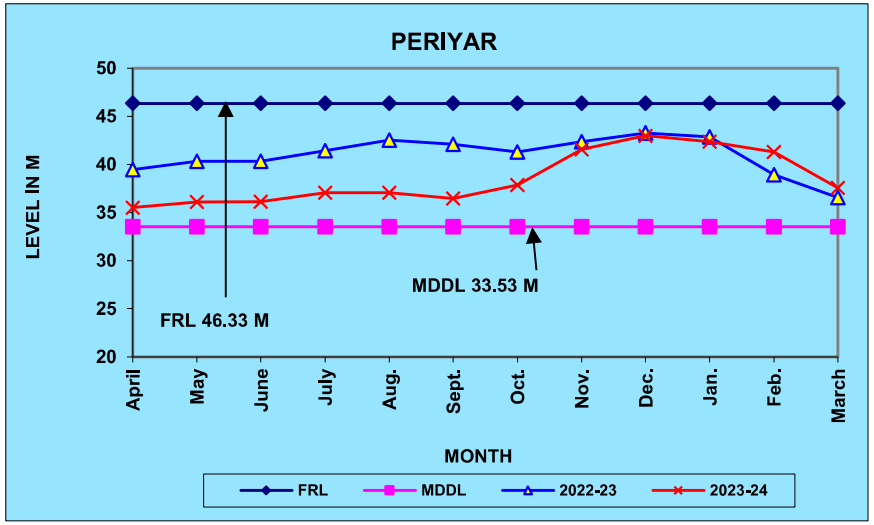
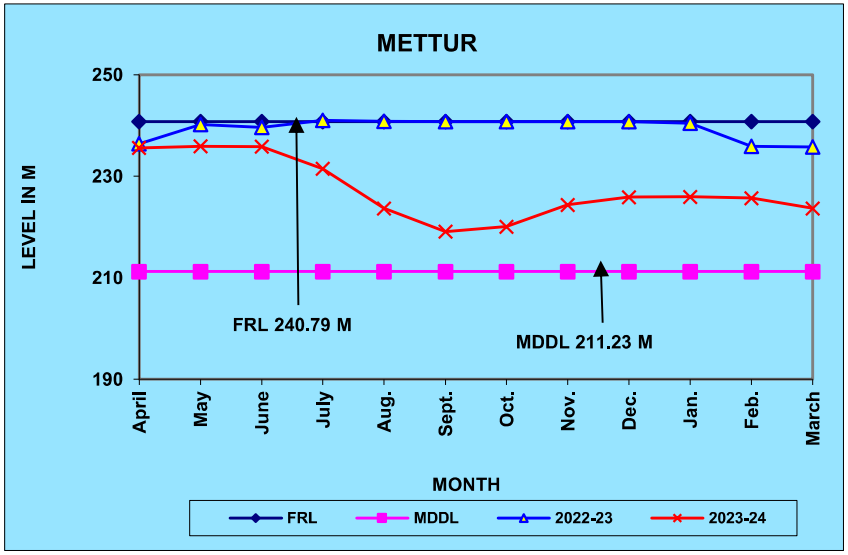


EXHIBIT 3.9

MONTH-WISE MAXIMUM LEVEL OF IMPORTANT RESERVOIRS







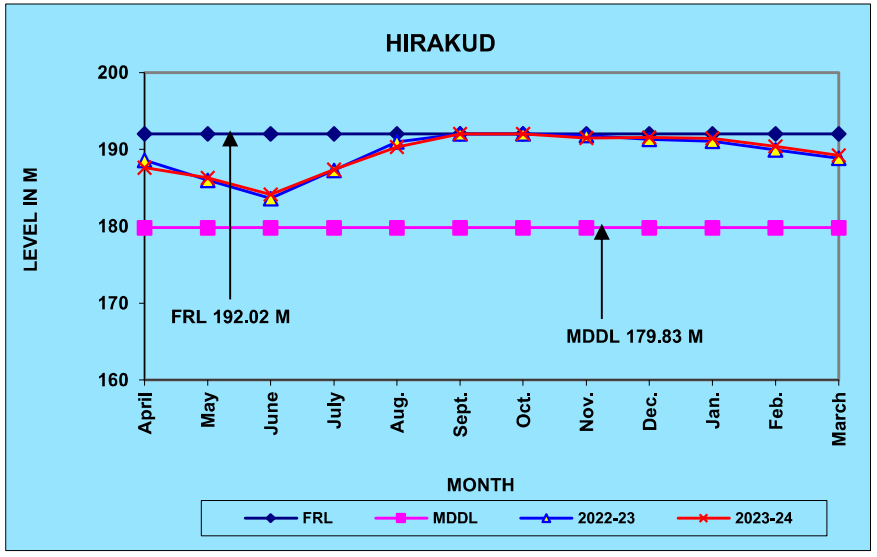
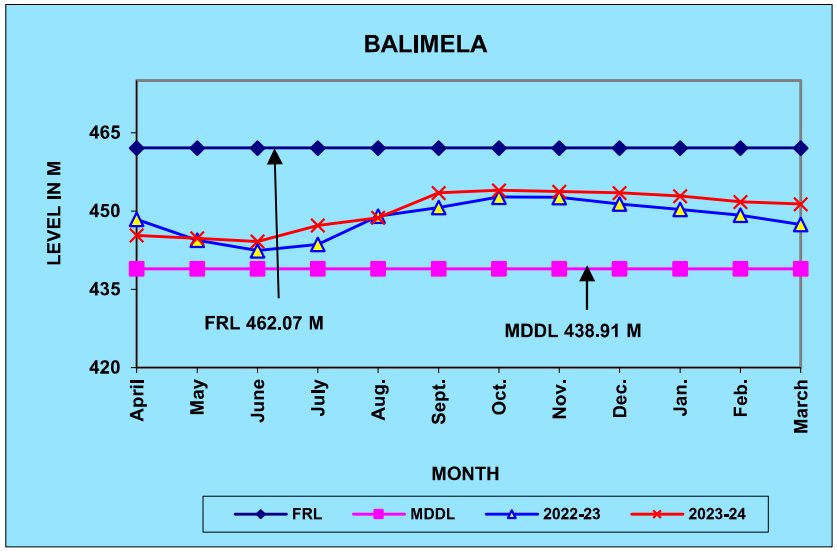
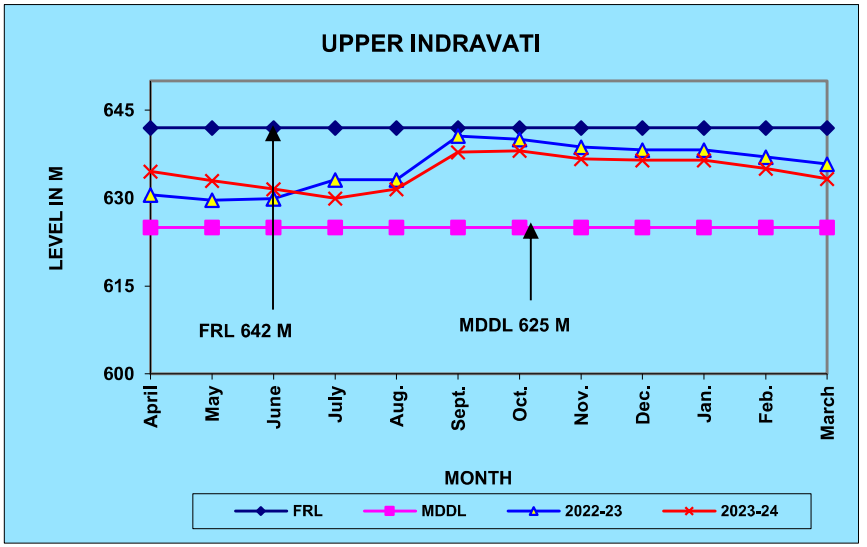
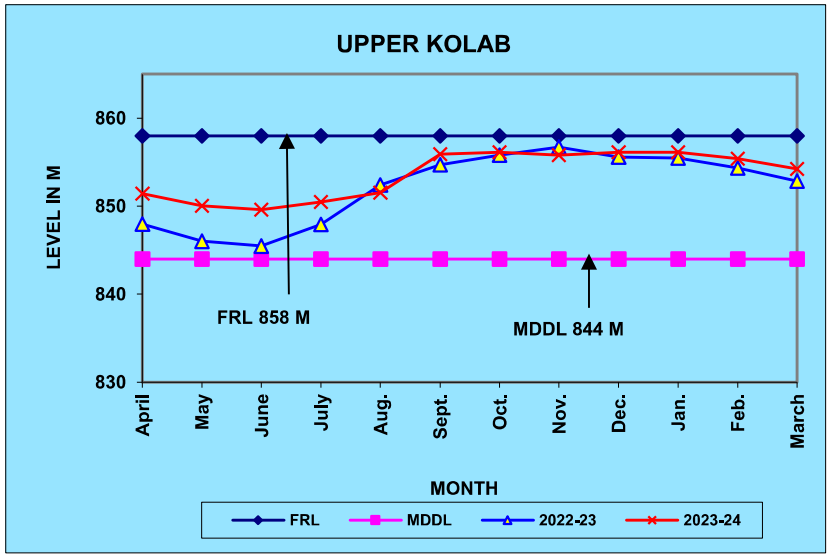


EXHIBIT 3.10

MONTH-WISE MAXIMUM LEVEL OF IMPORTANT RESERVOIRS







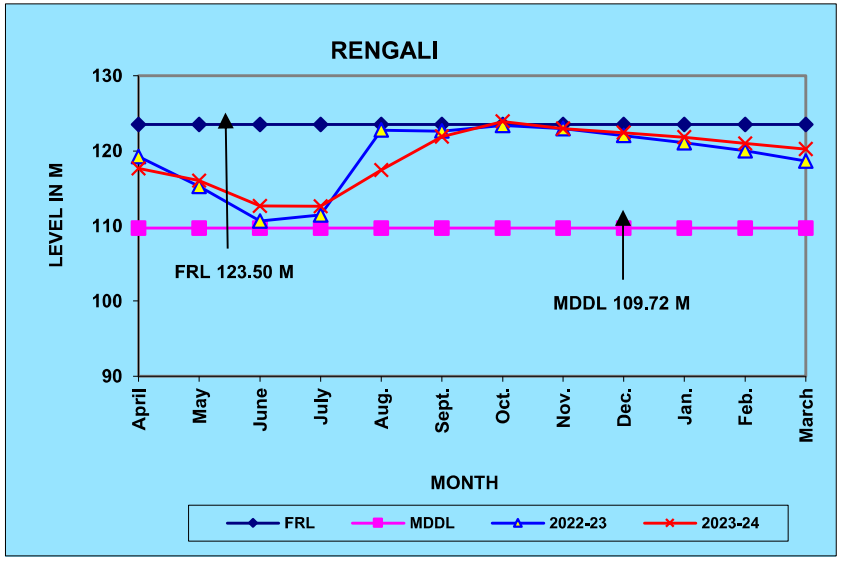


EXHIBIT 3.11

MONTH-WISE MAXIMUM LEVEL OF IMPORTANT RESERVOIRS

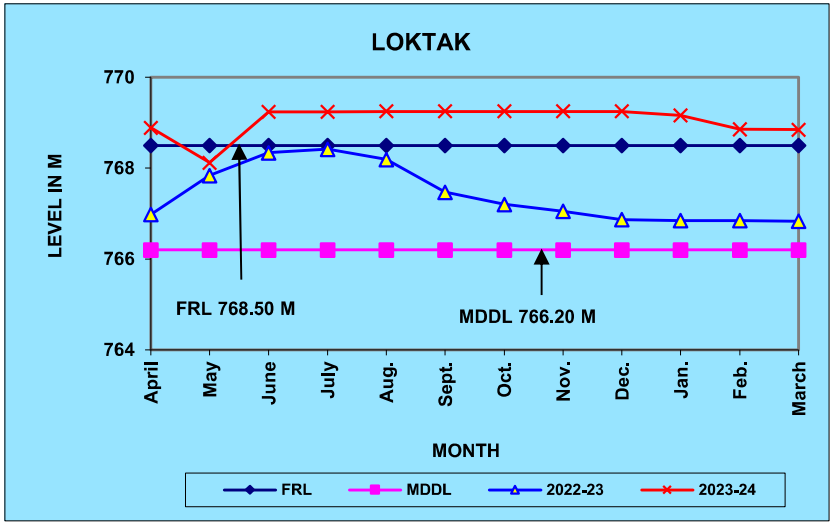
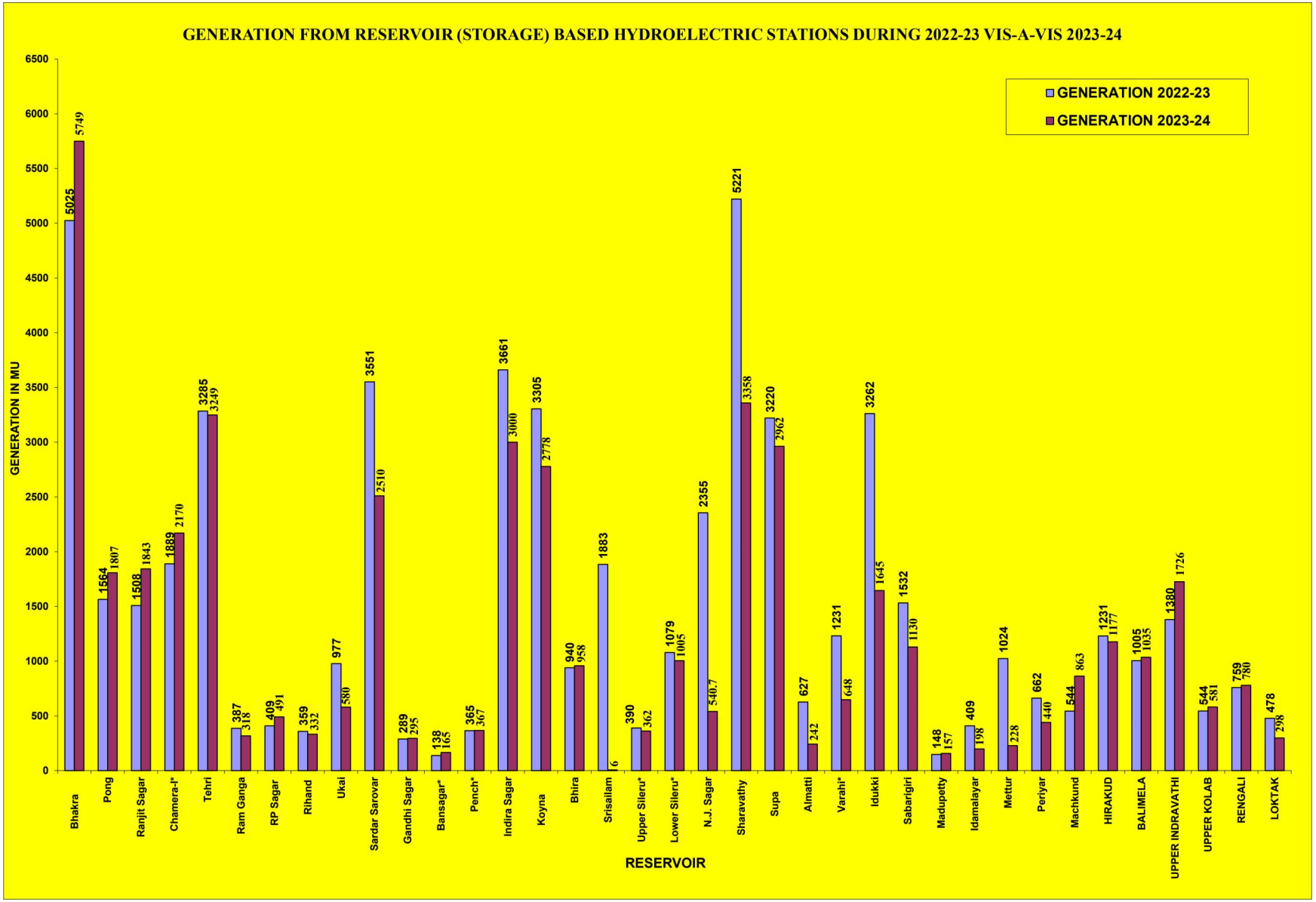


EXHIBIT-3.12


GENERATION FROM RESERVOIR (STORAGE) BASED HYDROELECTRIC STATIONS DURING 2022-23 VIS-A-VIS 2023-24
GENERATION 2022-23
GENERATION 2023-24
GENERATION IN MU
RESERVOIR
Bhakra 5025 5749
Pong 1564 1807
Ranjit Sagar 1508 1843
Chamera-I* 1889 2170
Tehri 3285 3249
Ram Ganga 387 318
RP Sagar 409 491
Rihand 359 332
Ukai 977 580
Sardar Sarovar 3551 2510
Gandhi Sagar 289 295
Bansagar* 138 165
Pench* 365 367
Indira Sagar 3661 3000
Koyna 3305 2778
Bhira 940 958
Srisailam 1883 6
Upper Sileru* 390 362
Lower Sileru* 1079 1005
N.J. Sagar 2355 540.7
Sharavathy 5221 3358
Supa 3220 2962
Almatti 627 242
Varahi* 1231 648
Idukki 3262 1645
Sabarigiri 1532 1130
Madupetty 148 157
Idamalayar 409 198
Mettur 1024 228
Periyar 662 440
Machkund 544 863
HIRAKUD 1231 1177
BALIMELA 1005 1035
UPPER INDRAVATHI 1380 1726
UPPER KOLAB 544 581
RENGALI 759 780
LOKTAK 478 298

SALIENT DETAILS OF IMPORTANT RESERVOIRS AND ASSOCIATED H.E. STATIONS

S. No	NAME OF RESERVOIR AND ASSOCIATED HE STATIONS	INSTALLED CAPACITY AS ON 31.03.2024	ANNUAL DESIGN ENERGY	FULL RESER-VOIR LEVEL	MINIMUM DRAW DOWN LEVEL	RESERVOIR CAPACITY AT FRL		ENERGY CONTENT AT FRL	LEVELS ATTAINED DURING 2023-24			
						GROSS :	LIVE		Max.	DATE	Min	DATE
		(MW)	(MU)	(M)	(M)	(MCM)	(MCM)	(MU)	(M)		(M)	
NORTHERN REGION												
1	Bhakra	1379.00	3924	513.59	445.62	8321	6516	1729.00	511.47	15.08.2023	353.15	03.05.2023
a	Bhakra Left	594.00	3924									
b	Bhakra Right	785.00										
2	Pong	396.00	1123	426.72	384.05	8053	6946	1084.00	426.54	15.08.2023	403.86	28.03.2024
3	Chamera	540.00	1664.56	760.00	749.20		87		759.88	20.04.2023	751.35	19.06.2023
4	Ranjit Sagar	600.00	1507	527.91	487.91	3292	2191	390.00	524.64	19.07.2023	498.06	14.04.2024
5	Tehri	1000.00	2797	829.79	740.04	3540	2615	1291.49	829.84	01.11.2023	741.90	12.06.2023
6	Ramganga	198.00	334	366	323	2503.96	2109.25	480.80	363.02	10.11.2023	332.99	30.06.2023
7	Rana Pratap Sagar	172.00	459	352.81	343.83	2901	1569	175.66	352.77	04.10.2023	346.48	06.03.2024
8	Rihand	300.00	920	268.22	252.98	10605	5723	1177.00	259.60	10.10.2023	255.10	01.07.2023
	Sub-Total NR	**4585.00**	**12728.56**				**27756.25**					
WESTERN REGION												
9	Ukai	300.00	1080	105.16	82.30	8515	6615	813.00	345.01	03.10.2023	308.22	29.06.2023
10	Sardar Sarovar	1200.00	3635	138.68	110.18	9460	5760	1817.553	138.68	17.09.2023, 18.09.2023, 19.09.2023 & 22.09.2023	116.63	22.05.2023
11	Gandhi Sagar	115.00	420	399.90	381.00	7743	6911	725.00	399.81	13.10.2023	394.15	30.06.2023
12	Bansagar	60.00	143	341.64	323.10		4934		341.48	26.09.2023	335.58	26.06.2023
13	Pench	160.00	315	490.00	464.00		1045		490	30.09.2023 & 01.10.2023	483.35	21.06.2023
14	Indira Sagar	1000.00	1980	262.13	243.23	12237	9706	1316.12	262.11	05.10.2023	249.76	29.06.2023
15	Koyna	1636.00	3030	657.91	609.60	2797	2677	3126.00	656.80	04.10.2023	618.40	24.06.2023
a	Koyna-I & II	600.00	3030									
c	Koyna-I & II	1000										
d	Koyna DPH	36										
16	Bhira	300	775	606.05	590.09	523	522	619	606.99	22.10.2023	590.54	24.06.2023
	Sub-Total WR	**4771.00**	**11378.84**				**38170.33**					
SOUTHERN REGION												
17	Upper Sileru	240.00	529	414.53	406.51		88		412.55	15.09.2023	408.37	02.04.2023
18	Lower Sileru	460.00	1070	316.08	291.01		365		315.93	19.09.2023	297.12	19.07.2023
19	Srisailam	770.00	2900	269.74	243.84	8723	7166	1548.00	263.71	10.08.2023	245.18	22.04.2023
20	Nagarjuna Sagar	815.60	2237	179.83	150.89	11560	6538	1398.00	-	-	-	-
21	Sharavathy	1035.00	4932	554.43	522.73	5310	4297	4394.00	545.81	08.11.2023	530.37	28.06.2023
22	SUPA	955.00	3927	564.00	513.50	4178	3758	3927.00	546.80	10.08.2023	525.5	06.07.2023
23	Almatti	290.00	483	519.60	511.10	2631.50	2628.00	175.30	519.60	16.08.2023	214.28	25.12.2023

SALIENT DETAILS OF IMPORTANT RESERVOIRS AND ASSOCIATED H.E. STATIONS

S. No	NAME OF RESERVOIR AND ASSOCIATED HE STATIONS	INSTALLED CAPACITY AS ON 31.03.2024	ANNUAL DESIGN ENERGY	FULL RESER-VOIR LEVEL	MINIMUM DRAW DOWN LEVEL	RESERVOIR CAPACITY AT FRL		ENERGY CONTENT AT FRL	LEVELS ATTAINED DURING 2023-24			
						GROSS :	LIVE		Max.	DATE	Min	DATE
		(MW)	(MU)	(M)	(M)	(MCM)	(MCM)	(MU)	(M)		(M)	
24	Varahi	460.00	1060	594.36	565.10		881.50		581.64	08.08.2023	569.87	10.06.2023
25	Idukki	780.00	2398	732.40	694.94	1996	1459	2146.00	721.01	08.01.2024	702.58	26.06.2023
26	Sabirigiri	300.00	1338	981.46	908.30	454	447	764.00	976.78	21.12.2023 & 22.12.2023	934.22	25.06.2023
27	Madupetty	37.50	284	1599.50	1554.48		55.32	77.40	1598.10	14.01.2023	1581.85	21.06.2023
28	Idamalayar	75.00	380	169.00	115.00		1017.80	254.45	158.58	11.12.2023	132.49	25.06.2023
29	Mettur	250.00	541	240.79	211.23	2708.80	2645.20	204.00	235.89	16.05.2023	213.63	10.10.2023
30	Periyar	161.00	409	46.33	33.53	443	299	216	42.98	24.12.2023	35.01	03.07.2023
	Sub-Total SR	**6629.10**	**22488.00**				**31645**					
EASTERN REGION												
31	Machkund	114.75	670	838.20	818.39	970	893	552.00	833.26	04.10.2023	821.31	17.07.2023
32	Hirakud	347.50	1174	192.02	179.83	4823	4709	372.00	192.01	12.10.2023	182.99	22.06.2023
33	Balimela	510.00	1183	462.07	438.91	3929	2676	898.00	453.95	19.10.2023	443.10	21.06.2023
34	Upper Indravati	600.00	1962	642.00	625.00	2300	1485.50	1213.14	638.10	06.10.2023	629.11	17.07.2023
35	Upper Kolab	320.00	832	858.00	844.00	1215	935.00	540	856.14	12.10.2023	849.20	18.06.2023
36	Rengali	250.00	525	123.50	109.72	3548	3167.81	275	123.92	11.10.2023	110.47	04.07.2023
	Sub-Total ER	**2142.25**	**6346.00**				**13866**					
NORTH EASTERN REGION												
37	Loktak	105	448	768.50	766.20	435.91	396.44	250	769.25	30.08.2023, 01.09.2023, 02.10.2023, 19.11.2023 & 08.12.2023	767.84	13.05.2020
	Sub-Total NER	**105**	**448**				396.44					
	Total All India	**18232.35**	**53389.40**				**111834.35**					

CHAPTER-4

PLANNED MAINTENANCE OF HE UNITS

CHAPTER-4

PLANNED MAINTENANCE OF HE UNITS

4.1 For the purpose of studies and analysis of performance in respect of availability of H.E. Stations, outage data of 731 generating units installed in 212 Hydro Electric Stations was made available by various organizations. The studies indicate that a total of 361303 hours were utilized for carrying out various types of planned maintenance works to facilitate healthy running of generating units. Details of long duration planned outages (50 hours and above) are given in **Annex-4.1**.

4.2 It is observed that capital maintenance was carried out for 56 generating units whereas annual maintenance was carried out for 79 generating units. Analysis of various types of planned maintenance indicates that while most of the planned outages were for periodic maintenance, many of these outages were for carrying out certain repairs/modification works also. Details of duration of periodic planned maintenance of generator, turbine, auxiliary equipments and civil structures etc. are indicated below in **Table 4.1**.

TABLE 4.1

DURATION OF PERIODIC PLANNED MAINTENANCE
PERIOD: 2023-24

S.NO	Type of Maintenance	No. of Units	Duration (Hours)	
			Max. for any unit	Average
1	ANNUAL MAINTENANCE	79	8784.00	702.76
2	AUXILIARY SYSTEM	3	9.92	4.79
3	B.F.VALVE	10	168.00	59.53
4	CAPITAL/3 YEARLY MTCE.	45	3230.00	790.25
5	CAPITAL MAINTENANCE	11	8784.00	1400.30
6	CIVI STRUCTURE	1	3.62	3.62
7	DESILING CHAMBER	1	467.63	467.63
8	FIREBAY/RESERVOIR	2	204.93	104.97
9	GENERATOR	43	867.58	90.21
10	GENERATOR TRANSFORMER	33	464.93	63.11

11	HRI/HRC/POWER CHANNEL	1	158.17	158.17
12	INSPECTION /MTCE	8	373.05	58.90
13	MISCELLANEOUS	31	261.32	37.70
14	MONTHLY MAINTENANCE	56	2061.60	90.84
15	OTHER EQUIPMENT	14	2333.83	307.57
16	OTHER PLANNED MAINTENANCE WORKS	86	2294.23	118.20
17	PAINTING OTHERS	27	2423.85	426.73
18	PLANNED MAINTENANCE	236	4803.02	708.92
19	PRESSURE SHAFT/PENSTOCK	14	312.00	99.54
20	R AND M WORKS	6	3816.00	2996.87
21	RENOVATION/MODERNISATION	2	215.00	191.50
22	ROUTINE MAINTENANCE	10	14.47	9.51
23	RUNNER INSPECTION /REPAIR	2	10.55	9.65
24	STATOR	3	5432.22	1921.42
25	SURGE SHAFT	1	3046.43	3046.43
26	SWITCHING EQUIPMENT	11	592.75	182.52
27	TESTING/CHECKING	4	16.52	10.32
28	TRI/TRC/DRAFT TUBE	10	441.98	125.88
29	TURBINE	13	7401.17	659.31
30	TURBINE MISC/GOVERNOR	49	1298.06	139.25

4.3 There were a total of 2044 outages due to Planned Maintenance during the Year 2023-24, out of which about 72.41% were of duration up to 24 hours, while 17.17% of the planned outages were of duration more than 10 days and 10.42% of the planned outages were of duration from 1 to 10 days. Details giving duration pattern of planned maintenance is indicated in **Table 4.2** and illustrated in **Exhibit 4.1**.

TABLE 4.2

DURATION PATTERN OF PLANNED OUTAGE
PERIOD: 2023-24

Sl. No.	Duration	Number of Outage	Maintenance % to total number of Outages
1	more than 10 days	351	17.17
2	Less than 6 hour	356	17.42
3	6 to 24 hours	1124	54.99
4	1 to 10 days	213	10.42
	Total No. of Outages	**2044**	**100**

4.4 Planned Maintenance age-wise

Planned maintenance carried out for different age groups of hydro generating units during the year 2023-24 is indicated in **Table 4.3**.

TABLE 4.3

PLANNED MAINTENANCE AGE-WISE
PERIOD: 2023-24

Sl. No.	Year of Commissioning	No. of Units	Installed Capacity (MW)	Planned Outages (Hours)	Non-Availability Per Unit (Hours)
1	2023-24	2	60	0	0
2	2022-23	2	120	0	0
3	2021-22	7	393	127	18
4	2020-21	8	510.00	0	0
5	2019-20	2	300.00	0	0
6	2018-19	3	140.00	0	0
7	2017-18	16	795.00	19	1
8	2016-17	18	1659.00	218	12
9	2015-16	17	1516.00	190	11
10	2010-11 to 2014-15	63	4437.02	61414	975
11	2005-06 to 2009-10	66	7077.00	53293	807

12	2000-01 to 2004-05	74	6741.80	38448	520
13	1989-90 to 1999-2000	86	5769.70	34464	401
14	1978-79 to 1988-89	124	7259.10	71448	576
15	1967-68 to 1977-78	81	5279.75	76872	949
16	Up to 1966-67	162	4724.85	119520	738
	Total	**731**	**46928.17**	**456013**	**624**

It is seen that the average non-availability of units due to planned maintenance is relatively higher in case of older units commissioned from 2010-11 to 2014-15 (975 hrs. /unit) and 1967-68 to 1977-78 (949 hrs. /unit) respectively.

4.5 Analysis based on Planned Maintenance of different types of Turbines

The details regarding non-availability of generating units due to planned maintenance for different types of turbines are indicated in **Table 4.4** given below.

TABLE 4.4

PLANNED MAINTENANCE-TURBINE TYPE-WISE
PERIOD: 2023-24

Sl. No.	Type of Turbine	No. of Units	Installed Capacity (MW)	Planned Outages (Hours)	Non-Availability Per Unit (Hours)
1	BULB	26	684.00	4620	178
2	FRANCIS	421	329666.22	225981	537
3	KAPLAN	133	4399.05	54590	410
4	PELTON	149	8818.90	76112	511
5	FRANCIS	2	60.0	0	0
	Total	**731**	**46928.17**	**361303**	**494**

The average non-availability due to planned maintenance was maximum for Francis turbine at 537 hrs. /unit followed by Pelton units at 511 hrs. /unit, while it was minimum for Bulb units at 178 hrs. /unit.

4.6 Analysis based on Make of Generating Units

About 49.57% of the installed capacity of Hydro has been sourced from indigenous suppliers with BHEL alone accounting for about 42.69% of the capacity. The remaining 49.93 % has been imported from various countries like Japan, Canada, UK and France etc. The non-availability due to planned maintenance has been analyzed for generating

units both indigenous and imported based on their make/supplier. The details are given below in **Table 4.5**:

TABLE 4.5

PLANNED MAINTENANCE-SUPPLIER-WISE
PERIOD: 2023-24

S. No	Name of Supplier/ Country of Make	No. of Units		Installed Capacity (MW)	Non-Availability due to		
		No.	% of total	MW	% of total	Total Hours	Hours/ Unit
A- Indigenous							
1	BHEL	312	42.68	20150.30	42.94	141388	453
2	Others	54	7.39	3395.50	7.24	28526	528
	SUB TOTAL	**366**	**49.57**	**23545.80**	**50.07**	**169914**	**464**
B- Imported							
3	USA	9	1.23	351.00	0.75	8677	964
4	U.K.	63	8.62	1242.10	2.65	26252	417
5	France	31	4.24	2179.20	4.64	3605	116
6	Canada	44	6.02	3132.00	6.67	18631	423
7	Russian Federation	26	3.56	2804.00	5.98	34861	1341
8	Switzerland	21	2.87	797.85	1.70	27030	1287
9	Japan	76	10.40	6416.20	13.67	28084	370
10	Other	95	13.00	6460	13.77	45103	475
	Sub Total	**365**	**49.93**	**23382.35**	**49.83**	**192244**	**527**
	Total	**731**	**100**	**46928.17**	**100**	**362155**	**495**

It is observed that during the year 2023-24, average non-availability due to planned maintenance of the units supplied by BHEL was 453 hrs. /unit.

Among the imported generating units, the average non-availability due to planned maintenance was the least for units supplied by France (116 hrs. /unit) and was maximum for units supplied by Russian Fedaration (1341 hrs. /unit).

4.7 Planned Maintenance – Region-wise

Region-wise non-availability of units due to planned maintenance in respect of various hydro power stations is indicated below in **Table 4.6**

TABLE 4.6

REGION-WISE PLANNED MAINTENANCE
PERIOD: 2023-24

S.No	Region	No. of Units	Installed Capacity (MW)	% Non-availability due to Planned Maintenance
1	Northern	260	19774.27	5.57
2	Western	101	7392	4.61
3	Southern	246	11747.15	5.26
4	Eastern	86	5987.75	6.17
5	North Eastern	38	2027.0	10.05
	All India	**731**	**46928.17**	**5.64**

The non-availability of generating unit due to planned maintenance was least in Eastern Region (6.17%) followed by Southern Region at 5.26%, whereas it was maximum in North Eastern Region (10.05 %) followed by Northern Region (5.61%).

The average non-availability of hydro electric units due to planned maintenance during the year 2023-24 was 5.65% as compared to 4.22% during the year 2022-23.

4.8 Planned Maintenance – Station-wise

The number of H.E. Stations falling under various ranges of non-availability due to planned maintenance during the year 2023-42 vis-à-vis 2022-23 is summarized below in **Table 4.7.**

TABLE 4.7

NON-AVAILABILITY OF HE STATIONS DUE TO PLANNED OUTAGES (2023-24 VIS-A-VIS 2022-23)

% Non-Availability due to planned maintenance	2023-24				2022-23			
	Stations		Capacity		Stations		Capacity	
	No.	% of Total	MW	% of Total	No.	% of Total	MW	% of Total
≤ 5	125	58.96	29204.07	62.23	141	66.82	32446.12	69.26
>5 to 10	45	21.23	7524.10	16.03	42	19.91	8482.40	18.11
>10 to 15	22	10.38	6211.00	13.24	14	6.64	2670.65	5.70
>15 to 20	8	3.77	1679.00	3.58	6	2.84	1570.00	3.35
>20 to 25	4	1.89	265.00	0.56	3	1.42	1066.00	2.28
>25 to 30	4	1.89	1562.00	3.33	0	0.00	0.00	0.00
above 30	4	1.89	483.00	1.03	5	2.37	615.00	1.31
Total	**212**	**100**	**46928.17**	**100**	**211**	**100**	**46850.17**	**100**

It could be seen from above that 125 nos. (58.96% of total) hydro-electric stations had non-availability factor less than or equal to 5% due to planned maintenance during 2023-24 as compared to 141 nos. (66.82% of total) during 2022-23.

Non-availability due to planned maintenance was more than 30% at 4 nos. (1.89% of total) H.E. Stations during 2023-24 and which was 5 nos. (2.37% of total) in 2022-23. The details of these stations for 2023-24 is given below in **Table 4.8.**

TABLE 4.8

H.E. STATIONS HAVING HIGH PLANNED MAINTENANCE FOR THE PERIOD: (2023-24)

Sl. No	Name of Station/Utility	Capacity (MW)	N.A. due to P.M.* (%)	Reasons
1	KHONDONG HPS / NEEPCO.	50.00	91.17	R AND M WORKS
2	KHOPOLI HPS / TATA MAH.	72.00	36.85	ANNUAL MAINTENANCE
3	PERIYAR HPS / TANGEDCO	161.00	38.68	PLANNED MAINTENANCE

*** N.A.** -Non availability, **P.M.-** Planned Maintenance

41.04% of stations had operational availability lower than 95% on account of planned maintenance alone against the normative design/plan annual availability of 95% total

during the entire station life. These utilities need to improve their O&M practices to bring down their total outages i.e. planned & forced to less than 5% as per best practices.

It is observed from above that stations may be having high planned maintenance outages on account of ageing, O&M management issues, etc. Further, those stations which are having continuously high planned maintenance outages over past few years may be requiring major repair & maintenance works or Renovation & Modernisation (R&M) works for improving the availability, reliability & security of the plant besides providing life extension where the assets have outlived their useful life.

4.9 Planned Maintenance – Utility-wise/Sector-wise

Performance of hydro-electric units under various utilities in Central Sector, State Sector, and Private Sector with respect to non-availability due to planned maintenance is indicated in **Table 4.9**.

In case of Central Sector, non-availability due to planned maintenance was maximum under NEEPCO (1192 hrs. /unit).

In case of State Sector, non-availability due to planned maintenance was maximum under OHPC (1194 hrs. /unit).

In case of Private Sector, non-availability due to planned maintenance was maximum under TATA MAH (1233 hrs. /unit).

It is also observed that the average duration of planned maintenance in respect of H.E. Stations in Central Sector, State Sector and Private Sector is 593 hrs. /Unit, 450 hrs. /Unit and 596 hrs. /Unit respectively.

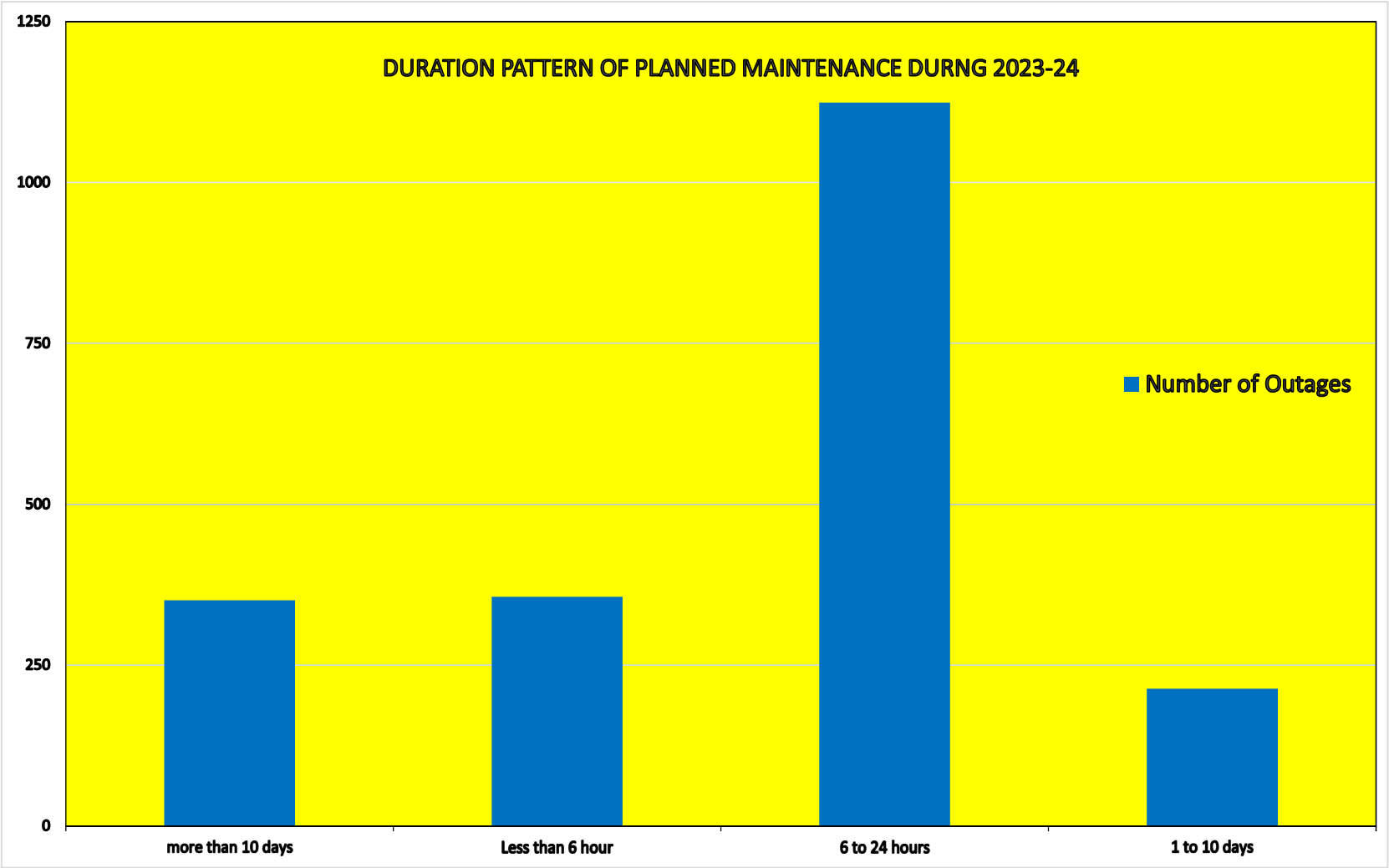
TABLE 4.9

SECTOR-WISE/ UTILITY-WISE PERFORMANCE PLANNED MAINTENANCE PERIOD: 2023-24

Sl. No.	Organization	No. of Units	Installed Capacity (MW)	Planned Maintenance (Hours)	Planned Maintenance per Unit (Hours)
(A)	**Central Sector**				
1	BBMB	28	2956.30	21590	771
2	DVC	5	143.20	1703	341
3	NEEPCO.	20	1500.00	23843	1192
4	NHDC	16	1520.00	5591	349
5	NHPC	70	5451.20	37875	541
6	NTPC Ltd.	4	800.00	0	0
7	SJVNL	14	1972.02	2145	153

8	THDC	8	1400.00	5060	633
Sub Total (CS)		**165**	**15742.72**	**97813**	**593**
(B)	**Private Sector**				
1	ADHPL	2	192.00	1927	963
2	AHPC (GVK)	4	330.00	298	75
3	DEPL	2	96.00	281	141
4	DLHP	1	34.00	0	0
5	E.P.P.L.	2	100.00	0	0
6	GBHPPL	2	70.00	1359	679
7	GIPL	2	110.00	1199	599
8	GMR BHHPL	3	180.00	438	146
9	HBPCL	7	1345.00	5245	749
10	HSPCL	2	100.00	581	291
11	IAEPL	3	36.00	2330	777
12	JPPVL	4	400.00	706	176
13	L&T	3	99.00	951	317
14	MBPC	2	113.00	866	433
15	MPCL	2	86.00	1062	531
16	SEPL	2	97.00	0	0
17	SKPPPL	2	96.00	0	0
18	TATA MAH.	15	447.00	18496	1233
Sub Total (Pvt.)		**60**	**3931**	**35739**	**596**
(C)	**State Sector**				
1	APGCL	2	100.00	3131	1566
2	APGENCO	34	1796.75	5865	172
3	CSPGCL	3	120.00	0	0
4	GSECL	8	540.00	0	0
5	HPPCL	8	406.00	1103	138
6	HPSEB	12	372.00	5407	451
7	JKSPDC	12	1110.00	3509	292
8	JUUNL	2	130.00	0	0
9	KPCL	66	3617.20	11928	181
10	KSEB	47	1864.15	43820	932
11	MAHAGENCO	24	2406.00	3178	132
12	MeECL	13	322.00	5485	422
13	MPPGCL	23	875.00	9025	392
14	OHPC	31	2039.80	37010	1194
15	PSPCL	25	1051.00	10627	425
16	RRVUNL	11	411.00	5366	488
17	SSNNL	11	1450.00	4642	422
18	TANGEDCO	69	2178.20	50710	735

19	TSGENCO	36	2405.60	1335	37
20	TUL	6	1200.00	66	11
21	UJVNL	36	1372.15	16448	457
22	UPJVNL	15	501.60	7096	473
23	WBSEDCL	12	986.00	1998	167
Sub Total (State)		**506**	**27254.45**	**227750**	**450**
All India		**731**	**46928.17**	**361303**	**494**


DURATION PATTERN OF PLANNED MAINTENANCE DURNG 2023-24
1250
1000
750
500
250
0
Number of Outages
more than 10 days
Less than 6 hour
6 to 24 hours
1 to 10 days

CENTRAL ELECTRICITY AUTHORITY
Hydro WING
Hydro Project Planning & Investigation Division

Annex-4.1

DETAILS OF LONG DURATION PLANNED OUTAGES IN HYDRO - ELECTRIC UNITS DURING 2023-24

(OUTAGE DURATION 50 HOURS AND ABOVE)

S.No	STATION	UNIT	CAPACITY(MW)	DATE OF OUTAGE	DATE OF RETURN	OUTAGE HOURS	REASONS
Eastern							
OHPC							
1	BALIMELA HPS	1	60.0	08/25/2023	08/27/2023	54.00	DRAFT TUBE
		1	60.0	02/08/2024	02/22/2024	339.33	ANNUAL MAINTENANCE
		1	60.0	08/02/2023	08/11/2023	226.00	DRAFT TUBE
		2	60.0	11/08/2023	11/21/2023	319.75	ANNUAL MAINTENANCE
		2	60.0	03/15/2024	03/22/2024	168.50	TURBINE INSPECTION MISC
		3	60.0	06/01/2023	06/30/2023	720.00	R AND M WORKS
		3	60.0	05/01/2023	05/31/2023	744.00	R AND M WORKS
		3	60.0	10/01/2023	10/31/2023	744.00	R AND M WORKS
		3	60.0	07/01/2023	07/31/2023	744.00	R AND M WORKS
		3	60.0	09/01/2023	09/30/2023	720.00	R AND M WORKS
		3	60.0	01/01/2024	01/31/2024	744.00	R AND M WORKS
		3	60.0	08/01/2023	08/31/2023	744.00	R AND M WORKS
		3	60.0	12/01/2023	12/31/2023	744.00	R AND M WORKS
		3	60.0	02/01/2024	02/29/2024	696.00	R AND M WORKS
		3	60.0	03/01/2024	03/31/2024	744.00	R AND M WORKS
		3	60.0	11/01/2023	11/30/2023	720.00	R AND M WORKS
		3	60.0	04/01/2023	04/30/2023	720.00	R AND M WORKS
		4	60.0	07/01/2023	07/31/2023	744.00	MONTHLY MAINTENANCE
		4	60.0	12/01/2023	12/31/2023	744.00	R AND M WORKS
		4	60.0	10/01/2023	10/31/2023	744.00	R AND M WORKS
		4	60.0	01/01/2024	01/31/2024	744.00	R AND M WORKS
		4	60.0	09/01/2023	09/30/2023	720.00	R AND M WORKS
		4	60.0	08/01/2023	08/31/2023	744.00	R AND M WORKS
		4	60.0	11/01/2023	11/30/2023	720.00	R AND M WORKS
		4	60.0	02/01/2024	02/06/2024	137.25	R AND M WORKS
		4	60.0	04/01/2023	04/30/2023	720.00	R AND M WORKS
		4	60.0	05/01/2023	05/31/2023	744.00	R AND M WORKS
		4	60.0	06/01/2023	06/30/2023	720.00	R AND M WORKS

S.No	STATION	UNIT	CAPACITY(MW)	DATE OF OUTAGE	DATE OF RETURN	OUTAGE HOURS	REASONS
		5	60.0	05/01/2023	05/04/2023	84.93	ANNUAL MAINTENANCE
		5	60.0	04/08/2023	04/30/2023	535.95	ANNUAL MAINTENANCE
		7	75.0	07/25/2023	07/27/2023	51.33	MONTHLY MAINTENANCE
		7	75.0	12/18/2023	12/31/2023	327.00	ANNUAL MAINTENANCE
		7	75.0	01/01/2024	01/13/2024	308.98	ANNUAL MAINTENANCE
		8	75.0	12/18/2023	12/31/2023	327.00	ANNUAL MAINTENANCE
		8	75.0	01/01/2024	01/17/2024	401.58	ANNUAL MAINTENANCE
2	CHIPLIMA HPS	1	24.0	03/01/2024	03/31/2024	744.00	CAPITAL MAINTENANCE
		1	24.0	12/15/2023	12/31/2023	398.00	CAPITAL MAINTENANCE
		1	24.0	01/01/2024	01/31/2024	744.00	CAPITAL MAINTENANCE
		1	24.0	02/01/2024	02/29/2024	696.00	CAPITAL MAINTENANCE
GIPL							
3	CHUZACHEN HPS	1	55.0	02/01/2024	03/06/2024	835.43	ANNUAL MAINTENANCE
		2	55.0	02/11/2024	02/26/2024	360.42	ANNUAL MAINTENANCE
OHPC							
4	HIRAKUD HPS	2	49.5	04/03/2023	04/15/2023	296.50	ANNUAL MAINTENANCE
		3	32.0	12/12/2023	12/29/2023	416.50	ANNUAL MAINTENANCE
		4	32.0	12/01/2023	12/05/2023	112.00	ANNUAL MAINTENANCE
		4	32.0	11/15/2023	11/30/2023	351.50	ANNUAL MAINTENANCE
		5	43.65	02/01/2024	02/10/2024	228.00	ANNUAL MAINTENANCE
		5	43.65	04/20/2023	04/28/2023	200.00	ANNUAL MAINTENANCE
		6	43.65	01/04/2024	01/15/2024	272.25	ANNUAL MAINTENANCE
		6	43.65	06/01/2023	06/09/2023	202.67	ANNUAL MAINTENANCE
		7	37.5	02/13/2024	02/29/2024	393.98	ANNUAL MAINTENANCE
		7	37.5	03/01/2024	03/31/2024	743.92	ANNUAL MAINTENANCE
DEPL							
5	JORETHANG LOOP	2	48.0	04/01/2023	04/12/2023	281.37	ANNUAL MAINTENANCE
DVC							
6	MAITHON HPS	1	20.0	04/01/2023	04/17/2023	404.83	GOVERNOR SYSTEM
		3	20.0	04/12/2023	06/05/2023	1,298.06	GOVERNOR SYSTEM
WBSEDCL							
7	PURULIA PSS HPS	1	225.0	11/01/2023	11/03/2023	63.98	MISC.PAINTING WORKS/OTHER
		1	225.0	06/23/2023	06/25/2023	56.42	MISC.PAINTING WORKS/OTHER
		2	225.0	12/17/2023	12/20/2023	83.15	ANNUAL MAINTENANCE
		3	225.0	12/29/2023	12/31/2023	54.08	ANNUAL MAINTENANCE
		4	225.0	12/26/2023	12/28/2023	61.00	ANNUAL MAINTENANCE
8	RAMMAM HPS	3	12.5	04/01/2023	05/27/2023	1,363.20	OVERHAULING WORKS
		3	12.5	02/15/2024	02/28/2024	316.43	ANNUAL MAINTENANCE
NHPC							

S.No	STATION	UNIT	CAPACITY(MW)	DATE OF OUTAGE	DATE OF RETURN	OUTAGE HOURS	REASONS
9	RANGIT HPS	1	20.0	07/18/2023	07/23/2023	114.02	TURBINE INSPECTION MISC
		3	20.0	02/27/2024	03/06/2024	190.88	TURBINE INSPECTION MISC
		3	20.0	01/04/2024	02/26/2024	1,295.00	ANNUAL MAINTENANCE
		3	20.0	04/15/2023	04/28/2023	322.67	STATOR REWINDING
OHPC							
10	RENGALI HPS	1	50.0	11/14/2023	12/15/2023	754.08	ANNUAL MAINTENANCE
		2	50.0	04/01/2023	05/08/2023	909.95	ANNUAL MAINTENANCE
		3	50.0	03/01/2024	03/23/2024	544.70	CAPITAL MAINTENANCE
		3	50.0	02/07/2024	02/29/2024	542.13	CAPITAL MAINTENANCE
		4	50.0	12/18/2023	01/05/2024	441.80	ANNUAL MAINTENANCE
		5	50.0	07/05/2023	07/11/2023	147.25	MISC.PAINTING WORKS/OTHER
MBPC							
11	RONGNICHU HPS	1	56.5	02/14/2024	02/27/2024	312.89	ANNUAL MAINTENANCE
		2	56.5	02/14/2024	03/04/2024	446.78	ANNUAL MAINTENANCE
NHPC							
12	TEESTA LOW DAM-III	1	33.0	06/03/2023	06/05/2023	52.88	RUNNER INSPECTION
13	TEESTA LOW DAM-IV	3	40.0	02/22/2024	03/15/2024	537.17	ANNUAL MAINTENANCE
		4	40.0	12/05/2023	12/22/2023	420.88	ANNUAL MAINTENANCE
OHPC							
14	UPPER INDRAVATI HPS	2	150.0	02/01/2024	02/29/2024	696.00	CAPITAL MAINTENANCE
		2	150.0	03/01/2024	03/24/2024	576.00	CAPITAL MAINTENANCE
		2	150.0	01/01/2024	01/31/2024	744.00	CAPITAL MAINTENANCE
		2	150.0	11/23/2023	11/30/2023	181.50	CAPITAL MAINTENANCE
		4	150.0	07/01/2023	07/31/2023	744.00	OVERHAULING WORKS
		4	150.0	04/01/2023	04/30/2023	720.00	OVERHAULING WORKS
		4	150.0	09/01/2023	09/25/2023	594.83	OVERHAULING WORKS
		4	150.0	05/01/2023	05/31/2023	744.00	OVERHAULING WORKS
		4	150.0	08/01/2023	08/31/2023	744.00	OVERHAULING WORKS
		4	150.0	06/01/2023	06/30/2023	720.00	OVERHAULING WORKS
15	UPPER KOLAB HPS	1	80.0	02/01/2024	02/28/2024	667.33	ANNUAL MAINTENANCE
North Eastern							
NEEPCO.							
16	DOYANG HPS	1	25.0	04/03/2023	04/11/2023	205.00	MISCELLANEOUS PLANNED
		2	25.0	04/03/2023	04/11/2023	205.00	MISCELLANEOUS PLANNED
		3	25.0	04/03/2023	04/11/2023	205.00	MISCELLANEOUS PLANNED
17	KAMENG HPS	1	150.0	04/01/2023	07/05/2023	2,294.23	MISCELLANEOUS PLANNED
		3	150.0	03/01/2024	03/23/2024	552.00	MISCELLANEOUS PLANNED
APGCL							
18	KARBI LANGPI HPS	1	50.0	04/01/2023	04/05/2023	96.22	ANNUAL MAINTENANCE

S.No	STATION	UNIT	CAPACITY(MW)	DATE OF OUTAGE	DATE OF RETURN	OUTAGE HOURS	REASONS
		2	50.0	04/01/2023	08/03/2023	2,987.53	OVERHAULING WORKS
NEEPCO.							
19	KHONDONG HPS	1	25.0	04/01/2023	09/06/2023	3,816.00	R AND M / REFURBISHMENT
		2	25.0	04/01/2023	09/06/2023	3,816.00	R AND M / REFURBISHMENT
MeECL							
20	KYRDEMKULAI HPS	1	30.0	04/12/2023	06/19/2023	1,648.60	R AND M / REFURBISHMENT
		1	30.0	04/03/2023	04/12/2023	216.00	RENOVATION/MODERNISATION
		2	30.0	04/01/2023	04/10/2023	232.00	TURBINE INSPECTION MISC
NHPC							
21	LOKTAK HPS	1	35.0	02/23/2024	03/08/2024	339.68	ANNUAL MAINTENANCE
		2	35.0	02/09/2024	02/19/2024	245.55	ANNUAL MAINTENANCE
		3	35.0	01/16/2024	02/05/2024	488.75	ANNUAL MAINTENANCE
MeECL							
22	MYNTDU(LESHKA) St-1	1	42.0	04/01/2023	04/12/2023	284.50	ANNUAL MAINTENANCE
23	NEW UMTRU HPS	2	20.0	01/19/2024	02/15/2024	667.17	ANNUAL MAINTENANCE
NEEPCO.							
24	TUIRIAL HPS	1	30.0	05/02/2023	05/25/2023	564.00	ANNUAL MAINTENANCE
		2	30.0	04/01/2023	04/14/2023	326.83	ANNUAL MAINTENANCE
MeECL							
25	UMIAM HPS ST-IV	8	30.0	04/01/2023	07/11/2023	2,436.50	OVERHAULING WORKS
Northern							
ADHPL							
26	ALLAIN DUHANGAN	1	96.0	03/11/2024	03/13/2024	56.83	MISCELLANEOUS PLANNED
		1	96.0	12/01/2023	12/25/2023	583.00	ANNUAL MAINTENANCE
		1	96.0	02/19/2024	03/04/2024	345.68	MISCELLANEOUS PLANNED
		2	96.0	01/02/2024	01/25/2024	561.28	ANNUAL MAINTENANCE
		2	96.0	10/09/2023	10/13/2023	97.00	MISCELLANEOUS PLANNED
		2	96.0	04/19/2023	04/24/2023	113.67	MISCELLANEOUS PLANNED
		2	96.0	04/25/2023	04/28/2023	84.50	MISCELLANEOUS PLANNED
NHPC							
27	BAIRA SIUL HPS	1	60.0	12/30/2023	01/22/2024	556.43	ANNUAL MAINTENANCE
		2	60.0	12/11/2023	12/29/2023	448.00	ANNUAL MAINTENANCE
		3	60.0	11/15/2023	12/10/2023	606.43	ANNUAL MAINTENANCE
GMR BHHPL							
28	BAJOLI HOLI HPS	2	60.0	11/13/2023	12/01/2023	438.17	ANNUAL MAINTENANCE
HBPCL							
29	BASPA HPS	1	100.0	02/01/2024	02/19/2024	435.25	ANNUAL MAINTENANCE
		2	100.0	02/27/2024	03/06/2024	196.00	ANNUAL MAINTENANCE
		3	100.0	03/12/2024	03/21/2024	226.17	ANNUAL MAINTENANCE
HPSEB							
30	BASSI HPS	1	16.5	10/24/2023	11/21/2023	680.93	ANNUAL MAINTENANCE

S.No	STATION	UNIT	CAPACITY(MW)	DATE OF OUTAGE	DATE OF RETURN	OUTAGE HOURS	REASONS
		1	16.5	11/22/2023	12/14/2023	536.61	ANNUAL MAINTENANCE
		2	16.5	12/30/2023	01/08/2024	216.01	ANNUAL MAINTENANCE
		3	16.5	01/12/2024	03/01/2024	1,176.00	ANNUAL MAINTENANCE
BBMB							
31	BHAKRA LEFT HPS	1	126.0	04/01/2023	05/25/2023	1,320.00	RENOVATION/MODERNISATION
		2	126.0	11/22/2023	01/10/2024	1,178.35	ANNUAL MAINTENANCE
32	BHAKRA RIGHT HPS	6	157.0	01/29/2024	02/27/2024	698.47	ANNUAL MAINTENANCE
GBHPPL							
33	BUDHIL HPS	1	35.0	11/21/2023	12/22/2023	751.38	ANNUAL MAINTENANCE
		2	35.0	01/02/2024	01/27/2024	607.25	ANNUAL MAINTENANCE
NHPC							
34	CHAMERA-I HPS	1	180.0	01/26/2024	02/12/2024	411.50	ANNUAL MAINTENANCE
		2	180.0	01/06/2024	01/25/2024	453.57	ANNUAL MAINTENANCE
		3	180.0	12/15/2023	01/04/2024	488.03	ANNUAL MAINTENANCE
35	CHAMERA-II HPS	1	100.0	12/08/2023	12/24/2023	383.27	ANNUAL MAINTENANCE
		2	100.0	02/02/2024	02/21/2024	447.45	ANNUAL MAINTENANCE
		3	100.0	12/27/2023	01/27/2024	748.83	ANNUAL MAINTENANCE
36	CHAMERA-III HPS	1	77.0	01/10/2024	02/16/2024	901.38	ANNUAL MAINTENANCE
		2	77.0	11/18/2023	12/15/2023	630.23	ANNUAL MAINTENANCE
		2	77.0	01/10/2024	02/16/2024	897.83	MISCELLANEOUS PLANNED
		3	77.0	01/10/2024	02/16/2024	898.02	ANNUAL MAINTENANCE
		3	77.0	03/23/2024	03/30/2024	157.00	MISCELLANEOUS PLANNED
IAEPL							
37	CHANJU-I HPS	1	12.0	10/02/2023	10/31/2023	708.25	ANNUAL MAINTENANCE
		2	12.0	11/01/2023	12/07/2023	886.03	ANNUAL MAINTENANCE
		3	12.0	12/08/2023	01/07/2024	736.00	ANNUAL MAINTENANCE
UJVNL							
38	CHILLA HPS	1	36.0	11/21/2023	12/28/2023	908.50	ANNUAL MAINTENANCE
		2	36.0	12/30/2023	01/29/2024	731.32	ANNUAL MAINTENANCE
NHPC							
39	CHUTAK HPS	1	11.0	11/23/2023	12/07/2023	340.82	ANNUAL MAINTENANCE
		2	11.0	12/21/2023	01/01/2024	270.57	ANNUAL MAINTENANCE
		3	11.0	11/07/2023	11/23/2023	401.00	ANNUAL MAINTENANCE
		4	11.0	12/08/2023	12/21/2023	319.82	ANNUAL MAINTENANCE
BBMB							
40	DEHAR HPS	1	165.0	11/08/2023	03/14/2024	3,046.43	SURGE SHAFT TRT MTc.
		4	165.0	02/27/2024	03/26/2024	675.58	ANNUAL MAINTENANCE
		5	165.0	10/14/2023	02/25/2024	3,230.00	CAPITAL MAINTENANCE
		6	165.0	04/01/2023	03/31/2024	8,784.00	CAPITAL MAINTENANCE

S.No	STATION	UNIT	CAPACITY(MW)	DATE OF OUTAGE	DATE OF RETURN	OUTAGE HOURS	REASONS
UJVNL							
41	DHAKRANI HPS	2	11.25	12/15/2023	01/17/2024	799.00	ANNUAL MAINTENANCE
		3	11.25	01/23/2024	02/15/2024	548.83	ANNUAL MAINTENANCE
42	DHALIPUR HPS	1	17.0	04/01/2023	06/02/2023	1,507.67	RENOVATION/MODERNISATION
		3	17.0	04/01/2023	10/09/2023	4,584.08	RENOVATION/MODERNISATION
NHPC							
43	DHAULI GANGA HPS	1	70.0	09/27/2023	09/29/2023	60.67	SWITCHING EQUIPMENT
		1	70.0	01/19/2024	02/14/2024	633.50	ANNUAL MAINTENANCE
		2	70.0	09/27/2023	09/29/2023	60.10	SWITCHING EQUIPMENT
		2	70.0	12/26/2023	01/16/2024	519.40	ANNUAL MAINTENANCE
		3	70.0	04/01/2023	04/08/2023	183.97	ANNUAL MAINTENANCE
		3	70.0	03/04/2024	03/23/2024	460.45	ANNUAL MAINTENANCE
		4	70.0	09/27/2023	09/29/2023	60.02	SWITCHING EQUIPMENT
		4	70.0	02/14/2024	03/04/2024	461.75	ANNUAL MAINTENANCE
44	DULHASTI HPS	1	130.0	07/23/2023	07/27/2023	92.50	TESTING/CHECKING
		1	130.0	07/14/2023	07/17/2023	58.92	TURBINE INSPECTION MISC
		1	130.0	02/26/2024	03/23/2024	639.23	ANNUAL MAINTENANCE
		2	130.0	07/11/2023	07/26/2023	361.88	MAIN GENERTATOR
		2	130.0	02/04/2024	02/25/2024	517.17	ANNUAL MAINTENANCE
		3	130.0	01/05/2024	02/03/2024	698.82	ANNUAL MAINTENANCE
BBMB							
45	GANGUWAL HPS	1	29.25	12/22/2023	12/31/2023	222.27	ANNUAL MAINTENANCE
		2	24.2	12/02/2023	12/11/2023	224.37	ANNUAL MAINTENANCE
		3	24.2	12/11/2023	12/21/2023	240.58	ANNUAL MAINTENANCE
HPSEB							
46	GIRI BATA HPS	1	30.0	04/01/2023	04/20/2023	464.39	ANNUAL MAINTENANCE
		2	30.0	05/17/2023	06/06/2023	498.00	ANNUAL MAINTENANCE
HBPCL							
47	KARCHAM WANGTOO	1	261.25	04/01/2023	09/06/2023	3,792.00	ANNUAL MAINTENANCE
		1	261.25	02/16/2024	02/27/2024	285.15	ANNUAL MAINTENANCE
		2	261.25	03/11/2024	03/22/2024	288.00	ANNUAL MAINTENANCE
HPPCL							
48	KASHANG	3	65.0	04/01/2023	05/01/2023	720.00	ANNUAL MAINTENANCE
UPJVNL							
49	KHARA HPS	2	24.0	04/01/2023	04/27/2023	645.33	ANNUAL MAINTENANCE
UJVNL							
50	KHODRI HPS	1	30.0	02/08/2024	03/13/2024	824.47	ANNUAL MAINTENANCE
		2	30.0	03/06/2024	03/11/2024	126.65	MISCELLANEOUS PLANNED
		3	30.0	01/25/2024	02/02/2024	204.17	PENSTOCK PRESSURE SHAFT

S.No	STATION	UNIT	CAPACITY(MW)	DATE OF OUTAGE	DATE OF RETURN	OUTAGE HOURS	REASONS
		4	30.0	12/27/2023	02/03/2024	919.58	ANNUAL MAINTENANCE
NHPC							
51	KISHANGANGA HPS	1	110.0	09/12/2023	10/06/2023	576.78	ANNUAL MAINTENANCE
		1	110.0	04/01/2023	04/18/2023	428.90	GENERATOR
		1	110.0	04/20/2023	04/25/2023	102.80	TESTING/CHECKING
		2	110.0	01/06/2024	01/16/2024	249.74	ANNUAL MAINTENANCE
		2	110.0	04/30/2023	06/10/2023	969.61	TURBINE INSPECTION MISC
		2	110.0	10/23/2023	11/02/2023	251.09	RUNNER REPAIR
		3	110.0	08/19/2023	09/05/2023	422.92	GENERATOR
THDC							
52	KOTESHWAR HPS	2	100.0	05/01/2023	05/23/2023	537.75	ANNUAL MAINTENANCE
		3	100.0	05/25/2023	06/15/2023	512.00	ANNUAL MAINTENANCE
		4	100.0	11/03/2023	11/23/2023	488.47	ANNUAL MAINTENANCE
BBMB							
53	KOTLA HPS	1	29.25	12/22/2023	12/31/2023	222.78	ANNUAL MAINTENANCE
		1	29.25	04/02/2023	04/08/2023	144.00	MISCELLANEOUS PLANNED
		2	24.2	12/02/2023	12/11/2023	227.25	ANNUAL MAINTENANCE
RRVUNL							
54	MAHI BAJAJ-II HPS	3	45.0	05/03/2023	08/05/2023	2,272.75	ANNUAL MAINTENANCE
		4	45.0	06/01/2023	08/04/2023	1,553.75	ANNUAL MAINTENANCE
MPCL							
55	MALANA HPS	1	43.0	02/06/2024	02/27/2024	512.50	ANNUAL MAINTENANCE
		2	43.0	01/07/2024	01/30/2024	550.00	ANNUAL MAINTENANCE
UJVNL							
56	MANERI BHALI-I HPS	1	30.0	08/04/2023	08/09/2023	120.02	TESTING/CHECKING
		2	30.0	08/04/2023	08/09/2023	120.02	MISCELLANEOUS PLANNED
SJVNL							
57	NATHPA JHAKRI HPS	1	250.0	02/06/2024	02/16/2024	244.97	ANNUAL MAINTENANCE
		5	250.0	03/01/2024	03/09/2024	180.12	ANNUAL MAINTENANCE
		6	250.0	03/11/2024	03/20/2024	205.47	ANNUAL MAINTENANCE
		6	250.0	03/06/2024	03/09/2024	64.72	BUTTERFLY VALVE
NHPC							
58	NIMMO BAZGO HPS	1	15.0	11/26/2023	12/20/2023	585.88	ANNUAL MAINTENANCE
		2	15.0	02/02/2024	02/21/2024	459.18	ANNUAL MAINTENANCE
		3	15.0	12/30/2023	01/25/2024	631.77	ANNUAL MAINTENANCE
UPJVNL							
59	OBRA HPS	2	33.0	04/28/2023	07/14/2023	1,861.42	ANNUAL MAINTENANCE
		3	33.0	04/01/2023	05/03/2023	785.25	CAPITAL MAINTENANCE
NHPC							
60	PARBATI-III HPS	1	130.0	08/12/2023	08/20/2023	174.27	DAM/SPILL GATES

S.No	STATION	UNIT	CAPACITY(MW)	DATE OF OUTAGE	DATE OF RETURN	OUTAGE HOURS	REASONS
		2	130.0	08/12/2023	08/20/2023	179.28	DAM/SPILL GATES
		2	130.0	07/01/2023	07/04/2023	68.72	INSPECTION /MTCE
		4	130.0	03/23/2024	03/30/2024	187.93	GENERATOR
		4	130.0	01/10/2024	03/21/2024	1,710.63	ANNUAL MAINTENANCE
BBMB							
61	PONG HPS	1	66.0	10/23/2023	11/01/2023	221.42	ANNUAL MAINTENANCE
		3	66.0	11/18/2023	11/24/2023	145.67	ANNUAL MAINTENANCE
		5	66.0	12/16/2023	01/15/2024	720.97	MISC.PAINTING WORKS/OTHER
		6	66.0	11/24/2023	12/06/2023	287.75	ANNUAL MAINTENANCE
UJVNL							
62	RAMGANGA HPS	1	66.0	07/27/2023	02/12/2024	4,803.02	ANNUAL MAINTENANCE
SJVNL							
63	RAMPUR HPS	1	68.67	02/11/2024	02/16/2024	107.42	BUTTERFLY VALVE
		1	68.67	02/18/2024	02/23/2024	136.63	ANNUAL MAINTENANCE
		2	68.67	02/07/2024	02/16/2024	227.77	ANNUAL MAINTENANCE
		3	68.67	01/17/2024	01/24/2024	188.58	ANNUAL MAINTENANCE
		4	68.67	01/28/2024	02/02/2024	143.98	ANNUAL MAINTENANCE
		5	68.67	03/11/2024	03/15/2024	120.00	ANNUAL MAINTENANCE
		6	68.67	03/02/2024	03/08/2024	168.00	ANNUAL MAINTENANCE
PSPCL							
64	RANJIT SAGAR HPS	1	150.0	11/22/2023	12/22/2023	734.17	ANNUAL MAINTENANCE
		1	150.0	04/04/2023	05/10/2023	867.58	GENERATOR
		2	150.0	01/15/2024	02/23/2024	940.00	ANNUAL MAINTENANCE
		3	150.0	11/21/2023	11/23/2023	54.75	TESTING/CHECKING
		3	150.0	10/18/2023	11/17/2023	723.00	ANNUAL MAINTENANCE
		3	150.0	05/12/2023	06/09/2023	672.62	ANNUAL MAINTENANCE
		4	150.0	02/15/2024	03/19/2024	794.83	ANNUAL MAINTENANCE
		4	150.0	01/29/2024	02/14/2024	387.83	GENERATOR TRANSFORMER
UPJVNL							
65	RIHAND HPS	1	50.0	01/24/2024	02/23/2024	726.03	ANNUAL MAINTENANCE
		1	50.0	04/01/2023	04/19/2023	432.00	GENERATOR TRANSFORMER
		2	50.0	04/01/2023	04/13/2023	305.83	ANNUAL MAINTENANCE
		4	50.0	04/01/2023	04/19/2023	432.00	GENERATOR TRANSFORMER
		5	50.0	04/17/2023	05/28/2023	981.42	ANNUAL MAINTENANCE
		6	50.0	11/21/2023	12/29/2023	918.17	ANNUAL MAINTENANCE
RRVUNL							
66	R P SAGAR HPS	1	43.0	04/01/2023	04/24/2023	562.25	ANNUAL MAINTENANCE
		3	43.0	05/17/2023	06/07/2023	512.30	ANNUAL MAINTENANCE
		4	43.0	04/26/2023	05/15/2023	465.42	ANNUAL MAINTENANCE

S.No	STATION	UNIT	CAPACITY(MW)	DATE OF OUTAGE	DATE OF RETURN	OUTAGE HOURS	REASONS
HPPCL							
67	SAINJ HPS	1	50.0	01/23/2024	02/01/2024	221.07	ANNUAL MAINTENANCE
NHPC							
68	SALAL HPS	1	115.0	11/02/2023	11/11/2023	223.72	ANNUAL MAINTENANCE
		2	115.0	12/26/2023	01/08/2024	318.92	ANNUAL MAINTENANCE
		3	115.0	02/15/2024	03/19/2024	793.43	INSPECTION OF GENERATING
		3	115.0	10/16/2023	10/31/2023	367.10	ANNUAL MAINTENANCE
		4	115.0	01/12/2024	03/14/2024	1,497.65	CAPITAL MAINTENANCE
		5	115.0	12/08/2023	12/24/2023	389.98	ANNUAL MAINTENANCE
		6	115.0	11/22/2023	12/07/2023	365.50	ANNUAL MAINTENANCE
HPSEB							
69	SANJAY HPS	1	40.0	12/11/2023	01/11/2024	738.99	ANNUAL MAINTENANCE
		2	40.0	10/24/2023	11/10/2023	432.00	ANNUAL MAINTENANCE
		3	40.0	01/19/2024	02/14/2024	639.75	ANNUAL MAINTENANCE
HPPCL							
70	SAWRA KUDDU HPS	3	37.0	06/16/2023	06/22/2023	162.39	MISCELLANEOUS PLANNED
NHPC							
71	SEWA-II HPS	1	40.0	12/08/2023	12/26/2023	440.41	ANNUAL MAINTENANCE
		2	40.0	11/20/2023	12/05/2023	360.95	ANNUAL MAINTENANCE
		2	40.0	12/31/2023	01/06/2024	168.00	PENSTOCK B.F.VALVE PROBLEM
		3	40.0	12/27/2023	01/10/2024	343.25	ANNUAL MAINTENANCE
PSPCL							
72	SHANAN HPS	2	15.0	10/30/2023	11/27/2023	678.30	ANNUAL MAINTENANCE
		2	15.0	02/28/2024	03/01/2024	62.75	RUNNER REPAIR
		3	15.0	12/27/2023	02/02/2024	905.58	ANNUAL MAINTENANCE
		3	15.0	04/01/2023	06/25/2023	2,061.60	MONTHLY MAINTENANCE
		4	15.0	11/27/2023	02/02/2024	1,608.00	ANNUAL MAINTENANCE
AHPC (GVK)							
73	SHRINAGAR HPS	1	82.5	04/01/2023	04/13/2023	298.03	ANNUAL MAINTENANCE
L&T							
74	SINGOLI BHATWARI	1	33.0	12/15/2023	01/23/2024	943.83	ANNUAL MAINTENANCE
HSPCL							
75	SORANG HPS	1	50.0	03/22/2024	03/31/2024	233.98	MISC.PAINTING WORKS/OTHER
		2	50.0	03/22/2024	03/31/2024	233.92	MISC.PAINTING WORKS/OTHER
		2	50.0	05/25/2023	05/28/2023	65.77	MISC.PAINTING WORKS/OTHER
NHPC							
76	TANAKPUR HPS	1	31.4	10/16/2023	10/19/2023	81.18	TURBINE INSPECTION MISC
		1	31.4	02/10/2024	02/18/2024	204.93	FOREBAY WORKS
		1	31.4	11/27/2023	12/29/2023	782.98	ANNUAL MAINTENANCE
		2	31.4	04/12/2023	04/18/2023	148.22	MISCELLANEOUS PLANNED

S.No	STATION	UNIT	CAPACITY(MW)	DATE OF OUTAGE	DATE OF RETURN	OUTAGE HOURS	REASONS
		2	31.4	01/04/2024	02/04/2024	763.23	ANNUAL MAINTENANCE
THDC							
77	TEHRI ST-1 HPS	2	250.0	05/02/2023	05/18/2023	403.50	ANNUAL MAINTENANCE
		3	250.0	05/19/2023	06/04/2023	406.00	ANNUAL MAINTENANCE
		4	250.0	06/05/2023	06/20/2023	378.75	ANNUAL MAINTENANCE
		4	250.0	11/27/2023	03/03/2024	2,333.83	GENERATOR TRANSFORMER
JKSPDC							
78	UPPER SINDH-II HPS	5	35.0	08/22/2023	09/19/2023	661.75	MISC.PAINTING WORKS/OTHER
NHPC							
79	URI-I HPS	1	120.0	10/10/2023	10/13/2023	85.53	TURBINE INSPECTION MISC
		1	120.0	10/16/2023	10/18/2023	58.23	TURBINE INSPECTION MISC
		1	120.0	12/14/2023	01/15/2024	778.17	CAPITAL MAINTENANCE
		2	120.0	06/07/2023	06/11/2023	108.05	GENERATOR
		2	120.0	02/06/2024	03/08/2024	750.00	CAPITAL MAINTENANCE
		3	120.0	01/17/2024	02/07/2024	509.77	ANNUAL MAINTENANCE
		4	120.0	11/22/2023	12/11/2023	462.82	ANNUAL MAINTENANCE
80	URI-II HPS	2	60.0	12/08/2023	12/21/2023	314.43	ANNUAL MAINTENANCE
		3	60.0	12/22/2023	01/19/2024	675.47	CAPITAL MAINTENANCE
		4	60.0	01/14/2024	01/30/2024	383.57	ANNUAL MAINTENANCE
JPPVL							
81	VISHNU PRAYAG HPS	1	100.0	01/25/2024	01/31/2024	156.85	ANNUAL MAINTENANCE
		2	100.0	01/25/2024	01/31/2024	156.85	ANNUAL MAINTENANCE
		3	100.0	01/25/2024	01/31/2024	156.85	ANNUAL MAINTENANCE
		4	100.0	01/25/2024	01/31/2024	156.85	ANNUAL MAINTENANCE
Southern							
TANGEDCO							
82	ALIYAR HPS	1	60.0	03/01/2024	03/10/2024	228.62	MISC.PAINTING WORKS/OTHER
		1	60.0	04/29/2023	05/31/2023	764.37	MISC.PAINTING WORKS/OTHER
83	BHAWANI BARRAGE-II	1	15.0	01/30/2024	02/02/2024	72.01	MISCELLANEOUS PLANNED
84	BHAWANI KATTAL	1	15.0	09/15/2023	09/19/2023	100.17	MISC.PAINTING WORKS/OTHER
		2	15.0	04/01/2023	04/15/2023	341.00	OVERHAULING WORKS
KPCL							
85	GERUSUPPA HPS	1	60.0	12/13/2023	12/27/2023	345.53	ANNUAL MAINTENANCE
		1	60.0	04/03/2023	04/06/2023	81.12	R AND M WORKS
		2	60.0	05/16/2023	05/31/2023	363.95	DRAFT TUBE
		4	60.0	12/01/2023	12/13/2023	291.22	ANNUAL MAINTENANCE
86	GHAT PRABHA HPS	1	16.0	06/23/2023	08/18/2023	1,342.25	ANNUAL MAINTENANCE
		2	16.0	06/24/2023	08/15/2023	1,242.75	ANNUAL MAINTENANCE
KSEB							

S.No	STATION	UNIT	CAPACITY(MW)	DATE OF OUTAGE	DATE OF RETURN	OUTAGE HOURS	REASONS
87	IDAMALAYAR HPS	1	37.5	10/27/2023	11/23/2023	658.37	ANNUAL MAINTENANCE
		1	37.5	05/07/2023	05/11/2023	111.35	MISCELLANEOUS PLANNED
		2	37.5	06/25/2023	07/22/2023	659.50	ANNUAL MAINTENANCE
		2	37.5	05/07/2023	05/12/2023	115.38	MISCELLANEOUS PLANNED
88	IDUKKI HPS	1	130.0	09/04/2023	10/06/2023	772.78	ANNUAL MAINTENANCE
		2	130.0	10/17/2023	11/11/2023	617.62	ANNUAL MAINTENANCE
		3	130.0	07/28/2023	08/21/2023	586.98	ANNUAL MAINTENANCE
		3	130.0	10/08/2023	10/16/2023	200.48	MISCELLANEOUS PLANNED
		4	130.0	07/07/2023	07/14/2023	177.52	MONTHLY MAINTENANCE
		4	130.0	11/15/2023	12/10/2023	605.87	ANNUAL MAINTENANCE
		5	130.0	12/11/2023	01/02/2024	528.27	ANNUAL MAINTENANCE
		6	130.0	01/24/2024	02/09/2024	373.05	INSPECTION /MTCE
		6	130.0	02/28/2024	03/11/2024	304.80	TURBINE INSPECTION MISC
		6	130.0	06/30/2023	09/06/2023	1,642.33	ANNUAL MAINTENANCE
KPCL							
89	JOG HPS	1	13.2	07/11/2023	07/17/2023	158.17	POWER CHANNEL WORKS
		1	13.2	01/14/2024	01/19/2024	113.33	GOVERNOR SYSTEM
		2	13.2	07/13/2023	07/17/2023	114.83	DAM/SPILL GATES
		3	13.2	07/13/2023	07/17/2023	114.92	DAM/SPILL GATES
		4	13.2	07/13/2023	07/19/2023	146.35	DAM/SPILL GATES
		4	13.2	01/19/2024	02/05/2024	423.60	GOVERNOR SYSTEM
		7	21.6	01/12/2024	01/18/2024	127.17	MISCELLANEOUS PLANNED
		8	21.6	08/19/2023	08/22/2023	79.48	INSPECTION OF GENERATING
90	KADRA HPS	1	50.0	11/04/2023	11/17/2023	332.70	ANNUAL MAINTENANCE
		1	50.0	11/01/2023	11/03/2023	72.00	ANNUAL MAINTENANCE
		2	50.0	12/07/2023	12/28/2023	511.30	ANNUAL MAINTENANCE
		3	50.0	11/20/2023	12/06/2023	388.73	ANNUAL MAINTENANCE
KSEB							
91	KAKKAD HPS	1	25.0	01/04/2024	01/25/2024	514.12	MONTHLY MAINTENANCE
		2	25.0	01/27/2024	02/22/2024	622.68	ANNUAL MAINTENANCE
KPCL							
92	KALINADI HPS	1	150.0	10/31/2023	11/28/2023	671.02	TURBINE INSPECTION MISC
		2	150.0	10/31/2023	11/24/2023	581.90	TURBINE INSPECTION MISC
		4	150.0	05/02/2023	05/04/2023	57.32	TURBINE INSPECTION MISC
93	KODASALI HPS	1	40.0	01/15/2024	02/16/2024	770.27	ANNUAL MAINTENANCE
		2	40.0	12/15/2023	12/29/2023	340.17	ANNUAL MAINTENANCE
		3	40.0	11/28/2023	12/08/2023	241.83	ANNUAL MAINTENANCE
TANGEDCO							

S.No	STATION	UNIT	CAPACITY(MW)	DATE OF OUTAGE	DATE OF RETURN	OUTAGE HOURS	REASONS
94	KODAYAR-I HPS	1	60.0	08/10/2023	08/22/2023	294.60	MISCELLANEOUS PLANNED
95	KUNDAH-II HPS	5	35.0	05/15/2023	06/01/2023	421.93	ANNUAL MAINTENANCE
		6	35.0	11/28/2023	12/27/2023	702.52	ANNUAL MAINTENANCE
		7	35.0	10/16/2023	11/16/2023	752.55	ANNUAL MAINTENANCE
		8	35.0	08/24/2023	09/27/2023	805.80	ANNUAL MAINTENANCE
96	KUNDAH-III HPS	10	60.0	04/01/2023	08/11/2023	3,179.32	OVERHAULING WORKS
		11	60.0	07/12/2023	08/11/2023	721.07	ANNUAL MAINTENANCE
		9	60.0	11/15/2023	11/29/2023	345.20	ANNUAL MAINTENANCE
TEDAG							
97	KUNDAH-V HPS	15	20.0	08/01/2023	08/05/2023	113.75	OVERHAULING WORKS
		15	20.0	04/12/2023	04/30/2023	441.98	T.R.T/ T.R.C.
		15	20.0	07/17/2023	07/31/2023	327.00	OVERHAULING WORKS
		15	20.0	01/04/2024	01/06/2024	55.58	PENSTOCK B.F.VALVE PROBLEM
KSEB							
98	KUTTIYADI ADDL EXTN	1	50.0	12/19/2023	03/15/2024	2,095.30	ANNUAL MAINTENANCE
		1	50.0	05/27/2023	05/29/2023	56.93	INSPECTION /MTCE
		1	50.0	04/01/2023	04/14/2023	330.00	BEARING OIL TOPPING
		2	50.0	04/28/2023	05/19/2023	512.23	ANNUAL MAINTENANCE
99	KUTTIYADI EXTN HPS	4	50.0	06/03/2023	06/07/2023	106.38	PENSTOCK PRESSURE SHAFT
		4	50.0	10/03/2023	10/12/2023	234.80	RENOVATION/MODERNISATION
100	KUTTIYADI HPS	1	25.0	06/03/2023	06/07/2023	89.00	PENSTOCK PRESSURE SHAFT
		1	25.0	10/03/2023	10/12/2023	237.20	ANNUAL MAINTENANCE
		1	25.0	10/13/2023	11/07/2023	616.65	ANNUAL MAINTENANCE
		2	25.0	11/10/2023	12/15/2023	855.62	ANNUAL MAINTENANCE
		2	25.0	06/03/2023	06/07/2023	106.65	PENSTOCK PRESSURE SHAFT
		2	25.0	10/03/2023	10/12/2023	237.20	RENOVATION/MODERNISATION
TANGEDCO							
101	LOWER METTUR-I HPS	1	15.0	05/24/2023	06/14/2023	504.00	ANNUAL MAINTENANCE
		2	15.0	05/24/2023	06/14/2023	504.00	ANNUAL MAINTENANCE
102	LOWER METTUR-II HPS	3	15.0	05/23/2023	05/31/2023	206.42	OVERHAULING WORKS
		4	15.0	05/04/2023	05/22/2023	435.25	OVERHAULING WORKS
		4	15.0	04/01/2023	04/11/2023	255.83	OVERHAULING WORKS
103	LOWER METTUR-III	5	15.0	04/15/2023	05/04/2023	459.92	ANNUAL MAINTENANCE
		6	15.0	04/01/2023	04/15/2023	336.00	ANNUAL MAINTENANCE
		6	15.0	04/15/2023	05/04/2023	455.83	ANNUAL MAINTENANCE
104	LOWER METTUR-IV	7	15.0	04/01/2023	04/14/2023	329.00	MISC.PAINTING WORKS/OTHER
		7	15.0	04/21/2023	04/30/2023	222.00	MISC.PAINTING WORKS/OTHER
		8	15.0	04/01/2023	04/14/2023	328.00	MISC.PAINTING WORKS/OTHER

S.No	STATION	UNIT	CAPACITY(MW)	DATE OF OUTAGE	DATE OF RETURN	OUTAGE HOURS	REASONS
KSEB							
105	LOWER PERIYAR HPS	1	60.0	12/08/2023	12/21/2023	323.55	ANNUAL MAINTENANCE
		2	60.0	11/22/2023	12/01/2023	235.05	ANNUAL MAINTENANCE
		3	60.0	01/05/2024	01/12/2024	191.98	EXTENDED ANNUAL
TANGEDCO							
106	METTUR TUNNEL HPS	1	50.0	04/01/2023	06/15/2023	1,804.42	ANNUAL MAINTENANCE
		2	50.0	04/01/2023	06/08/2023	1,641.58	ANNUAL MAINTENANCE
		3	50.0	04/02/2023	02/05/2024	7,401.17	RUNNER INSPECTION /REPAIR
107	MOYAR HPS	3	12.0	03/02/2024	03/04/2024	53.00	MISC.PAINTING WORKS/OTHER
TSGENCO							
108	NAGARJUN SGR HPS	1	110.0	06/19/2023	08/13/2023	1,334.77	ANNUAL MAINTENANCE
KSEB							
109	NARIAMANGLAM HPS	1	17.55	03/18/2024	03/28/2024	239.00	MISCELLANEOUS PLANNED
		2	17.55	02/12/2024	03/04/2024	512.52	ANNUAL MAINTENANCE
		2	17.55	02/01/2024	02/05/2024	104.13	MISCELLANEOUS PLANNED
		2	17.55	04/01/2023	04/19/2023	448.87	ANNUAL MAINTENANCE
		3	17.55	02/01/2024	02/04/2024	79.46	MISCELLANEOUS PLANNED
110	PALLIVASAL HPS	3	5.0	05/16/2023	06/04/2023	467.35	ANNUAL MAINTENANCE
		3	5.0	12/13/2023	12/29/2023	384.78	ANNUAL MAINTENANCE
		4	7.5	05/16/2023	06/04/2023	466.85	ANNUAL MAINTENANCE
		4	7.5	01/17/2024	01/29/2024	297.07	ANNUAL MAINTENANCE
		5	7.5	05/16/2023	06/04/2023	467.63	DESILING CHANMBER
		5	7.5	02/06/2024	02/16/2024	248.15	ANNUAL MAINTENANCE
		6	7.5	01/01/2024	01/15/2024	327.25	ANNUAL MAINTENANCE
		6	7.5	05/16/2023	06/04/2023	464.93	DAM/SPILL GATES
111	PANNIAR HPS	1	15.0	06/03/2023	06/17/2023	352.88	GENERATOR TRANSFORMER
		1	15.0	01/04/2024	01/31/2024	663.54	ANNUAL MAINTENANCE
		2	15.0	02/03/2024	02/26/2024	552.88	ANNUAL MAINTENANCE
		2	15.0	06/28/2023	07/11/2023	335.98	MAIN GENERTATOR
TANGEDCO							
112	PAPANASAM HPS	1	8.0	04/01/2023	04/25/2023	592.75	SWITCHING EQUIPMENT
		2	8.0	04/01/2023	04/25/2023	592.75	SWITCHING EQUIPMENT
		3	8.0	04/01/2023	04/25/2023	592.75	SWITCHING EQUIPMENT
		3	8.0	05/02/2023	05/31/2023	696.58	ANNUAL MAINTENANCE
		4	8.0	04/05/2023	04/30/2023	607.00	ANNUAL MAINTENANCE
113	PARSON`S VALLEY	1	30.0	05/01/2023	07/31/2023	2,207.98	MISC.PAINTING WORKS/OTHER
114	PERIYAR HPS	1	42.0	04/01/2023	09/05/2023	3,775.54	ANNUAL MAINTENANCE
		2	42.0	04/11/2023	09/06/2023	3,559.99	ANNUAL MAINTENANCE
		3	42.0	04/22/2023	09/06/2023	3,295.47	ANNUAL MAINTENANCE

S.No	STATION	UNIT	CAPACITY(MW)	DATE OF OUTAGE	DATE OF RETURN	OUTAGE HOURS	REASONS
		4	35.0	05/05/2023	09/05/2023	2,959.54	ANNUAL MAINTENANCE
KSEB							
115	PORINGALKUTTU HPS	1	8.0	04/01/2023	06/10/2023	1,696.63	ANNUAL MAINTENANCE
		2	8.0	08/02/2023	08/19/2023	409.27	GENERATOR
		2	8.0	05/25/2023	05/27/2023	66.60	MISC. SHORT DURATION
		2	8.0	06/27/2023	07/21/2023	566.67	MONTHLY MAINTENANCE
		2	8.0	11/15/2023	12/07/2023	535.55	ANNUAL MAINTENANCE
		2	8.0	04/01/2023	04/05/2023	108.53	ANNUAL MAINTENANCE
		3	8.0	04/01/2023	07/21/2023	2,664.00	MONTHLY MAINTENANCE
		3	8.0	08/08/2023	08/19/2023	261.32	TESTING/CHECKING
		4	8.0	04/01/2023	07/21/2023	2,664.00	MONTHLY MAINTENANCE
		4	8.0	12/11/2023	01/01/2024	493.75	ANNUAL MAINTENANCE
TANGEDCO							
116	PYKARA HPS	1	7.0	09/19/2023	09/30/2023	254.08	MISC.PAINTING WORKS/OTHER
		1	7.0	03/16/2024	03/31/2024	350.50	MONTHLY MAINTENANCE
		1	7.0	10/01/2023	10/14/2023	312.00	PENSTOCK PRESSURE SHAFT
117	PYKARA ULTMATE HPS	3	50.0	11/20/2023	11/30/2023	244.58	UNSCHEDULED ANNUAL
KSEB							
118	SABARIGIRI HPS	1	50.0	07/05/2023	08/06/2023	778.35	ANNUAL MAINTENANCE
		2	50.0	01/10/2024	02/02/2024	563.52	ANNUAL MAINTENANCE
		4	50.0	10/25/2023	12/13/2023	1,186.92	ANNUAL MAINTENANCE
		5	50.0	07/01/2023	07/04/2023	59.42	PENSTOCK PRESSURE SHAFT
		5	50.0	04/01/2023	04/04/2023	86.62	ANNUAL MAINTENANCE
		6	50.0	02/04/2024	02/23/2024	461.25	ANNUAL MAINTENANCE
		6	50.0	07/01/2023	07/04/2023	59.42	PENSTOCK PRESSURE SHAFT
TANGEDCO							
119	SARKARPATHY HPS	1	30.0	05/03/2023	06/16/2023	1,073.00	ANNUAL MAINTENANCE
KSEB							
120	SENGULAM HPS	1	12.0	01/11/2024	02/08/2024	684.97	ANNUAL MAINTENANCE
		3	12.0	12/22/2023	01/08/2024	416.97	ANNUAL MAINTENANCE
KPCL							
121	SHARAVATHI HPS	1	103.5	06/02/2023	06/05/2023	82.65	GENERATOR
		1	103.5	03/25/2024	03/28/2024	81.27	TURBINE INSPECTION MISC
		10	103.5	01/12/2024	01/23/2024	266.50	R AND M / REFURBISHMENT
		2	103.5	06/07/2023	06/12/2023	127.60	INSPECTION OF GENERATING
		3	103.5	07/19/2023	08/12/2023	577.72	ANNUAL MAINTENANCE
		3	103.5	03/16/2024	03/22/2024	142.08	PENSTOCK PRESSURE SHAFT
		4	103.5	03/05/2024	03/08/2024	85.70	PENSTOCK PRESSURE SHAFT
		5	103.5	01/29/2024	01/31/2024	55.38	MISCELLANEOUS PLANNED

S.No	STATION	UNIT	CAPACITY(MW)	DATE OF OUTAGE	DATE OF RETURN	OUTAGE HOURS	REASONS
		8	103.5	03/20/2024	03/23/2024	77.63	PENSTOCK PRESSURE SHAFT
		9	103.5	04/10/2023	04/13/2023	80.82	MISCELLANEOUS PLANNED
		9	103.5	03/11/2024	03/19/2024	197.57	MISCELLANEOUS PLANNED
KSEB							
122	SHOLAYAR HPS	1	18.0	09/09/2023	09/12/2023	82.38	PENSTOCK PRESSURE SHAFT
		2	18.0	07/03/2023	02/14/2024	5,432.22	STATOR REWINDING
		3	18.0	01/09/2024	01/15/2024	152.42	TESTING/CHECKING
		3	18.0	09/09/2023	09/12/2023	81.93	MISCELLANEOUS PLANNED
TANGEDCO							
123	SHOLAYAR HPS (TN)	1	35.0	06/01/2023	07/25/2023	1,293.10	MISC.PAINTING WORKS/OTHER
		1	35.0	05/06/2023	05/31/2023	611.92	MISC.PAINTING WORKS/OTHER
		2	35.0	04/15/2023	07/25/2023	2,423.85	MISC.PAINTING WORKS/OTHER
APGENCO							
124	T B DAM HPS	2	9.0	04/01/2023	08/10/2023	3,157.75	ANNUAL MAINTENANCE
		3	9.0	04/07/2023	07/28/2023	2,707.00	ANNUAL MAINTENANCE
KPCL							
125	VARAHI HPS	3	115.0	12/01/2023	12/12/2023	270.52	ANNUAL MAINTENANCE
		4	115.0	11/08/2023	11/29/2023	512.18	ANNUAL MAINTENANCE
Western							
MPPGCL							
126	BANSAGAR-II HPS	2	15.0	06/21/2023	09/06/2023	1,846.92	ANNUAL MAINTENANCE
127	BANSAGAR TONS-I	1	105.0	04/01/2023	08/03/2023	2,997.75	CAPITAL MAINTENANCE
		2	105.0	07/04/2023	09/21/2023	1,888.42	ANNUAL MAINTENANCE
128	BARGI HPS	1	45.0	06/08/2023	06/30/2023	551.18	ANNUAL MAINTENANCE
TATA MAH.							
129	BHIRA HPS	4	25.0	04/01/2023	03/31/2024	8,784.00	ANNUAL MAINTENANCE
NHDC							
130	INDIRA SAGAR HPS	1	125.0	05/16/2023	05/31/2023	363.47	ANNUAL MAINTENANCE
		2	125.0	05/04/2023	05/14/2023	253.10	ANNUAL MAINTENANCE
		3	125.0	06/02/2023	06/14/2023	300.02	ANNUAL MAINTENANCE
		4	125.0	03/01/2024	03/15/2024	347.90	ANNUAL MAINTENANCE
		4	125.0	04/01/2023	04/10/2023	232.42	ANNUAL MAINTENANCE
		5	125.0	06/15/2023	06/27/2023	301.97	ANNUAL MAINTENANCE
		6	125.0	04/10/2023	04/22/2023	302.25	ANNUAL MAINTENANCE
		7	125.0	04/24/2023	05/03/2023	229.75	ANNUAL MAINTENANCE
		8	125.0	03/16/2024	03/30/2024	349.78	ANNUAL MAINTENANCE
		8	125.0	10/10/2023	10/14/2023	104.88	MISCELLANEOUS PLANNED
		8	125.0	09/06/2023	09/09/2023	80.27	MISCELLANEOUS PLANNED
TATA MAH.							
131	KHOPOLI HPS	1	24.0	11/18/2023	12/27/2023	927.60	ANNUAL MAINTENANCE

S.No	STATION	UNIT	CAPACITY(MW)	DATE OF OUTAGE	DATE OF RETURN	OUTAGE HOURS	REASONS
		2	24.0	04/01/2023	03/31/2024	8,784.00	ANNUAL MAINTENANCE
MAHAGENCO							
132	KOYNA-I&II HPS	1	70.0	12/14/2023	12/25/2023	288.00	RENOVATION/MODERNISATION
		2	70.0	01/08/2024	01/14/2024	143.42	RENOVATION/MODERNISATION
		3	70.0	01/16/2024	01/23/2024	168.00	RENOVATION/MODERNISATION
		4	70.0	01/05/2024	01/08/2024	63.08	RENOVATION/MODERNISATION
		4	70.0	12/28/2023	01/05/2024	215.00	RENOVATION/MODERNISATION
		8	80.0	07/13/2023	09/22/2023	1,721.05	CAPITAL MAINTENANCE
NHDC							
133	OMKARESHWAR HPS	1	65.0	04/01/2023	04/12/2023	283.27	ANNUAL MAINTENANCE
		2	65.0	04/13/2023	04/27/2023	344.30	ANNUAL MAINTENANCE
		3	65.0	04/28/2023	05/10/2023	297.58	ANNUAL MAINTENANCE
		4	65.0	05/11/2023	05/23/2023	292.00	ANNUAL MAINTENANCE
		5	65.0	06/13/2023	06/24/2023	272.50	ANNUAL MAINTENANCE
		6	65.0	06/01/2023	06/12/2023	271.67	ANNUAL MAINTENANCE
		6	65.0	05/24/2023	05/27/2023	81.95	ANNUAL MAINTENANCE
		7	65.0	03/01/2024	03/15/2024	343.33	ANNUAL MAINTENANCE
		8	65.0	05/26/2023	05/31/2023	122.52	ANNUAL MAINTENANCE
		8	65.0	03/16/2024	03/27/2024	265.63	ANNUAL MAINTENANCE
MPPGCL							
134	PENCH HPS	1	80.0	06/08/2023	07/28/2023	1,222.02	ANNUAL MAINTENANCE
		2	80.0	06/21/2023	07/12/2023	512.86	CAPITAL MAINTENANCE
SSNNL							
135	S SAROVAR CHPH HPS	2	50.0	05/12/2023	11/21/2023	4,641.87	CAPITAL MAINTENANCE
MAHAGENCO							
136	VAITARNA HPS	1	60.0	07/14/2023	08/04/2023	523.83	MISCELLANEOUS PLANNED

CHAPTER-5

FORCED OUTAGES OF HE UNITS

CHAPTER-5

FORCED OUTAGES OF HE UNITS

5.1 Forced outages of generating units are due to various problems in generating equipments, auxiliary systems, civil structures. Based on the analysis carried out for 731 hydro generating units installed in 212 Hydro Electric Power Stations, non-availability of hydro-electric units in the country due to forced outages during the year 2023-24 (excluding miscellaneous outages) was 2.84% as compared to 2.96% during 2022-23.

Unit-wise details of forced outages of duration 24 hours and above are given in **Annex- 5.1**.

During 2023-24, the turbine and generator faults accounted for 36.78% and 29.30% of the forced outages respectively whereas other equipment & civil structure faults accounted for 10.07% & 23.86% respectively of the forced outages. The summary of forced outages caused due to breakdown of generator, turbine and other equipment during 2023-24 vis-à-vis 2022-23 is given in **Table 5.1** below.

TABLE 5.1

EQUIPMENT/SYSTEM-WISE FORCED OUTAGES
(2023-24 VIS-A-VIS 2022-23)

Sl. No.	Equipment	Forced Outage (Hours)		% of total Forced Outage		Increase/ Decrease viz-z-viz 2022-23
		2023-24	2022-23	2023-24	2022-23	
1	GENERATOR	38428.21	35713.87	29.30	28.16	-7.60
2	TURBINE	48240.64	45341.17	36.78	35.75	-6.39
3	CIVIL STRUCTURE	31294.60	41510.94	23.86	32.73	24.61
4	OTHER EQUIPMENT	13203.02	4273.08	10.07	3.37	-208.98
	Total	**131166.46**	**126839.06**	**100.00**	**100.00**	**-3.41**

It is observed that forced outages in 2023-24 vis-a-vis 2022-23 have increased on account of turbine, generator and other equipment whereas the same have decreased on account of civil structures.

5.2 FORCED OUTAGE DUE TO GENERATOR COMPONENTS

5.2.1 The major source of forced outage during 2023-24 includes Stator (53.49%), followed by Rotor (23.94%) and Miscellaneous Generator (13.67%) which together accounted for more than the 91.1% of the forced outages due to generator components.

The details of forced outages due to various generator faults and associated systems under different categories based on their size are given in **Table 5.2** below:

TABLE 5.2

FORCED OUTAGE HOURS DUE TO BREAKDOWN OF GENERATOR COMPONENTS (PERIOD: 2023-24)

Sl. No.	Components of Generator	Unit size up to 50 MW		Unit size above 50 MW & up to 100 MW		Unit size above 100 MW		Total	
1	AUTOMATIC VOLTAGE REGULATOR	0.00	0.00	12.48	0.10	28.20	1.10	40.68	0.11
2	BRAKE AND JACKS	18.52	0.08	0.77	0.01	1.85	0.07	21.13	0.05
3	EXCITATION SYSTEM	54.32	0.23	40.43	0.32	684.48	26.74	779.23	2.03
4	GENERATOR COOLING SYSTEM	126.17	0.54	6.95	0.06	0.00	0.00	133.12	0.35
5	LOWER GUIDE BEARING	312.94	1.34	36.98	0.30	0.52	0.02	350.44	0.91
6	MISCELLANEOUS GENERATOR	5032.28	21.54	33.63	0.27	186.41	7.28	5252.32	13.67
7	PROTECTION SYSTEM	164.65	0.70	28.82	0.23	1188.41	46.42	1381.87	3.60
8	ROTOR	957.03	4.10	8092.43	64.72	151.29	5.91	9200.76	23.94
9	STATOR	16309.39	69.81	4219.57	33.74	25.41	0.99	20554.37	53.49
10	THRUST BEARING	314.53	1.35	22.60	0.18	19.53	0.76	356.67	0.93
11	UPPER GUIDE BEARING	69.67	0.30	0.00	0.00	273.95	10.70	343.62	0.89
12	VIBRATION/SOUND/ALIGNMENT	4.18	0.02	9.83	0.08	0.00	0.00	14.01	0.04
	Total	**23363.67**	**100**	**12504.49**	**100**	**2560.05**	**100**	**38428.21**	**100**

From the Table 5.2, it is observed that Stator fault (69.81%) constitute the major reason for forced outage in respect unit size up to 50 MW the major contributors of forced outage in respect unit size above 50 MW.

5.3 FORCED OUTAGE DUE TO TURBINE COMPONENTS

5.3.1 Faults in Miscellaneous Turbine Components parts (32.40%), Runner/underwater parts (26.11%) and Bearing (26.02%) are the major reasons of forced outages on account of turbine components.

The details of forced outages due to various turbine faults and associated systems under different categories based on their size are given in **Table 5.3** below:

TABLE 5.3

FORCED OUTAGE HOURS DUE TO BREAKDOWN OF TURBINE COMPONENTS
PERIOD: 2023-24

Sl. No.	Components of Turbine	Unit size up to 50 MW		Unit size above 50 MW & up to 100 MW		Unit size above 100 MW		Total	
1	GOVERNOR SYSTEM	298.08	1.14	33.20	0.19	17.03	0.36	348.31	0.72
2	MISCELLANEOUS TURBINE COMPONENTS	14384.87	55.14	174.65	1.01	1068.36	22.35	15627.88	32.40
3	OTHERS	30.05	0.12	60.53	0.35	268.28	5.61	358.86	0.74
4	BEARING	6434.02	24.66	4068.81	23.42	2050.31	42.89	12553.14	26.02
5	GUIDE VANES	16.45	0.06	13.13	0.08	41.75	0.87	71.33	0.15
6	RUNNER/UNDERWATER PARTS	3810.73	14.61	8784.00	50.56	0.00	0.00	12594.73	26.11
7	SHAFT VIBRATION/ALIGNMENT/S	1109.80	4.25	9.35	0.05	1331.51	27.85	2450.66	5.08
8	MAIN INLET VALVE	2.36	0.01	4230.42	24.35	2.94	0.06	4235.72	8.78
	Total	**26086.86**	**100**	**17374.09**	**100**	**4780.18**	**100**	**48240.63**	**100**

From the Table 5.3, it is observed that Miscellaneous turbine components (55.14%) constitute the major reason for forced outage in respect unit size up to 50 MW while Shaft

vibrations/alignment constitute the major contributor of forced outage in respect of unit size above 50 MW.

5.4 ANALYSIS BASED ON TYPE OF TURBINE

The analysis of forced outages due to turbine components as per type of turbines is given in **Table 5.4** below:

TABLE 5.4

FORCED OUTAGES-TURBINE TYPE-WISE
PERIOD: 2023-24

S. No.	Type of Turbine	Number of Units	Installed Capacity MW	Forced Outage Hours	Avg. Forced Outage Hours per Unit
1	Bulb	26	684.00	0	0
2	Francis	423	32966.22	23519.50	55.87
3	Kaplan	133	4399.05	5014.97	37.71
4	Pelton	149	8818.90	19706.16	132.26
5	Francis	2	60.0		
	TOTAL	**731**	**46928.17**	**48240.64**	**65.99**

Forced outage rate was observed to be the highest in case of Pelton turbines (132.26 hrs./unit) followed by Francis turbines (55.87 hrs./unit) and Kaplan turbines (37.71 hrs./unit.

5.5 ANALYSIS BASED ON MAKE OF UNITS

The comparative performance of generating units of different makes is indicated in **Table 5.5**. The outage figures in the table relate to faults in turbine and generator only.

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TABLE 5.5

FORCED OUTAGES DUE TO FAULT IN TURBINE & GENERATOR (SUPPLIER-WISE) PERIOD: 2023-24

S. No.	Name of Supplier/ Country of Make	No. of Units	Installed Capacity (MW)	Total No. of Forced Outages Hours)	Average Forced Outages due to Generating Units (Hours/Unit)	Performance Ranking in Term of Lowest Average Outage Hours/Unit
A-Indigenous						
1	BHEL	312	20150.30	70760.65	226.80	6
2	Others*	54	3395.50	17943.84	332.29	2
	SUB TOTAL	**366**	**23545.80**	**88704.49**	**242.36**	
B-Imported						
3	USA	9	351.00	7453.40	169.40	7
4	U.K.	63	1242.10	15432.11	244.95	5
5	France	31	2179.20	24169.20	318.02	3
6	Canada	44	3132.00	16818.98	800.90	1
7	Russian Federation	26	2804.00	912.30	101.37	9
8	Switzerland	21	790.20	818.82	31.49	10
9	Japan	76	6416.20	4079.95	131.61	8
10	Other	95	6460	23398.80	246.30	4
	SUB-TOTAL	**365**	**23382.35**	**93083.55**	**255.02**	
	TOTAL	**731**	**46928.17**	**181788.04**	**248.68**	

* Indigenous supplier like Andriz India, B Fouress Bangalore, Atstom India, VA Tech India, etc.

It is observed that Performance Ranking in Term of Lowest Average Outage Hours/Unit is best with Imported by country such as Switzerland, Russian Federation, Japan & USA.

5.6 ANALYSIS AGE-WISE

Details of forced outages of generating units commissioned during different years are indicated in **Table 5.6**. Forced outages caused by equipment failure i.e. the fault relating to

generator, turbine, and auxiliary system equipments have been taken into account for the purpose of computation.

TABLE - 5.6

FORCED OUTAGES DUE TO EQUIPMENT BREAKDOWN (AGE-WISE) PERIOD: 2023-24

S. No.	Year of Commissioning	No. of Units	Installed Capacity (MW)	Forced Outage (Hours)	Average Annual Non-availability per Unit (Hours)
1	2023-24	2	60	0	0
2	2022-23	2	120	0	0
3	2021-22	7	393	50.23	7.18
4	2020-21	8	510	6.30	0.79
5	2019-20	2	300.00	0.00	0.0
6	2018-19	3	140.00	1.28	0.43
7	2017-18	16	795.00	1862.42	116.4
8	2016-17	18	1,659.00	109.33	6.11
9	2015-16	17	1,516.00	623.80	36.69
10	2010-11 to 2014-15	63	4,437.00	74867.75	1188.38
11	2005-06 to 2009-10	66	7,077.00	39828.40	603.46
12	2000-01 to 2004-05	74	6,741.80	9828.11	132.81
13	1989-90 to 1999-2000	86	5,769.70	28775.03	334.59
14	1978-79 to 1988-89	124	7,259.10	24620.16	198.55
15	1967-68 to 1977-78	81	5,279.75	23706.8	292.68
16	Up to 1966-67	162	4,724.85	62182.2	383.84
	Total	**727**	**46722.50**	**266461.90**	**364.52**

It is observed that the per unit forced outage rate was relatively higher in older units and was maximum in the case of units commissioned in during 2010-11 to 2014-15 (1188.38 hrs./unit).

5.7 REGION-WISE PERFORMANCE

The region-wise summary of performance of the hydel generating units is indicated in **Table 5.7**. For the purpose of computation, all types of forced outages/tripping due to faults in generator, turbine, auxiliary system & other equipments and civil structure faults (excluding misc.) have been included.

TABLE 5.7

FORCED OUTAGES – REGION-WISE
PERIOD: 2023-24

S.No	Region	No. of Units	Installed Capacity (MW)	% Non-availability due to Forced Outages
1	Northern	260	19774.27	1.14
2	Western	101	7392.00	1.87
3	Southern	246	11747.15	3.27
4	Eastern	86	5987.75	1.85
5	North Eastern	38	2027.00	8.53
	All India	**731**	**46928.17**	**2.43**

Performance of hydro generating equipment installed in Northern Region was the best as the non-availability due to forced outages was least (1.14%). The average non-availability of the units in the North Eastern Region (8.53%) and in the Southern Region (3.27%) was observed to be on the higher side.

5.8 FORCED OUTAGE – UTILITY-WISE

The forced outages of hydro electric units under various Central Sector Utilities, Private Sector and State Power Generation Corporations are indicated in **Table 5.8**.

All types of forced outages/tripping due to problems in generating units, auxiliary equipments and civil structure have been taken into account for the analysis.

Table 5.8

FORCED OUTAGES- BOARD /CORPORATION WISE
PERIOD: 2023-24

S. No.	Organization	No. of Units	Installed Capacity (MW)	Forced Outage (Hours)	Average Annual Forced Outage/Unit (Hours)
Central Sector					
1	BBMB	28	2956.30	10.57	0.38
2	DVC	5	143.20	12.94	2.59
3	NEEPCO.	20	1500.00	23273.03	1163.65
4	NHDC	16	1520.00	50.97	3.19
5	NHPC	70	5451.20	2411.45	34.45

6	NTPC LTD.	4	800.00	342.00	85.50
7	SJVNL	14	1972.02	72.97	5.21
8	THDC	8	1400.00	11.00	1.38
	Sub Total	**165**	**15742.72**	**26184.91**	**158.70**
State Sector					
1	APGCL	2	100.00	212.66	106.33
2	APGENCO	34	1796.75	4511.33	132.69
3	CSPGCL	3	120.00	0.00	0.00
4	GSECL	8	540.00	6.00	0.75
5	HPPCL	8	406.00	7283.85	910.48
7	HPSEB	12	372.00	0.00	0.00
8	JKSPDC	12	1110.00	770.40	64.20
9	JUUNL	2	130.00	0.00	0.00
10	KPCL	66	3617.20	8700.34	131.82
11	KSEB	47	1864.15	6352.67	135.16
12	MAHAGENCO	24	2406.00	7048.84	293.70
13	MePGCL	13	322.00	4827.67	371.36
14	MPPGCL	23	875.00	9478.80	412.12
15	OHPC	31	2039.80	8633.10	278.49
16	PSPCL	25	1051.00	352.71	14.11
17	RRVUNL	11	411.00	8989.58	817.23
18	SSNNL	11	1450.00	8.88	0.81
19	TANGEDCO	69	2178.20	38631.06	559.87
20	TSGENCO	36	2405.60	12026.73	334.08
21	TUL	6	1200.00	76.68	12.78
22	UJVNL	36	1372.15	1242.96	34.53
23	UPJVNL	15	501.60	2231.99	148.80
24	WBSEDCL	12	986.00	4635.45	386.29
	Sub Total	**506**	**27254.45**	**126021.71**	**249.05**
Private Sector					
1	ADHPL	2	192.00	278.86	139.43
2	AHPC (GVK)	4	330.00	0.00	0.00
3	DEPL	2	96.00	2.62	1.31
4	DLHP	1	34.00	0.00	0.00
5	E.P.P.L.	2	100.00	19.50	9.75

6	GBHPPL	2	70.00	0.00	0.00
7	GIPL	2	110.00	65.76	32.88
8	GMR BHHPL	3	180.00	7.43	2.48
9	HBPCL	7	1345.00	0.00	0.00
10	HSPCL	2	100.00	2032.52	1016.26
11	IAEPL	3	36.00	330.73	110.24
12	JPPVL	4	400.00	37.42	9.35
13	L&T	3	99.00	81.28	27.09
14	MBPC	2	113.00	117.91	58.96
12	MPCL	2	86.00	0.00	0.00
13	SEPL	2	97.00	107.08	53.54
14	SKPPPL	2	96.00	2.07	1.03
15	TATA MAH.	15	447.00	0.00	0.00
	Sub Total	**60**	**3931.00**	**3083.18**	**51.39**
	All India Total	**731**	**46928.17**	**155289.81**	**212.43**

It is observed that utility-wise, per unit forced outages for generating units was maximum in respect of hydro-electric stations under NEEPCO (1163.65 hrs./unit). On the other hand, the hydro generating units of CSPGCL, HPSEB, JUUNL, AHPC (GVK), DLHP, GBHPPL, HBPCL, MPCL and TATA MAH have reported nil forced outage operation.

5.9 DURATION OF FORCED OUTAGES

There were total 1939 forced outages/tripping during the year 2023-24. Duration of individual outage varied widely from a few minutes to the maximum of full year.

The duration pattern of forced outages is indicated in **Table 5.9** and **Exhibit 5.1**. It could be seen that about 56.11% of the total forced shutdown were of duration less than 6 hours while 31.10% of outages were of duration varying from 6 to 24 hours and only 3.82% of shutdowns persisted for more than 10 days.

TABLE 5.9

DURATION PATTERN OF FORCED OUTAGES
PERIOD: 2023-24

S. No.	Duration of Hours	Number of Outages	% of Total of Outages
1	More than 10 days	74	3.82
2	Less than 6 hour	1088	56.11
3	6 to 24 hours	603	31.10
4	1 to 10 days	174	8.97
	Total No. of Outages	**1939**	**100**

5.10 FORCED OUTAGES - STATION-WISE

The number of H.E. Stations falling under various ranges of non-availability due to forced outages during the year 2023-24 vis-à-Vis 2022-23 is summarized below in **Table 5.10.**

TABLE 5.10

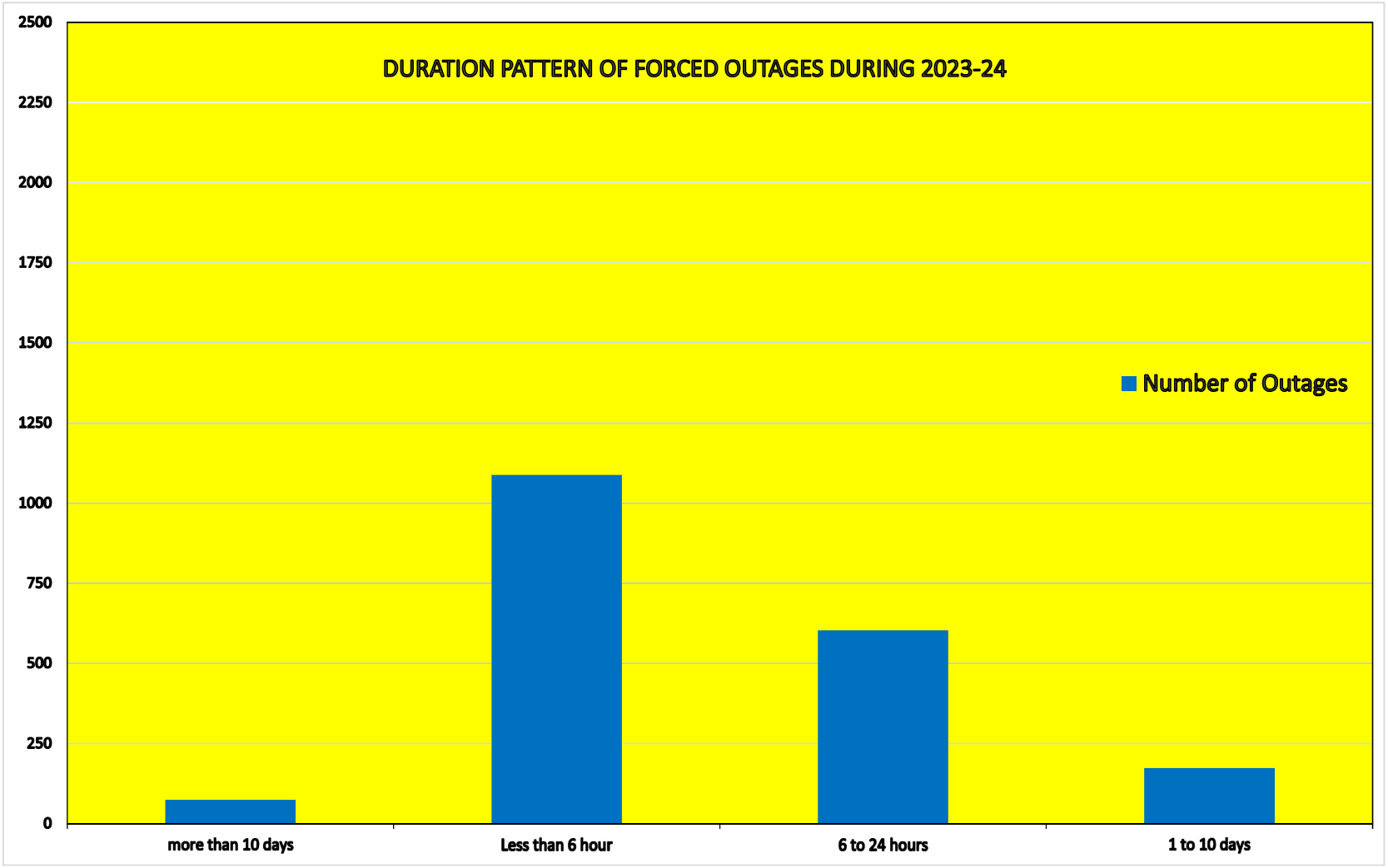
NON-AVAILABILITY OF HE STATIONS DUE TO FORCED OUTAGES
(2023-24 VIS-A-VIS 2022-23)

% Non-Availability due to Forced Outages	2023-24				2022-23			
	Stations		Capacity		Stations		Capacity	
	No.	% of Total	MW	% of Total	No.	% of Total	MW	% of Total
0	92	43.40	18,531.90	39.17	81.00	38.39	16,666.35	35.57
>0 to 1	18	8.49	5,348.30	11.40	29.00	13.74	6,079.85	12.98
>1 to 2	4	1.89	1,185.00	2.53	7.00	3.32	3,093.00	6.60
>2 to 3	3	1.42	1,506.00	3.21	4.00	1.90	947.05	2.02
>3 to 4	2	0.94	555.00	1.18	2.00	0.95	221.65	0.47
>4 to 5	1	0.47	480.00	1.02	4.00	1.90	444.00	0.95
>5	92	43.40	19,471.97	41.49	84.00	39.81	19,398.27	41.40
Total	**212**	**100**	**46928.17**	**100**	**211**	**100**	**46850.17**	**100**

It could be seen from above that there was no forced outage at 92 nos. (43.40% of total) hydro-electric stations during 2023-24 as compared to 81 nos. (38.39% of total) hydro-electric stations during 2022-23.

43.40% of stations had operational availability lower than 95% on account of forced outages alone against the normative design/planned annual availability of 95% during the entire station life. These utilities need to improve their O&M practices to bring down their total outages i.e. planned & forced to less than 5% as per best practices.

It is observed from above that stations may be having high forced outages on account of ageing, O&M management issues, etc. Further, those stations which are having continuously high planned maintenance/forced outages over past few years may be requiring major repair and maintenance works or Renovation & Modernization (R&M) works for improving the availability, reliability & security of the plant besides providing life extension where the assets have outlived their useful life.


DURATION PATTERN OF FORCED OUTAGES DURING 2023-24
2500
2250
2000
1750
1500
1250
1000
750
500
250
0
Number of Outages
more than 10 days
Less than 6 hour
6 to 24 hours
1 to 10 days

CENTRAL ELECTRICITY AUTHORITY
Hydro WING
Hydro Project Planning & Investigation Division

Annexure 5.1

DETAILS OF LONG DURATION FORCED OUTAGE IN HYDRO-ELECTRIC UNITS DURING: 2023-24

(OUTAGE DURATION 24 HOURS AND ABOVE)

S.NO	STATION	UNIT	CAPACITY(MW)	DATE OD OUTAGE	DATE OF RETURN	OUTAGE HOURS	REASONS
Northern							
ADHPL							
1	ALLAIN DUHANGAN HPS	1	96.0	7/12/23, 2:00 AM	7/16/23, 8:03 PM	114.05	FLOODS
		2	96.0	7/12/23, 2:00 AM	7/16/23, 6:15 PM	112.25	FLOODS
NHPC							
2	BAIRA SIUL HPS	1	60.0	4/5/23, 12:00 AM	4/12/23, 12:31 PM	180.52	MAIN INLET VALVE PROBLEM
3	CHAMERA-III HPS	1	77.0	7/14/23, 4:00 PM	7/16/23, 12:49 AM	32.82	TRANSMISSION CONSTRAINTS
		2	77.0	7/14/23, 4:00 PM	7/16/23, 12:29 AM	32.48	TRANSMISSION CONSTRAINTS
		3	77.0	7/14/23, 4:00 PM	7/16/23, 12:04 AM	32.07	TRANSMISSION CONSTRAINTS
IAEPL							
4	CHANJU-I HPS	1	12.0	7/9/23, 2:25 AM	7/12/23, 1:00 PM	82.58	FLOODS
		2	12.0	7/9/23, 2:25 AM	7/12/23, 1:00 PM	82.58	FLOODS
		2	12.0	8/25/23, 12:00 AM	8/26/23, 5:41 PM	41.68	DC SYSTEM FAILTURE/LEAKAGE/EARTH FAULT
		3	12.0	7/9/23, 2:25 AM	7/12/23, 1:00 PM	82.58	FLOODS
UJVNL							
5	CHILLA HPS	1	36.0	1/11/24, 6:51 PM	1/15/24, 12:00 AM	77.15	GOVERN.SYSTEM TROUB/EQPT. FAIL/EHG FAULT
		3	36.0	1/20/24, 12:58 PM	1/25/24, 12:00 AM	107.03	OIL HEAD PROBLEM
6	DHAKRANI HPS	3	11.25	7/2/23, 12:00 AM	7/8/23, 10:35 AM	154.58	GOVERN.SYSTEM TROUB/EQPT. FAIL/EHG FAULT
		3	11.25	10/8/23, 11:00 AM	10/13/23, 4:15 PM	125.25	ABNORMAL SOUND
NHPC							
7	DULHASTI HPS	3	130.0	7/19/23, 7:18 AM	7/22/23, 6:58 PM	83.67	MIV LEAKAGE
UPJVNL							
8	KHARA HPS	3	24.0	8/18/23, 12:00 AM	8/20/23, 4:40 PM	64.67	UAT REF/OVERCURRENT
		3	24.0	9/8/23, 12:00 AM	10/5/23, 11:05 AM	659.08	STATOR EARTH FAULT
NHPC							
9	KISHANGANGA HPS	3	110.0	6/9/23, 3:30 PM	6/12/23, 11:26 PM	79.94	CT/PT/LA/NUSDUCT/NEUT. GROUNING
NTPC Ltd.							

S.NO	STATION	UNIT	CAPACITY(MW)	DATE OD OUTAGE	DATE OF RETURN	OUTAGE HOURS	REASONS
10	KOLDAM	2	200.0	2/23/24, 7:00 PM	2/29/24, 6:14 AM	131.23	FUEL SUPPLY & OTHER MISC. PROBLEMS
RRVUNL							
11	MAHI BAJAJ-II HPS	3	45.0	8/28/23, 9:30 AM	8/29/23, 7:45 PM	34.25	EXCITATION PROBLEM
		4	45.0	8/28/23, 10:30 PM	9/2/23, 7:00 PM	116.50	STATOR EARTH FAULT
SJVNL							
12	NATHPA JHAKRI HPS	1	250.0	4/26/23, 5:09 AM	4/27/23, 6:00 PM	36.85	GEN.TR.BREAKER TRIPPED
UPJVNL							
13	OBRA HPS	2	33.0	7/15/23, 10:40 PM	7/21/23, 9:50 PM	143.17	MISCELLANEOUS
		3	33.0	5/20/23, 1:30 AM	5/22/23, 10:35 PM	69.08	ELECTRICAL FAULT
		3	33.0	7/26/23, 12:00 AM	7/28/23, 11:30 PM	71.50	OIL LEAKAGE PROBLEM OPU/SUM/SYSTEM
		3	33.0	10/12/23, 5:00 PM	10/13/23, 11:59 PM	30.98	OIL LEAKAGE PROBLEM OPU/SUM/SYSTEM
		3	33.0	1/2/24, 1:30 PM	1/4/24, 1:35 PM	48.08	OIL LEAKAGE PROBLEM OPU/SUM/SYSTEM
NHPC							
14	PARBATI-III HPS	1	130.0	7/8/23, 11:30 PM	7/28/23, 1:18 PM	469.80	HEAVY DOWN POUR/RAIN WATER LEAKAGE/ FLOOD IN RIVER
UJVNL							
15	RAMGANGA HPS	1	66.0	2/23/24, 4:07 AM	2/26/24, 9:45 PM	89.63	STATOR EARTH FAULT
		3	66.0	5/20/23, 4:06 PM	5/31/23, 6:35 AM	254.48	GOVERNING SYSTEM PROBLEM
		3	66.0	6/6/23, 12:00 AM	6/9/23, 6:45 AM	78.75	EHT/CT/PT
PSPCL							
16	RANJIT SAGAR HPS	1	150.0	9/1/23, 11:30 AM	9/3/23, 5:20 AM	41.83	TURBINE SHAFT SEAL LEAK/BOLTS BROKEN
		2	150.0	8/25/23, 4:00 PM	9/4/23, 5:25 PM	241.42	ABNORMAL SOUND
		2	150.0	3/4/24, 11:30 AM	3/6/24, 3:50 PM	52.34	GENERATOR DIFFERENTIALPROTECTION
UPJVNL							
17	RIHAND HPS	3	50.0	10/25/23, 6:00 PM	11/7/23, 6:10 PM	312.17	ROTOR EARTH FAULT
		5	50.0	1/22/24, 4:45 PM	1/23/24, 4:45 PM	24.00	B. C. BREAKER /AIR SYSTEM PROB.OIL LEAK/MISC.
		6	50.0	4/1/23, 12:00 AM	4/19/23, 7:30 PM	451.50	B. C. BREAKER /AIR SYSTEM PROB.OIL LEAK/MISC.
		6	50.0	7/7/23, 5:00 AM	7/8/23, 8:55 PM	39.92	TURBINE BEARING COOLING SYS/OIL COOLER
		6	50.0	8/10/23, 7:35 PM	8/13/23, 9:20 PM	73.75	ROTOR EARTH FAULT
		6	50.0	10/15/23, 12:00 AM	10/18/23, 6:25 PM	90.42	ELECTRICAL FAULT
		6	50.0	1/3/24, 6:30 PM	1/5/24, 3:05 PM	44.58	GOVERNING SYSTEM PROBLEM
RRVUNL							
18	R P SAGAR HPS	2	43.0	4/1/23, 12:00 AM	3/31/24, 11:59 PM	8784.00	GENERATOR STATOR DAMAGED
HPPCL							

S.NO	STATION	UNIT	CAPACITY(MW)	DATE OD OUTAGE	DATE OF RETURN	OUTAGE HOURS	REASONS
19	SAINJ HPS	1	50.0	7/8/23, 9:12 PM	9/6/23, 1:32 AM	1420.33	ABNORMAL SOUND
		2	50.0	4/11/23, 8:33 PM	4/19/23, 2:03 PM	185.50	CONTROL SYSTEM PROBLEMS
		2	50.0	7/8/23, 12:00 AM	9/6/23, 1:33 AM	1441.55	ABNORMAL SOUND
		2	50.0	12/30/23, 12:00 AM	1/1/24, 5:04 PM	65.07	AIR PR./OIL PR. PROBLEM
NHPC							
20	SALAL HPS	5	115.0	4/25/23, 10:33 AM	4/27/23, 7:13 PM	56.67	BUS BAR PROTECION OPERATED
HPPCL							
21	SAWRA KUDDU HPS	1	37.0	3/6/24, 12:00 AM	3/18/24, 6:00 PM	306.00	TURBINE SHAFT SEAL WORK/REPLACMEENT
		2	37.0	6/24/23, 12:00 AM	6/29/23, 11:10 PM	143.17	TURBINE SHAFT SEAL WORK/REPLACMEENT
		2	37.0	2/17/24, 12:00 AM	3/5/24, 7:57 AM	415.95	TURBINE SHAFT SEAL WORK/REPLACMEENT
		3	37.0	7/20/23, 11:00 AM	12/4/23, 7:54 AM	3284.90	GENERATOR STATOR DAMAGED
NHPC							
22	SEWA-II HPS	1	40.0	7/14/23, 11:02 PM	7/16/23, 8:18 AM	33.27	PENSTOCK EXP. JOINT PROBLEM
		2	40.0	7/14/23, 11:02 PM	7/16/23, 8:33 AM	33.52	PENSTOCK EXP. JOINT PROBLEM
		3	40.0	7/14/23, 11:01 PM	7/16/23, 8:18 AM	33.28	PENSTOCK EXP. JOINT PROBLEM
L&T							
23	SINGOLI BHATWARI HPS	3	33.0	11/6/23, 12:00 AM	11/7/23, 7:35 PM	43.58	TURBINE MISC. PROBLEM
HSPCL							
24	SORANG HPS	1	50.0	7/8/23, 8:45 PM	7/31/23, 12:00 AM	531.25	MISCELLANEOUS
		1	50.0	8/1/23, 12:00 AM	8/20/23, 2:44 PM	470.73	MISCELLANEOUS
		2	50.0	7/8/23, 4:48 PM	7/31/23, 11:55 PM	559.12	MISCELLANEOUS
		2	50.0	8/1/23, 12:00 AM	8/20/23, 3:25 PM	471.42	MISCELLANEOUS
NHPC							
25	TANAKPUR HPS	2	31.4	7/5/23, 2:41 PM	7/8/23, 11:59 PM	81.32	LGB TEMPRATURE HIGH
		2	31.4	9/7/23, 6:15 AM	9/8/23, 11:59 PM	41.75	GENERATOR EARTH FAULT
JKSPDC							
26	UPPER SINDH-II HPS	5	35.0	11/1/23, 12:00 AM	11/22/23, 12:53 PM	516.88	MISCELLANEOUS
NHPC							
27	URI-I HPS	4	120.0	8/8/23, 3:57 PM	8/10/23, 7:52 PM	51.93	EXCITATION SYSTEM FAILURE
Western							
MPPGCL							
28	BANSAGAR TONS-I HPS	3	105.0	1/20/24, 8:10 AM	1/28/24, 12:30 PM	196.35	MISCELLANEOUS
29	GANDHI SAGAR HPS	1	23.0	7/19/23, 6:08 PM	8/7/23, 8:52 PM	458.73	GENEARTOR MISC.

S.NO	STATION	UNIT	CAPACITY(MW)	DATE OD OUTAGE	DATE OF RETURN	OUTAGE HOURS	REASONS
		3	23.0	4/1/23, 12:00 AM	3/31/24, 11:59 PM	8784.00	POWER HOUSE FLOODED
		5	23.0	2/8/24, 8:30 PM	2/9/24, 11:45 PM	27.26	D.C.SUPPLY FAILURE.
MAHAGENCO							
30	GHATGHAR PSS HPS	1	125.0	1/18/24, 4:00 PM	1/28/24, 11:59 PM	248.00	GOVERNING SYSTEM PROBLEM
		1	125.0	2/20/24, 5:15 PM	2/22/24, 5:15 PM	48.00	CONTROL SYSTEM PROBLEMS
		1	125.0	2/28/24, 10:00 PM	3/1/24, 11:59 PM	50.00	CONTROL SYSTEM PROBLEMS
		1	125.0	3/9/24, 6:00 PM	3/10/24, 6:30 PM	24.50	CONTROL SYSTEM PROBLEMS
		2	125.0	4/1/23, 12:00 AM	5/27/23, 7:00 PM	1363.00	STATOR EARTH FAULT
		2	125.0	3/14/24, 6:15 PM	3/22/24, 7:25 PM	193.17	CONTROL SYSTEM PROBLEMS
NHDC							
31	INDIRA SAGAR HPS	7	125.0	1/17/24, 8:00 AM	1/19/24, 8:37 AM	48.62	ROTOR EARTH FAULT
MAHAGENCO							
32	KOYNA-I&II HPS	2	70.0	4/1/23, 12:00 AM	9/8/23, 12:43 AM	3840.73	TURBINE BEARING COOLING SYS/OIL COOLER
		7	80.0	8/13/23, 9:00 AM	9/20/23, 7:50 PM	922.83	MAIN INLET VALVE
33	TILLARI HPS	1	60.0	4/10/23, 12:00 AM	4/21/23, 4:50 PM	280.83	BREAKER/ISOLATOR PROBLEM
34	VAITARNA HPS	1	60.0	5/9/23, 4:00 PM	5/10/23, 10:07 PM	30.12	COOLING WATER DELIVERY VALVES PROBLEM
Southern							
TANGEDCO							
35	ALIYAR HPS	1	60.0	6/1/23, 12:00 PM	6/8/23, 11:05 PM	179.08	MISCELLANEOUS
		1	60.0	6/18/23, 9:52 AM	6/19/23, 10:22 PM	36.50	MISCELLANEOUS
36	BHAWANI KATTAL	1	15.0	8/15/23, 1:10 PM	8/19/23, 6:30 PM	101.33	MISCELLANEOUS
		1	15.0	11/14/23, 3:12 PM	11/15/23, 5:00 PM	25.80	MISCELLANEOUS
		1	15.0	11/23/23, 4:00 PM	11/25/23, 2:40 PM	46.67	MISCELLANEOUS
		2	15.0	5/30/23, 6:30 AM	6/2/23, 2:25 PM	79.92	MISCELLANEOUS
KPCL							
37	GERUSUPPA HPS	1	60.0	7/11/23, 12:00 AM	9/6/23, 7:27 AM	1375.45	PENSTOCK GATE PROBLEM
KSEB							
38	IDUKKI HPS	3	130.0	2/3/24, 9:09 AM	2/14/24, 3:04 PM	269.92	UPPER GUIDE BEARING MISC.
KPCL							
39	JOG HPS	1	13.2	3/17/24, 12:00 AM	3/19/24, 7:20 AM	55.33	SWITCHYARD MISCELLANOUS.
		2	13.2	4/17/23, 10:30 AM	6/20/23, 11:59 PM	1549.50	ELECTRICAL MISCELLANEOUS PROBLEMS
		3	13.2	5/22/23, 11:55 AM	5/24/23, 3:25 PM	51.50	WATER WALL TUBE LEAKAGE

S.NO	STATION	UNIT	CAPACITY(MW)	DATE OD OUTAGE	DATE OF RETURN	OUTAGE HOURS	REASONS
		4	13.2	5/22/23, 11:55 AM	5/24/23, 5:10 PM	53.25	WATER WALL TUBE LEAKAGE
		6	21.6	5/27/23, 12:00 AM	8/4/23, 5:30 PM	1673.51	OIL PRESSURE UNIT
		6	21.6	2/5/24, 12:01 AM	3/14/24, 9:50 AM	921.83	BEARING
		7	21.6	5/9/23, 12:00 AM	5/12/23, 11:45 AM	83.75	EXCITATION PROBLEM
		7	21.6	5/19/23, 12:00 AM	6/1/23, 12:00 PM	324.01	A.V.R. PROBLEM
		7	21.6	6/6/23, 7:00 AM	6/7/23, 12:30 PM	29.50	EXCITATION PROBLEM
TANGEDCO							
40	KADAMPARI HPS	1	100.0	4/1/23, 12:00 AM	3/31/24, 11:59 PM	8784.00	RUNNER
		4	100.0	4/1/23, 12:00 AM	12/30/23, 1:20 AM	6553.33	ROTOR EARTH FAULT
KPCL							
41	KALINADI HPS	2	150.0	1/4/24, 4:40 PM	1/9/24, 5:07 PM	120.45	MIV SERVO MOTOR [PROBLEM
42	KODASALI HPS	1	40.0	2/19/24, 11:40 AM	2/23/24, 3:55 PM	100.25	PENSTOCK LEAKAGE
TANGEDCO							
43	KODAYAR-I HPS	1	60.0	4/1/23, 12:00 AM	8/7/23, 10:24 PM	3094.42	MAIN INLET VALVE PROBLEM
44	KUNDAH-I HPS	3	20.0	4/1/23, 12:00 AM	9/6/23, 8:18 AM	3800.31	BEARING
45	KUNDAH-II HPS	4	35.0	6/11/23, 8:45 AM	6/15/23, 11:39 PM	110.90	PENSTOCK LEAKAGE
		5	35.0	6/7/23, 8:57 AM	6/8/23, 8:48 PM	35.85	NEEDLE PROBLEM
		5	35.0	7/2/23, 12:01 AM	7/6/23, 11:13 AM	107.20	PENSTOCK LEAKAGE
		6	35.0	10/25/23, 10:25 AM	10/26/23, 8:51 PM	34.43	PENSTOCK LEAKAGE
		7	35.0	6/26/23, 9:03 AM	6/29/23, 10:50 PM	85.78	PENSTOCK LEAKAGE
		7	35.0	8/1/23, 9:10 AM	8/4/23, 6:47 PM	81.62	PENSTOCK LEAKAGE
		8	35.0	6/17/23, 8:37 AM	6/23/23, 10:48 PM	158.18	PENSTOCK LEAKAGE
46	KUNDAH-IV HPS	13	50.0	4/1/23, 8:45 AM	4/2/23, 8:40 PM	35.92	B. C. BREAKER /AIR SYSTEM PROB.OIL LEAK/MISC.
TEDAG							
47	KUNDAH-V HPS	14	20.0	4/7/23, 4:41 PM	4/12/23, 2:00 AM	105.32	B. C. BREAKER /AIR SYSTEM PROB.OIL LEAK/MISC.
		14	20.0	8/11/23, 6:00 PM	8/14/23, 9:00 PM	75.00	B. C. BREAKER /AIR SYSTEM PROB.OIL LEAK/MISC.
		14	20.0	9/4/23, 1:05 PM	9/12/23, 7:30 PM	198.42	B. C. BREAKER /AIR SYSTEM PROB.OIL LEAK/MISC.
		14	20.0	9/26/23, 8:12 AM	9/28/23, 8:05 PM	59.88	MISCELLANEOUS
		15	20.0	1/18/24, 10:30 AM	1/19/24, 12:30 PM	26.00	MISCELLANEOUS
KSEB							
48	KUTTIYADI EXTN HPS	4	50.0	6/8/23, 3:00 PM	6/14/23, 5:53 PM	146.88	GENEATOR CONTROL PROBLEM
KPCL							

S.NO	STATION	UNIT	CAPACITY(MW)	DATE OD OUTAGE	DATE OF RETURN	OUTAGE HOURS	REASONS
49	LIGANAMAKKI HPS	2	27.5	10/21/23, 12:00 AM	10/26/23, 4:46 PM	136.77	EXCITATION PROBLEM
APGENCO							
50	LOWER SILERU HPS	4	115.0	12/8/23, 12:00 AM	1/5/24, 3:30 PM	687.50	VIBRATIONS
TANGEDCO							
51	MOYAR HPS	3	12.0	1/28/24, 3:25 PM	1/31/24, 12:00 AM	56.58	TRIPPING--EQUIP.DAMAGED
		3	12.0	2/1/24, 12:00 AM	2/8/24, 11:15 AM	179.25	LGBCOOLING WATER/LEAKAGE PROBLEMBS
		3	12.0	2/22/24, 4:00 PM	2/28/24, 11:10 AM	139.17	TRIPPING--EQUIP.DAMAGED
TSGENCO							
52	NAGARJUN SGR HPS	3	100.8	6/2/23, 9:09 AM	6/6/23, 10:18 PM	109.15	STATOR EARTH FAULT
		5	100.8	10/26/23, 12:00 AM	10/27/23, 12:00 AM	24.00	ROTOR EARTH FAULT
		5	100.8	10/27/23, 12:00 AM	10/28/23, 12:00 AM	24.00	ROTOR EARTH FAULT
		5	100.8	10/28/23, 12:00 AM	10/29/23, 3:30 PM	39.50	ROTOR EARTH FAULT
		5	100.8	1/24/24, 10:58 AM	1/25/24, 11:59 PM	37.03	GEN. TRANSFORMER TRIPPING/ DAMAGED
		5	100.8	2/2/24, 12:00 AM	3/19/24, 6:15 PM	1122.25	GENEATOR PROTECTION MISC/BACK UP PROT
KSEB							
53	NARIAMANGLAM HPS	1	17.55	6/10/23, 6:45 PM	6/11/23, 11:52 PM	29.12	SPEED SENSING DEVICE FAILURE/SPEED RELAY
		1	17.55	6/15/23, 6:59 PM	6/16/23, 9:14 PM	26.26	LOW RPM
		1	17.55	10/3/23, 5:09 PM	10/6/23, 11:31 PM	78.37	BREAKER/ISOLATOR PROBLEM
		2	17.55	4/21/23, 12:00 AM	6/18/23, 1:43 AM	1393.72	BEARING
		2	17.55	9/29/23, 11:02 AM	9/30/23, 6:04 PM	31.03	TURBINE SHAFT SEAL WORK/REPLACMEENT
		3	17.55	4/18/23, 11:43 AM	4/20/23, 4:17 PM	52.57	GOVERNING SYSTEM PROBLEM
		3	17.55	7/12/23, 3:21 PM	7/13/23, 7:27 PM	28.10	BREAKER/ISOLATOR PROBLEM
54	PALLIVASAL HPS	4	7.5	12/26/23, 4:14 PM	12/27/23, 6:55 PM	26.68	PENSTOCK LEAKAGE
		4	7.5	1/11/24, 1:42 PM	1/15/24, 9:30 AM	91.81	GENERATOR PROTECTION MALOPERATION
55	PORINGALKUTTU HPS	4	8.0	12/4/23, 7:05 PM	12/5/23, 10:23 PM	27.31	GOVERNING SYSTEM PROBLEM
TSGENCO							
56	PRIYADARSHNI JURALA HPS	1	39.0	6/2/23, 12:00 AM	7/25/23, 12:00 AM	1272.00	MINOR MAINTENANCE WORKS
		3	39.0	9/13/23, 12:00 AM	9/21/23, 12:00 AM	192.00	STATOR
		3	39.0	9/21/23, 12:00 AM	9/22/23, 12:00 AM	24.00	STATOR
		3	39.0	9/22/23, 12:00 AM	9/23/23, 12:00 AM	24.00	STATOR
		6	39.0	6/2/23, 12:00 AM	7/22/23, 12:00 AM	1200.00	GENERATOR MISCLLANEOUS MAINTENANCE
57	PULICHINTALA HPS	3	30.0	9/28/23, 12:00 AM	9/29/23, 12:00 AM	24.00	TURBINE SHAFT SEAL WORK/REPLACMEENT

S.NO	STATION	UNIT	CAPACITY(MW)	DATE OD OUTAGE	DATE OF RETURN	OUTAGE HOURS	REASONS
		3	30.0	9/29/23, 12:00 AM	9/30/23, 12:00 AM	24.00	TURBINE SHAFT SEAL WORK/REPLACMEENT
TANGEDCO							
58	PYKARA HPS	1	7.0	7/24/23, 7:35 PM	8/1/23, 12:00 AM	172.42	B. C. BREAKER /AIR SYSTEM PROB.OIL LEAK/MISC.
		1	7.0	8/1/23, 12:00 AM	8/31/23, 12:00 AM	720.00	B. C. BREAKER /AIR SYSTEM PROB.OIL LEAK/MISC.
		1	7.0	9/1/23, 12:00 AM	9/19/23, 9:55 AM	441.92	B. C. BREAKER /AIR SYSTEM PROB.OIL LEAK/MISC.
		1	7.0	10/18/23, 10:00 AM	10/20/23, 2:00 PM	52.00	PENSTOCK AIR VALVE PROBLEM
		1	7.0	12/6/23, 2:00 PM	12/11/23, 9:00 AM	115.00	B. C. BREAKER /AIR SYSTEM PROB.OIL LEAK/MISC.
		2	7.0	7/24/23, 7:35 PM	7/26/23, 8:10 PM	48.58	MISCELLANEOUS
		2	7.0	10/18/23, 10:00 AM	10/20/23, 2:00 PM	52.00	MISCELLANEOUS
		2	7.0	12/6/23, 2:00 PM	12/12/23, 12:30 PM	142.50	MISCELLANEOUS
		3	7.0	9/23/23, 1:15 PM	9/27/23, 1:00 PM	95.75	MISCELLANEOUS
		3	7.0	12/6/23, 2:00 PM	12/9/23, 9:30 AM	67.50	MISCELLANEOUS
		3	7.0	2/11/24, 9:00 AM	2/14/24, 1:30 PM	76.50	MISCELLANEOUS
		5	13.6	7/24/23, 7:35 PM	7/27/23, 4:45 PM	69.17	MISCELLANEOUS
		5	13.6	9/23/23, 1:15 PM	9/27/23, 1:00 PM	95.75	MISCELLANEOUS
		5	13.6	12/6/23, 2:00 PM	12/9/23, 9:30 AM	67.50	MISCELLANEOUS
		5	13.6	2/11/24, 9:00 AM	2/14/24, 1:30 PM	76.50	MISCELLANEOUS
		6	11.0	4/1/23, 12:00 AM	3/31/24, 12:00 AM	8760.00	TRIPPING--EQUIP.DAMAGED
59	PYKARA ULTMATE HPS	1	50.0	10/21/23, 2:16 AM	11/3/23, 6:35 PM	328.32	ROTOR EARTH FAULT
KSEB							
60	SABARIGIRI HPS	3	50.0	7/31/23, 12:43 PM	8/2/23, 6:59 PM	54.27	NEEDLE PROBLEM
		4	50.0	6/8/23, 3:33 PM	6/18/23, 8:29 PM	244.93	THRUST BEARING TEMP. HIGH
		4	50.0	1/4/24, 9:30 AM	1/5/24, 11:59 PM	38.48	MISCELLANEOUS
		5	50.0	4/5/23, 10:30 AM	4/6/23, 1:22 PM	26.87	VIBRATIONS
		5	50.0	10/5/23, 3:27 PM	10/8/23, 4:50 AM	61.38	PENSTOCK LEAKAGE
KPCL							
61	SHARAVATHI HPS	2	103.5	8/16/23, 11:44 AM	8/17/23, 11:52 AM	24.13	GOVERNING SYSTEM PROBLEM
		7	103.5	9/23/23, 1:13 PM	12/15/23, 3:50 PM	1994.62	TURBINE BEARING OIL LEAKAGE
KSEB							
62	SHOLAYAR HPS	1	18.0	4/1/23, 12:00 AM	5/15/23, 3:17 PM	1071.28	STATOR COIL BURNT
		3	18.0	4/1/23, 12:00 AM	6/20/23, 9:08 AM	1929.13	STATOR COIL BURNT
TANGEDCO							

S.NO	STATION	UNIT	CAPACITY(MW)	DATE OD OUTAGE	DATE OF RETURN	OUTAGE HOURS	REASONS
63	SHOLAYAR HPS (TN)	1	35.0	8/17/23, 10:31 AM	8/18/23, 7:52 PM	33.35	MISCELLANEOUS
		1	35.0	10/27/23, 3:00 AM	10/29/23, 12:00 AM	45.00	B. C. BREAKER /AIR SYSTEM PROB.OIL LEAK/MISC.
		2	35.0	10/2/23, 6:32 AM	10/3/23, 9:37 PM	39.08	MISCELLANEOUS
TSGENCO							
64	SRISAILAM LB HPS	1	150.0	5/25/23, 5:26 PM	7/26/23, 11:59 PM	1494.55	INTAKE STRUCTURE TROUBLE
		2	150.0	5/25/23, 5:26 PM	7/24/23, 10:21 AM	1432.92	INTAKE STRUCTURE TROUBLE
		3	150.0	5/25/23, 5:26 PM	7/24/23, 10:21 AM	1432.92	INTAKE STRUCTURE TROUBLE
		4	150.0	8/17/23, 12:05 AM	9/7/23, 12:00 AM	503.92	EXCT. FAIL/LOSS OF EXCITATION /MISC. PROB.
		4	150.0	9/8/23, 12:00 AM	9/9/23, 12:00 AM	24.00	EXCT. FAIL/LOSS OF EXCITATION /MISC. PROB.
		4	150.0	9/9/23, 12:00 AM	9/10/23, 12:00 AM	24.00	EXCT. FAIL/LOSS OF EXCITATION /MISC. PROB.
		4	150.0	9/10/23, 12:00 AM	9/11/23, 12:00 AM	24.00	EXCT. FAIL/LOSS OF EXCITATION /MISC. PROB.
		4	150.0	9/11/23, 12:00 AM	9/12/23, 12:00 AM	24.00	EXCT. FAIL/LOSS OF EXCITATION /MISC. PROB.
		5	150.0	5/25/23, 5:26 PM	7/24/23, 10:21 AM	1432.92	INTAKE STRUCTURE TROUBLE
		6	150.0	5/25/23, 5:26 PM	7/24/23, 10:21 AM	1432.92	INTAKE STRUCTURE TROUBLE
TANGEDCO							
65	SURULIYAR HPS	1	35.0	9/8/23, 12:00 AM	1/19/24, 11:59 PM	3215.98	VARIOUS MAINTENANCE WORKS
APGENCO							
66	T B DAM HPS	4	9.0	4/1/23, 12:00 AM	9/6/23, 11:25 AM	3803.42	RUNNER BLADE BROKEN/TROUBLE
Eastern							
OHPC							
67	BALIMELA HPS	1	60.0	9/12/23, 10:43 PM	9/14/23, 12:08 PM	37.42	MISCELLANEOUS
		1	60.0	9/14/23, 5:05 PM	9/15/23, 6:04 PM	24.98	MISCELLANEOUS
		2	60.0	3/22/24, 1:00 PM	3/31/24, 11:59 PM	227.00	TURBINE BEARING PROBLEMS
		6	60.0	8/2/23, 11:30 AM	8/3/23, 1:45 PM	26.25	LGB OIL LEAKAGE/LEVEL
		7	75.0	2/5/24, 7:00 AM	2/6/24, 6:00 PM	35.00	MISCELLANEOUS
GIPL							
68	CHUZACHEN HPS	1	55.0	5/9/23, 3:10 PM	5/11/23, 10:15 PM	55.08	CONTROL SYSTEM PROBLEMS
OHPC							
69	HIRAKUD HPS	2	49.5	2/2/24, 6:57 PM	2/6/24, 7:00 PM	96.05	CONTROL SYSTEM PROBLEMS
		6	43.65	8/24/23, 9:13 AM	8/31/23, 11:55 PM	182.72	MISCELLANEOUS
		6	43.65	9/1/23, 12:00 AM	9/13/23, 4:00 PM	304.00	MISCELLANEOUS
WBSEDCL							

S.NO	STATION	UNIT	CAPACITY(MW)	DATE OD OUTAGE	DATE OF RETURN	OUTAGE HOURS	REASONS
70	JALDHAKA HPS ST-I	1	9.0	4/1/23, 12:00 AM	4/4/23, 9:10 AM	81.17	RAW WATER LOW IN INTAKE CANAL
		1	9.0	4/4/23, 12:55 PM	5/4/23, 7:25 AM	714.50	RAW WATER LOW IN INTAKE CANAL
		1	9.0	5/4/23, 1:30 PM	5/6/23, 11:25 PM	57.92	RAW WATER LOW IN INTAKE CANAL
		2	9.0	4/1/23, 12:00 AM	4/7/23, 11:23 AM	155.38	RAW WATER LOW IN INTAKE CANAL
		2	9.0	4/7/23, 4:10 PM	4/20/23, 9:55 PM	317.75	RAW WATER LOW IN INTAKE CANAL
		2	9.0	4/24/23, 3:30 PM	4/25/23, 6:10 PM	26.67	RAW WATER LOW IN INTAKE CANAL
		2	9.0	4/26/23, 6:20 AM	4/27/23, 8:25 AM	26.08	RAW WATER LOW IN INTAKE CANAL
		2	9.0	6/27/23, 7:19 AM	6/28/23, 11:45 AM	28.43	FLOODS
		2	9.0	7/9/23, 9:20 PM	7/11/23, 10:57 AM	37.62	TURBINE BEARING OIL LEAKAGE
		2	9.0	7/29/23, 10:55 AM	7/30/23, 4:40 PM	29.75	TURBINE BEARING OIL LEVEL LOW/HIGH
		2	9.0	8/29/23, 4:09 PM	8/30/23, 5:53 PM	25.73	TURBINE BEARING OIL LEVEL LOW/HIGH
		2	9.0	9/9/23, 3:25 AM	9/10/23, 9:05 AM	29.67	FLOODS
		3	9.0	4/11/23, 1:45 PM	4/17/23, 6:20 AM	136.58	RAW WATER LOW IN INTAKE CANAL
		4	9.0	4/22/23, 4:05 AM	4/25/23, 6:25 AM	74.33	RAW WATER LOW IN INTAKE CANAL
71	PURULIA PSS HPS	1	225.0	11/4/23, 12:00 AM	2/16/24, 4:00 PM	2512.00	MISCELLANEOUS
NHPC							
72	RANGIT HPS	3	20.0	10/16/23, 12:00 AM	10/17/23, 6:21 PM	42.35	UGB OIL COOLERS PROBLEM
OHPC							
73	RENGALI HPS	1	50.0	4/6/23, 1:22 AM	4/7/23, 9:44 PM	44.37	TURBINE MISC.
		1	50.0	3/22/24, 7:57 PM	3/31/24, 11:59 PM	220.05	STATOR EARTH FAULT
		2	50.0	5/10/23, 11:25 AM	5/12/23, 8:07 PM	56.70	TURBINE BEARING TEMP. HIGH
MBPC							
74	RONGNICHU HPS	2	56.5	8/10/23, 10:53 AM	8/12/23, 1:54 PM	51.02	DAMAGE TO TURBINE
SEPL							
75	TASHIDING HPS	1	48.5	6/15/23, 10:02 PM	6/17/23, 1:53 PM	39.85	VARIOUS MAINTENANCE WORKS
		2	48.5	6/15/23, 10:05 PM	6/17/23, 1:16 PM	39.18	VARIOUS MAINTENANCE WORKS
TUL							
76	TEESTA-III HPS	4	200.0	4/5/23, 12:00 PM	4/6/23, 4:31 PM	28.52	GENEATOR TRANSFORMER MISC.
NHPC							
77	TEESTA LOW DAM-IV HPS	2	40.0	9/5/23, 6:00 PM	9/7/23, 2:08 AM	32.13	OPU PRESSURE PROBLEM
OHPC							
78	UPPER INDRAVATI HPS	2	150.0	5/21/23, 11:09 PM	5/27/23, 10:28 AM	131.32	STATOR/ STATOR EARTH FAULT

S.NO	STATION	UNIT	CAPACITY(MW)	DATE OD OUTAGE	DATE OF RETURN	OUTAGE HOURS	REASONS
		2	150.0	9/26/23, 6:30 PM	9/30/23, 11:59 PM	101.50	GENERATOR EARTH FAULT
		3	150.0	10/1/23, 12:00 AM	11/6/23, 7:52 PM	883.87	GENERATOR EARTH FAULT
		4	150.0	1/18/24, 2:33 PM	1/19/24, 3:30 PM	24.95	GENEATOR TRANSFORMER /BUSHING OIL LEAKAGE
79	UPPER KOLAB HPS	2	80.0	4/1/23, 12:00 AM	4/30/23, 11:59 PM	720.00	STATOR EARTH FAULT
		2	80.0	5/1/23, 12:00 AM	5/31/23, 11:59 PM	744.00	STATOR EARTH FAULT
		2	80.0	6/1/23, 12:00 AM	6/30/23, 11:59 PM	720.00	STATOR EARTH FAULT
		2	80.0	7/1/23, 12:00 AM	7/24/23, 7:34 PM	571.57	STATOR EARTH FAULT
		2	80.0	8/25/23, 5:18 PM	8/31/23, 11:59 PM	150.70	ROTOR EARTH FAULT/POLE FAILURE
		2	80.0	9/1/23, 12:00 AM	9/30/23, 11:59 PM	720.00	ROTOR EARTH FAULT/POLE FAILURE
		2	80.0	10/1/23, 12:00 AM	10/24/23, 11:59 PM	576.00	ROTOR EARTH FAULT/POLE FAILURE
		2	80.0	11/1/23, 12:00 AM	11/30/23, 11:59 PM	720.00	STATOR
		2	80.0	12/1/23, 12:00 AM	12/31/23, 11:59 PM	744.00	STATOR
		2	80.0	1/1/24, 12:00 AM	1/4/24, 6:00 PM	90.00	ROTOR EARTH FAULT/POLE FAILURE
North Eastern							
NEEPCO.							
80	DOYANG HPS	1	25.0	9/3/23, 1:30 PM	9/4/23, 4:15 PM	26.75	ROTOR EARTH FAULT
81	KAMENG HPS	1	150.0	9/20/23, 2:55 AM	9/21/23, 11:59 PM	45.08	OIL LEAKAGE PROBLEM OPU/SUM/SYSTEM
		4	150.0	9/8/23, 5:07 AM	9/9/23, 11:59 PM	42.88	TURBINE BEARING PROBLEM
APGCL							
82	KARBI LANGPI HPS	1	50.0	5/28/23, 7:40 AM	5/30/23, 2:20 PM	54.67	A.V.R. FAILURE
		1	50.0	12/20/23, 4:45 PM	12/22/23, 6:37 PM	49.87	WATER CONDCUTOR SYSTEM
NEEPCO.							
83	KOPILI HPS	1	50.0	4/1/23, 12:00 AM	9/6/23, 11:59 PM	3816.00	PENSTOCK LEAKAGE
		1	50.0	2/12/24, 12:00 AM	2/13/24, 11:59 PM	48.00	PENSTOCK LEAKAGE
		1	50.0	3/1/24, 12:00 AM	3/19/24, 11:59 PM	456.00	PENSTOCK LEAKAGE
		2	50.0	4/1/23, 12:00 AM	9/6/23, 11:59 PM	3816.00	PENSTOCK LEAKAGE
		3	50.0	4/1/23, 12:00 AM	8/29/23, 2:55 PM	3614.92	PENSTOCK REPAIR WORKS
		3	50.0	8/29/23, 11:31 PM	9/1/23, 9:02 PM	69.52	MISCELLANEOUS
		3	50.0	10/15/23, 7:03 AM	10/16/23, 12:54 PM	29.85	TURBINE SHAFT SEAL C.W. TROUBLE
		3	50.0	3/13/24, 12:00 AM	3/14/24, 4:32 PM	40.53	MISCELLANEOUS
		3	50.0	3/26/24, 2:00 PM	3/27/24, 2:00 PM	24.00	GEN.TR.BREAKER MECH.PROBLEM
		4	50.0	4/1/23, 12:00 AM	8/18/23, 12:10 PM	3348.18	PENSTOCK LEAKAGE

S.NO	STATION	UNIT	CAPACITY(MW)	DATE OD OUTAGE	DATE OF RETURN	OUTAGE HOURS	REASONS
		4	50.0	8/24/23, 5:12 PM	8/28/23, 4:32 PM	95.33	MISCELLANEOUS
MeECL							
84	KYRDEMKULAI HPS	1	30.0	8/13/23, 9:00 AM	8/15/23, 1:50 PM	52.83	HRT LEAKAGE
NHPC							
85	LOKTAK HPS	1	35.0	8/29/23, 6:43 PM	8/31/23, 2:18 PM	43.58	STATOR EARTH FAULT
		1	35.0	10/10/23, 9:40 PM	10/15/23, 10:15 PM	120.58	GENEREATOR HOT AIR TEMPERATAURE
MeECL							
86	MYNTDU(LESHKA) St-1 HPS	1	42.0	10/1/23, 12:00 AM	10/3/23, 2:00 AM	50.00	MISCELLANEOUS
		1	42.0	10/28/23, 12:00 AM	11/2/23, 5:00 PM	137.00	ROTOR MISC. FAULTS
		3	42.0	12/30/23, 6:30 PM	1/3/24, 12:05 AM	77.58	STATOR
NEEPCO.							
87	RANGANADI HPS	1	135.0	3/6/24, 12:00 AM	3/8/24, 11:59 PM	72.00	UNDER WATER PARTS MISC
		2	135.0	3/6/24, 12:00 AM	3/8/24, 11:59 PM	72.00	UNDER WATER PARTS MISC
		3	135.0	3/6/24, 12:00 AM	3/8/24, 11:59 PM	72.00	UNDER WATER PARTS MISC
MeECL							
88	UMIAM HPS ST-I	2	9.0	5/20/23, 12:00 AM	11/14/23, 6:30 PM	4290.50	GENEATOR TRANSFORMER MISC.
89	UMIAM HPS ST-IV	7	30.0	10/1/23, 12:00 AM	10/3/23, 11:00 AM	59.00	MIV LEAKAGE
		7	30.0	10/9/23, 12:00 AM	10/13/23, 11:45 PM	119.75	BREAKER/ISOLATOR PROBLEM
		7	30.0	11/26/23, 12:00 AM	11/27/23, 5:00 PM	41.00	BEARING

CHAPTER-6

OPERATING AVAILABILITY OF HE UNITS

CHAPTER-6

OPERATING AVAILABILITY OF HE UNITS

6.1 Based on the analysis of data received from the utilities regarding planned maintenance undertaken and forced outages at 731 Hydro Generating units of 212 HE Stations comprising of 46928.17 MW, operating availability of various units and stations has been computed. During the year 2023-24, the average operating availability of hydro generating units on all India basis was 91.93% as compared to 92.82% during 2022-23.

The station-wise/unit-wise non-availability due to Planned Maintenance (P.M) and Forced Outages (F.O) and overall operating availability of various H.E. Stations in the country is indicated in **Annex-6.1**. The station-wise details are also graphically depicted in **Exhibits from 6.1 to 6.14**.

6.2 The number of H.E. Stations falling under various ranges of operating availability during the year 2023-24 is summarized below in **Table 6.1.**

TABLE 6.1

OPERATING AVAILABILITY OF H.E. STATIONS
(PERIOD: 2023-24)

Operating Availability (%)	No. of Stations	% of total Stations	Installed Capacity (MW)	% of total Installed Capacity
>=95%	101	47.64	23807.67	50.73
>=90 to 95	51	24.06	9313.65	19.85
>=85 to 90	28	13.21	7585.65	16.16
>=80 to 85	11	5.19	2234.00	4.76
<80	22	10.38	4787.20	8.50
Total	**212**	**100.00**	**46928.17**	**100.00**

6.3 OPERATING AVAILABILITY – REGION-WISE

Region-wise operating availability of hydro-electric units during 2023-24 is indicated in **Table 6.2**.

TABLE 6.2

AVAILABILITY OF UNITS - REGION-WISE
PERIOD: 2023-24

Sl. No.	Region	No. of Units	Installed Capacity (MW)	Planned Maintenance %	Forced Outage %	Operating Availability (%)
1	Northern	260	19774.27	5.57	1.14	93.28
2	Western	101	7392.00	4.61	1.87	93.52
3	Southern	246	11747.15	5.26	3.27	91.47
4	Eastern	86	5987.75	6.17	1.85	91.98
5	N- Eastern	38	2027.00	10.05	8.53	81.42
	All India	**731**	**46928.17**	**5.35**	**2.43**	**92.22**

It is seen that the operating availability of hydel generating units during 2023-24 was the highest (93.52%) in Western Region due to relatively lower forced outages. The operating availability was the lowest in case of units in North-Eastern Region (81.42%) due to high planned maintenance and forced outages.

6.4 OPERATING AVAILABILITY: AGE-WISE

The average operating availability during 2023-24 of hydro units commissioned in various years has been indicated in **Table 6.3**. It is observed that units commissioned during 2023-24 have achieved the operating availability of 100%. Operating availability was more than 90% for all the other years.

TABLE - 6.3

OPERATING AVAILABILITY – AGE-WISE
PERIOD: 2023-24

Sl. No.	Year of Commissioning	No. of Units	Installed Capacity (MW)	Operating Availability (%)
1	2023-24	2	60.00	100.00
2	2022-23	2	120.00	100.00
3	2021-22	7	393.00	99.23
4	2020-21	8	510.00	99.97
5	2019-20	2	300.00	100.00
6	2018-19	3	140.00	99.99
7	2017-18	16	795.00	97.36
8	2016-17	18	1659.00	99.41
9	2015-16	17	1516.00	99.01
10	2010-11 to 2014-15	63	4482.02	90.20
11	2005-06 to 2009-10	66	7077.00	94.65
12	2000-01 to 2004-05	74	6741.80	94.48
13	1989-90 to 1999-2000	86	5769.70	90.47
14	1978-79 to 1988-89	124	5279.75	86.37
15	1967-68 to 1977-78	81	4780.80	87.32

16	Up to 1966-67	162	4780.80	87.32
	Total	**731**	**46928.17**	**92.22**

6.5 OPERATING AVAILABILITY – UTILITY-WISE

Sector-wise/State & Private Power Generating Corporation-wise operating availability of HE units is indicated in **Table 6.4**.

It was observed that the operating availability of generating units of Private Sector was the highest (92.63%) followed by State Sector (92.03%) and Central Sector (91.38%).

TABLE 6.4

SECTOR-WISE OPERATING AVAILABILITY OF UTILITIES FOR PERIOD: 2023-24

S. No.	Organization	No. of Units	Installed Capacity	Planned Maintenance	Forced Outage	Operating Availability per Unit
			(MW)	(%)	(%)	(%)
Central						
1	BBMB	28	2956.30	8.78	0.00	91.22
2	DVC	5	143.20	3.89	0.03	96.08
3	NEEPCO.	20	1500.00	13.57	13.25	73.18
4	NHDC	16	1520.00	3.98	0.04	95.99
5	NHPC	70	5451.20	6.16	0.39	93.45
6	NTPC Ltd.	4	800.00	0.0	0.97	99.03
7	SJVNL	14	1972.02	1.93	0.07	98.01
8	THDC	8	1400.00	7.20	0.02	92.78
Sub Total (CS)		**165**	**15742.72**	**6.80**	**1.82**	**91.38**
State						
1	APGCL	2	100.00	17.82	1.21	80.97
2	APGENCO	34	1796.75	1.96	1.51	96.53
3	CSPGCL	3	120.00	0.00	0.00	100.00
4	GSECL	8	540.00	0.00	0.01	99.99
5	HPPCL	8	406.00	1.57	10.37	88.06
6	HPSEB	12	372.00	5.13	0.00	94.87
7	JKSPDC	12	1110.00	3.33	0.73	95.94
8	JUUNL	2	130.00	0.00	0.00	100.00
9	KPCL	66	3617.20	2.06	1.50	96.44
10	KSEB	47	1864.15	10.61	1.54	87.85
11	MAHAGENCO	24	2406.00	1.51	3.34	95.15

12	MeECL	13	322.00	4.80	4.23	90.97
13	MPPGCL	23	875.00	4.47	4.69	90.84
14	OHPC	31	2039.80	13.59	3.17	83.24
15	PSPCL	25	1051.00	4.84	0.16	95.00
16	RRVUNL	11	411.00	5.55	9.30	85.14
17	SSNNL	11	1450.00	4.80	0.01	95.19
18	TANGEDCO	69	2178.20	8.37	6.45	85.18
19	TSGENCO	36	2405.60	0.42	3.80	95.77
20	TUL	6	1200.00	0.12	0.15	99.73
21	UJVNL	36	1372.15	5.20	0.39	94.41
22	UPJVNL	15	501.60	5.39	1.69	92.92
23	WBSEDCL	12	986.00	1.90	4.40	93.71
Sub Total (State)		**506**	**27254.45**	**5.12**	**2.85**	**92.03**
Private						
1	ADHPL	2	192.00	10.97	1.59	87.44
2	AHPC (GVK)	4	330.00	0.85	0.00	99.15
3	DEPL	2	96.00	1.60	0.01	98.38
4	DLHP	1	34.00	0.00	0.00	100.00
5	E.P.P.L.	2	100.00	0.00	0.11	99.89
6	GBHPPL	2	70.00	7.73	0.00	92.27
7	GIPL	2	110.00	6.82	0.37	92.80
8	GMR BHHPL	3	180.00	1.66	0.03	98.31
9	HBPCL	7	1345.00	8.53	0.00	91.47
10	HSPCL	2	100.00	0.00	0.00	100.00
11	IAEPL	3	36.00	8.84	1.26	89.90
12	JPPVL	4	400.00	2.01	0.11	97.89
13	L&T	3	99.00	3.61	0.31	96.08
14	MBPC	2	113.00	4.93	0.67	94.40
15	MPCL	2	86.00	6.05	0.00	93.95
16	SEPL	2	97.00	0.00	0.00	100.00
17	SKPPPL	2	96.00	0.00	0.00	100.00
18	TATA MAH.	15	447.00	14.04	0.00	85.96
Sub Total (Pvt.)		**60**	**3931.00**	**6.78**	**0.59**	**92.63**
Grand Total		**731**	**46928.17**	**5.35**	**2.43**	**92.22**

6.6 OPERATING AVAILABILITY BELOW 90%- STATION-WISE

It is observed that 112 nos. of stations had operating availability below 90% continuously for last 3 years. The details of these stations is given below in **Table 6.5.** As normative availability factor for entire useful life of station considered during planning stage is 95%, the stations/utilities having lower operating availability factor need to improve their O&M practices to bring down the outages as per best practices.

TABLE-6.5

OPERATING AVAILABILITY OF H. E. STATIONS CONTINUOUSLY LESS THAN 90% DURING LAST THREE YEARS (2021-22 To 2023-24)

Sl. No.	Name of the Stations	Name of the Utility	Installed Capacity (MW)	Operating Availability (%)		
				2021-22	2022-23	2023-24
1	BANSAGAR TONS-I HPS	MPPGCL	315.00	66.67	42.38	80.69
2	GANDHI SAGAR HPS	MPPGCL	115.00	79.67	80.00	78.87
3	IDUKKI HPS	KSEB	780.00	88.94	88.05	87.20
4	KADAMPARI HPS	TANGEDCO	400.00	46.31	77.83	56.35
5	KAMENG HPS	NEEPCO.	600.00	71.92	83.08	85.88
6	KHOPOLI HPS	TATA MAH.	72.00	66.66	66.67	63.15
7	KOPILI HPS	NEEPCO.	200.00	0.00	0.00	39.07
8	KYRDEMKULAI HPS	MeECL	60.00	50.00	81.34	87.77
9	NARIAMANGLAM HPS	KSEB	52.65	66.67	87.03	87.73
10	NARIAMANGLAM HPS	KSEB	45.00	66.67	87.03	87.73
11	R P SAGAR HPS	RRVUNL	172.00	6.32	49.80	70.62

EXHIBIT 6.1

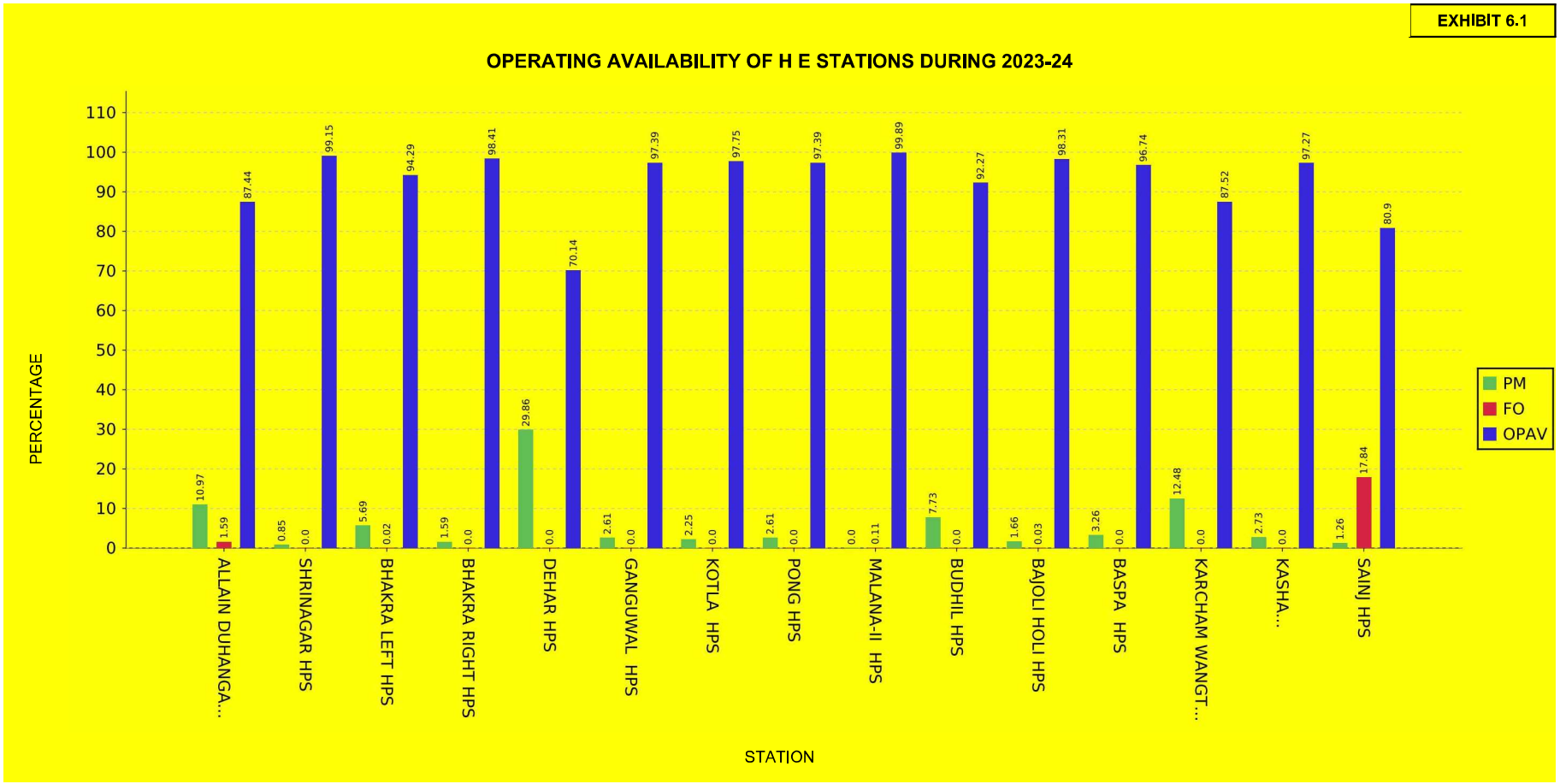

OPERATING AVAILABILITY OF H E STATIONS DURING 2023-24
PERCENTAGE
STATION
PM
FO
OPAV
ALLAIN DUHANGA...
SHRINAGAR HPS
BHAKRA LEFT HPS
BHAKRA RIGHT HPS
DEHAR HPS
GANGUWAL HPS
KOTLA HPS
PONG HPS
MALANA-II HPS
BUDHIL HPS
BAJOLI HOLI HPS
BASPA HPS
KARCHAM WANGT...
KASHA...
SAINJ HPS
10.97
1.59
87.44
0.85
0.0
99.15
5.69
0.20
94.29
1.59
0.0
98.41
29.86
0.0
70.14
2.61
0.0
97.39
2.25
0.0
97.75
2.61
0.0
97.39
0.0
0.11
99.89
7.73
0.0
92.27
1.66
0.03
98.31
3.26
0.0
96.74
12.48
0.0
87.52
2.73
0.0
97.27
1.26
17.84
80.9

EXHIBIT 6.2

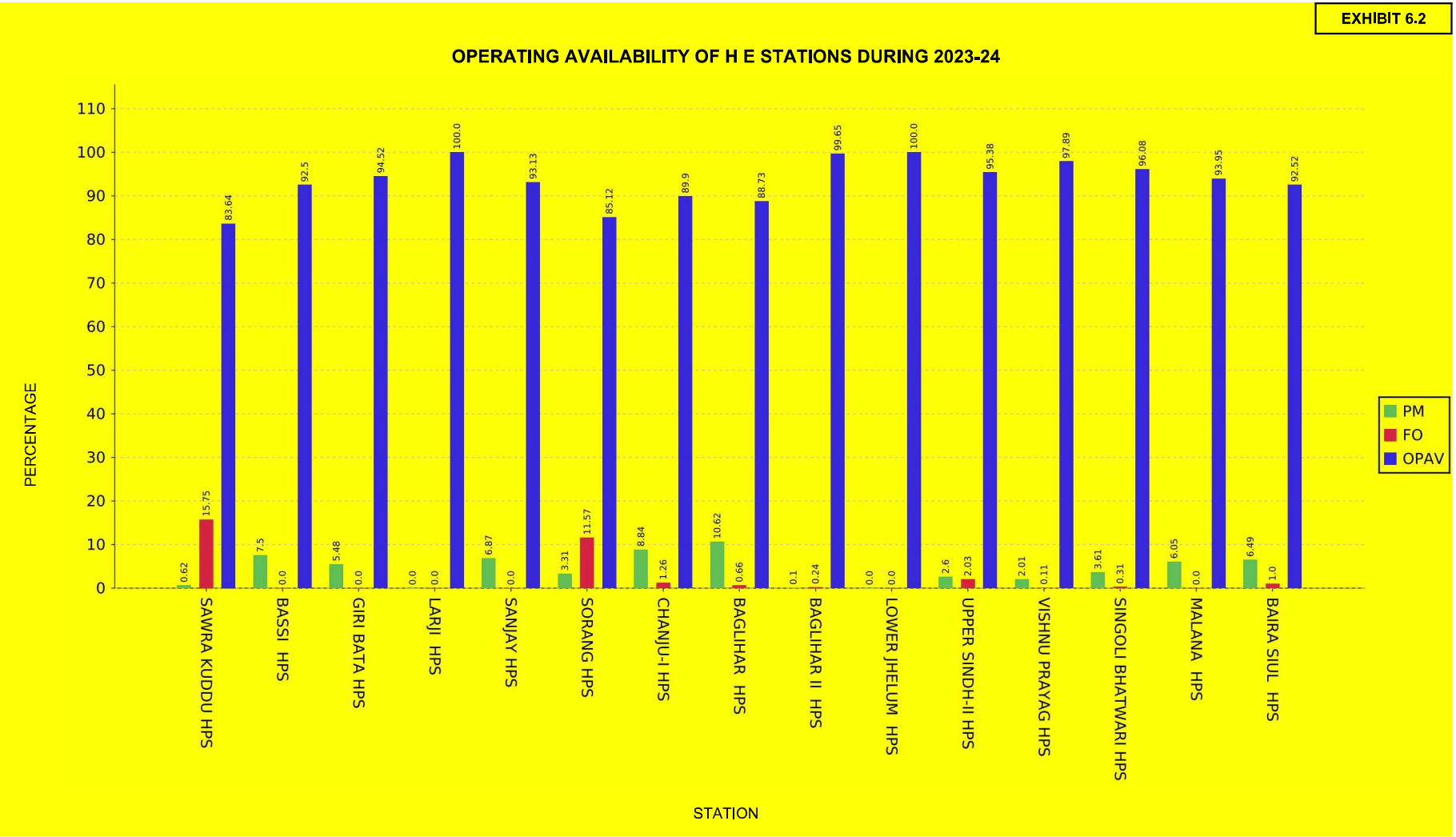

OPERATING AVAILABILITY OF H E STATIONS DURING 2023-24
PERCENTAGE
STATION
PM
FO
OPAV
SAWRA KUDDU HPS
BASSI HPS
GIRI BATA HPS
LARJI HPS
SANJAY HPS
SORANG HPS
CHANJU-I HPS
BAGLIHAR HPS
BAGLIHAR II HPS
LOWER JHELUM HPS
UPPER SINDH-II HPS
VISHNU PRAYAG HPS
SINGOLI BHATWARI HPS
MALANA HPS
BAIRA SIUL HPS
0.62
15.75
83.64
7.5
0.0
92.5
5.48
0.0
94.52
0.0
0.0
100.0
6.87
0.0
93.13
3.31
11.57
85.12
8.84
1.26
89.9
10.62
0.66
88.73
0.1
0.24
99.65
0.0
0.0
100.0
2.6
2.03
95.38
2.01
0.11
97.89
3.61
0.31
96.08
6.05
0.0
93.95
6.49
1.0
92.52

EXHIBIT 6.3

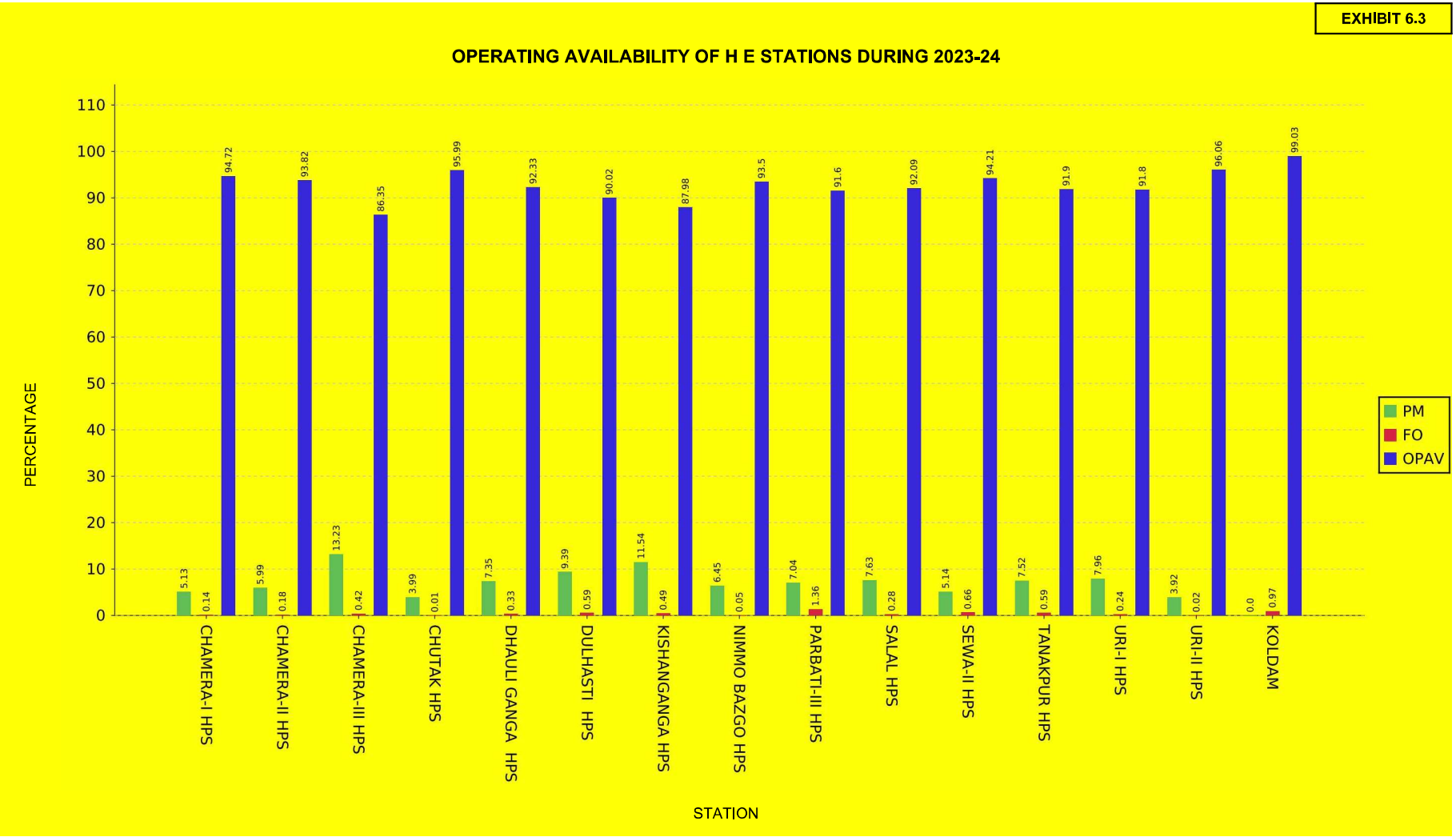

OPERATING AVAILABILITY OF H E STATIONS DURING 2023-24
PERCENTAGE
STATION
PM
FO
OPAV
CHAMERA-I HPS 5.13 0.14 94.72
CHAMERA-II HPS 5.99 0.18 93.82
CHAMERA-III HPS 13.23 0.42 86.35
CHUTAK HPS 3.99 0.01 95.99
DHAULI GANGA HPS 7.35 0.33 92.33
DULHASTI HPS 9.39 0.59 90.02
KISHANGANGA HPS 11.54 0.49 87.98
NIMMO BAZGO HPS 6.45 0.05 93.5
PARBATI-III HPS 7.04 1.36 91.6
SALAL HPS 7.63 0.28 92.09
SEWA-II HPS 5.14 0.66 94.21
TANAKPUR HPS 7.52 0.59 91.9
URI-I HPS 7.96 0.24 91.8
URI-II HPS 3.92 0.02 96.06
KOLDAM 0.0 0.97 99.03

EXHIBIT 6.4

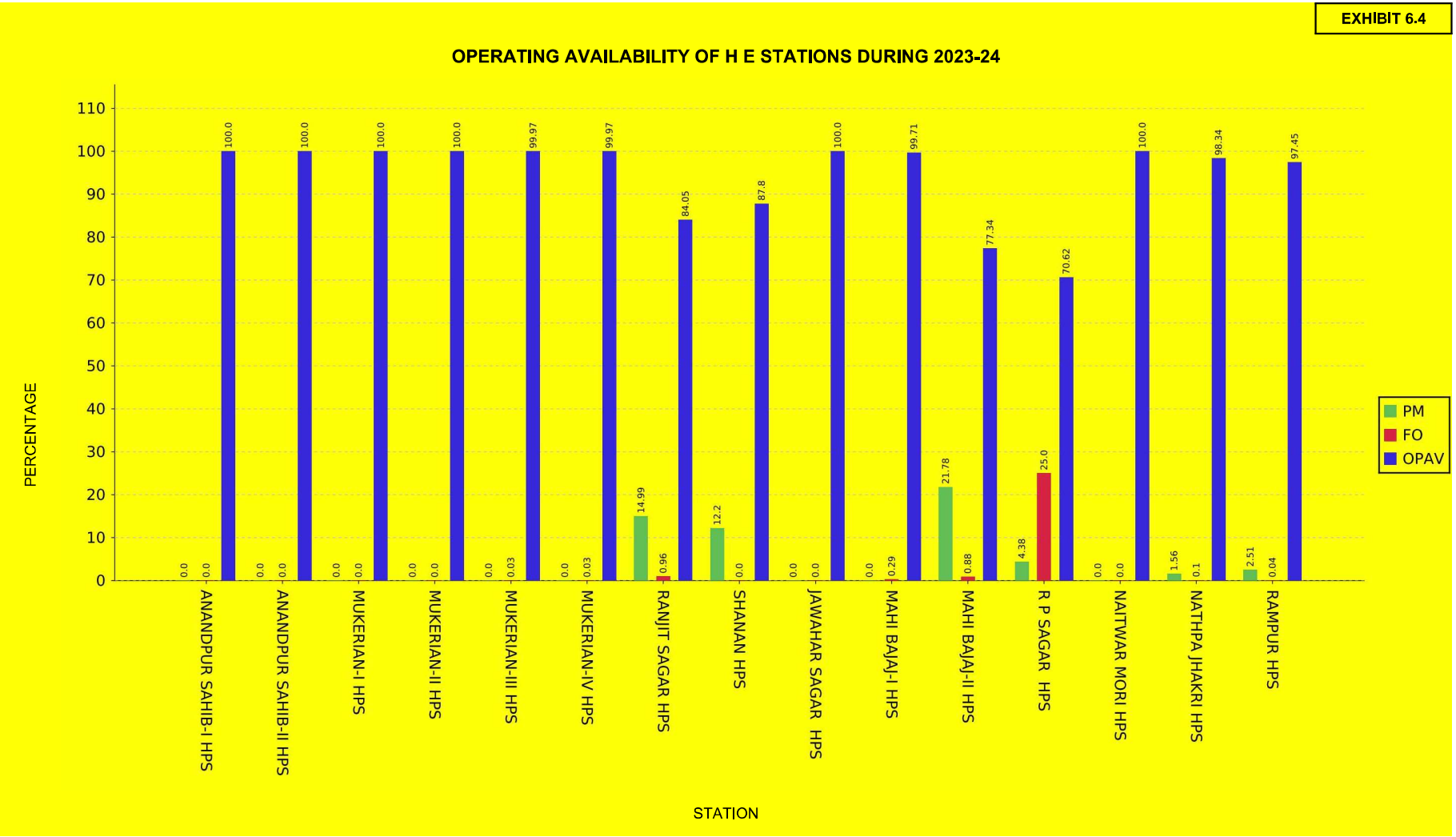

OPERATING AVAILABILITY OF H E STATIONS DURING 2023-24
PERCENTAGE
STATION
PM
FO
OPAV
ANANDPUR SAHIB-I HPS
ANANDPUR SAHIB-II HPS
MUKERIAN-I HPS
MUKERIAN-II HPS
MUKERIAN-III HPS
MUKERIAN-IV HPS
RANJIT SAGAR HPS
SHANAN HPS
JAWAHAR SAGAR HPS
MAHI BAJAJ-I HPS
MAHI BAJAJ-II HPS
R P SAGAR HPS
NAITWAR MORI HPS
NATHPA JHAKRI HPS
RAMPUR HPS

EXHIBIT 6.5

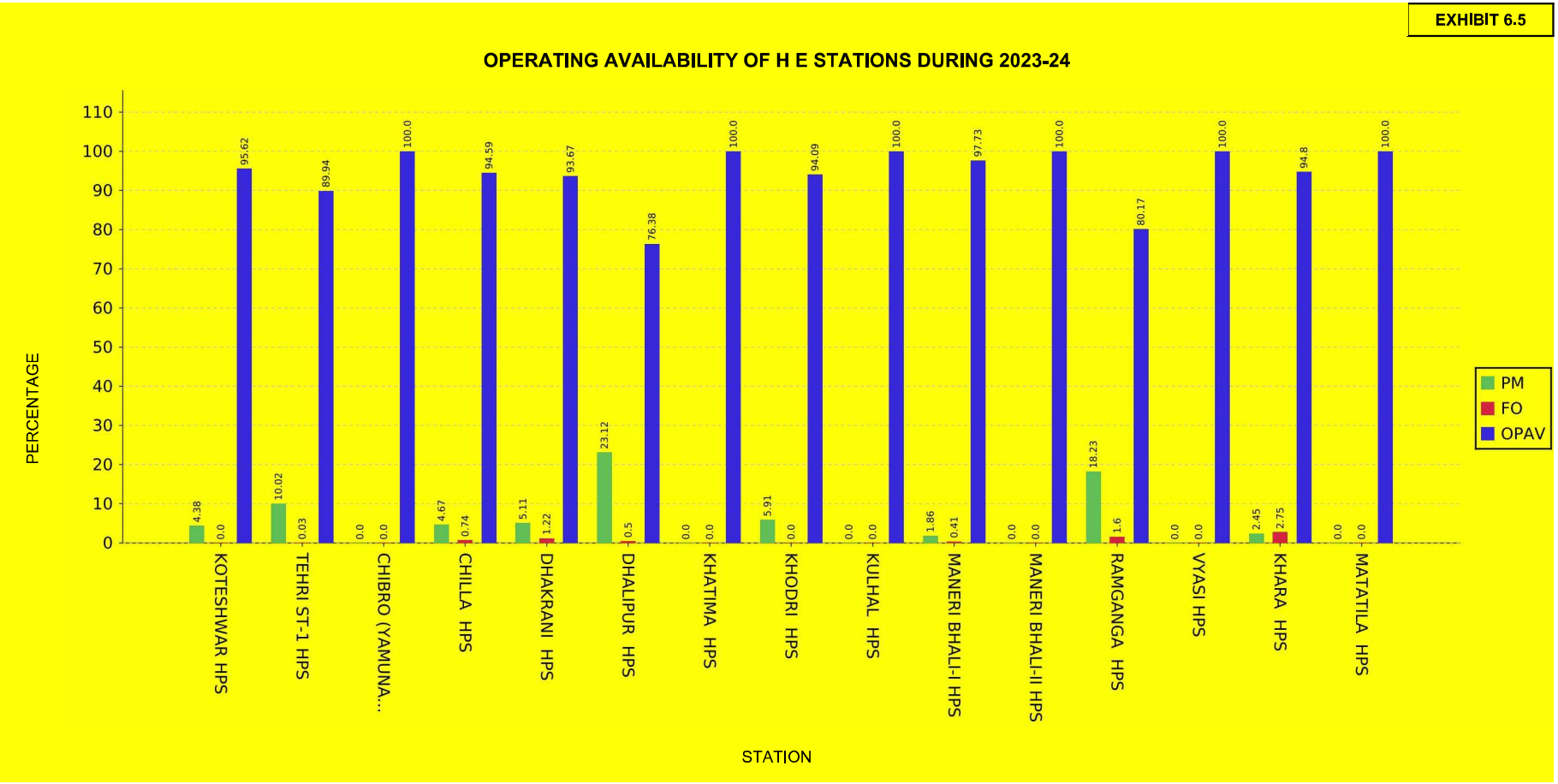

OPERATING AVAILABILITY OF H E STATIONS DURING 2023-24
PERCENTAGE
STATION
PM
FO
OPAV
KOTESHWAR HPS
TEHRI ST-1 HPS
CHIBRO (YAMUNA...
CHILLA HPS
DHAKRANI HPS
DHALIPUR HPS
KHATIMA HPS
KHODRI HPS
KULHAL HPS
MANERI BHALI-I HPS
MANERI BHALI-II HPS
RAMGANGA HPS
VYASI HPS
KHARA HPS
MATATILA HPS

EXHIBIT 6.6

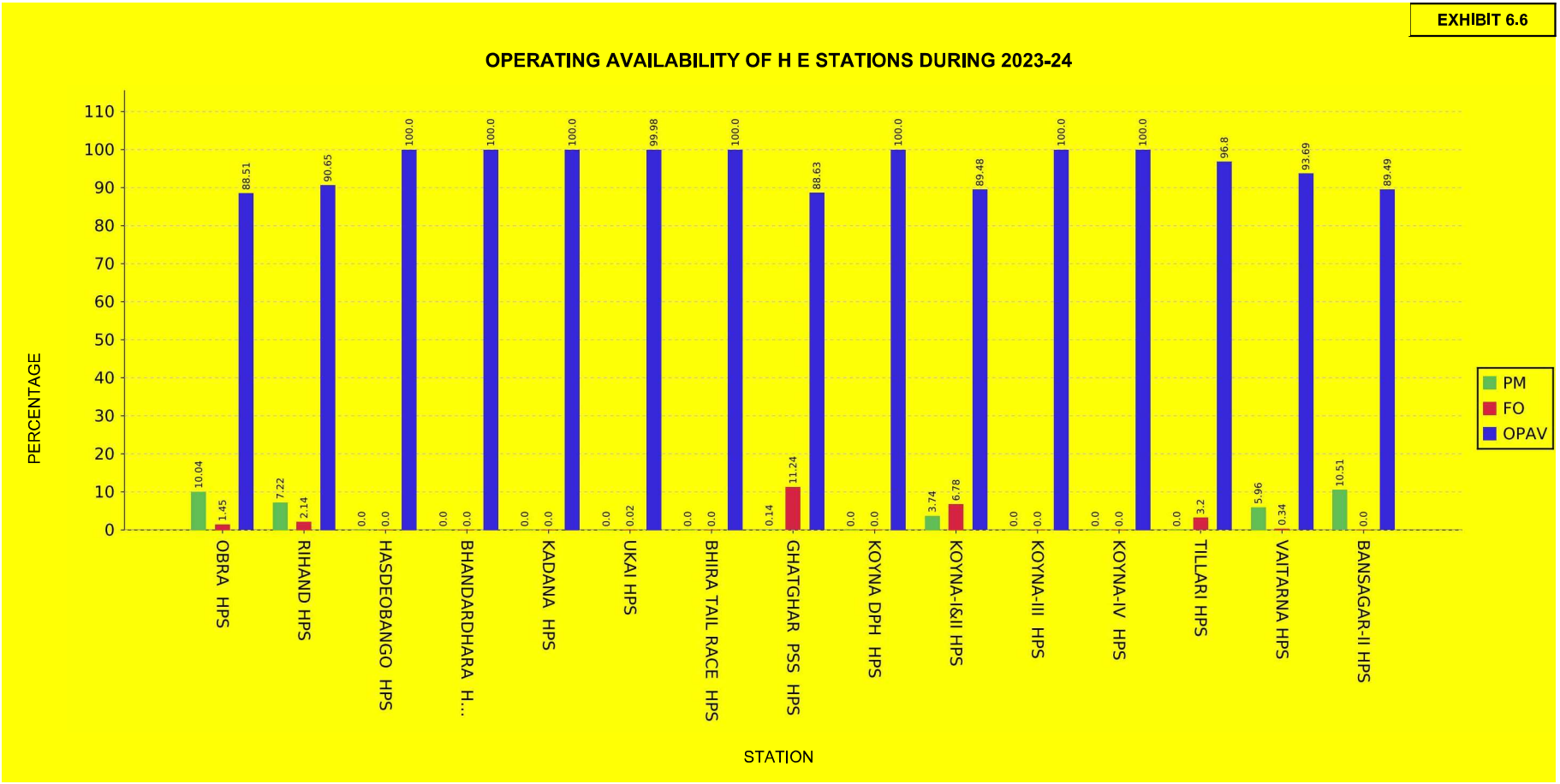

OPERATING AVAILABILITY OF H E STATIONS DURING 2023-24
PERCENTAGE
STATION
PM
FO
OPAV
OBRA HPS
RIHAND HPS
HASDEOBANGO HPS
BHANDARDHARA H...
KADANA HPS
UKAI HPS
BHIRA TAIL RACE HPS
GHATGHAR PSS HPS
KOYNA DPH HPS
KOYNA-I&II HPS
KOYNA-III HPS
KOYNA-IV HPS
TILLARI HPS
VAITARNA HPS
BANSAGAR-II HPS

EXHIBIT 6.7

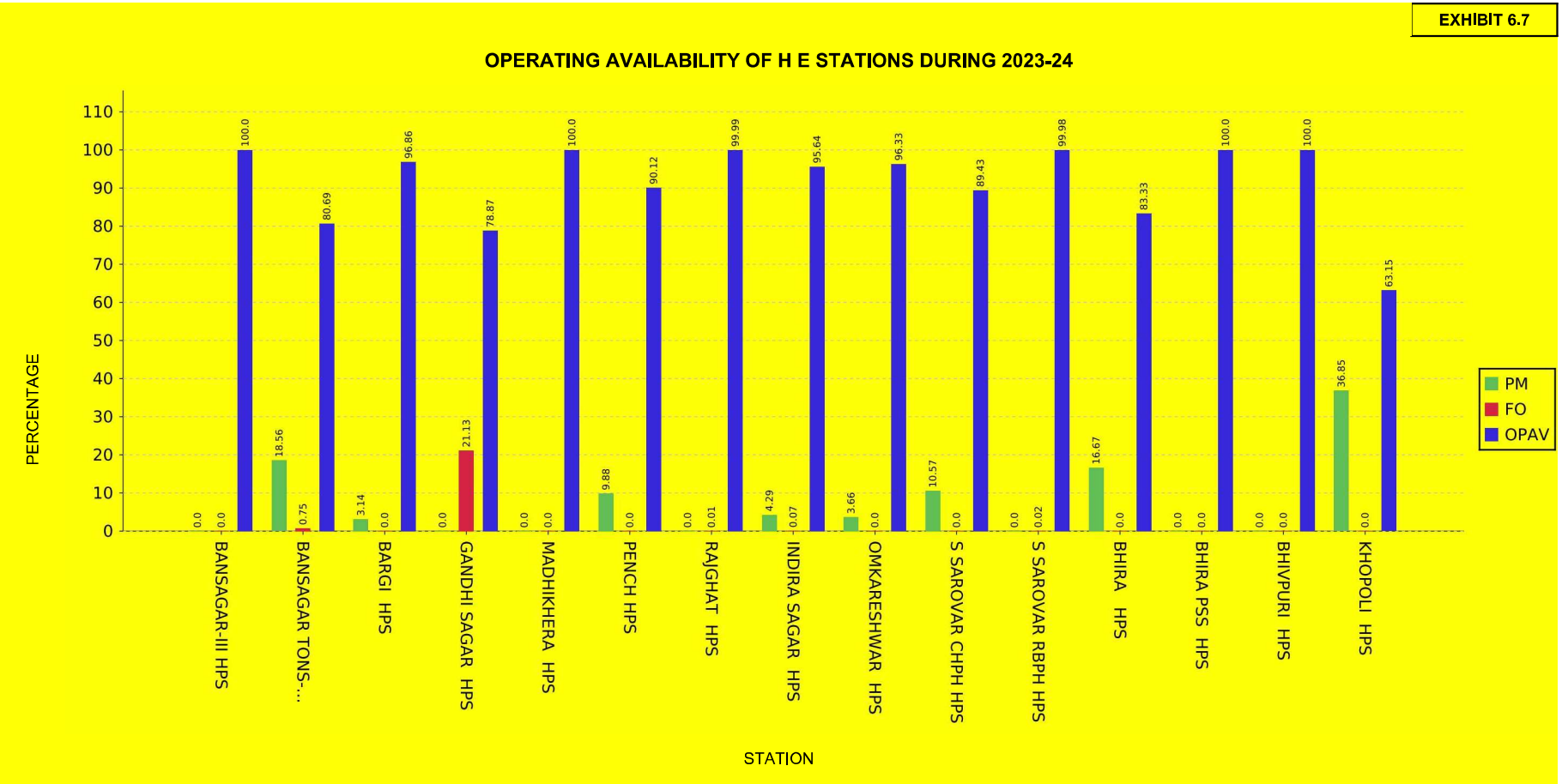

OPERATING AVAILABILITY OF H E STATIONS DURING 2023-24
PERCENTAGE
STATION
PM
FO
OPAV
BANSAGAR-III HPS
BANSAGAR TONS-...
BARGI HPS
GANDHI SAGAR HPS
MADHIKHERA HPS
PENCH HPS
RAJGHAT HPS
INDIRA SAGAR HPS
OMKARESHWAR HPS
S SAROVAR CHPH HPS
S SAROVAR RBPH HPS
BHIRA HPS
BHIRA PSS HPS
BHIVPURI HPS
KHOPOLI HPS

EXHIBIT 6.8

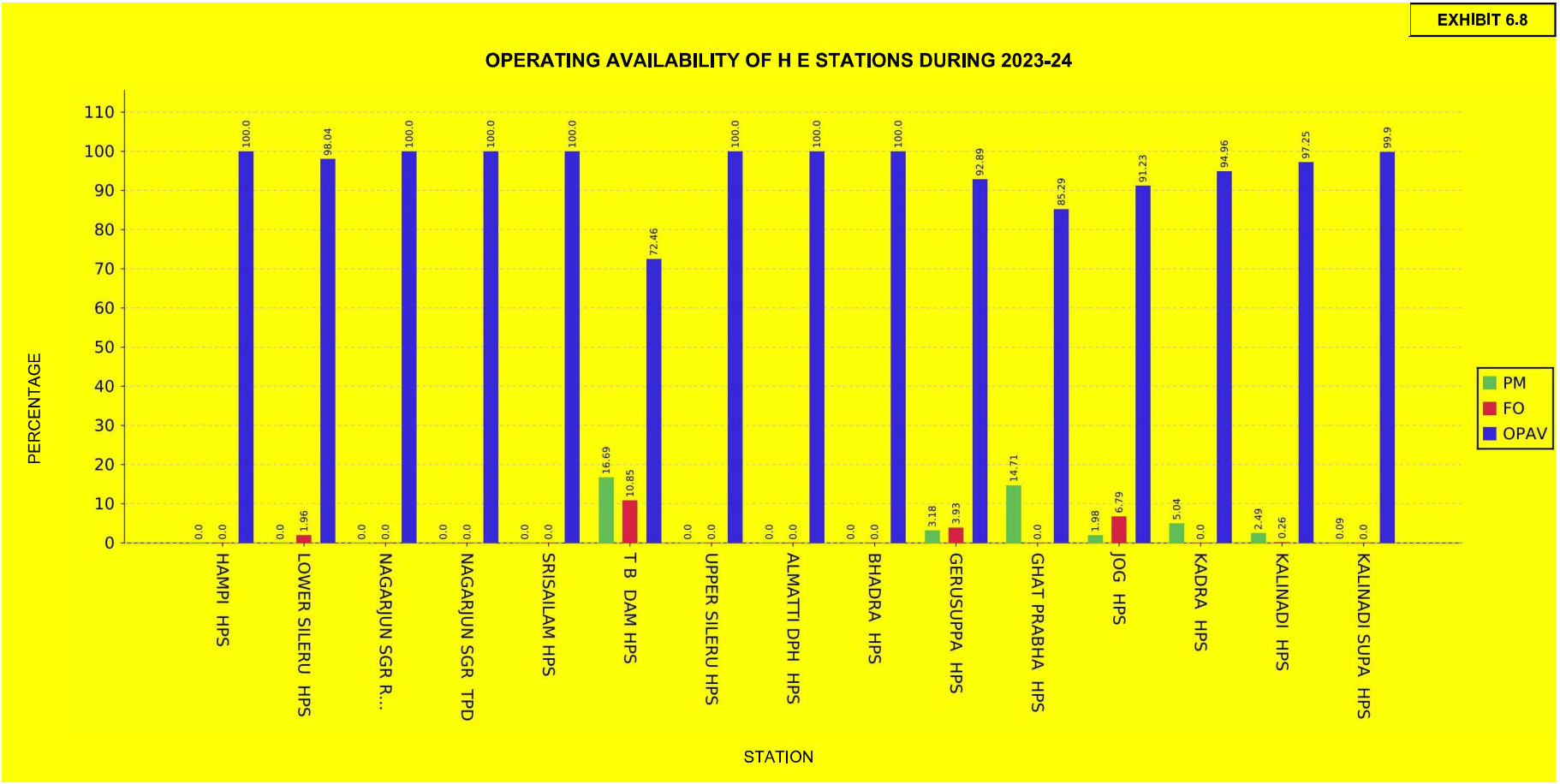

OPERATING AVAILABILITY OF H E STATIONS DURING 2023-24
PERCENTAGE
STATION
PM
FO
OPAV
HAMPI HPS
LOWER SILERU HPS
NAGARJUN SGR R...
NAGARJUN SGR TPD
SRISAILAM HPS
T B DAM HPS
UPPER SILERU HPS
ALMATTI DPH HPS
BHADRA HPS
GERUSUPPA HPS
GHAT PRABHA HPS
JOG HPS
KADRA HPS
KALINADI HPS
KALINADI SUPA HPS

EXHIBIT 6.9

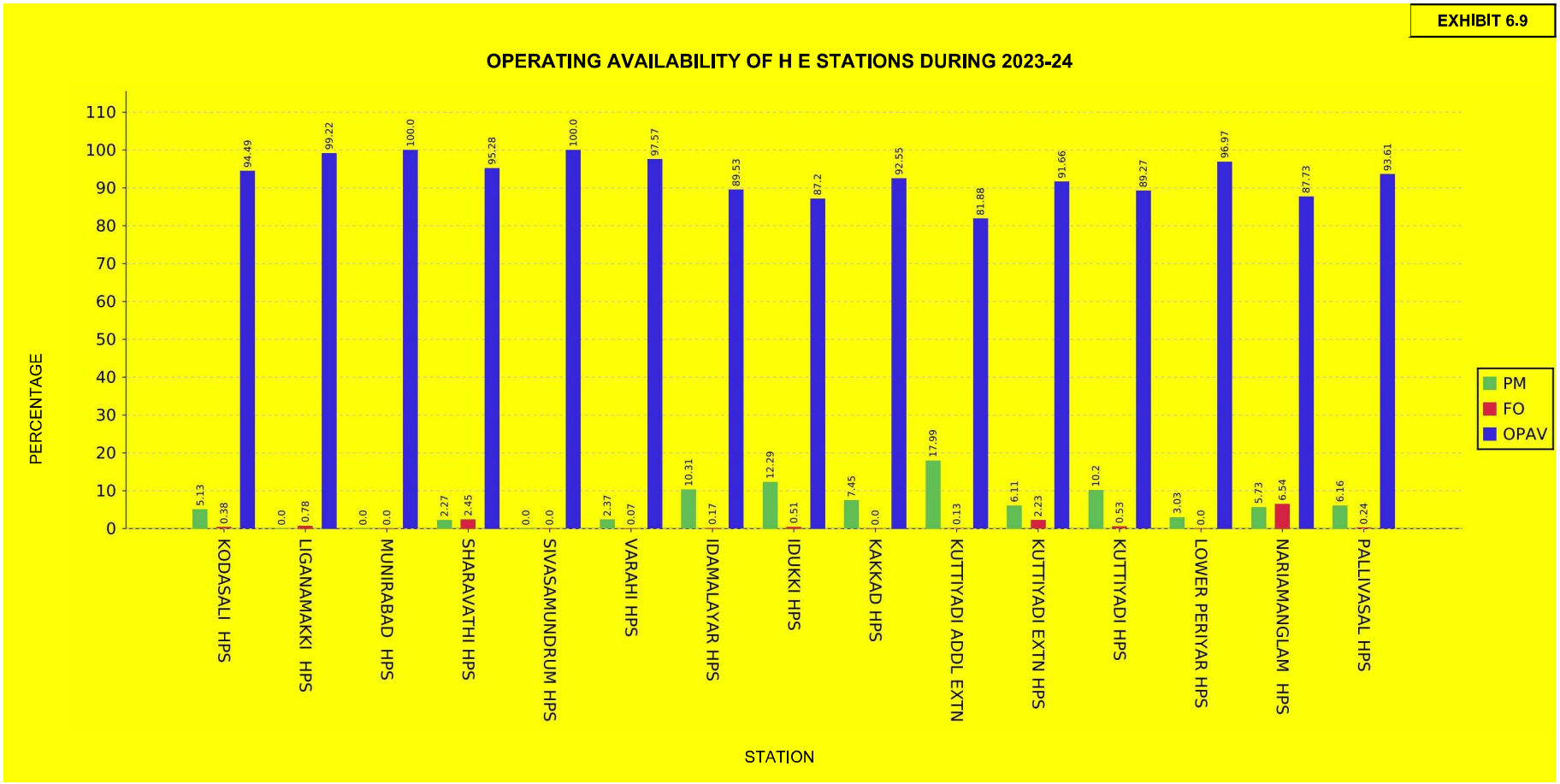

OPERATING AVAILABILITY OF H E STATIONS DURING 2023-24
PERCENTAGE
STATION
PM
FO
OPAV
KODASALI HPS
5.13
0.38
94.49
LIGANAMAKKI HPS
0.0
0.78
99.22
MUNIRABAD HPS
0.0
0.0
100.0
SHARAVATHI HPS
2.27
2.45
95.28
SIVASAMUNDRUM HPS
0.0
0.0
100.0
VARAHI HPS
2.37
0.07
97.57
IDAMALAYAR HPS
10.31
0.17
89.53
IDUKKI HPS
12.29
0.51
87.2
KAKKAD HPS
7.45
0.0
92.55
KUTTIYADI ADDL EXTN
17.99
0.13
81.88
KUTTIYADI EXTN HPS
6.11
2.23
91.66
KUTTIYADI HPS
10.2
0.53
89.27
LOWER PERIYAR HPS
3.03
0.0
96.97
NARIAMANGLAM HPS
5.73
6.54
87.73
PALLIVASAL HPS
6.16
0.24
93.61

EXHIBIT 6.10

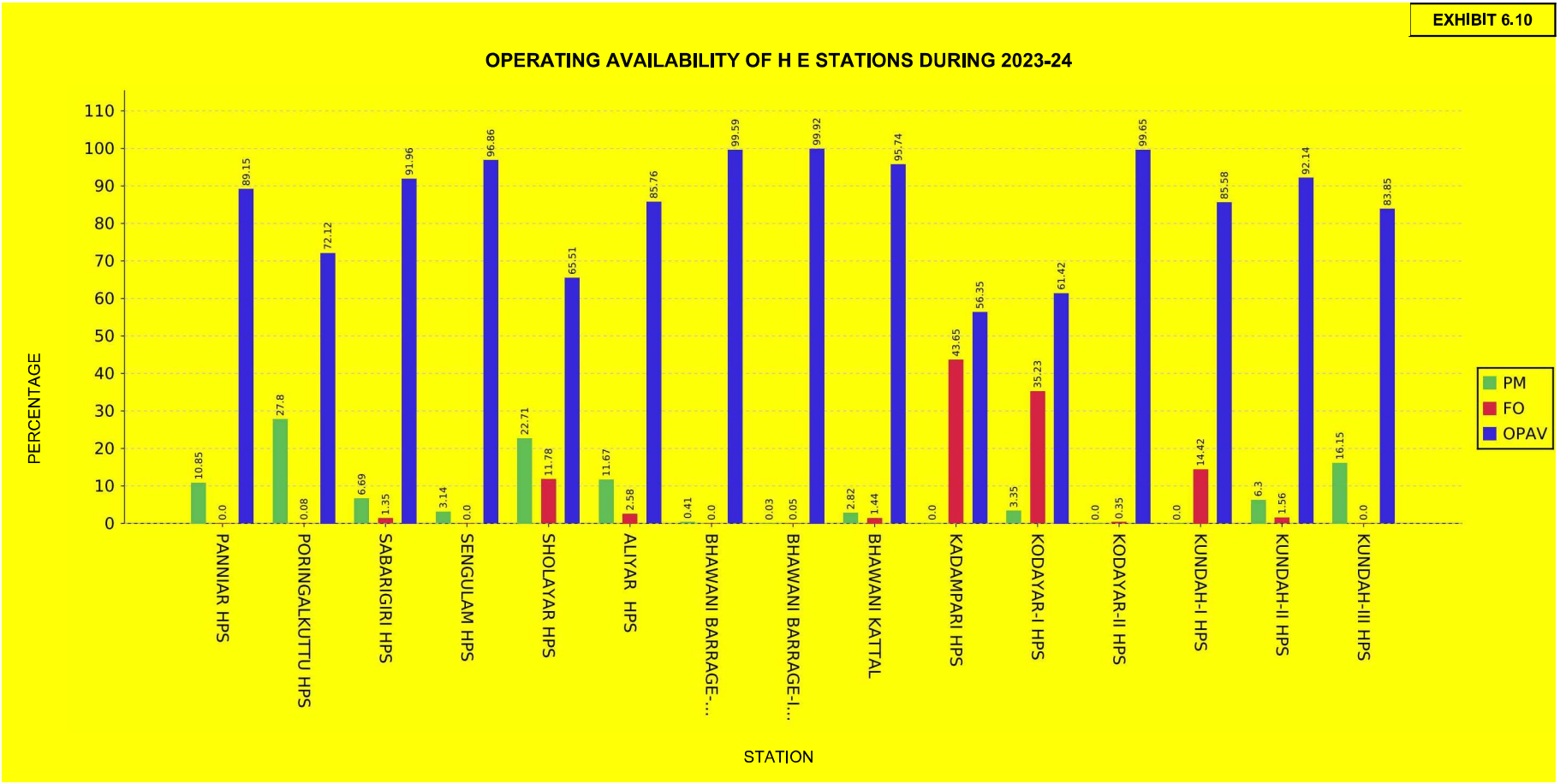

OPERATING AVAILABILITY OF H E STATIONS DURING 2023-24
PERCENTAGE
STATION
PM
FO
OPAV
PANNIAR HPS
PORINGALKUTTU HPS
SABARIGIRI HPS
SENGULAM HPS
SHOLAYAR HPS
ALIYAR HPS
BHAWANI BARRAGE-...
BHAWANI BARRAGE-I...
BHAWANI KATTAL
KADAMPARI HPS
KODAYAR-I HPS
KODAYAR-II HPS
KUNDAH-I HPS
KUNDAH-II HPS
KUNDAH-III HPS
10.85
0.0
89.15
27.8
0.08
72.12
6.69
1.35
91.96
3.14
0.0
96.86
22.71
11.78
65.51
11.67
2.58
85.76
0.41
0.0
99.59
0.63
0.50
99.92
2.82
1.44
95.74
0.0
43.65
56.35
3.35
35.23
61.42
0.0
0.35
99.65
0.0
14.42
85.58
6.3
1.56
92.14
16.15
0.0
83.85

EXHIBIT 6.11

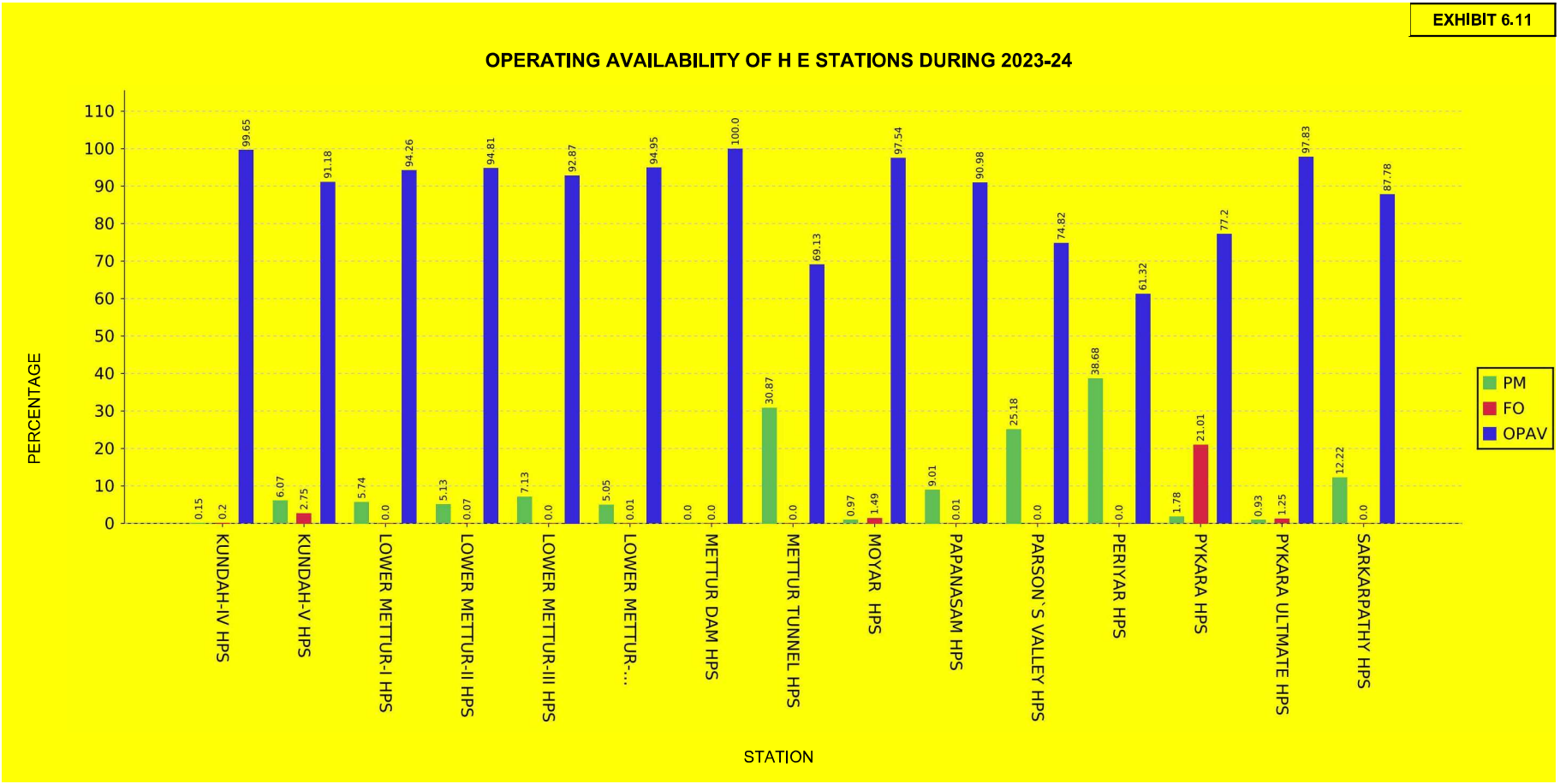

OPERATING AVAILABILITY OF H E STATIONS DURING 2023-24
PERCENTAGE
STATION
PM
FO
OPAV
KUNDAH-IV HPS
KUNDAH-V HPS
LOWER METTUR-I HPS
LOWER METTUR-II HPS
LOWER METTUR-III HPS
LOWER METTUR-...
METTUR DAM HPS
METTUR TUNNEL HPS
MOYAR HPS
PAPANASAM HPS
PARSON`S VALLEY HPS
PERIYAR HPS
PYKARA HPS
PYKARA ULTMATE HPS
SARKARPATHY HPS
0.15
0.2
99.65
6.07
2.75
91.18
5.74
0.0
94.26
5.13
0.07
94.81
7.13
0.0
92.87
5.05
0.01
94.95
0.0
0.0
100.0
30.87
0.0
69.13
0.97
1.49
97.54
9.01
0.01
90.98
25.18
0.0
74.82
38.68
0.0
61.32
1.78
21.01
77.2
0.93
1.25
97.83
12.22
0.0
87.78

EXHIBIT 6.12

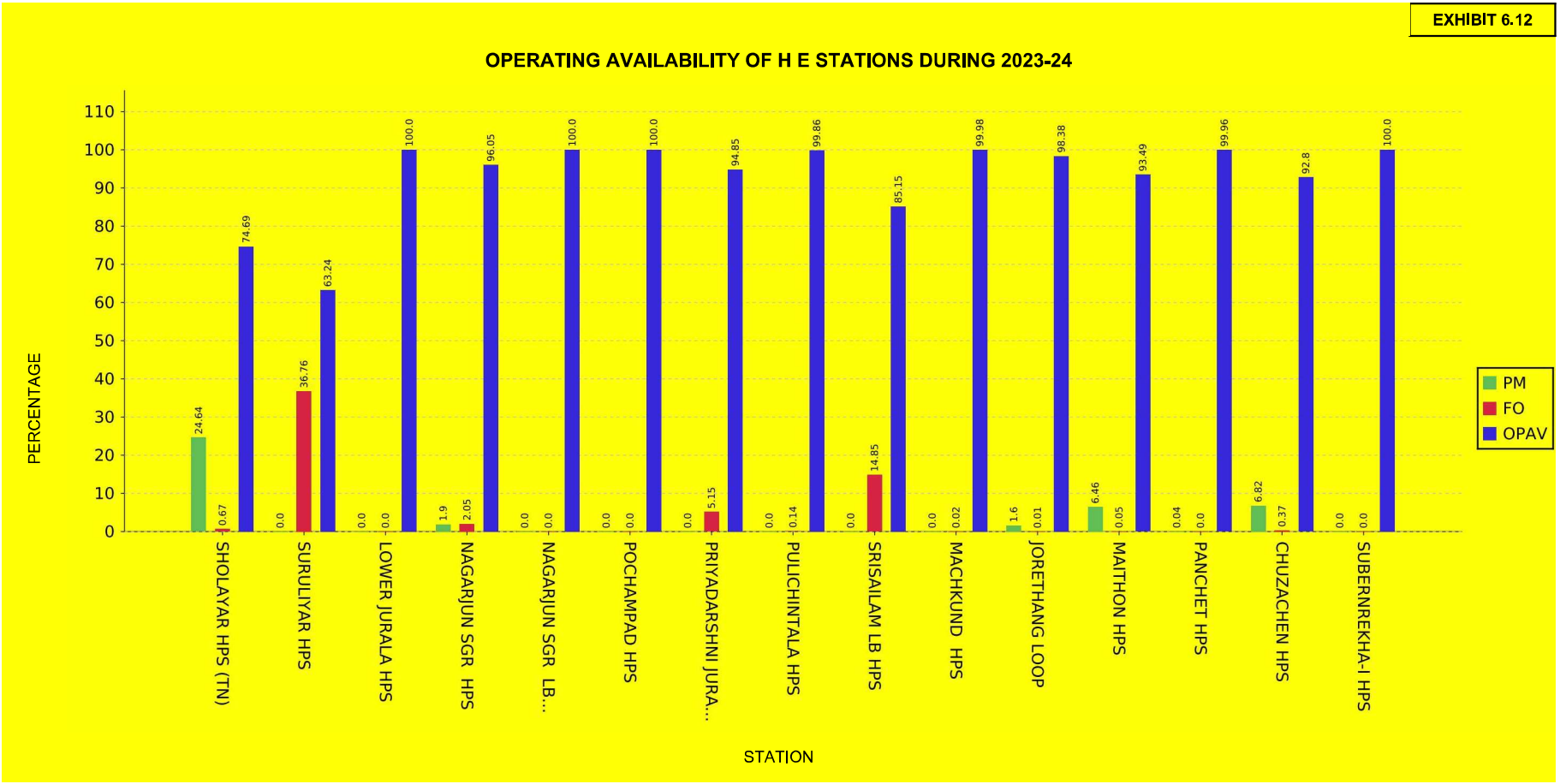

OPERATING AVAILABILITY OF H E STATIONS DURING 2023-24
PERCENTAGE
STATION
PM
FO
OPAV
SHOLAYAR HPS (TN)
SURULIYAR HPS
LOWER JURALA HPS
NAGARJUN SGR HPS
NAGARJUN SGR LB...
POCHAMPAD HPS
PRIYADARSHNI JURA...
PULICHINTALA HPS
SRISAILAM LB HPS
MACHKUND HPS
JORETHANG LOOP
MAITHON HPS
PANCHET HPS
CHUZACHEN HPS
SUBERNREKHA-I HPS

EXHIBIT 6.13

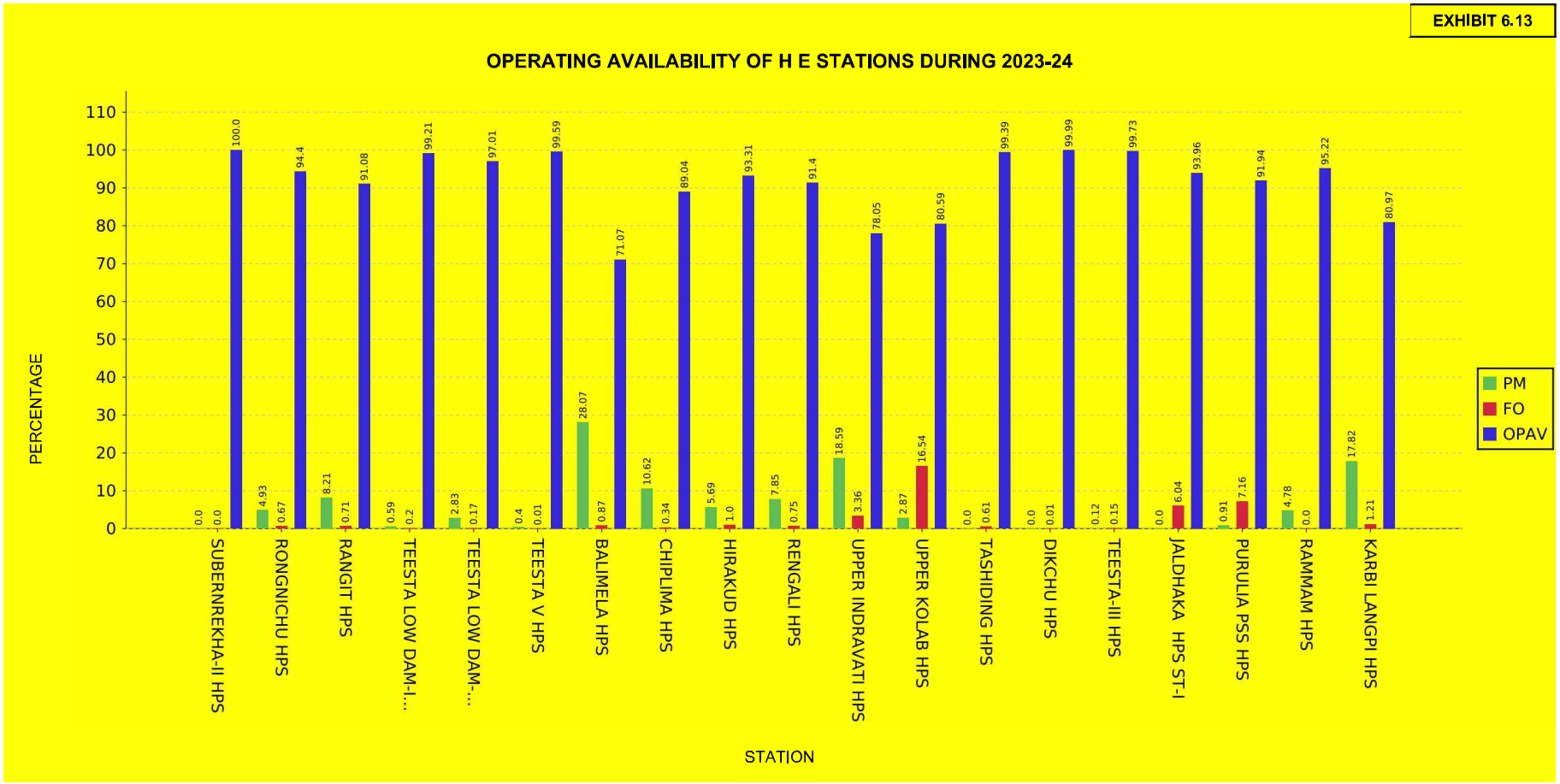
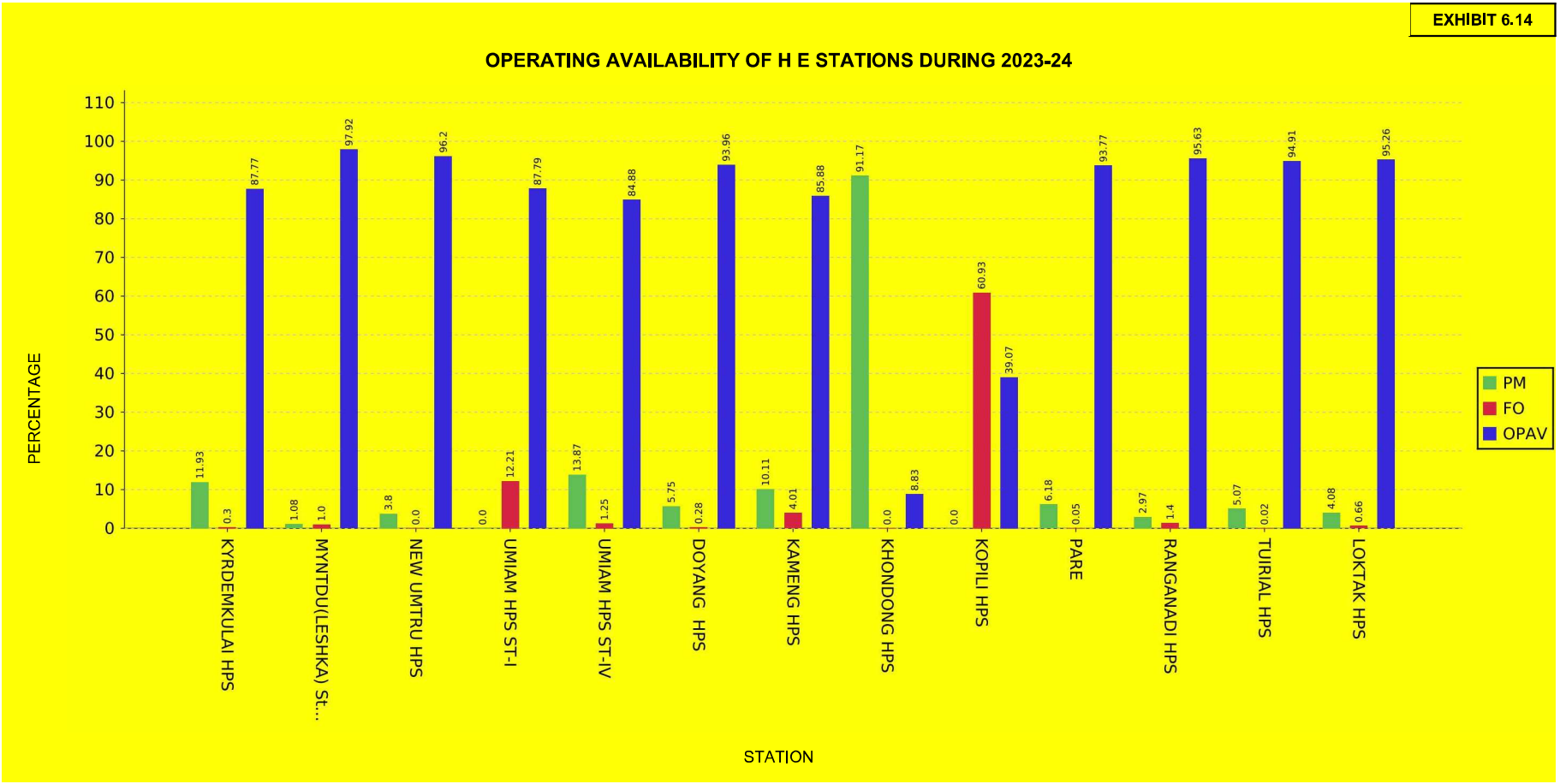

OPERATING AVAILABILITY OF H E STATIONS DURING 2023-24
PERCENTAGE
STATION
PM
FO
OPAV
SUBERNREKHA-II HPS
RONGNICHU HPS
RANGIT HPS
TEESTA LOW DAM-I...
TEESTA LOW DAM-...
TEESTA V HPS
BALIMELA HPS
CHIPLIMA HPS
HIRAKUD HPS
RENGALI HPS
UPPER INDRAVATI HPS
UPPER KOLAB HPS
TASHIDING HPS
DIKCHU HPS
TEESTA-III HPS
JALDHAKA HPS ST-I
PURULIA PSS HPS
RAMMAM HPS
KARBI LANGPI HPS

EXHIBIT 6.14


OPERATING AVAILABILITY OF H E STATIONS DURING 2023-24
PERCENTAGE
STATION
PM
FO
OPAV
KYRDEMKULAI HPS
MYNTDU(LESHKA) St...
NEW UMTRU HPS
UMIAM HPS ST-I
UMIAM HPS ST-IV
DOYANG HPS
KAMENG HPS
KHONDONG HPS
KOPILI HPS
PARE
RANGANADI HPS
TUIRIAL HPS
LOKTAK HPS
11.93
0.3
87.77
1.08
1.0
97.92
3.8
0.0
96.2
0.0
12.21
87.79
13.87
1.25
84.88
5.75
0.28
93.96
10.11
4.01
85.88
91.17
0.0
8.83
0.0
60.93
39.07
6.18
0.05
93.77
2.97
1.4
95.63
5.07
0.02
94.91
4.08
0.66
95.26

CENTRAL ELECTRICITY AUTHORITY
Hydro WING
Hydro Project Planning & Investigation Division

Annex 6.1

OPERAING AVAILABILITY OF HYDRO ELECTRIC UNITS DURING 2023-24

S.No.	STATION / CORPORATION	UNIT No.	INSTALLED CAPAPCITY (MW)	PLANNED MAINTENANCE (P.M) (%)	FORCED OUTAGE (F.O) (%)	OPERATING AVAILABILITY (100-FO-PM)
	Northern					
	ADHPL					
1	**ALLAIN DUHANGAN HPS**	1	96.00	12.04	1.90	86.06
		2	96.00	9.89	1.28	88.83
	TOTAL		**192.00**	**10.97**	**1.59**	**87.44**
	AHPC (GVK)					
2	**SHRINAGAR HPS**	1	82.50	3.39	0.00	96.61
		2	82.50	0.00	0.00	100.00
		3	82.50	0.00	0.00	100.00
		4	82.50	0.00	0.00	100.00
	TOTAL		**330.00**	**0.85**	**0.00**	**99.15**
	BBMB					
3	**BHAKRA LEFT HPS**	1	126.00	15.03	0.00	84.97
		2	126.00	13.41	0.00	86.59
		3	126.00	0.00	0.12	99.88
		4	126.00	0.00	0.00	100.00

S.No.	STATION / CORPORATION	UNIT No.	INSTALLED CAPAPCITY (MW)	PLANNED MAINTENANCE (P.M) (%)	FORCED OUTAGE (F.O) (%)	OPERATING AVAILABILITY (100-FO-PM)
		5	126.00	0.00	0.00	100.00
	TOTAL		**630.00**	**5.69**	**0.02**	**94.29**
4	**BHAKRA RIGHT HPS**	6	157.00	7.95	0.00	92.05
		7	157.00	0.00	0.00	100.00
		8	157.00	0.00	0.00	100.00
		9	157.00	0.00	0.00	100.00
		10	157.00	0.00	0.00	100.00
	TOTAL		**785.00**	**1.59**	**0.00**	**98.41**
5	**DEHAR HPS**	1	165.00	34.68	0.00	65.32
		2	165.00	0.00	0.00	100.00
		3	165.00	0.00	0.00	100.00
		4	165.00	7.69	0.00	92.31
		5	165.00	36.77	0.00	63.23
		6	165.00	100.00	0.00	0.00
	TOTAL		**990.00**	**29.86**	**0.00**	**70.14**
6	**GANGUWAL HPS**	1	29.25	2.53	0.00	97.47
		2	24.20	2.55	0.00	97.45
		3	24.20	2.74	0.00	97.26

S.No.	STATION / CORPORATION	UNIT No.	INSTALLED CAPAPCITY (MW)	PLANNED MAINTENANCE (P.M) (%)	FORCED OUTAGE (F.O) (%)	OPERATING AVAILABILITY (100-FO-PM)
	TOTAL		**77.65**	**2.61**	**0.00**	**97.39**
7	**KOTLA HPS**	1	29.25	4.18	0.00	95.82
		2	24.20	2.59	0.00	97.41
		3	24.20	0.00	0.00	100.00
	TOTAL		**77.65**	**2.25**	**0.00**	**97.75**
8	**PONG HPS**	1	66.00	2.52	0.00	97.48
		2	66.00	0.00	0.00	100.00
		3	66.00	1.66	0.00	98.34
		4	66.00	0.00	0.00	100.00
		5	66.00	8.21	0.00	91.79
		6	66.00	3.28	0.00	96.72
	TOTAL		**396.00**	**2.61**	**0.00**	**97.39**
	E.P.P.L.					
9	**MALANA-II HPS**	1	50.00	0.00	0.00	100.00
		2	50.00	0.00	0.22	99.78
	TOTAL		**100.00**	**0.00**	**0.11**	**99.89**
	GBHPPL					
10	**BUDHIL HPS**	1	35.00	8.55	0.00	91.45
		2	35.00	6.91	0.00	93.09

S.No.	STATION / CORPORATION	UNIT No.	INSTALLED CAPAPCITY (MW)	PLANNED MAINTENANCE (P.M) (%)	FORCED OUTAGE (F.O) (%)	OPERATING AVAILABILITY (100-FO-PM)
	TOTAL		**70.00**	**7.73**	**0.00**	**92.27**
	GMR BHHPL					
11	**BAJOLI HOLI HPS**	1	60.00	0.00	0.02	99.98
		2	60.00	4.99	0.06	94.95
		3	60.00	0.00	0.01	99.99
	TOTAL		**180.00**	**1.66**	**0.03**	**98.31**
	HBPCL					
12	**BASPA HPS**	1	100.00	4.96	0.00	95.04
		2	100.00	2.23	0.00	97.77
		3	100.00	2.60	0.00	97.40
	TOTAL		**300.00**	**3.26**	**0.00**	**96.74**
13	**KARCHAM WANGTOO HPS**	1	261.25	46.42	0.00	53.58
		2	261.25	3.28	0.00	96.72
		3	261.25	0.00	0.00	100.00
		4	261.25	0.22	0.00	99.78
	TOTAL		**1045.00**	**12.48**	**0.00**	**87.52**
	HPPCL					
14	**KASHANG INTEGRATED HEP**	1	65.00	0.00	0.00	100.00
		2	65.00	0.00	0.00	100.00

S.No.	STATION / CORPORATION	UNIT No.	INSTALLED CAPAPCITY (MW)	PLANNED MAINTENANCE (P.M) (%)	FORCED OUTAGE (F.O) (%)	OPERATING AVAILABILITY (100-FO-PM)
		3	65.00	8.20	0.00	91.80
	TOTAL		**195.00**	**2.73**	**0.00**	**97.27**
15	**SAINJ HPS**	1	50.00	2.52	16.41	81.07
		2	50.00	0.00	19.26	80.74
	TOTAL		**100.00**	**1.26**	**17.84**	**80.90**
16	**SAWRA KUDDU HPS**	1	37.00	0.00	3.48	96.52
		2	37.00	0.00	6.37	93.63
		3	37.00	1.85	37.40	60.75
	TOTAL		**111.00**	**0.62**	**15.75**	**83.64**
	HPSEB					
17	**BASSI HPS**	1	16.50	13.86	0.00	86.14
		2	16.50	2.73	0.00	97.27
		3	16.50	13.39	0.00	86.61
		4	16.50	0.00	0.00	100.00
	TOTAL		**66.00**	**7.50**	**0.00**	**92.50**
18	**GIRI BATA HPS**	1	30.00	5.29	0.00	94.71
		2	30.00	5.67	0.00	94.33
	TOTAL		**60.00**	**5.48**	**0.00**	**94.52**
19	**LARJI HPS**	1	42.00	0.00	0.00	100.00

S.No.	STATION / CORPORATION	UNIT No.	INSTALLED CAPAPCITY (MW)	PLANNED MAINTENANCE (P.M) (%)	FORCED OUTAGE (F.O) (%)	OPERATING AVAILABILITY (100-FO-PM)
		2	42.00	0.00	0.00	100.00
		3	42.00	0.00	0.00	100.00
	TOTAL		**126.00**	**0.00**	**0.00**	**100.00**
20	**SANJAY HPS**	1	40.00	8.41	0.00	91.59
		2	40.00	4.92	0.00	95.08
		3	40.00	7.28	0.00	92.72
	TOTAL		**120.00**	**6.87**	**0.00**	**93.13**
	HSPCL					
21	**SORANG HPS**	1	50.00	3.20	11.41	85.39
		2	50.00	3.42	11.73	84.85
	TOTAL		**100.00**	**3.31**	**11.57**	**85.12**
	IAEPL					
22	**CHANJU-I HPS**	1	12.00	8.06	1.20	90.74
		2	12.00	10.09	1.52	88.39
		3	12.00	8.38	1.05	90.57
	TOTAL		**36.00**	**8.84**	**1.26**	**89.90**
	JKSPDC					
23	**BAGLIHAR HPS**	1	150.00	15.98	0.80	83.22
		2	150.00	10.12	0.78	89.10

S.No.	STATION / CORPORATION	UNIT No.	INSTALLED CAPAPCITY (MW)	PLANNED MAINTENANCE (P.M) (%)	FORCED OUTAGE (F.O) (%)	OPERATING AVAILABILITY (100-FO-PM)
		3	150.00	5.75	0.38	93.87
	TOTAL		**450.00**	**10.62**	**0.66**	**88.73**
24	**BAGLIHAR II HPS**	1	150.00	0.30	0.41	99.29
		2	150.00	0.01	0.32	99.67
		3	150.00	0.00	0.00	100.00
	TOTAL		**450.00**	**0.10**	**0.24**	**99.65**
25	**LOWER JHELUM HPS**	1	35.00	0.00	0.00	100.00
		2	35.00	0.00	0.00	100.00
		3	35.00	0.00	0.00	100.00
	TOTAL		**105.00**	**0.00**	**0.00**	**100.00**
26	**UPPER SINDH-II HPS**	3	35.00	0.00	0.00	100.00
		4	35.00	0.00	0.00	100.00
		5	35.00	7.79	6.08	86.14
	TOTAL		**105.00**	**2.60**	**2.03**	**95.38**
	JPPVL					
27	**VISHNU PRAYAG HPS**	1	100.00	2.13	0.09	97.78
		2	100.00	1.97	0.12	97.91
		3	100.00	2.15	0.09	97.75
		4	100.00	1.79	0.12	98.09

S.No.	STATION / CORPORATION	UNIT No.	INSTALLED CAPAPCITY (MW)	PLANNED MAINTENANCE (P.M) (%)	FORCED OUTAGE (F.O) (%)	OPERATING AVAILABILITY (100-FO-PM)
	TOTAL		**400.00**	**2.01**	**0.11**	**97.89**
	L&T					
28	**SINGOLI BHATWARI HPS**	1	33.00	10.77	0.17	89.05
		2	33.00	0.03	0.09	99.88
		3	33.00	0.03	0.66	99.31
	TOTAL		**99.00**	**3.61**	**0.31**	**96.08**
	MPCL					
29	**MALANA HPS**	1	43.00	5.83	0.00	94.17
		2	43.00	6.26	0.00	93.74
	TOTAL		**86.00**	**6.05**	**0.00**	**93.95**
	NHPC					
30	**BAIRA SIUL HPS**	1	60.00	6.62	2.58	90.80
		2	60.00	5.40	0.10	94.50
		3	60.00	7.44	0.31	92.26
	TOTAL		**180.00**	**6.49**	**1.00**	**92.52**
31	**CHAMERA-I HPS**	1	180.00	4.68	0.05	95.26
		2	180.00	5.16	0.29	94.55
		3	180.00	5.56	0.08	94.36
	TOTAL		**540.00**	**5.13**	**0.14**	**94.72**

S.No.	STATION / CORPORATION	UNIT No.	INSTALLED CAPAPCITY (MW)	PLANNED MAINTENANCE (P.M) (%)	FORCED OUTAGE (F.O) (%)	OPERATING AVAILABILITY (100-FO-PM)
32	**CHAMERA-II HPS**	1	100.00	4.36	0.21	95.43
		2	100.00	5.09	0.31	94.60
		3	100.00	8.52	0.04	91.44
	TOTAL		**300.00**	**5.99**	**0.18**	**93.82**
33	**CHAMERA-III HPS**	1	77.00	10.26	0.46	89.27
		2	77.00	17.41	0.39	82.20
		3	77.00	12.02	0.40	87.57
	TOTAL		**231.00**	**13.23**	**0.42**	**86.35**
34	**CHUTAK HPS**	1	11.00	4.08	0.00	95.92
		2	11.00	3.28	0.03	96.69
		3	11.00	4.77	0.02	95.22
		4	11.00	3.84	0.00	96.16
	TOTAL		**44.00**	**3.99**	**0.01**	**95.99**
35	**DHAULI GANGA HPS**	1	70.00	8.20	0.12	91.67
		2	70.00	6.91	0.14	92.95
		3	70.00	8.04	0.66	91.30
		4	70.00	6.23	0.38	93.39
	TOTAL		**280.00**	**7.35**	**0.33**	**92.33**

S.No.	STATION / CORPORATION	UNIT No.	INSTALLED CAPAPCITY (MW)	PLANNED MAINTENANCE (P.M) (%)	FORCED OUTAGE (F.O) (%)	OPERATING AVAILABILITY (100-FO-PM)
36	**DULHASTI HPS**	1	130.00	9.09	0.34	90.57
		2	130.00	10.14	0.06	89.80
		3	130.00	8.94	1.37	89.68
	TOTAL		**390.00**	**9.39**	**0.59**	**90.02**
37	**KISHANGANGA HPS**	1	110.00	12.94	0.19	86.87
		2	110.00	16.82	0.17	83.01
		3	110.00	4.84	1.09	94.06
	TOTAL		**330.00**	**11.54**	**0.49**	**87.98**
38	**NIMMO BAZGO HPS**	1	15.00	6.75	0.00	93.25
		2	15.00	5.39	0.15	94.46
		3	15.00	7.20	0.00	92.80
	TOTAL		**45.00**	**6.45**	**0.05**	**93.50**
39	**PARBATI-III HPS**	1	130.00	2.83	5.36	91.81
		2	130.00	3.49	0.03	96.47
		3	130.00	0.13	0.02	99.85
		4	130.00	21.72	0.02	78.26
	TOTAL		**520.00**	**7.04**	**1.36**	**91.60**
40	**SALAL HPS**	1	115.00	2.61	0.34	97.06

S.No.	STATION / CORPORATION	UNIT No.	INSTALLED CAPAPCITY (MW)	PLANNED MAINTENANCE (P.M) (%)	FORCED OUTAGE (F.O) (%)	OPERATING AVAILABILITY (100-FO-PM)
		2	115.00	3.70	0.05	96.25
		3	115.00	13.73	0.15	86.12
		4	115.00	17.10	0.31	82.59
		5	115.00	4.51	0.71	94.78
		6	115.00	4.16	0.11	95.73
	TOTAL		**690.00**	**7.63**	**0.28**	**92.09**
41	**SEWA-II HPS**	1	40.00	5.36	0.64	94.01
		2	40.00	6.15	0.70	93.15
		3	40.00	3.91	0.64	95.46
	TOTAL		**120.00**	**5.14**	**0.66**	**94.21**
42	**TANAKPUR HPS**	1	31.40	12.17	0.13	87.70
		2	31.40	10.38	1.49	88.14
		3	31.40	0.00	0.15	99.85
	TOTAL		**94.20**	**7.52**	**0.59**	**91.90**
43	**URI-I HPS**	1	120.00	10.63	0.17	89.20
		2	120.00	9.82	0.03	90.14
		3	120.00	5.84	0.11	94.05
		4	120.00	5.55	0.66	93.80

S.No.	STATION / CORPORATION	UNIT No.	INSTALLED CAPAPCITY (MW)	PLANNED MAINTENANCE (P.M) (%)	FORCED OUTAGE (F.O) (%)	OPERATING AVAILABILITY (100-FO-PM)
	TOTAL		**480.00**	**7.96**	**0.24**	**91.80**
44	**URI-II HPS**	1	60.00	0.00	0.06	99.94
		2	60.00	3.62	0.02	96.36
		3	60.00	7.69	0.00	92.31
		4	60.00	4.37	0.02	95.61
	TOTAL		**240.00**	**3.92**	**0.02**	**96.06**
	NTPC Ltd.					
45	**KOLDAM**	1	200.00	0.00	0.71	99.29
		2	200.00	0.00	2.16	97.84
		3	200.00	0.00	0.67	99.33
		4	200.00	0.00	0.35	99.65
	TOTAL		**800.00**	**0.00**	**0.97**	**99.03**
	PSPCL					
46	**ANANDPUR SAHIB-I HPS**	1	33.50	0.00	0.00	100.00
		2	33.50	0.00	0.00	100.00
	TOTAL		**67.00**	**0.00**	**0.00**	**100.00**
47	**ANANDPUR SAHIB-II HPS**	3	33.50	0.00	0.00	100.00
		4	33.50	0.00	0.00	100.00
	TOTAL		**67.00**	**0.00**	**0.00**	**100.00**

S.No.	STATION / CORPORATION	UNIT No.	INSTALLED CAPAPCITY (MW)	PLANNED MAINTENANCE (P.M) (%)	FORCED OUTAGE (F.O) (%)	OPERATING AVAILABILITY (100-FO-PM)
48	**MUKERIAN-I HPS**	1	15.00	0.00	0.00	100.00
		2	15.00	0.00	0.00	100.00
		3	15.00	0.00	0.00	100.00
	TOTAL		**45.00**	**0.00**	**0.00**	**100.00**
49	**MUKERIAN-II HPS**	4	15.00	0.00	0.00	100.00
		5	15.00	0.00	0.00	100.00
		6	15.00	0.00	0.00	100.00
	TOTAL		**45.00**	**0.00**	**0.00**	**100.00**
50	**MUKERIAN-III HPS**	7	19.50	0.00	0.02	99.98
		8	19.50	0.00	0.02	99.98
		9	19.50	0.00	0.07	99.93
	TOTAL		**58.50**	**0.00**	**0.03**	**99.97**
51	**MUKERIAN-IV HPS**	10	19.50	0.00	0.01	99.99
		11	19.50	0.00	0.01	99.99
		12	19.50	0.00	0.07	99.93
	TOTAL		**58.50**	**0.00**	**0.03**	**99.97**
52	**RANJIT SAGAR HPS**	1	150.00	18.38	0.48	81.14
		2	150.00	10.70	3.34	85.95

S.No.	STATION / CORPORATION	UNIT No.	INSTALLED CAPAPCITY (MW)	PLANNED MAINTENANCE (P.M) (%)	FORCED OUTAGE (F.O) (%)	OPERATING AVAILABILITY (100-FO-PM)
		3	150.00	17.29	0.00	82.71
		4	150.00	13.59	0.00	86.41
	TOTAL		**600.00**	**14.99**	**0.96**	**84.05**
53	**SHANAN HPS**	1	15.00	0.00	0.00	100.00
		2	15.00	8.44	0.00	91.56
		3	15.00	34.27	0.00	65.73
		4	15.00	18.31	0.00	81.69
		5	50.00	0.00	0.00	100.00
	TOTAL		**110.00**	**12.20**	**0.00**	**87.80**
	RRVUNL					
54	**JAWAHAR SAGAR HPS**	1	33.00	0.00	0.00	100.00
		2	33.00	0.00	0.00	100.00
		3	33.00	0.00	0.00	100.00
	TOTAL		**99.00**	**0.00**	**0.00**	**100.00**
55	**MAHI BAJAJ-I HPS**	1	25.00	0.00	0.40	99.60
		2	25.00	0.00	0.18	99.82
	TOTAL		**50.00**	**0.00**	**0.29**	**99.71**
56	**MAHI BAJAJ-II HPS**	3	45.00	25.87	0.44	73.69
		4	45.00	17.69	1.33	80.99

S.No.	STATION / CORPORATION	UNIT No.	INSTALLED CAPAPCITY (MW)	PLANNED MAINTENANCE (P.M) (%)	FORCED OUTAGE (F.O) (%)	OPERATING AVAILABILITY (100-FO-PM)
	TOTAL		**90.00**	**21.78**	**0.88**	**77.34**
57	**R P SAGAR HPS**	1	43.00	6.40	0.00	93.60
		2	43.00	0.00	100.00	0.00
		3	43.00	5.83	0.00	94.17
		4	43.00	5.30	0.00	94.70
	TOTAL		**172.00**	**4.38**	**25.00**	**70.62**
	SJVNL					
58	**NAITWAR MORI HPS**	1	30.00	0.00	0.00	100.00
		2	30.00	0.00	0.00	100.00
	TOTAL		**60.00**	**0.00**	**0.00**	**100.00**
59	**NATHPA JHAKRI HPS**	1	250.00	2.97	0.42	96.61
		2	250.00	0.46	0.12	99.42
		3	250.00	0.00	0.01	99.99
		4	250.00	0.82	0.01	99.17
		5	250.00	2.05	0.00	97.95
		6	250.00	3.08	0.02	96.91
	TOTAL		**1500.00**	**1.56**	**0.10**	**98.34**
60	**RAMPUR HPS**	1	68.67	2.78	0.09	97.13
		2	68.67	2.59	0.01	97.40

S.No.	STATION / CORPORATION	UNIT No.	INSTALLED CAPAPCITY (MW)	PLANNED MAINTENANCE (P.M) (%)	FORCED OUTAGE (F.O) (%)	OPERATING AVAILABILITY (100-FO-PM)
		3	68.67	2.49	0.03	97.48
		4	68.67	2.62	0.00	97.38
		5	68.67	2.45	0.04	97.50
		6	68.67	2.11	0.08	97.81
	TOTAL		**412.02**	**2.51**	**0.04**	**97.45**
	THDC					
61	**KOTESHWAR HPS**	1	100.00	0.00	0.00	100.00
		2	100.00	6.12	0.00	93.88
		3	100.00	5.83	0.00	94.17
		4	100.00	5.56	0.00	94.44
	TOTAL		**400.00**	**4.38**	**0.00**	**95.62**
62	**TEHRI ST-1 HPS**	1	250.00	0.00	0.02	99.98
		2	250.00	4.59	0.07	95.33
		3	250.00	4.62	0.03	95.35
		4	250.00	30.88	0.00	69.12
	TOTAL		**1000.00**	**10.02**	**0.03**	**89.94**
	UJVNL					
63	**CHIBRO (YAMUNA) HPS**	1	60.00	0.00	0.00	100.00
		2	60.00	0.00	0.00	100.00

S.No.	STATION / CORPORATION	UNIT No.	INSTALLED CAPAPCITY (MW)	PLANNED MAINTENANCE (P.M) (%)	FORCED OUTAGE (F.O) (%)	OPERATING AVAILABILITY (100-FO-PM)
		3	60.00	0.00	0.00	100.00
		4	60.00	0.00	0.00	100.00
	TOTAL		**240.00**	**0.00**	**0.00**	**100.00**
64	**CHILLA HPS**	1	36.00	10.34	1.12	88.53
		2	36.00	8.33	0.06	91.61
		3	36.00	0.00	1.51	98.49
		4	36.00	0.00	0.26	99.74
	TOTAL		**144.00**	**4.67**	**0.74**	**94.59**
65	**DHAKRANI HPS**	1	11.25	0.00	0.00	100.00
		2	11.25	9.10	0.15	90.75
		3	11.25	6.25	3.49	90.26
	TOTAL		**33.75**	**5.11**	**1.22**	**93.67**
66	**DHALIPUR HPS**	1	17.00	17.16	0.80	82.03
		2	17.00	0.00	0.61	99.39
		3	17.00	52.19	0.10	47.71
	TOTAL		**51.00**	**23.12**	**0.50**	**76.38**
67	**KHATIMA HPS**	1	13.80	0.00	0.00	100.00
		2	13.80	0.00	0.00	100.00

S.No.	STATION / CORPORATION	UNIT No.	INSTALLED CAPAPCITY (MW)	PLANNED MAINTENANCE (P.M) (%)	FORCED OUTAGE (F.O) (%)	OPERATING AVAILABILITY (100-FO-PM)
		3	13.80	0.00	0.00	100.00
	TOTAL		**41.40**	**0.00**	**0.00**	**100.00**
68	**KHODRI HPS**	1	30.00	9.39	0.00	90.61
		2	30.00	1.44	0.00	98.56
		3	30.00	2.32	0.00	97.68
		4	30.00	10.47	0.00	89.53
	TOTAL		**120.00**	**5.91**	**0.00**	**94.09**
69	**KULHAL HPS**	1	10.00	0.00	0.00	100.00
		2	10.00	0.00	0.00	100.00
		3	10.00	0.00	0.00	100.00
	TOTAL		**30.00**	**0.00**	**0.00**	**100.00**
70	**MANERI BHALI-I HPS**	1	30.00	2.42	0.50	97.08
		2	30.00	2.06	0.13	97.81
		3	30.00	1.11	0.59	98.31
	TOTAL		**90.00**	**1.86**	**0.41**	**97.73**
71	**MANERI BHALI-II HPS**	1	76.00	0.00	0.00	100.00
		2	76.00	0.00	0.00	100.00
		3	76.00	0.00	0.00	100.00

S.No.	STATION / CORPORATION	UNIT No.	INSTALLED CAPAPCITY (MW)	PLANNED MAINTENANCE (P.M) (%)	FORCED OUTAGE (F.O) (%)	OPERATING AVAILABILITY (100-FO-PM)
		4	76.00	0.00	0.00	100.00
	TOTAL		**304.00**	**0.00**	**0.00**	**100.00**
72	**RAMGANGA HPS**	1	66.00	54.68	1.02	44.30
		2	66.00	0.00	0.00	100.00
		3	66.00	0.00	3.79	96.21
	TOTAL		**198.00**	**18.23**	**1.60**	**80.17**
73	**VYASI HPS**	1	60.00	0.00	0.00	100.00
		2	60.00	0.00	0.00	100.00
	TOTAL		**120.00**	**0.00**	**0.00**	**100.00**
	UPJVNL					
74	**KHARA HPS**	1	24.00	0.00	0.00	100.00
		2	24.00	7.35	0.00	92.65
		3	24.00	0.00	8.24	91.76
	TOTAL		**72.00**	**2.45**	**2.75**	**94.80**
75	**MATATILA HPS**	1	10.20	0.00	0.00	100.00
		2	10.20	0.00	0.00	100.00
		3	10.20	0.00	0.00	100.00
	TOTAL		**30.60**	**0.00**	**0.00**	**100.00**
76	**OBRA HPS**	1	33.00	0.00	0.00	100.00

S.No.	STATION / CORPORATION	UNIT No.	INSTALLED CAPAPCITY (MW)	PLANNED MAINTENANCE (P.M) (%)	FORCED OUTAGE (F.O) (%)	OPERATING AVAILABILITY (100-FO-PM)
		2	33.00	21.19	1.63	77.18
		3	33.00	8.94	2.72	88.34
	TOTAL		**99.00**	**10.04**	**1.45**	**88.51**
77	**RİHAND HPS**	1	50.00	13.28	0.26	86.45
		2	50.00	3.48	0.43	96.08
		3	50.00	0.00	3.57	96.43
		4	50.00	4.92	0.05	95.03
		5	50.00	11.17	0.27	88.55
		6	50.00	10.45	8.23	81.32
	TOTAL		**300.00**	**7.22**	**2.14**	**90.65**
	Western					
	CSPGCL					
78	**HASDEOBANGO HPS**	1	40.00	0.00	0.00	100.00
		2	40.00	0.00	0.00	100.00
		3	40.00	0.00	0.00	100.00
	TOTAL		**120.00**	**0.00**	**0.00**	**100.00**
	DLHP					
79	**BHANDARDHARA HPS ST-II**	2	34.00	0.00	0.00	100.00
	TOTAL		**34.00**	**0.00**	**0.00**	**100.00**

S.No.	STATION / CORPORATION	UNIT No.	INSTALLED CAPAPCITY (MW)	PLANNED MAINTENANCE (P.M) (%)	FORCED OUTAGE (F.O) (%)	OPERATING AVAILABILITY (100-FO-PM)
	GSECL					
80	**KADANA HPS**	1	60.00	0.00	0.00	100.00
		2	60.00	0.00	0.00	100.00
		3	60.00	0.00	0.00	100.00
		4	60.00	0.00	0.00	100.00
	TOTAL		**240.00**	**0.00**	**0.00**	**100.00**
81	**UKAI HPS**	1	75.00	0.00	0.00	100.00
		2	75.00	0.00	0.00	100.00
		3	75.00	0.00	0.00	100.00
		4	75.00	0.00	0.07	99.93
	TOTAL		**300.00**	**0.00**	**0.02**	**99.98**
	MAHAGENCO					
82	**BHIRA TAIL RACE HPS**	1	40.00	0.00	0.00	100.00
		2	40.00	0.00	0.00	100.00
	TOTAL		**80.00**	**0.00**	**0.00**	**100.00**
83	**GHATGHAR PSS HPS**	1	125.00	0.27	4.68	95.04
		2	125.00	0.00	17.79	82.21
	TOTAL		**250.00**	**0.14**	**11.24**	**88.63**
84	**KOYNA DPH HPS**	1	18.00	0.00	0.00	100.00

S.No.	STATION / CORPORATION	UNIT No.	INSTALLED CAPAPCITY (MW)	PLANNED MAINTENANCE (P.M) (%)	FORCED OUTAGE (F.O) (%)	OPERATING AVAILABILITY (100-FO-PM)
		2	18.00	0.00	0.00	100.00
	TOTAL		**36.00**	**0.00**	**0.00**	**100.00**
85	**KOYNA-I&II HPS**	1	70.00	3.28	0.00	96.72
		2	70.00	1.63	43.72	54.64
		3	70.00	1.91	0.00	98.09
		4	70.00	3.17	0.00	96.83
		5	80.00	0.00	0.00	100.00
		6	80.00	0.00	0.00	100.00
		7	80.00	0.24	10.51	89.26
		8	80.00	19.71	0.00	80.29
	TOTAL		**600.00**	**3.74**	**6.78**	**89.48**
86	**KOYNA-III HPS**	1	80.00	0.00	0.00	100.00
		2	80.00	0.00	0.00	100.00
		3	80.00	0.00	0.00	100.00
		4	80.00	0.00	0.00	100.00
	TOTAL		**320.00**	**0.00**	**0.00**	**100.00**
87	**KOYNA-IV HPS**	1	250.00	0.00	0.00	100.00
		2	250.00	0.00	0.00	100.00

S.No.	STATION / CORPORATION	UNIT No.	INSTALLED CAPAPCITY (MW)	PLANNED MAINTENANCE (P.M) (%)	FORCED OUTAGE (F.O) (%)	OPERATING AVAILABILITY (100-FO-PM)
		3	250.00	0.00	0.00	100.00
		4	250.00	0.00	0.00	100.00
	TOTAL		**1000.00**	**0.00**	**0.00**	**100.00**
88	**TILLARI HPS**	1	60.00	0.00	3.20	96.80
	TOTAL		**60.00**	**0.00**	**3.20**	**96.80**
89	**VAITARNA HPS**	1	60.00	5.96	0.34	93.69
	TOTAL		**60.00**	**5.96**	**0.34**	**93.69**
	MPPGCL					
90	**BANSAGAR-II HPS**	1	15.00	0.00	0.00	100.00
		2	15.00	21.03	0.00	78.97
	TOTAL		**30.00**	**10.51**	**0.00**	**89.49**
91	**BANSAGAR-III HPS**	1	20.00	0.00	0.00	100.00
		2	20.00	0.00	0.00	100.00
		3	20.00	0.00	0.00	100.00
	TOTAL		**60.00**	**0.00**	**0.00**	**100.00**
92	**BANSAGAR TONS-I HPS**	1	105.00	34.13	0.00	65.87
		2	105.00	21.50	0.00	78.50
		3	105.00	0.07	2.24	97.70
	TOTAL		**315.00**	**18.56**	**0.75**	**80.69**

S.No.	STATION / CORPORATION	UNIT No.	INSTALLED CAPAPCITY (MW)	PLANNED MAINTENANCE (P.M) (%)	FORCED OUTAGE (F.O) (%)	OPERATING AVAILABILITY (100-FO-PM)
93	**BARGI HPS**	1	45.00	6.27	0.00	93.73
		2	45.00	0.00	0.00	100.00
	TOTAL		**90.00**	**3.14**	**0.00**	**96.86**
94	**GANDHI SAGAR HPS**	1	23.00	0.00	5.34	94.66
		2	23.00	0.00	0.00	100.00
		3	23.00	0.00	100.00	0.00
		4	23.00	0.00	0.00	100.00
		5	23.00	0.00	0.31	99.69
	TOTAL		**115.00**	**0.00**	**21.13**	**78.87**
95	**MADHIKHERA HPS**	1	20.00	0.00	0.00	100.00
		2	20.00	0.00	0.00	100.00
		3	20.00	0.00	0.00	100.00
	TOTAL		**60.00**	**0.00**	**0.00**	**100.00**
96	**PENCH HPS**	1	80.00	13.91	0.00	86.09
		2	80.00	5.84	0.00	94.16
	TOTAL		**160.00**	**9.88**	**0.00**	**90.12**
97	**RAJGHAT HPS**	1	15.00	0.00	0.03	99.97
		2	15.00	0.00	0.00	100.00

S.No.	STATION / CORPORATION	UNIT No.	INSTALLED CAPAPCITY (MW)	PLANNED MAINTENANCE (P.M) (%)	FORCED OUTAGE (F.O) (%)	OPERATING AVAILABILITY (100-FO-PM)
		3	15.00	0.00	0.00	100.00
	TOTAL		**45.00**	**0.00**	**0.01**	**99.99**
	NHDC					
98	**INDIRA SAGAR HPS**	1	125.00	4.70	0.00	95.30
		2	125.00	3.11	0.00	96.89
		3	125.00	3.42	0.00	96.58
		4	125.00	6.99	0.00	93.01
		5	125.00	3.44	0.00	96.56
		6	125.00	3.44	0.00	96.56
		7	125.00	2.62	0.55	96.83
		8	125.00	6.63	0.00	93.37
	TOTAL		**1000.00**	**4.29**	**0.07**	**95.64**
99	**OMKARESHWAR HPS**	1	65.00	3.22	0.03	96.75
		2	65.00	3.92	0.00	96.08
		3	65.00	3.39	0.00	96.61
		4	65.00	3.32	0.00	96.68
		5	65.00	3.10	0.00	96.90
		6	65.00	4.03	0.00	95.97

S.No.	STATION / CORPORATION	UNIT No.	INSTALLED CAPAPCITY (MW)	PLANNED MAINTENANCE (P.M) (%)	FORCED OUTAGE (F.O) (%)	OPERATING AVAILABILITY (100-FO-PM)
		7	65.00	3.91	0.00	96.09
		8	65.00	4.42	0.00	95.58
	TOTAL		**520.00**	**3.66**	**0.00**	**96.33**
	SSNNL					
100	**S SAROVAR CHPH HPS**	1	50.00	0.00	0.00	100.00
		2	50.00	52.84	0.00	47.16
		3	50.00	0.00	0.00	100.00
		4	50.00	0.00	0.00	100.00
		5	50.00	0.00	0.00	100.00
	TOTAL		**250.00**	**10.57**	**0.00**	**89.43**
101	**S SAROVAR RBPH HPS**	1	200.00	0.00	0.00	100.00
		2	200.00	0.00	0.00	100.00
		3	200.00	0.00	0.00	100.00
		4	200.00	0.00	0.02	99.98
		5	200.00	0.00	0.00	100.00
		6	200.00	0.00	0.08	99.92
	TOTAL		**1200.00**	**0.00**	**0.02**	**99.98**
	TATA MAH.					
102	**BHIRA HPS**	1	25.00	0.00	0.00	100.00

S.No.	STATION / CORPORATION	UNIT No.	INSTALLED CAPAPCITY (MW)	PLANNED MAINTENANCE (P.M) (%)	FORCED OUTAGE (F.O) (%)	OPERATING AVAILABILITY (100-FO-PM)
		2	25.00	0.00	0.00	100.00
		3	25.00	0.00	0.00	100.00
		4	25.00	100.00	0.00	0.00
		5	25.00	0.00	0.00	100.00
		6	25.00	0.00	0.00	100.00
	TOTAL		**150.00**	**16.67**	**0.00**	**83.33**
103	**BHIRA PSS HPS**	1	150.00	0.00	0.00	100.00
	TOTAL		**150.00**	**0.00**	**0.00**	**100.00**
104	**BHIVPURI HPS**	1	24.00	0.00	0.00	100.00
		2	24.00	0.00	0.00	100.00
		3	24.00	0.00	0.00	100.00
		4	1.50	0.00	0.00	100.00
		5	1.50	0.00	0.00	100.00
	TOTAL		**75.00**	**0.00**	**0.00**	**100.00**
105	**KHOPOLI HPS**	1	24.00	10.56	0.00	89.44
		2	24.00	100.00	0.00	0.00
		3	24.00	0.00	0.00	100.00
	TOTAL		**72.00**	**36.85**	**0.00**	**63.15**

S.No.	STATION / CORPORATION	UNIT No.	INSTALLED CAPAPCITY (MW)	PLANNED MAINTENANCE (P.M) (%)	FORCED OUTAGE (F.O) (%)	OPERATING AVAILABILITY (100-FO-PM)
	Southern					
	APGENCO					
106	**HAMPI HPS**	1	9.00	0.00	0.00	100.00
		2	9.00	0.00	0.00	100.00
		3	9.00	0.00	0.00	100.00
		4	9.00	0.00	0.00	100.00
	TOTAL		**36.00**	**0.00**	**0.00**	**100.00**
107	**LOWER SILERU HPS**	1	115.00	0.00	0.00	100.00
		2	115.00	0.00	0.00	100.00
		3	115.00	0.00	0.00	100.00
		4	115.00	0.00	7.83	92.17
	TOTAL		**460.00**	**0.00**	**1.96**	**98.04**
108	**NAGARJUN SGR RBC HPS**	1	30.00	0.00	0.00	100.00
		2	30.00	0.00	0.00	100.00
		3	30.00	0.00	0.00	100.00
	TOTAL		**90.00**	**0.00**	**0.00**	**100.00**
109	**NAGARJUN SGR TPD**	1	25.00	0.00	0.00	100.00
		2	25.00	0.00	0.00	100.00
	TOTAL		**50.00**	**0.00**	**0.00**	**100.00**

S.No.	STATION / CORPORATION	UNIT No.	INSTALLED CAPAPCITY (MW)	PLANNED MAINTENANCE (P.M) (%)	FORCED OUTAGE (F.O) (%)	OPERATING AVAILABILITY (100-FO-PM)
110	**SRISAILAM HPS**	1	110.00	0.00	0.00	100.00
		2	110.00	0.00	0.00	100.00
		3	110.00	0.00	0.00	100.00
		4	110.00	0.00	0.00	100.00
		5	110.00	0.00	0.00	100.00
		6	110.00	0.00	0.00	100.00
		7	110.00	0.00	0.00	100.00
	TOTAL		**770.00**	**0.00**	**0.00**	**100.00**
111	**T B DAM HPS**	1	9.00	0.00	0.00	100.00
		2	9.00	35.95	0.03	64.02
		3	9.00	30.82	0.04	69.14
		4	9.00	0.00	43.32	56.68
	TOTAL		**36.00**	**16.69**	**10.85**	**72.46**
112	**UPPER SILERU HPS**	1	60.00	0.00	0.00	100.00
		2	60.00	0.00	0.00	100.00
		3	60.00	0.00	0.00	100.00
		4	60.00	0.00	0.00	100.00
	TOTAL		**240.00**	**0.00**	**0.00**	**100.00**

S.No.	STATION / CORPORATION	UNIT No.	INSTALLED CAPAPCITY (MW)	PLANNED MAINTENANCE (P.M) (%)	FORCED OUTAGE (F.O) (%)	OPERATING AVAILABILITY (100-FO-PM)
	KPCL					
113	**ALMATTI DPH HPS**	1	15.00	0.00	0.00	100.00
		2	55.00	0.00	0.00	100.00
		3	55.00	0.00	0.00	100.00
		4	55.00	0.00	0.00	100.00
		5	55.00	0.00	0.00	100.00
		6	55.00	0.00	0.00	100.00
	TOTAL		**290.00**	**0.00**	**0.00**	**100.00**
114	**BHADRA HPS**	1	2.00	0.00	0.00	100.00
		2	12.00	0.00	0.00	100.00
		3	12.00	0.00	0.00	100.00
	TOTAL		**26.00**	**0.00**	**0.00**	**100.00**
115	**GERUSUPPA HPS**	1	60.00	4.86	15.66	79.48
		2	60.00	4.14	0.00	95.86
		3	60.00	0.42	0.00	99.58
		4	60.00	3.32	0.07	96.62
	TOTAL		**240.00**	**3.18**	**3.93**	**92.89**
116	**GHAT PRABHA HPS**	1	16.00	15.28	0.00	84.72

S.No.	STATION / CORPORATION	UNIT No.	INSTALLED CAPAPCITY (MW)	PLANNED MAINTENANCE (P.M) (%)	FORCED OUTAGE (F.O) (%)	OPERATING AVAILABILITY (100-FO-PM)
		2	16.00	14.15	0.00	85.85
	TOTAL		**32.00**	**14.71**	**0.00**	**85.29**
117	**JOG HPS**	1	13.20	3.09	0.63	96.28
		2	13.20	1.31	17.64	81.05
		3	13.20	1.31	0.83	97.85
		4	13.20	6.75	0.61	92.64
		5	21.60	0.40	0.00	99.60
		6	21.60	0.00	29.64	70.36
		7	21.60	1.71	4.98	93.31
		8	21.60	1.26	0.00	98.74
	TOTAL		**139.20**	**1.98**	**6.79**	**91.23**
118	**KADRA HPS**	1	50.00	4.88	0.00	95.12
		2	50.00	5.82	0.00	94.18
		3	50.00	4.43	0.00	95.57
	TOTAL		**150.00**	**5.04**	**0.00**	**94.96**
119	**KALINADI HPS**	1	150.00	7.64	0.15	92.21
		2	150.00	6.62	1.37	92.00
		3	150.00	0.00	0.00	100.00

S.No.	STATION / CORPORATION	UNIT No.	INSTALLED CAPAPCITY (MW)	PLANNED MAINTENANCE (P.M) (%)	FORCED OUTAGE (F.O) (%)	OPERATING AVAILABILITY (100-FO-PM)
		4	150.00	0.65	0.00	99.35
		5	150.00	0.00	0.05	99.95
		6	150.00	0.00	0.00	100.00
	TOTAL		**900.00**	**2.49**	**0.26**	**97.25**
120	**KALINADI SUPA HPS**	1	50.00	0.09	0.01	99.90
		2	50.00	0.09	0.00	99.91
	TOTAL		**100.00**	**0.09**	**0.00**	**99.90**
121	**KODASALI HPS**	1	40.00	8.77	1.14	90.09
		2	40.00	3.87	0.00	96.13
		3	40.00	2.75	0.00	97.25
	TOTAL		**120.00**	**5.13**	**0.38**	**94.49**
122	**LIGANAMAKKI HPS**	1	27.50	0.00	0.00	100.00
		2	27.50	0.00	1.56	98.44
	TOTAL		**55.00**	**0.00**	**0.78**	**99.22**
123	**MUNIRABAD HPS**	1	9.00	0.00	0.00	100.00
		2	9.00	0.00	0.00	100.00
		3	10.00	0.00	0.00	100.00
	TOTAL		**28.00**	**0.00**	**0.00**	**100.00**

S.No.	STATION / CORPORATION	UNIT No.	INSTALLED CAPAPCITY (MW)	PLANNED MAINTENANCE (P.M) (%)	FORCED OUTAGE (F.O) (%)	OPERATING AVAILABILITY (100-FO-PM)
124	**SHARAVATHI HPS**	1	103.50	1.97	0.08	97.94
		2	103.50	1.66	0.31	98.03
		3	103.50	8.94	0.26	90.80
		4	103.50	1.40	0.00	98.60
		5	103.50	0.74	0.07	99.18
		6	103.50	0.10	0.54	99.37
		7	103.50	0.29	22.91	76.80
		8	103.50	1.15	0.04	98.81
		9	103.50	3.18	0.23	96.59
		10	103.50	3.28	0.02	96.70
	TOTAL		**1035.00**	**2.27**	**2.45**	**95.28**
125	**SIVASAMUNDRUM HPS**	1	3.00	0.00	0.00	100.00
		2	3.00	0.00	0.00	100.00
		3	3.00	0.00	0.00	100.00
		4	3.00	0.00	0.00	100.00
		5	3.00	0.00	0.00	100.00
		6	3.00	0.00	0.00	100.00
		7	6.00	0.00	0.00	100.00

S.No.	STATION / CORPORATION	UNIT No.	INSTALLED CAPAPCITY (MW)	PLANNED MAINTENANCE (P.M) (%)	FORCED OUTAGE (F.O) (%)	OPERATING AVAILABILITY (100-FO-PM)
		8	6.00	0.00	0.00	100.00
		9	6.00	0.00	0.00	100.00
		10	6.00	0.00	0.00	100.00
	TOTAL		**42.00**	**0.00**	**0.00**	**100.00**
126	**VARAHI HPS**	1	115.00	0.55	0.19	99.25
		2	115.00	0.00	0.04	99.96
		3	115.00	3.08	0.02	96.90
		4	115.00	5.83	0.01	94.16
	TOTAL		**460.00**	**2.37**	**0.07**	**97.57**
	KSEB					
127	**IDAMALAYAR HPS**	1	37.50	10.09	0.29	89.61
		2	37.50	10.52	0.04	89.44
	TOTAL		**75.00**	**10.31**	**0.17**	**89.53**
128	**IDUKKI HPS**	1	130.00	9.25	0.00	90.75
		2	130.00	8.08	0.00	91.92
		3	130.00	10.75	3.07	86.18
		4	130.00	10.76	0.00	89.24
		5	130.00	7.41	0.00	92.59

S.No.	STATION / CORPORATION	UNIT No.	INSTALLED CAPAPCITY (MW)	PLANNED MAINTENANCE (P.M) (%)	FORCED OUTAGE (F.O) (%)	OPERATING AVAILABILITY (100-FO-PM)
		6	130.00	27.47	0.01	72.52
	TOTAL		**780.00**	**12.29**	**0.51**	**87.20**
129	**KAKKAD HPS**	1	25.00	7.06	0.00	92.94
		2	25.00	7.83	0.00	92.17
	TOTAL		**50.00**	**7.45**	**0.00**	**92.55**
130	**KUTTIYADI ADDL EXTN**	1	50.00	29.42	0.07	70.51
		2	50.00	6.56	0.20	93.24
	TOTAL		**100.00**	**17.99**	**0.13**	**81.88**
131	**KUTTIYADI EXTN HPS**	4	50.00	6.11	2.23	91.66
	TOTAL		**50.00**	**6.11**	**2.23**	**91.66**
132	**KUTTIYADI HPS**	1	25.00	13.63	0.53	85.84
		2	25.00	16.09	0.94	82.97
		3	25.00	0.89	0.12	98.99
	TOTAL		**75.00**	**10.20**	**0.53**	**89.27**
133	**LOWER PERIYAR HPS**	1	60.00	4.07	0.00	95.93
		2	60.00	2.76	0.00	97.24
		3	60.00	2.27	0.00	97.73
	TOTAL		**180.00**	**3.03**	**0.00**	**96.97**
134	**NARIAMANGLAM HPS**	1	17.55	3.51	1.96	94.53

S.No.	STATION / CORPORATION	UNIT No.	INSTALLED CAPAPCITY (MW)	PLANNED MAINTENANCE (P.M) (%)	FORCED OUTAGE (F.O) (%)	OPERATING AVAILABILITY (100-FO-PM)
		2	17.55	12.31	16.42	71.27
		3	17.55	1.38	1.23	97.39
	TOTAL		**52.65**	**5.73**	**6.54**	**87.73**
135	**PALLIVASAL HPS**	1	5.00	0.00	0.00	100.00
		2	5.00	0.00	0.00	100.00
		3	5.00	10.01	0.03	89.96
		4	7.50	8.91	1.35	89.74
		5	7.50	8.45	0.00	91.55
		6	7.50	9.57	0.04	90.39
	TOTAL		**37.50**	**6.16**	**0.24**	**93.61**
136	**PANNIAR HPS**	1	15.00	11.57	0.00	88.43
		2	15.00	10.12	0.00	89.88
	TOTAL		**30.00**	**10.85**	**0.00**	**89.15**
137	**PORINGALKUTTU HPS**	1	8.00	20.53	0.00	79.47
		2	8.00	19.86	0.02	80.12
		3	8.00	34.31	0.00	65.69
		4	8.00	36.50	0.31	63.19
	TOTAL		**32.00**	**27.80**	**0.08**	**72.12**

S.No.	STATION / CORPORATION	UNIT No.	INSTALLED CAPAPCITY (MW)	PLANNED MAINTENANCE (P.M) (%)	FORCED OUTAGE (F.O) (%)	OPERATING AVAILABILITY (100-FO-PM)
138	**SABARIGIRI HPS**	1	50.00	9.50	0.32	90.18
		2	50.00	6.91	0.18	92.91
		3	50.00	0.48	0.86	98.66
		4	50.00	14.92	4.87	80.20
		5	50.00	1.95	1.11	96.94
		6	50.00	6.38	0.77	92.85
	TOTAL		**300.00**	**6.69**	**1.35**	**91.96**
139	**SENGULAM HPS**	1	12.00	7.80	0.00	92.20
		2	12.00	0.00	0.00	100.00
		3	12.00	4.75	0.00	95.25
		4	12.00	0.00	0.00	100.00
	TOTAL		**48.00**	**3.14**	**0.00**	**96.86**
140	**SHOLAYAR HPS**	1	18.00	1.79	12.59	85.62
		2	18.00	62.39	0.67	36.94
		3	18.00	3.95	22.10	73.96
	TOTAL		**54.00**	**22.71**	**11.78**	**65.51**
	TANGEDCO					
141	**ALIYAR HPS**	1	60.00	11.67	2.58	85.76
	TOTAL		**60.00**	**11.67**	**2.58**	**85.76**

S.No.	STATION / CORPORATION	UNIT No.	INSTALLED CAPAPCITY (MW)	PLANNED MAINTENANCE (P.M) (%)	FORCED OUTAGE (F.O) (%)	OPERATING AVAILABILITY (100-FO-PM)
142	**BHAWANI BARRAGE-II HPS**	1	15.00	0.82	0.00	99.18
		2	15.00	0.00	0.00	100.00
	TOTAL		**30.00**	**0.41**	**0.00**	**99.59**
143	**BHAWANI BARRAGE-III HPS**	1	15.00	0.03	0.04	99.93
		2	15.00	0.03	0.05	99.92
	TOTAL		**30.00**	**0.03**	**0.05**	**99.92**
144	**BHAWANI KATTAL**	1	15.00	1.43	1.98	96.59
		2	15.00	4.21	0.91	94.88
	TOTAL		**30.00**	**2.82**	**1.44**	**95.74**
145	**KADAMPARI HPS**	1	100.00	0.00	100.00	0.00
		2	100.00	0.00	0.00	100.00
		3	100.00	0.00	0.00	100.00
		4	100.00	0.00	74.61	25.39
	TOTAL		**400.00**	**0.00**	**43.65**	**56.35**
146	**KODAYAR-I HPS**	1	60.00	3.35	35.23	61.42
	TOTAL		**60.00**	**3.35**	**35.23**	**61.42**
147	**KODAYAR-II HPS**	2	40.00	0.00	0.35	99.65
	TOTAL		**40.00**	**0.00**	**0.35**	**99.65**
148	**KUNDAH-I HPS**	1	20.00	0.00	0.00	100.00

S.No.	STATION / CORPORATION	UNIT No.	INSTALLED CAPAPCITY (MW)	PLANNED MAINTENANCE (P.M) (%)	FORCED OUTAGE (F.O) (%)	OPERATING AVAILABILITY (100-FO-PM)
		2	20.00	0.00	0.00	100.00
		3	20.00	0.00	43.26	56.74
	TOTAL		**60.00**	**0.00**	**14.42**	**85.58**
149	**KUNDAH-II HPS**	4	35.00	0.22	1.57	98.22
		5	35.00	5.09	1.63	93.28
		6	35.00	8.25	0.54	91.21
		7	35.00	8.77	1.96	89.26
		8	35.00	9.17	2.11	88.72
	TOTAL		**175.00**	**6.30**	**1.56**	**92.14**
150	**KUNDAH-III HPS**	9	60.00	4.04	0.00	95.96
		10	60.00	36.19	0.00	63.81
		11	60.00	8.21	0.00	91.79
	TOTAL		**180.00**	**16.15**	**0.00**	**83.85**
151	**KUNDAH-IV HPS**	12	50.00	0.15	0.00	99.85
		13	50.00	0.14	0.41	99.45
	TOTAL		**100.00**	**0.15**	**0.20**	**99.65**
152	**KUNDAH-V HPS**	14	20.00	0.80	4.99	94.20
		15	20.00	11.34	0.50	88.16

S.No.	STATION / CORPORATION	UNIT No.	INSTALLED CAPAPCITY (MW)	PLANNED MAINTENANCE (P.M) (%)	FORCED OUTAGE (F.O) (%)	OPERATING AVAILABILITY (100-FO-PM)
	TOTAL		**40.00**	**6.07**	**2.75**	**91.18**
153	**LOWER METTUR-I HPS**	1	15.00	5.74	0.00	94.26
		2	15.00	5.74	0.00	94.26
	TOTAL		**30.00**	**5.74**	**0.00**	**94.26**
154	**LOWER METTUR-II HPS**	3	15.00	2.39	0.01	97.61
		4	15.00	7.87	0.13	92.01
	TOTAL		**30.00**	**5.13**	**0.07**	**94.81**
155	**LOWER METTUR-III HPS**	5	15.00	5.24	0.00	94.76
		6	15.00	9.01	0.00	90.99
	TOTAL		**30.00**	**7.13**	**0.00**	**92.87**
156	**LOWER METTUR-IV HPS**	7	15.00	6.27	0.00	93.73
		8	15.00	3.82	0.01	96.17
	TOTAL		**30.00**	**5.05**	**0.01**	**94.95**
157	**METTUR DAM HPS**	1	12.50	0.00	0.00	100.00
		2	12.50	0.00	0.00	100.00
		3	12.50	0.00	0.00	100.00
		4	12.50	0.00	0.00	100.00
	TOTAL		**50.00**	**0.00**	**0.00**	**100.00**
158	**METTUR TUNNEL HPS**	1	50.00	20.54	0.00	79.46

S.No.	STATION / CORPORATION	UNIT No.	INSTALLED CAPAPCITY (MW)	PLANNED MAINTENANCE (P.M) (%)	FORCED OUTAGE (F.O) (%)	OPERATING AVAILABILITY (100-FO-PM)
		2	50.00	18.69	0.00	81.31
		3	50.00	84.26	0.00	15.74
		4	50.00	0.00	0.00	100.00
	TOTAL		**200.00**	**30.87**	**0.00**	**69.13**
159	**MOYAR HPS**	1	12.00	0.00	0.00	100.00
		2	12.00	1.05	0.00	98.95
		3	12.00	1.86	4.48	93.66
	TOTAL		**36.00**	**0.97**	**1.49**	**97.54**
160	**PAPANASAM HPS**	1	8.00	6.98	0.02	92.99
		2	8.00	6.98	0.00	93.02
		3	8.00	14.91	0.01	85.07
		4	8.00	7.15	0.00	92.85
	TOTAL		**32.00**	**9.01**	**0.01**	**90.98**
161	**PARSON`S VALLEY HPS**	1	30.00	25.18	0.00	74.82
	TOTAL		**30.00**	**25.18**	**0.00**	**74.82**
162	**PERIYAR HPS**	1	42.00	42.98	0.00	57.02
		2	42.00	40.53	0.00	59.47
		3	42.00	37.52	0.00	62.48

S.No.	STATION / CORPORATION	UNIT No.	INSTALLED CAPAPCITY (MW)	PLANNED MAINTENANCE (P.M) (%)	FORCED OUTAGE (F.O) (%)	OPERATING AVAILABILITY (100-FO-PM)
		4	35.00	33.69	0.00	66.31
	TOTAL		**161.00**	**38.68**	**0.00**	**61.32**
163	**PYKARA HPS**	1	7.00	10.51	17.09	72.39
		2	7.00	0.00	2.81	97.19
		3	7.00	0.00	2.93	97.07
		4	13.60	0.10	0.00	99.90
		5	13.60	0.08	3.52	96.40
		6	11.00	0.00	99.73	0.27
	TOTAL		**59.20**	**1.78**	**21.01**	**77.20**
164	**PYKARA ULTMATE HPS**	1	50.00	0.00	3.74	96.26
		2	50.00	0.00	0.00	100.00
		3	50.00	2.78	0.00	97.22
	TOTAL		**150.00**	**0.93**	**1.25**	**97.83**
165	**SARKARPATHY HPS**	1	30.00	12.22	0.00	87.78
	TOTAL		**30.00**	**12.22**	**0.00**	**87.78**
166	**SHOLAYAR HPS (TN)**	1	35.00	21.69	0.89	77.42
		2	35.00	27.59	0.44	71.96
	TOTAL		**70.00**	**24.64**	**0.67**	**74.69**

S.No.	STATION / CORPORATION	UNIT No.	INSTALLED CAPAPCITY (MW)	PLANNED MAINTENANCE (P.M) (%)	FORCED OUTAGE (F.O) (%)	OPERATING AVAILABILITY (100-FO-PM)
167	SURULIYAR HPS	1	35.00	0.00	36.76	63.24
	TOTAL		**35.00**	**0.00**	**36.76**	**63.24**
	TSGENCO					
168	LOWER JURALA HPS	1	40.00	0.00	0.00	100.00
		2	40.00	0.00	0.00	100.00
		3	40.00	0.00	0.00	100.00
		4	40.00	0.00	0.00	100.00
		5	40.00	0.00	0.00	100.00
		6	40.00	0.00	0.00	100.00
	TOTAL		**240.00**	**0.00**	**0.00**	**100.00**
169	NAGARJUN SGR HPS	1	110.00	15.20	0.38	84.43
		2	100.80	0.00	0.15	99.85
		3	100.80	0.00	1.24	98.76
		4	100.80	0.00	0.16	99.84
		5	100.80	0.00	14.47	85.53
		6	100.80	0.00	0.00	100.00
		7	100.80	0.00	0.00	100.00
		8	100.80	0.00	0.00	100.00

S.No.	STATION / CORPORATION	UNIT No.	INSTALLED CAPAPCITY (MW)	PLANNED MAINTENANCE (P.M) (%)	FORCED OUTAGE (F.O) (%)	OPERATING AVAILABILITY (100-FO-PM)
	TOTAL		**815.60**	**1.90**	**2.05**	**96.05**
170	**NAGARJUN SGR LBC HPS**	1	30.00	0.00	0.00	100.00
		2	30.00	0.00	0.00	100.00
	TOTAL		**60.00**	**0.00**	**0.00**	**100.00**
171	**POCHAMPAD HPS**	1	9.00	0.00	0.00	100.00
		2	9.00	0.00	0.00	100.00
		3	9.00	0.00	0.00	100.00
		4	9.00	0.00	0.00	100.00
	TOTAL		**36.00**	**0.00**	**0.00**	**100.00**
172	**PRIYADARSHNI JURALA HPS**	1	39.00	0.00	14.48	85.52
		2	39.00	0.00	0.00	100.00
		3	39.00	0.00	2.73	97.27
		4	39.00	0.00	0.00	100.00
		5	39.00	0.00	0.00	100.00
		6	39.00	0.00	13.66	86.34
	TOTAL		**234.00**	**0.00**	**5.15**	**94.85**
173	**PULICHINTALA HPS**	1	30.00	0.00	0.00	100.00
		2	30.00	0.00	0.00	100.00

S.No.	STATION / CORPORATION	UNIT No.	INSTALLED CAPAPCITY (MW)	PLANNED MAINTENANCE (P.M) (%)	FORCED OUTAGE (F.O) (%)	OPERATING AVAILABILITY (100-FO-PM)
		3	30.00	0.00	0.55	99.45
		4	30.00	0.00	0.00	100.00
	TOTAL		**120.00**	**0.00**	**0.14**	**99.86**
174	**SRISAILAM LB HPS**	1	150.00	0.00	17.01	82.99
		2	150.00	0.00	16.31	83.69
		3	150.00	0.00	16.31	83.69
		4	150.00	0.00	6.83	93.17
		5	150.00	0.00	16.31	83.69
		6	150.00	0.00	16.31	83.69
	TOTAL		**900.00**	**0.00**	**14.85**	**85.15**
	Eastern					
	APGENCO					
175	**MACHKUND HPS**	1	17.00	0.00	0.00	100.00
		2	17.00	0.00	0.00	100.00
		3	17.00	0.00	0.00	100.00
		4	21.25	0.00	0.00	100.00
		5	21.25	0.00	0.00	100.00
		6	21.25	0.00	0.14	99.86
	TOTAL		**114.75**	**0.00**	**0.02**	**99.98**

S.No.	STATION / CORPORATION	UNIT No.	INSTALLED CAPAPCITY (MW)	PLANNED MAINTENANCE (P.M) (%)	FORCED OUTAGE (F.O) (%)	OPERATING AVAILABILITY (100-FO-PM)
	DEPL					
176	**JORETHANG LOOP**	1	48.00	0.00	0.01	99.99
		2	48.00	3.20	0.02	96.78
	TOTAL		**96.00**	**1.60**	**0.01**	**98.38**
	DVC					
177	**MAITHON HPS**	1	20.00	4.61	0.05	95.34
		2	23.20	0.00	0.05	99.95
		3	20.00	14.78	0.05	85.17
	TOTAL		**63.20**	**6.46**	**0.05**	**93.49**
178	**PANCHET HPS**	1	40.00	0.08	0.00	99.92
		2	40.00	0.00	0.00	100.00
	TOTAL		**80.00**	**0.04**	**0.00**	**99.96**
	GIPL					
179	**CHUZACHEN HPS**	1	55.00	9.54	0.64	89.82
		2	55.00	4.10	0.11	95.79
	TOTAL		**110.00**	**6.82**	**0.37**	**92.80**
	JUUNL					
180	**SUBERNREKHA-I HPS**	1	65.00	0.00	0.00	100.00
	TOTAL		**65.00**	**0.00**	**0.00**	**100.00**
181	**SUBERNREKHA-II HPS**	2	65.00	0.00	0.00	100.00

S.No.	STATION / CORPORATION	UNIT No.	INSTALLED CAPAPCITY (MW)	PLANNED MAINTENANCE (P.M) (%)	FORCED OUTAGE (F.O) (%)	OPERATING AVAILABILITY (100-FO-PM)
	TOTAL		**65.00**	**0.00**	**0.00**	**100.00**
	MBPC					
182	**RONGNICHU HPS**	1	56.50	4.35	0.37	95.28
		2	56.50	5.51	0.97	93.52
	TOTAL		**113.00**	**4.93**	**0.67**	**94.40**
	NHPC					
183	**RANGIT HPS**	1	20.00	2.85	0.65	96.50
		2	20.00	0.87	0.35	98.78
		3	20.00	20.91	1.12	77.97
	TOTAL		**60.00**	**8.21**	**0.71**	**91.08**
184	**TEESTA LOW DAM-III HPS**	1	33.00	1.05	0.21	98.74
		2	33.00	0.16	0.22	99.61
		3	33.00	0.56	0.28	99.16
		4	33.00	0.58	0.10	99.33
	TOTAL		**132.00**	**0.59**	**0.20**	**99.21**
185	**TEESTA LOW DAM-IV HPS**	1	40.00	0.18	0.00	99.81
		2	40.00	0.00	0.48	99.52
		3	40.00	6.12	0.18	93.71
		4	40.00	5.01	0.00	94.99

S.No.	STATION / CORPORATION	UNIT No.	INSTALLED CAPAPCITY (MW)	PLANNED MAINTENANCE (P.M) (%)	FORCED OUTAGE (F.O) (%)	OPERATING AVAILABILITY (100-FO-PM)
	TOTAL		**160.00**	**2.83**	**0.17**	**97.01**
186	**TEESTA V HPS**	1	170.00	0.39	0.02	99.59
		2	170.00	0.41	0.00	99.59
		3	170.00	0.40	0.01	99.59
	TOTAL		**510.00**	**0.40**	**0.01**	**99.59**
	OHPC					
187	**BALIMELA HPS**	1	60.00	7.72	1.46	90.82
		2	60.00	6.15	3.56	90.29
		3	60.00	100.00	0.00	0.00
		4	60.00	85.24	0.25	14.51
		5	60.00	7.46	0.00	92.54
		6	60.00	0.49	0.85	98.66
		7	75.00	8.63	0.47	90.90
		8	75.00	8.84	0.35	90.81
	TOTAL		**510.00**	**28.07**	**0.87**	**71.07**
188	**CHIPLIMA HPS**	1	24.00	29.87	0.14	70.00
		2	24.00	1.20	0.16	98.64
		3	24.00	0.80	0.71	98.48
	TOTAL		**72.00**	**10.62**	**0.34**	**89.04**

S.No.	STATION / CORPORATION	UNIT No.	INSTALLED CAPAPCITY (MW)	PLANNED MAINTENANCE (P.M) (%)	FORCED OUTAGE (F.O) (%)	OPERATING AVAILABILITY (100-FO-PM)
189	**HIRAKUD HPS**	1	49.50	0.50	0.00	99.50
		2	49.50	3.89	1.34	94.77
		3	32.00	5.21	0.00	94.79
		4	32.00	5.81	0.00	94.19
		5	43.65	5.32	0.00	94.68
		6	43.65	5.81	5.54	88.65
		7	37.50	13.29	0.13	86.58
	TOTAL		**287.80**	**5.69**	**1.00**	**93.31**
190	**RENGALI HPS**	1	50.00	8.80	3.01	88.19
		2	50.00	10.45	0.65	88.90
		3	50.00	12.72	0.00	87.28
		4	50.00	5.52	0.00	94.48
		5	50.00	1.73	0.12	98.15
	TOTAL		**250.00**	**7.85**	**0.75**	**91.40**
191	**UPPER INDRAVATI HPS**	1	150.00	0.07	0.03	99.90
		2	150.00	25.09	2.78	72.13
		3	150.00	0.25	10.32	89.43
		4	150.00	48.96	0.28	50.76

S.No.	STATION / CORPORATION	UNIT No.	INSTALLED CAPAPCITY (MW)	PLANNED MAINTENANCE (P.M) (%)	FORCED OUTAGE (F.O) (%)	OPERATING AVAILABILITY (100-FO-PM)
	TOTAL		**600.00**	**18.59**	**3.36**	**78.05**
192	**UPPER KOLAB HPS**	1	80.00	8.93	0.00	91.07
		2	80.00	0.10	65.71	34.19
		3	80.00	1.11	0.44	98.45
		4	80.00	1.35	0.00	98.65
	TOTAL		**320.00**	**2.87**	**16.54**	**80.59**
	SEPL					
193	**TASHIDING HPS**	1	48.50	0.00	0.62	99.38
		2	48.50	0.00	0.60	99.40
	TOTAL		**97.00**	**0.00**	**0.61**	**99.39**
	SKPPPL					
194	**DIKCHU HPS**	1	48.00	0.00	0.00	100.00
		2	48.00	0.00	0.02	99.98
	TOTAL		**96.00**	**0.00**	**0.01**	**99.99**
	TUL					
195	**TEESTA-III HPS**	1	200.00	0.00	0.09	99.91
		2	200.00	0.00	0.10	99.90
		3	200.00	0.00	0.08	99.92
		4	200.00	0.10	0.42	99.48

S.No.	STATION / CORPORATION	UNIT No.	INSTALLED CAPAPCITY (MW)	PLANNED MAINTENANCE (P.M) (%)	FORCED OUTAGE (F.O) (%)	OPERATING AVAILABILITY (100-FO-PM)
		5	200.00	0.26	0.09	99.65
		6	200.00	0.39	0.08	99.53
	TOTAL		**1200.00**	**0.12**	**0.15**	**99.73**
	WBSEDCL					
196	**JALDHAKA HPS ST-I**	1	9.00	0.00	9.80	90.20
		2	9.00	0.00	10.75	89.25
		3	9.00	0.00	2.59	97.41
		4	9.00	0.00	1.01	98.99
	TOTAL		**36.00**	**0.00**	**6.04**	**93.96**
197	**PURULIA PSS HPS**	1	225.00	1.37	28.60	70.03
		2	225.00	0.95	0.01	99.04
		3	225.00	0.62	0.01	99.38
		4	225.00	0.69	0.01	99.29
	TOTAL		**900.00**	**0.91**	**7.16**	**91.94**
198	**RAMMAM HPS**	1	12.50	0.00	0.00	100.00
		2	12.50	0.00	0.00	100.00
		3	12.50	19.12	0.00	80.88
		4	12.50	0.00	0.00	100.00
	TOTAL		**50.00**	**4.78**	**0.00**	**95.22**

S.No.	STATION / CORPORATION	UNIT No.	INSTALLED CAPAPCITY (MW)	PLANNED MAINTENANCE (P.M) (%)	FORCED OUTAGE (F.O) (%)	OPERATING AVAILABILITY (100-FO-PM)
	North Eastern					
	APGCL					
199	**KARBI LANGPI HPS**	1	50.00	1.32	2.17	96.51
		2	50.00	34.33	0.25	65.42
	TOTAL		**100.00**	**17.82**	**1.21**	**80.97**
	MeECL					
200	**KYRDEMKULAI HPS**	1	30.00	21.23	0.60	78.17
		2	30.00	2.64	0.00	97.36
	TOTAL		**60.00**	**11.93**	**0.30**	**87.77**
201	**MYNTDU(LESHKA) St-1 HPS**	1	42.00	3.24	2.13	94.63
		2	42.00	0.00	0.00	100.00
		3	42.00	0.00	0.88	99.12
	TOTAL		**126.00**	**1.08**	**1.00**	**97.92**
202	**NEW UMTRU HPS**	1	20.00	0.00	0.00	100.00
		2	20.00	7.60	0.00	92.40
	TOTAL		**40.00**	**3.80**	**0.00**	**96.20**
203	**UMIAM HPS ST-I**	1	9.00	0.00	0.00	100.00
		2	9.00	0.00	48.84	51.16
		3	9.00	0.00	0.00	100.00

S.No.	STATION / CORPORATION	UNIT No.	INSTALLED CAPAPCITY (MW)	PLANNED MAINTENANCE (P.M) (%)	FORCED OUTAGE (F.O) (%)	OPERATING AVAILABILITY (100-FO-PM)
		4	9.00	0.00	0.00	100.00
	TOTAL		**36.00**	**0.00**	**12.21**	**87.79**
204	**UMIAM HPS ST-IV**	7	30.00	0.00	2.50	97.50
		8	30.00	27.74	0.00	72.26
	TOTAL		**60.00**	**13.87**	**1.25**	**84.88**
	NEEPCO.					
205	**DOYANG HPS**	1	25.00	5.75	0.34	93.90
		2	25.00	5.75	0.08	94.16
		3	25.00	5.75	0.42	93.83
	TOTAL		**75.00**	**5.75**	**0.28**	**93.96**
206	**KAMENG HPS**	1	150.00	26.39	4.27	69.34
		2	150.00	2.69	1.10	96.21
		3	150.00	11.34	0.44	88.22
		4	150.00	0.00	10.23	89.77
	TOTAL		**600.00**	**10.11**	**4.01**	**85.88**
207	**KHONDONG HPS**	1	25.00	91.26	0.00	8.74
		2	25.00	91.08	0.00	8.92
	TOTAL		**50.00**	**91.17**	**0.00**	**8.83**
208	**KOPILI HPS**	1	50.00	0.00	96.45	3.55

S.No.	STATION / CORPORATION	UNIT No.	INSTALLED CAPAPCITY (MW)	PLANNED MAINTENANCE (P.M) (%)	FORCED OUTAGE (F.O) (%)	OPERATING AVAILABILITY (100-FO-PM)
		2	50.00	0.00	60.89	39.11
		3	50.00	0.00	46.28	53.72
		4	50.00	0.00	40.11	59.89
	TOTAL		**200.00**	**0.00**	**60.93**	**39.07**
209	**PARE**	1	55.00	3.47	0.04	96.49
		2	55.00	8.89	0.05	91.06
	TOTAL		**110.00**	**6.18**	**0.05**	**93.77**
210	**RANGANADI HPS**	1	135.00	4.16	1.40	94.44
		2	135.00	2.25	1.34	96.41
		3	135.00	2.50	1.46	96.05
	TOTAL		**405.00**	**2.97**	**1.40**	**95.63**
211	**TUIRIAL HPS**	1	30.00	6.42	0.02	93.56
		2	30.00	3.72	0.02	96.26
	TOTAL		**60.00**	**5.07**	**0.02**	**94.91**
	NHPC					
212	**LOKTAK HPS**	1	35.00	3.87	1.92	94.21
		2	35.00	2.80	0.03	97.18
		3	35.00	5.56	0.03	94.41
	TOTAL		**105.00**	**4.08**	**0.66**	**95.26**

CHAPTER-7

MISCELLANEOUS OUTAGES OF HE UNITS

CHAPTER-7

MISCELLANEOUS OUTAGES OF HE UNITS

7.1 Non-availability of hydel generating units due to reasons other than planned maintenance and forced outages of unit components, auxiliary and other equipments and civil structures has been defined as "Miscellaneous Non-Availability". This may be due to shortage of water, high silt content in the river, electrical grid disturbance, low system demand, disaster/natural calamity, reserve shutdown, transmission constraints & power evacuation problems, high tailrace level, strikes, etc. constitutes the miscellaneous outages. The station-wise details of miscellaneous non-availability during 2023-24 is given at **Annex-7.1** and summarized below in Table **7.1**

TABLE 7.1

MISCELLANEOUS OUTAGES FOR PERIOD: 2023-24

S. No.	Causes of Miscellaneous Outage	Duration of Outage (Hours)	% of Total Outage
	NOT ASSOCIATED WITH THE EQUIPMENT AND CIVIL STRUCTURE		
1	WATER CONSTRAINTS	918,202.45	85.73
2	OTHER MISC.	50,045.11	4.67
3	GRID CONSTRAINT	102,743.09	9.59
	TOTAL	**1,070,990.65**	**100.00**

7.2 The overall non-availability on account of miscellaneous outages has been estimated as 0.32%. It was highest (2.18%) in case of HE Stations from GSECL followed by RRVUNL (1.22%), BBMB (4.93%), SJVNL (0.22%), etc. However, miscellaneous non-availability being beyond the control of utilities, does not have not any impact on the operating availability of HE Stations.

CENTRAL ELECTRICITY AUTHORITY
Hydro WING
Hydro Project Planning & Investigation Division

Annex 7.1

NON-AVAILABILITY OF HYDROELECTRIC UNITS DUE TO REASONS OTHER THAN PLANNED MAINTENANACE AND FORCED OUTAGE DURING 2023-24

SL.No.	UTILITY/STATION	UNIT No.	INSTALLED CAPAPCITY (MW)	MISCELLANEOUS NON-AVAILABILITY (%)
	Northern			
	ADHPL			
1	**ALLAIN DUHANGAN HPS**	1	96.00	0.00
		2	96.00	0.00
	TOTAL		**192.00**	**0.00**
	AHPC (GVK)			
2	**SHRINAGAR HPS**	1	82.50	0.00
		2	82.50	0.00
		3	82.50	0.00
		4	82.50	0.00
	TOTAL		**330.00**	**0.00**
	BBMB			
3	**BHAKRA LEFT HPS**	1	126.00	0.00
		2	126.00	0.00
		3	126.00	5.19
		4	126.00	0.00

SL.No.	UTILITY/STATION	UNIT No.	INSTALLED CAPAPCITY (MW)	MISCELLANEOUS NON-AVAILABILITY (%)
		5	126.00	7.72
	TOTAL		**630.00**	**2.58**
4	**BHAKRA RIGHT HPS**	10	157.00	0.27
		6	157.00	7.92
		7	157.00	0.00
		8	157.00	0.00
		9	157.00	1.37
	TOTAL		**785.00**	**1.91**
5	**DEHAR HPS**	1	165.00	0.00
		2	165.00	0.00
		3	165.00	0.00
		4	165.00	0.82
		5	165.00	0.82
		6	165.00	0.00
	TOTAL		**990.00**	**0.27**
6	**GANGUWAL HPS**	1	29.25	0.00
		2	24.20	0.00
		3	24.20	0.00
	TOTAL		**77.65**	**0.00**
7	**KOTLA HPS**	1	29.25	0.00

SL.No.	UTILITY/STATION	UNIT No.	INSTALLED CAPAPCITY (MW)	MISCELLANEOUS NON-AVAILABILITY (%)
		2	24.20	0.00
		3	24.20	2.54
	TOTAL		**77.65**	**0.85**
8	**PONG HPS**	1	66.00	0.00
		2	66.00	2.19
		3	66.00	0.55
		4	66.00	13.66
		5	66.00	13.93
		6	66.00	3.01
	TOTAL		**396.00**	**5.56**
	E.P.P.L.			
9	**MALANA-II HPS**	1	50.00	154.00
		2	50.00	54.30
	TOTAL		**100.00**	**104.15**
	GBHPPL			
10	**BUDHIL HPS**	1	35.00	0.00
		2	35.00	0.00
	TOTAL		**70.00**	**0.00**
	GMR BHHPL			
11	**BAJOLI HOLI HPS**	1	60.00	31.74

SL.No.	UTILITY/STATION	UNIT No.	INSTALLED CAPAPCITY (MW)	MISCELLANEOUS NON-AVAILABILITY (%)
		2	60.00	9.56
		3	60.00	40.55
	TOTAL		**180.00**	**27.28**
	HBPCL			
12	**BASPA HPS**	1	100.00	1.20
		2	100.00	1.20
		3	100.00	1.21
	TOTAL		**300.00**	**1.20**
13	**KARCHAM WANGTOO HPS**	1	261.25	0.00
		2	261.25	0.00
		3	261.25	0.00
		4	261.25	0.00
	TOTAL		**1045.00**	**0.00**
	HPPCL			
14	**KASHANG INTEGRATED HEP**	1	65.00	0.00
		2	65.00	0.00
		3	65.00	0.00
	TOTAL		**195.00**	**0.00**
15	**SAINJ HPS**	1	50.00	0.00
		2	50.00	0.11

SL.No.	UTILITY/STATION	UNIT No.	INSTALLED CAPAPCITY (MW)	MISCELLANEOUS NON-AVAILABILITY (%)
	TOTAL		**100.00**	**0.06**
16	**SAWRA KUDDU HPS**	1	37.00	0.00
		2	37.00	0.00
		3	37.00	0.00
	TOTAL		**111.00**	**0.00**
	HPSEB			
17	**BASSI HPS**	1	16.50	1.73
		2	16.50	9.97
		3	16.50	4.28
		4	16.50	35.49
	TOTAL		**66.00**	**12.87**
18	**GIRI BATA HPS**	1	30.00	58.03
		2	30.00	23.23
	TOTAL		**60.00**	**40.63**
19	**LARJI HPS**	1	42.00	0.64
		2	42.00	0.87
		3	42.00	100.96
	TOTAL		**126.00**	**34.16**
20	**SANJAY HPS**	1	40.00	35.26
		2	40.00	14.89

SL.No.	UTILITY/STATION	UNIT No.	INSTALLED CAPAPCITY (MW)	MISCELLANEOUS NON-AVAILABILITY (%)
		3	40.00	37.55
	TOTAL		**120.00**	**29.23**
	HSPCL			
21	**SORANG HPS**	1	50.00	0.00
		2	50.00	0.00
	TOTAL		**100.00**	**0.00**
	IAEPL			
22	**CHANJU-I HPS**	1	12.00	0.00
		2	12.00	0.00
		3	12.00	0.00
	TOTAL		**36.00**	**0.00**
	JKSPDC			
23	**BAGLIHAR HPS**	1	150.00	2.64
		2	150.00	20.22
		3	150.00	33.16
	TOTAL		**450.00**	**18.67**
24	**BAGLIHAR II HPS**	1	150.00	2.77
		2	150.00	4.37
		3	150.00	100.00
	TOTAL		**450.00**	**35.72**

SL.No.	UTILITY/STATION	UNIT No.	INSTALLED CAPAPCITY (MW)	MISCELLANEOUS NON-AVAILABILITY (%)
25	**LOWER JHELUM HPS**	1	35.00	0.00
		2	35.00	0.00
		3	35.00	100.00
	TOTAL		**105.00**	**33.33**
26	**UPPER SINDH-II HPS**	3	35.00	0.00
		4	35.00	0.00
		5	35.00	0.00
	TOTAL		**105.00**	**0.00**
	JPPVL			
27	**VISHNU PRAYAG HPS**	1	100.00	0.00
		2	100.00	0.03
		3	100.00	0.00
		4	100.00	0.00
	TOTAL		**400.00**	**0.01**
	L&T			
28	**SINGOLI BHATWARI HPS**	1	33.00	0.00
		2	33.00	0.00
		3	33.00	0.00
	TOTAL		**99.00**	**0.00**
	MPCL			

SL.No.	UTILITY/STATION	UNIT No.	INSTALLED CAPAPCITY (MW)	MISCELLANEOUS NON-AVAILABILITY (%)
29	**MALANA HPS**	1	43.00	15.30
		2	43.00	3.73
	TOTAL		**86.00**	**9.52**
	NHPC			
30	**BAIRA SIUL HPS**	1	60.00	147.73
		2	60.00	59.94
		3	60.00	59.27
	TOTAL		**180.00**	**88.98**
31	**CHAMERA-I HPS**	1	180.00	46.25
		2	180.00	52.65
		3	180.00	44.00
	TOTAL		**540.00**	**47.63**
32	**CHAMERA-II HPS**	1	100.00	146.23
		2	100.00	40.85
		3	100.00	47.32
	TOTAL		**300.00**	**78.13**
33	**CHAMERA-III HPS**	1	77.00	45.49
		2	77.00	138.81
		3	77.00	41.76
	TOTAL		**231.00**	**75.35**

SL.No.	UTILITY/STATION	UNIT No.	INSTALLED CAPAPCITY (MW)	MISCELLANEOUS NON-AVAILABILITY (%)
34	**CHUTAK HPS**	1	11.00	50.98
		2	11.00	48.89
		3	11.00	246.54
		4	11.00	53.61
	TOTAL		**44.00**	**100.01**
35	**DHAULI GANGA HPS**	1	70.00	51.94
		2	70.00	44.31
		3	70.00	55.12
		4	70.00	52.65
	TOTAL		**280.00**	**51.00**
36	**DULHASTI HPS**	1	130.00	31.49
		2	130.00	26.97
		3	130.00	23.27
	TOTAL		**390.00**	**27.24**
37	**KISHANGANGA HPS**	1	110.00	141.55
		2	110.00	44.19
		3	110.00	44.79
	TOTAL		**330.00**	**76.85**
38	**NIMMO BAZGO HPS**	1	15.00	25.73
		2	15.00	135.51

SL.No.	UTILITY/STATION	UNIT No.	INSTALLED CAPAPCITY (MW)	MISCELLANEOUS NON-AVAILABILITY (%)
		3	15.00	131.33
	TOTAL		**45.00**	**97.52**
39	**PARBATI-III HPS**	1	130.00	54.84
		2	130.00	56.17
		3	130.00	62.97
		4	130.00	64.17
	TOTAL		**520.00**	**59.54**
40	**SALAL HPS**	1	115.00	29.07
		2	115.00	44.01
		3	115.00	34.90
		4	115.00	19.60
		5	115.00	43.84
		6	115.00	29.57
	TOTAL		**690.00**	**33.50**
41	**SEWA-II HPS**	1	40.00	137.33
		2	40.00	43.24
		3	40.00	38.24
	TOTAL		**120.00**	**72.94**
42	**TANAKPUR HPS**	1	31.40	19.05
		2	31.40	19.24

SL.No.	UTILITY/STATION	UNIT No.	INSTALLED CAPAPCITY (MW)	MISCELLANEOUS NON-AVAILABILITY (%)
		3	31.40	19.07
	TOTAL		**94.20**	**19.12**
43	**URI-I HPS**	1	120.00	0.96
		2	120.00	13.27
		3	120.00	0.52
		4	120.00	2.60
	TOTAL		**480.00**	**4.34**
44	**URI-II HPS**	1	60.00	20.47
		2	60.00	28.30
		3	60.00	22.62
		4	60.00	16.52
	TOTAL		**240.00**	**21.98**
	NTPC Ltd.			
45	**KOLDAM**	1	200.00	57.40
		2	200.00	54.72
		3	200.00	57.49
		4	200.00	58.63
	TOTAL		**800.00**	**57.06**
	PSPCL			
46	**ANANDPUR SAHIB-I HPS**	1	33.50	0.00

SL.No.	UTILITY/STATION	UNIT No.	INSTALLED CAPAPCITY (MW)	MISCELLANEOUS NON-AVAILABILITY (%)
		2	33.50	0.00
	TOTAL		**67.00**	**0.00**
47	**ANANDPUR SAHIB-II HPS**	3	33.50	0.00
		4	33.50	0.00
	TOTAL		**67.00**	**0.00**
48	**MUKERIAN-I HPS**	1	15.00	0.00
		2	15.00	0.00
		3	15.00	0.00
	TOTAL		**45.00**	**0.00**
49	**MUKERIAN-II HPS**	4	15.00	0.00
		5	15.00	0.00
		6	15.00	0.00
	TOTAL		**45.00**	**0.00**
50	**MUKERIAN-III HPS**	7	19.50	0.00
		8	19.50	0.00
		9	19.50	0.00
	TOTAL		**58.50**	**0.00**
51	**MUKERIAN-IV HPS**	10	19.50	0.00
		11	19.50	0.00
		12	19.50	0.00

SL.No.	UTILITY/STATION	UNIT No.	INSTALLED CAPAPCITY (MW)	MISCELLANEOUS NON-AVAILABILITY (%)
	TOTAL		**58.50**	**0.00**
52	**RANJIT SAGAR HPS**	1	150.00	0.00
		2	150.00	0.00
		3	150.00	0.00
		4	150.00	0.00
	TOTAL		**600.00**	**0.00**
53	**SHANAN HPS**	1	15.00	14.27
		2	15.00	15.55
		3	15.00	11.85
		4	15.00	2.13
		5	50.00	22.58
	TOTAL		**110.00**	**13.28**
	RRVUNL			
54	**JAWAHAR SAGAR HPS**	1	33.00	0.00
		2	33.00	0.00
		3	33.00	0.00
	TOTAL		**99.00**	**0.00**
55	**MAHI BAJAJ-I HPS**	1	25.00	58.81
		2	25.00	58.89
	TOTAL		**50.00**	**58.85**

SL.No.	UTILITY/STATION	UNIT No.	INSTALLED CAPAPCITY (MW)	MISCELLANEOUS NON-AVAILABILITY (%)
56	**MAHI BAJAJ-II HPS**	3	45.00	50.51
		4	45.00	105.41
	TOTAL		**90.00**	**77.96**
57	**R P SAGAR HPS**	1	43.00	0.00
		2	43.00	0.00
		3	43.00	0.00
		4	43.00	0.00
	TOTAL		**172.00**	**0.00**
	SJVNL			
58	**NAITWAR MORI HPS**	1	30.00	0.00
		2	30.00	0.00
	TOTAL		**60.00**	**0.00**
59	**NATHPA JHAKRI HPS**	1	250.00	43.62
		2	250.00	151.22
		3	250.00	52.85
		4	250.00	55.66
		5	250.00	49.52
		6	250.00	142.94
	TOTAL		**1500.00**	**82.63**
60	**RAMPUR HPS**	1	68.67	40.96

SL.No.	UTILITY/STATION	UNIT No.	INSTALLED CAPAPCITY (MW)	MISCELLANEOUS NON-AVAILABILITY (%)
		2	68.67	55.20
		3	68.67	56.91
		4	68.67	56.78
		5	68.67	51.29
		6	68.67	41.49
	TOTAL		**412.02**	**50.44**
	THDC			
61	**KOTESHWAR HPS**	1	100.00	0.00
		2	100.00	0.00
		3	100.00	0.00
		4	100.00	0.00
	TOTAL		**400.00**	**0.00**
62	**TEHRI ST-1 HPS**	1	250.00	0.00
		2	250.00	0.00
		3	250.00	0.00
		4	250.00	0.00
	TOTAL		**1000.00**	**0.00**
	UJVNL			
63	**CHIBRO (YAMUNA) HPS**	1	60.00	0.00
		2	60.00	0.00

SL.No.	UTILITY/STATION	UNIT No.	INSTALLED CAPAPCITY (MW)	MISCELLANEOUS NON-AVAILABILITY (%)
		3	60.00	0.00
		4	60.00	12.57
	TOTAL		**240.00**	**3.14**
64	**CHILLA HPS**	1	36.00	6.02
		2	36.00	4.77
		3	36.00	13.34
		4	36.00	11.72
	TOTAL		**144.00**	**8.97**
65	**DHAKRANI HPS**	1	11.25	5.79
		2	11.25	19.49
		3	11.25	14.58
	TOTAL		**33.75**	**13.28**
66	**DHALIPUR HPS**	1	17.00	19.18
		2	17.00	35.88
		3	17.00	324.37
	TOTAL		**51.00**	**126.48**
67	**KHATIMA HPS**	1	13.80	0.00
		2	13.80	0.00
		3	13.80	0.00
	TOTAL		**41.40**	**0.00**

SL.No.	UTILITY/STATION	UNIT No.	INSTALLED CAPAPCITY (MW)	MISCELLANEOUS NON-AVAILABILITY (%)
68	**KHODRI HPS**	1	30.00	0.00
		2	30.00	43.31
		3	30.00	0.00
		4	30.00	0.00
	TOTAL		**120.00**	**10.83**
69	**KULHAL HPS**	1	10.00	0.00
		2	10.00	0.00
		3	10.00	0.00
	TOTAL		**30.00**	**0.00**
70	**MANERI BHALI-I HPS**	1	30.00	8.31
		2	30.00	18.83
		3	30.00	13.32
	TOTAL		**90.00**	**13.48**
71	**MANERI BHALI-II HPS**	1	76.00	0.00
		2	76.00	0.00
		3	76.00	0.00
		4	76.00	0.00
	TOTAL		**304.00**	**0.00**
72	**RAMGANGA HPS**	1	66.00	9.46
		2	66.00	19.23

SL.No.	UTILITY/STATION	UNIT No.	INSTALLED CAPAPCITY (MW)	MISCELLANEOUS NON-AVAILABILITY (%)
		3	66.00	20.75
	TOTAL		**198.00**	**16.48**
73	**VYASI HPS**	1	60.00	0.00
		2	60.00	0.00
	TOTAL		**120.00**	**0.00**
	UPJVNL			
74	**KHARA HPS**	1	24.00	8.04
		2	24.00	16.65
		3	24.00	18.47
	TOTAL		**72.00**	**14.39**
75	**MATATILA HPS**	1	10.20	0.00
		2	10.20	0.00
		3	10.20	0.00
	TOTAL		**30.60**	**0.00**
76	**OBRA HPS**	1	33.00	36.17
		2	33.00	51.11
		3	33.00	57.37
	TOTAL		**99.00**	**48.22**
77	**RIHAND HPS**	1	50.00	0.00
		2	50.00	0.00

SL.No.	UTILITY/STATION	UNIT No.	INSTALLED CAPAPCITY (MW)	MISCELLANEOUS NON-AVAILABILITY (%)
		3	50.00	0.00
		4	50.00	0.00
		5	50.00	0.00
		6	50.00	0.00
	TOTAL		**300.00**	**0.00**
	Western			
	CSPGCL			
78	**HASDEOBANGO HPS**	1	40.00	0.00
		2	40.00	0.00
		3	40.00	0.00
	TOTAL		**120.00**	**0.00**
	DLHP			
79	**BHANDARDHARA HPS ST-II**	2	34.00	0.00
	TOTAL		**34.00**	**0.00**
	GSECL			
80	**KADANA HPS**	1	60.00	0.00
		2	60.00	0.00
		3	60.00	0.00
		4	60.00	0.00
	TOTAL		**240.00**	**0.00**

SL.No.	UTILITY/STATION	UNIT No.	INSTALLED CAPAPCITY (MW)	MISCELLANEOUS NON-AVAILABILITY (%)
81	**UKAI HPS**	1	75.00	71.29
		2	75.00	72.57
		3	75.00	86.63
		4	75.00	40.67
	TOTAL		**300.00**	**67.79**
	MAHAGENCO			
82	**BHIRA TAIL RACE HPS**	1	40.00	0.00
		2	40.00	0.00
	TOTAL		**80.00**	**0.00**
83	**GHATGHAR PSS HPS**	1	125.00	3.58
		2	125.00	16.80
	TOTAL		**250.00**	**10.19**
84	**KOYNA DPH HPS**	1	18.00	0.00
		2	18.00	0.00
	TOTAL		**36.00**	**0.00**
85	**KOYNA-I&II HPS**	1	70.00	0.00
		2	70.00	0.00
		3	70.00	0.00
		4	70.00	0.00
		5	80.00	0.00

SL.No.	UTILITY/STATION	UNIT No.	INSTALLED CAPAPCITY (MW)	MISCELLANEOUS NON-AVAILABILITY (%)
		6	80.00	0.00
		7	80.00	0.00
		8	80.00	0.00
	TOTAL		**600.00**	**0.00**
86	**KOYNA-III HPS**	1	80.00	0.00
		2	80.00	0.00
		3	80.00	0.00
		4	80.00	0.00
	TOTAL		**320.00**	**0.00**
87	**KOYNA-IV HPS**	1	250.00	0.00
		2	250.00	0.00
		3	250.00	0.00
		4	250.00	0.00
	TOTAL		**1000.00**	**0.00**
88	**TILLARI HPS**	1	60.00	5.46
	TOTAL		**60.00**	**5.46**
89	**VAITARNA HPS**	1	60.00	0.00
	TOTAL		**60.00**	**0.00**
	MPPGCL			
90	**BANSAGAR-II HPS**	1	15.00	17.82

SL.No.	UTILITY/STATION	UNIT No.	INSTALLED CAPAPCITY (MW)	MISCELLANEOUS NON-AVAILABILITY (%)
		2	15.00	0.00
	TOTAL		**30.00**	**8.91**
91	**BANSAGAR-III HPS**	1	20.00	64.63
		2	20.00	61.55
		3	20.00	61.98
	TOTAL		**60.00**	**62.72**
92	**BANSAGAR TONS-I HPS**	1	105.00	0.00
		2	105.00	0.00
		3	105.00	10.23
	TOTAL		**315.00**	**3.41**
93	**BARGI HPS**	1	45.00	0.00
		2	45.00	0.00
	TOTAL		**90.00**	**0.00**
94	**GANDHI SAGAR HPS**	1	23.00	27.12
		2	23.00	57.14
		3	23.00	0.00
		4	23.00	28.31
		5	23.00	17.95
	TOTAL		**115.00**	**26.10**
95	**MADHIKHERA HPS**	1	20.00	54.09

SL.No.	UTILITY/STATION	UNIT No.	INSTALLED CAPAPCITY (MW)	MISCELLANEOUS NON-AVAILABILITY (%)
		2	20.00	52.50
		3	20.00	52.53
	TOTAL		**60.00**	**53.04**
96	**PENCH HPS**	1	80.00	0.00
		2	80.00	0.00
	TOTAL		**160.00**	**0.00**
97	**RAJGHAT HPS**	1	15.00	55.89
		2	15.00	43.73
		3	15.00	61.28
	TOTAL		**45.00**	**53.63**
	NHDC			
98	**INDIRA SAGAR HPS**	1	125.00	0.00
		2	125.00	0.00
		3	125.00	0.00
		4	125.00	0.00
		5	125.00	0.00
		6	125.00	0.00
		7	125.00	0.00
		8	125.00	0.00
	TOTAL		**1000.00**	**0.00**

SL.No.	UTILITY/STATION	UNIT No.	INSTALLED CAPAPCITY (MW)	MISCELLANEOUS NON-AVAILABILITY (%)
99	**OMKARESHWAR HPS**	1	65.00	0.00
		2	65.00	0.00
		3	65.00	0.00
		4	65.00	0.00
		5	65.00	0.00
		6	65.00	0.00
		7	65.00	0.00
		8	65.00	0.00
	TOTAL		**520.00**	**0.00**
	SSNNL			
100	**S SAROVAR CHPH HPS**	1	50.00	0.00
		2	50.00	0.00
		3	50.00	0.00
		4	50.00	0.00
		5	50.00	0.00
	TOTAL		**250.00**	**0.00**
101	**S SAROVAR RBPH HPS**	1	200.00	0.00
		2	200.00	0.00
		3	200.00	0.00
		4	200.00	0.00

SL.No.	UTILITY/STATION	UNIT No.	INSTALLED CAPAPCITY (MW)	MISCELLANEOUS NON-AVAILABILITY (%)
		5	200.00	0.00
		6	200.00	0.00
	TOTAL		**1200.00**	**0.00**
	TATA MAH.			
102	**BHIRA HPS**	1	25.00	100.00
		2	25.00	0.00
		3	25.00	0.00
		4	25.00	0.00
		5	25.00	0.00
		6	25.00	0.00
	TOTAL		**150.00**	**16.67**
103	**BHIRA PSS HPS**	1	150.00	0.00
	TOTAL		**150.00**	**0.00**
104	**BHIVPURI HPS**	1	24.00	0.00
		2	24.00	0.00
		3	24.00	0.00
		4	1.50	0.00
		5	1.50	0.00
	TOTAL		**75.00**	**0.00**
105	**KHOPOLI HPS**	1	24.00	0.00

SL.No.	UTILITY/STATION	UNIT No.	INSTALLED CAPAPCITY (MW)	MISCELLANEOUS NON-AVAILABILITY (%)
		2	24.00	0.00
		3	24.00	0.00
	TOTAL		**72.00**	**0.00**
	Southern			
	APGENCO			
106	**HAMPI HPS**	1	9.00	0.00
		2	9.00	0.00
		3	9.00	0.00
		4	9.00	0.00
	TOTAL		**36.00**	**0.00**
107	**LOWER SILERU HPS**	1	115.00	0.00
		2	115.00	0.00
		3	115.00	0.00
		4	115.00	0.00
	TOTAL		**460.00**	**0.00**
108	**NAGARJUN SGR RBC HPS**	1	30.00	0.00
		2	30.00	0.00
		3	30.00	0.00
	TOTAL		**90.00**	**0.00**
109	**NAGARJUN SGR TPD**	1	25.00	0.00

SL.No.	UTILITY/STATION	UNIT No.	INSTALLED CAPAPCITY (MW)	MISCELLANEOUS NON-AVAILABILITY (%)
		2	25.00	0.00
	TOTAL		**50.00**	**0.00**
110	**SRISAILAM HPS**	1	110.00	0.00
		2	110.00	0.00
		3	110.00	0.00
		4	110.00	0.00
		5	110.00	0.00
		6	110.00	0.00
		7	110.00	0.00
	TOTAL		**770.00**	**0.00**
111	**T B DAM HPS**	1	9.00	41.69
		2	9.00	16.79
		3	9.00	10.26
		4	9.00	4.89
	TOTAL		**36.00**	**18.41**
112	**UPPER SILERU HPS**	1	60.00	0.00
		2	60.00	0.00
		3	60.00	0.00
		4	60.00	0.00
	TOTAL		**240.00**	**0.00**

SL.No.	UTILITY/STATION	UNIT No.	INSTALLED CAPAPCITY (MW)	MISCELLANEOUS NON-AVAILABILITY (%)
	KPCL			
113	**ALMATTI DPH HPS**	1	15.00	46.11
		2	55.00	29.58
		3	55.00	18.33
		4	55.00	59.33
		5	55.00	24.28
		6	55.00	33.88
	TOTAL		**290.00**	**35.25**
114	**BHADRA HPS**	1	2.00	100.00
		2	12.00	0.00
		3	12.00	0.00
	TOTAL		**26.00**	**33.33**
115	**GERUSUPPA HPS**	1	60.00	0.00
		2	60.00	0.00
		3	60.00	0.00
		4	60.00	0.00
	TOTAL		**240.00**	**0.00**
116	**GHAT PRABHA HPS**	1	16.00	50.64
		2	16.00	51.17
	TOTAL		**32.00**	**50.91**

SL.No.	UTILITY/STATION	UNIT No.	INSTALLED CAPAPCITY (MW)	MISCELLANEOUS NON-AVAILABILITY (%)
117	**JOG HPS**	1	13.20	0.74
		2	13.20	0.69
		3	13.20	12.10
		4	13.20	12.59
		5	21.60	3.95
		6	21.60	10.35
		7	21.60	19.78
		8	21.60	38.46
	TOTAL		**139.20**	**12.33**
118	**KADRA HPS**	1	50.00	71.29
		2	50.00	68.87
		3	50.00	70.29
	TOTAL		**150.00**	**70.15**
119	**KALINADI HPS**	1	150.00	41.74
		2	150.00	58.47
		3	150.00	61.24
		4	150.00	40.00
		5	150.00	68.42
		6	150.00	51.61
	TOTAL		**900.00**	**53.58**

SL.No.	UTILITY/STATION	UNIT No.	INSTALLED CAPAPCITY (MW)	MISCELLANEOUS NON-AVAILABILITY (%)
120	**KALINADI SUPA HPS**	1	50.00	44.01
		2	50.00	29.45
	TOTAL		**100.00**	**36.73**
121	**KODASALI HPS**	1	40.00	53.89
		2	40.00	68.37
		3	40.00	65.45
	TOTAL		**120.00**	**62.57**
122	**LIGANAMAKKI HPS**	1	27.50	0.00
		2	27.50	0.00
	TOTAL		**55.00**	**0.00**
123	**MUNIRABAD HPS**	1	9.00	35.06
		2	9.00	35.75
		3	10.00	35.44
	TOTAL		**28.00**	**35.41**
124	**SHARAVATHI HPS**	1	103.50	3.92
		10	103.50	21.80
		2	103.50	10.41
		3	103.50	20.39
		4	103.50	23.39
		5	103.50	26.74

SL.No.	UTILITY/STATION	UNIT No.	INSTALLED CAPAPCITY (MW)	MISCELLANEOUS NON-AVAILABILITY (%)
		6	103.50	6.42
		7	103.50	5.20
		8	103.50	17.91
		9	103.50	31.31
	TOTAL		**1035.00**	**16.75**
125	**SIVASAMUNDRUM HPS**	1	3.00	0.00
		10	6.00	0.00
		2	3.00	0.00
		3	3.00	0.00
		4	3.00	0.00
		5	3.00	0.00
		6	3.00	0.00
		7	6.00	0.00
		8	6.00	0.00
		9	6.00	0.00
	TOTAL		**42.00**	**0.00**
126	**VARAHI HPS**	1	115.00	25.01
		2	115.00	19.97
		3	115.00	28.05
		4	115.00	134.61

SL.No.	UTILITY/STATION	UNIT No.	INSTALLED CAPAPCITY (MW)	MISCELLANEOUS NON-AVAILABILITY (%)
	TOTAL		**460.00**	**51.91**
	KSEB			
127	**IDAMALAYAR HPS**	1	37.50	40.78
		2	37.50	42.29
	TOTAL		**75.00**	**41.54**
128	**IDUKKI HPS**	1	130.00	0.92
		2	130.00	2.40
		3	130.00	3.84
		4	130.00	0.00
		5	130.00	3.12
		6	130.00	5.74
	TOTAL		**780.00**	**2.67**
129	**KAKKAD HPS**	1	25.00	0.00
		2	25.00	0.00
	TOTAL		**50.00**	**0.00**
130	**KUTTIYADI ADDL EXTN**	1	50.00	0.00
		2	50.00	0.25
	TOTAL		**100.00**	**0.12**
131	**KUTTIYADI EXTN HPS**	4	50.00	0.27
	TOTAL		**50.00**	**0.27**

SL.No.	UTILITY/STATION	UNIT No.	INSTALLED CAPAPCITY (MW)	MISCELLANEOUS NON-AVAILABILITY (%)
132	**KUTTIYADI HPS**	1	25.00	0.24
		2	25.00	0.41
		3	25.00	0.42
	TOTAL		**75.00**	**0.36**
133	**LOWER PERIYAR HPS**	1	60.00	0.00
		2	60.00	35.33
		3	60.00	2.33
	TOTAL		**180.00**	**12.55**
134	**NARIAMANGLAM HPS**	1	17.55	0.82
		2	17.55	0.08
		3	17.55	0.00
	TOTAL		**52.65**	**0.30**
135	**PALLIVASAL HPS**	1	5.00	0.00
		2	5.00	0.00
		3	5.00	0.00
		4	7.50	0.00
		5	7.50	0.00
		6	7.50	0.00
	TOTAL		**37.50**	**0.00**
136	**PANNIAR HPS**	1	15.00	0.00

SL.No.	UTILITY/STATION	UNIT No.	INSTALLED CAPAPCITY (MW)	MISCELLANEOUS NON-AVAILABILITY (%)
		2	15.00	0.00
	TOTAL		**30.00**	**0.00**
137	**PORINGALKUTTU HPS**	1	8.00	0.00
		2	8.00	0.21
		3	8.00	0.00
		4	8.00	0.00
	TOTAL		**32.00**	**0.05**
138	**SABARIGIRI HPS**	1	50.00	25.47
		2	50.00	50.18
		3	50.00	38.12
		4	50.00	23.22
		5	50.00	37.63
		6	50.00	38.02
	TOTAL		**300.00**	**35.44**
139	**SENGULAM HPS**	1	12.00	0.00
		2	12.00	45.01
		3	12.00	44.74
		4	12.00	100.00
	TOTAL		**48.00**	**47.44**
140	**SHOLAYAR HPS**	1	18.00	10.40

SL.No.	UTILITY/STATION	UNIT No.	INSTALLED CAPAPCITY (MW)	MISCELLANEOUS NON-AVAILABILITY (%)
		2	18.00	1.13
		3	18.00	12.26
	TOTAL		**54.00**	**7.93**
	TANGEDCO			
141	**ALIYAR HPS**	1	60.00	0.00
	TOTAL		**60.00**	**0.00**
142	**BHAWANI BARRAGE-II HPS**	1	15.00	22.51
		2	15.00	18.09
	TOTAL		**30.00**	**20.30**
143	**BHAWANI BARRAGE-III HPS**	1	15.00	0.00
		2	15.00	0.00
	TOTAL		**30.00**	**0.00**
144	**BHAWANI KATTAL**	1	15.00	32.36
		2	15.00	0.00
	TOTAL		**30.00**	**16.18**
145	**KADAMPARI HPS**	1	100.00	0.00
		2	100.00	0.00
		3	100.00	0.00
		4	100.00	0.00
	TOTAL		**400.00**	**0.00**

SL.No.	UTILITY/STATION	UNIT No.	INSTALLED CAPAPCITY (MW)	MISCELLANEOUS NON-AVAILABILITY (%)
146	**KODAYAR-I HPS**	1	60.00	0.00
	TOTAL		**60.00**	**0.00**
147	**KODAYAR-II HPS**	2	40.00	1.36
	TOTAL		**40.00**	**1.36**
148	**KUNDAH-I HPS**	1	20.00	0.00
		2	20.00	0.00
		3	20.00	0.00
	TOTAL		**60.00**	**0.00**
149	**KUNDAH-II HPS**	4	35.00	0.00
		5	35.00	0.00
		6	35.00	0.00
		7	35.00	0.00
		8	35.00	0.00
	TOTAL		**175.00**	**0.00**
150	**KUNDAH-III HPS**	10	60.00	0.00
		11	60.00	0.00
		9	60.00	0.00
	TOTAL		**180.00**	**0.00**
151	**KUNDAH-IV HPS**	12	50.00	0.00
		13	50.00	0.52

SL.No.	UTILITY/STATION	UNIT No.	INSTALLED CAPAPCITY (MW)	MISCELLANEOUS NON-AVAILABILITY (%)
	TOTAL		**100.00**	**0.26**
152	**KUNDAH-V HPS**	14	20.00	0.00
		15	20.00	0.00
	TOTAL		**40.00**	**0.00**
153	**LOWER METTUR-I HPS**	1	15.00	0.00
		2	15.00	0.00
	TOTAL		**30.00**	**0.00**
154	**LOWER METTUR-II HPS**	3	15.00	0.00
		4	15.00	0.00
	TOTAL		**30.00**	**0.00**
155	**LOWER METTUR-III HPS**	5	15.00	0.00
		6	15.00	0.00
	TOTAL		**30.00**	**0.00**
156	**LOWER METTUR-IV HPS**	7	15.00	0.00
		8	15.00	0.00
	TOTAL		**30.00**	**0.00**
157	**METTUR DAM HPS**	1	12.50	71.60
		2	12.50	23.43
		3	12.50	75.05
		4	12.50	46.62

SL.No.	UTILITY/STATION	UNIT No.	INSTALLED CAPAPCITY (MW)	MISCELLANEOUS NON-AVAILABILITY (%)
	TOTAL		**50.00**	**54.17**
158	**METTUR TUNNEL HPS**	1	50.00	39.61
		2	50.00	6.96
		3	50.00	0.00
		4	50.00	8.99
	TOTAL		**200.00**	**13.89**
159	**MOYAR HPS**	1	12.00	0.00
		2	12.00	0.00
		3	12.00	0.00
	TOTAL		**36.00**	**0.00**
160	**PAPANASAM HPS**	1	8.00	0.00
		2	8.00	0.00
		3	8.00	0.00
		4	8.00	0.00
	TOTAL		**32.00**	**0.00**
161	**PARSON`S VALLEY HPS**	1	30.00	0.00
	TOTAL		**30.00**	**0.00**
162	**PERIYAR HPS**	1	42.00	0.00
		2	42.00	0.00
		3	42.00	0.00

SL.No.	UTILITY/STATION	UNIT No.	INSTALLED CAPAPCITY (MW)	MISCELLANEOUS NON-AVAILABILITY (%)
		4	35.00	0.00
	TOTAL		**161.00**	**0.00**
163	**PYKARA HPS**	1	7.00	0.00
		2	7.00	0.00
		3	7.00	0.00
		4	13.60	0.00
		5	13.60	0.00
		6	11.00	0.00
	TOTAL		**59.20**	**0.00**
164	**PYKARA ULTMATE HPS**	1	50.00	0.00
		2	50.00	0.00
		3	50.00	0.00
	TOTAL		**150.00**	**0.00**
165	**SARKARPATHY HPS**	1	30.00	0.00
	TOTAL		**30.00**	**0.00**
166	**SHOLAYAR HPS (TN)**	1	35.00	0.00
		2	35.00	0.00
	TOTAL		**70.00**	**0.00**
167	**SURULIYAR HPS**	1	35.00	0.00
	TOTAL		**35.00**	**0.00**

SL.No.	UTILITY/STATION	UNIT No.	INSTALLED CAPAPCITY (MW)	MISCELLANEOUS NON-AVAILABILITY (%)
	TSGENCO			
168	**LOWER JURALA HPS**	1	40.00	57.10
		2	40.00	64.48
		3	40.00	54.37
		4	40.00	66.67
		5	40.00	48.37
		6	40.00	49.99
	TOTAL		**240.00**	**56.83**
169	**NAGARJUN SGR HPS**	1	110.00	4.66
		2	100.80	7.66
		3	100.80	14.94
		4	100.80	14.76
		5	100.80	11.76
		6	100.80	16.67
		7	100.80	21.86
		8	100.80	15.85
	TOTAL		**815.60**	**13.52**
170	**NAGARJUN SGR LBC HPS**	1	30.00	64.75
		2	30.00	64.75
	TOTAL		**60.00**	**64.75**

SL.No.	UTILITY/STATION	UNIT No.	INSTALLED CAPAPCITY (MW)	MISCELLANEOUS NON-AVAILABILITY (%)
171	POCHAMPAD HPS	1	9.00	55.75
		2	9.00	48.36
		3	9.00	45.63
		4	9.00	63.93
	TOTAL		**36.00**	**53.42**
172	PRIYADARSHNI JURALA HPS	1	39.00	32.24
		2	39.00	47.54
		3	39.00	41.53
		4	39.00	48.36
		5	39.00	45.08
		6	39.00	37.16
	TOTAL		**234.00**	**41.99**
173	PULICHINTALA HPS	1	30.00	45.63
		2	30.00	37.43
		3	30.00	49.18
		4	30.00	71.31
	TOTAL		**120.00**	**50.89**
174	SRISAILAM LB HPS	1	150.00	30.25
		2	150.00	34.35
		3	150.00	41.18

SL.No.	UTILITY/STATION	UNIT No.	INSTALLED CAPAPCITY (MW)	MISCELLANEOUS NON-AVAILABILITY (%)
		4	150.00	34.07
		5	150.00	33.26
		6	150.00	34.79
	TOTAL		**900.00**	**34.65**
	Eastern			
	APGENCO			
175	**MACHKUND HPS**	1	17.00	0.00
		2	17.00	0.00
		3	17.00	0.00
		4	21.25	0.00
		5	21.25	0.00
		6	21.25	0.00
	TOTAL		**114.75**	**0.00**
	DEPL			
176	**JORETHANG LOOP**	1	48.00	2.86
		2	48.00	2.75
	TOTAL		**96.00**	**2.80**
	DVC			
177	**MAITHON HPS**	1	20.00	48.70
		2	23.20	58.60

SL.No.	UTILITY/STATION	UNIT No.	INSTALLED CAPAPCITY (MW)	MISCELLANEOUS NON-AVAILABILITY (%)
		3	20.00	42.76
	TOTAL		**63.20**	**50.02**
178	**PANCHET HPS**	1	40.00	0.00
		2	40.00	0.00
	TOTAL		**80.00**	**0.00**
	GIPL			
179	**CHUZACHEN HPS**	1	55.00	38.74
		2	55.00	50.38
	TOTAL		**110.00**	**44.56**
	JUUNL			
180	**SUBERNREKHA-I HPS**	1	65.00	0.00
	TOTAL		**65.00**	**0.00**
181	**SUBERNREKHA-II HPS**	2	65.00	0.00
	TOTAL		**65.00**	**0.00**
	MBPC			
182	**RONGNICHU HPS**	1	56.50	46.85
		2	56.50	46.57
	TOTAL		**113.00**	**46.71**
	NHPC			
183	**RANGIT HPS**	1	20.00	27.55

SL.No.	UTILITY/STATION	UNIT No.	INSTALLED CAPAPCITY (MW)	MISCELLANEOUS NON-AVAILABILITY (%)
		2	20.00	18.59
		3	20.00	21.20
	TOTAL		**60.00**	**22.45**
184	**TEESTA LOW DAM-III HPS**	1	33.00	261.78
		2	33.00	152.81
		3	33.00	256.90
		4	33.00	153.41
	TOTAL		**132.00**	**206.22**
185	**TEESTA LOW DAM-IV HPS**	1	40.00	142.40
		2	40.00	145.00
		3	40.00	31.52
		4	40.00	39.72
	TOTAL		**160.00**	**89.66**
186	**TEESTA V HPS**	1	170.00	5.87
		2	170.00	10.23
		3	170.00	6.99
	TOTAL		**510.00**	**7.70**
	OHPC			
187	**BALIMELA HPS**	1	60.00	0.44
		2	60.00	0.51

SL.No.	UTILITY/STATION	UNIT No.	INSTALLED CAPAPCITY (MW)	MISCELLANEOUS NON-AVAILABILITY (%)
		3	60.00	0.00
		4	60.00	0.00
		5	60.00	0.49
		6	60.00	0.26
		7	75.00	0.13
		8	75.00	0.12
	TOTAL		**510.00**	**0.24**
188	**CHIPLIMA HPS**	1	24.00	0.00
		2	24.00	0.00
		3	24.00	0.00
	TOTAL		**72.00**	**0.00**
189	**HIRAKUD HPS**	1	49.50	0.00
		2	49.50	0.00
		3	32.00	0.00
		4	32.00	0.00
		5	43.65	0.00
		6	43.65	0.00
		7	37.50	0.00
	TOTAL		**287.80**	**0.00**
190	**RENGALI HPS**	1	50.00	0.02

SL.No.	UTILITY/STATION	UNIT No.	INSTALLED CAPAPCITY (MW)	MISCELLANEOUS NON-AVAILABILITY (%)
		2	50.00	0.00
		3	50.00	0.00
		4	50.00	0.05
		5	50.00	0.00
	TOTAL		**250.00**	**0.01**
191	**UPPER INDRAVATI HPS**	1	150.00	0.00
		2	150.00	0.00
		3	150.00	0.00
		4	150.00	0.00
	TOTAL		**600.00**	**0.00**
192	**UPPER KOLAB HPS**	1	80.00	0.00
		2	80.00	0.00
		3	80.00	0.00
		4	80.00	0.00
	TOTAL		**320.00**	**0.00**
	SEPL			
193	**TASHIDING HPS**	1	48.50	0.00
		2	48.50	0.00
	TOTAL		**97.00**	**0.00**
	SKPPPL			

SL.No.	UTILITY/STATION	UNIT No.	INSTALLED CAPAPCITY (MW)	MISCELLANEOUS NON-AVAILABILITY (%)
194	**DIKCHU HPS**	1	48.00	0.08
		2	48.00	0.07
	TOTAL		**96.00**	**0.08**
	TUL			
195	**TEESTA-III HPS**	1	200.00	0.08
		2	200.00	0.26
		3	200.00	0.27
		4	200.00	0.26
		5	200.00	0.27
		6	200.00	0.27
	TOTAL		**1200.00**	**0.24**
	WBSEDCL			
196	**JALDHAKA HPS ST-I**	1	9.00	0.00
		2	9.00	0.00
		3	9.00	0.00
		4	9.00	0.00
	TOTAL		**36.00**	**0.00**
197	**PURULIA PSS HPS**	1	225.00	0.00
		2	225.00	0.00
		3	225.00	0.00

SL.No.	UTILITY/STATION	UNIT No.	INSTALLED CAPAPCITY (MW)	MISCELLANEOUS NON-AVAILABILITY (%)
		4	225.00	0.00
	TOTAL		**900.00**	**0.00**
198	**RAMMAM HPS**	1	12.50	31.27
		2	12.50	42.08
		3	12.50	7.86
		4	12.50	33.92
	TOTAL		**50.00**	**28.78**
	North Eastern			
	APGCL			
199	**KARBI LANGPI HPS**	1	50.00	24.59
		2	50.00	13.31
	TOTAL		**100.00**	**18.95**
	MeECL			
200	**KYRDEMKULAI HPS**	1	30.00	4.36
		2	30.00	8.78
	TOTAL		**60.00**	**6.57**
201	**MYNTDU(LESHKA) St-1 HPS**	1	42.00	6.02
		2	42.00	11.57
		3	42.00	1.54
	TOTAL		**126.00**	**6.38**

SL.No.	UTILITY/STATION	UNIT No.	INSTALLED CAPAPCITY (MW)	MISCELLANEOUS NON-AVAILABILITY (%)
202	**NEW UMTRU HPS**	1	20.00	0.49
		2	20.00	13.93
	TOTAL		**40.00**	**7.21**
203	**UMIAM HPS ST-I**	1	9.00	18.46
		2	9.00	1.75
		3	9.00	16.57
		4	9.00	6.81
	TOTAL		**36.00**	**10.90**
204	**UMIAM HPS ST-IV**	7	30.00	2.83
		8	30.00	0.66
	TOTAL		**60.00**	**1.75**
	NEEPCO.			
205	**DOYANG HPS**	1	25.00	20.70
		2	25.00	18.05
		3	25.00	16.33
	TOTAL		**75.00**	**18.36**
206	**KAMENG HPS**	1	150.00	0.00
		2	150.00	0.00
		3	150.00	0.00
		4	150.00	0.00

SL.No.	UTILITY/STATION	UNIT No.	INSTALLED CAPAPCITY (MW)	MISCELLANEOUS NON-AVAILABILITY (%)
	TOTAL		**600.00**	**0.00**
207	**KHONDONG HPS**	1	25.00	0.00
		2	25.00	0.00
	TOTAL		**50.00**	**0.00**
208	**KOPILI HPS**	1	50.00	0.00
		2	50.00	0.15
		3	50.00	0.13
		4	50.00	0.34
	TOTAL		**200.00**	**0.15**
209	**PARE**	1	55.00	0.88
		2	55.00	0.86
	TOTAL		**110.00**	**0.87**
210	**RANGANADI HPS**	1	135.00	0.02
		2	135.00	0.00
		3	135.00	0.00
	TOTAL		**405.00**	**0.01**
211	**TUIRIAL HPS**	1	30.00	9.84
		2	30.00	10.93
	TOTAL		**60.00**	**10.38**
	NHPC			

SL.No.	UTILITY/STATION	UNIT No.	INSTALLED CAPAPCITY (MW)	MISCELLANEOUS NON-AVAILABILITY (%)
212	**LOKTAK HPS**	1	35.00	66.29
		2	35.00	65.57
		3	35.00	46.39
	TOTAL		**105.00**	**59.42**

CHAPTER-8

GENERATION PROGRAMME FOR THE YEAR 2024-25

CHAPTER 8

GENERATION PROGRAMME FOR THE YEAR 2024-25

8.1 As on 31.03.2024, 212 HE Stations (of more than 25 MW capacity) having total installed capacity of 46928.17 MW are being monitored in the country. With the addition of new hydro units during 2024-25, the anticipated installed capacity of H.E. Stations in the country is likely to be 48658.17 MW by 31st March, 2025. The overall Generation Programme for H.E. stations for the year 2024-25 has been fixed at 155709 MU comprising 144709 MU from HE Stations in India and 8000 MU import from Bhutan, which is 16938.98 MU more than actual generation during 2023-24 (i.e.138770.02 MU comprising 134053.92 MU from HE Stations in India and 4716.1 MU import from Bhutan).

8.2 Region-wise summary of likely installed capacity as on 31.03.2025, Generation targets for 2024-25 and the hydro generation during 2023-24 are given in **Table 8.1** below:

TABLE 8.1

REGION-WISE LIKELY INSTALLED CAPACITY OF HE STATIONS AND HYDRO GENERATION PROGRAMME DURING 2024-25

Sl. No.	Region	Likely Hydro Installed Capacity (as on 31.03.2025) (MW)	Hydro Generation Programme for 2024-25 (MU)	Hydro Generation during 2023-24 (MU)	
				Programme	Actual
1.	Northern	20924.27	80886.00	77797.00	73088.83
2.	Western	7392.00	16573.00	15491.00	16587.36
3.	Southern	12327.15	30878.00	31078.00	20308.65
4.	Eastern	5987.75	12220.0	20178.00	17785.34
5.	North-Eastern	2027.0	7152.00	12156.00	6283.74
Sub total		**48658.17**	**147709.00**	**156700.00**	**134053.92**
6.	Import – from Bhutan		8000	8000	4716.10
Total (Including Import from Bhutan)			**155709.00**	**164700.00**	**138770.02**

8.3 While finalizing the Generation Programme for 2024-25 during last quarter of 2023-24, it was anticipated that 5 nos. H.E. stations having installed capacity of 1690 MW would be added during the year 2024-25. Unit-wise details of these units are given in **Annex-8.1**.

8.4 Sector-wise and Utility-wise details of likely installed Capacity as on 31.03.2025, targets and actual generation during 2023-24, generation target for 2024-25 are given in **Annex-8.2**.

Annex-8.1

Hydro Electric Projects likely to be commissioned in 2024-25

S. No.	Name of Hydro Power Project	Unit No.	Present Likely date of commissioning as per CEA/Utility	I.C (MW)	Present Capacity Addition Programme during
Central Sector					
1	Parbati-II /NHPC	1 to 4	U-1 to 4 (Mar 2025)	800	2024-25
2	Tehri PSS/THDC	1	U-1 (Mar 2025)	250	2024-25
	Sub Total (Central Sector)			**1050**	
State Sector					
1	Pallivasal (KSEBL-Kerala)	1 & 2	U- 1 & 2 (Feb 2025)	60	2024-25
2	Uhl-III / BVPCL	1 & 2	U- 1 to 2 (Mar 2025)	100	2024-25
	Sub Total (State Sector)			**160**	
Private Sector					
1	Pinapuram/Greenko	1 to 2	U- 1 to 2 (Mar 2025)	480	2024-25
	Sub Total (Private Sector)			**480**	
Grand Total				**1690**	

Annex-8.2

SECTOR-WISE PERFORMANCE OF HYDROELECTRIC STATIONS DURING 2023-2024 & TARGETS FOR 2024-2025

SECTOR/ UTILITY	Likely Hydro Installed Capacity as on 31.03.2025	Generation during 2023-2024 (MU)		Generation Programme for 2024-25 (MU)
		Targets	Actual	
A. CENTRAL SECTOR				
BBMB	2954.30	9700.00	11583.17	9650.00
NHPC Ltd	6251.20	25628.00	21585.84	25401.00
SJVN Ltd	1972.02	9080.00	8088.21	9145.00
NTPC Ltd	800.00	3100.00	2952.05	3100.00
THDC Ltd	1650.00	4160.00	4441.69	5269.00
NHDC Ltd.	1520.00	3265.00	4470.50	3265.00
DVC	143.20	286.00	176.28	286.00
NEEPCO Ltd.	1500.00	10366.00	4848.09	5247.00
Sub Total	**16792.72**	**65585.00**	**58145.83**	**61363.00**
B. STATE ELECTRICITY BOARDS/CORPORATIONS				
JKSPDCL	1110.00	5551.00	4781.78	5073.00
HPPCL	406.00	874.00	846.26	890.00
HPSEBL	372.00	1653.00	1278.95	1693.00
RRVUNL	411.00	672.00	1013.97	662.00
PSPCL	1051.00	3665.00	3956.85	3640.00
UPJVNL	501.60	1324.00	850.64	1215.00
UJVNL	1372.15	5135.00	4722.42	5069.00
SSNNL	1450.00	3100.00	3699.72	3955.00
GSECL	540.00	1051.00	856.61	1051.00
MAHAGENCO	2406.00	3888.00	3316.20	4051.00
MPPGCL	875.00	2407.00	2341.49	2461.00
CSPGCL	120.00	274.00	321.76	274.00
APGENCO	1796.75	3605.00	2334.98	3557.00
TSGENCO	2405.60	3969.00	1243.29	3686.00
KPCL	3617.20	12242.00	8874.40	11537.00
KSEBL	1964.15	7668.00	5155.72	7519.00
TANGEDCO	2178.20	4220.00	3563.28	4329.00
JUUNL	130.00	110.00	96.84	110.00
OHPC	2039.80	5363.00	5299.18	5684.00
TUL	1200.00	5652.00	4292.76	0.00
WBSEDCL	986.00	1560.00	1683.07	1600.00
APGCL	100.00	380.00	328.89	380.00
MePGCL	322.00	1106.00	808.58	1107.00
BVPCL	100.00	-	-	40.0

SECTOR/ UTILITY	Likely Hydro Installed Capacity as on 31.03.2025	Generation during 2023-2024 (MU)		Generation Programme for 2024-25 (MU)
		Targets	Actual	
Sub Total	**27454.45**	**75469.00**	**61667.64**	**69543.00**
C. PRIVATE SECTOR				
MPCL	86.00	332.00	249.06	333
EPPL	100.00	348.00	140.74	340
ADHPL	192.00	653.00	587.67	660
GBHPPL	70.00	293.00	256.33	274
HBPCL	300.00	1213.00	1162.78	1213
JSW ENERGY	1045.00	4132.00	3786.39	4131
IAEPL	36.00	158.00	154.99	158
AHPC LTD	330.00	1310.00	1306.39	1310
JPVL	400.00	1750.00	1627.52	1750
DLHP	34.00	36.00	23.48	36
GIPL	110.00	537.00	473.07	537
TPCL	447.00	1470.00	1557.60	1480
DEPL	96.00	412.00	356.93	425
SEPL	97.00	436.00	433.19	435
SNEHA KINETIC	96.00	463.00	394.08	495
NTPGPL	0.00	50.00	0.00	300
HSPPL	100.00	402.00	231.57	402
L&T	99.00	439.00	393.66	410
GMR	180.00	770.00	708.17	769
MBPC	113.00	442.00	396.83	465
GREENKO	480.00	0.00	0.00	880
Sub Total	**4441.00**	**15646.00**	**14240.45**	**16803.00**
Total All India	**48658.17**	**156700.00**	**134053.92**	**147709.00**
Import from Bhutan		**8000**	**4716.10**	**8000**
Total Hydro generation including import from Bhutan		**164700.00**	**138770.02**	**155709.00**

CHAPTER-9

RENOVATION & MODERNISATION OF HYDRO-ELECTRIC STATIONS

CHAPTER – 9

9. RENOVATION & MODERNISATION OF HYDRO ELECTRIC POWER PROJECTS

9.1 R&M Phase-I Programme

Recognising the benefits of the R&M programme, Govt. of India set up a National Committee in 1987 to formulate strategy on R&M of hydro power projects. Based on the recommendations of the National Committee and subsequent reviews, a programme for Renovation, Modernization and Uprating of Hydro Power Stations was formulated by Central Electricity Authority in which 55 schemes were identified with an aggregate capacity of 9653 MW. The total cost of these schemes were estimated as Rs.1493 Crores with expected benefit of 2531 MW.

9.2 R&M Phase-II Programme

As per the hydro policy of Govt. of India declared in 1998, Renovation & Modernization of Hydro Power Plants was accorded priority. Accordingly, 67 hydro R&M schemes having an aggregate capacity of 10318 MW were identified to be undertaken under Phase-II programme till the end of X Plan to accrue a benefit of 3685 MW at an estimated cost of Rs. 2161 Crores.

9.3 National Perspective Plan

CEA formulated the National Perspective Plan for hydro power stations in the year 2000 and incorporated R&M proposals under Phase-II programme alongwith the left out schemes as recommended in Phase-I programme of National Committee. The left out schemes were those which were either under implementation or were yet to be implemented. This Perspective Plan was for IX, X and XI Plan with 117 schemes having an aggregate installed capacity of 19370 MW with benefit of 7755MW at an estimated cost of Rs.4654 Crores.

9.4 Achievements during VIII, IX, X, XI, XII Plan and Period 2017-22

The R&M works at 118 (26 in Central and 92 in State Sector) hydro power plants (13 up to the VIII Plan, 20 in the IX Plan, 32 in the X Plan, 18 in the XI Plan, 21 in the XII Plan & 14 during 2017-22) with an aggregate installed capacity of 22634.7 MW had been completed by the end of the year 2017-22 and total a benefit of 4139.56 MW through Life Extension (LE), Uprating (U) and Restoration had been accrued. The State-wise list of Hydro RM&U Schemes completed during VIII, IX, X, XI XII Plans and 2017-22 are given at Annex-9.1, 9.2, 9.3, 9.4, 9.5 and 9.6 respectively.

9.5 Programme during the period 2022-27

The Renovation, Modernization, Uprating and Life Extension works at 57 Hydro Electric Plants (HEPs) with an aggregate installed capacity of 10583.9 MW is programmed for completion during the year 2022-27 with its break-up as 2041.8 MW through R&M at 12 HEPs, 6399.1 MW through Life Extension at 32 HEPs and 2143 MW through Life Extension and Uprating at 13 HEPs. The 13 HEPs where both Life Extension & Uprating are envisaged, the aggregate installed capacity of 2143 MW shall get uprated after completion of R&M works to 2395.5 MW resulting in additional benefit of installed capacity of 252.5 MW. As such, the revised aggregate installed capacity after completion of RMU&LE works of these 57 projects would be 10836.4 MW. The State-wise list of hydro R&M schemes expected for completion during the year 2022-27 is given at Annex-9.7.

9.6 Programme during the period 2027-32

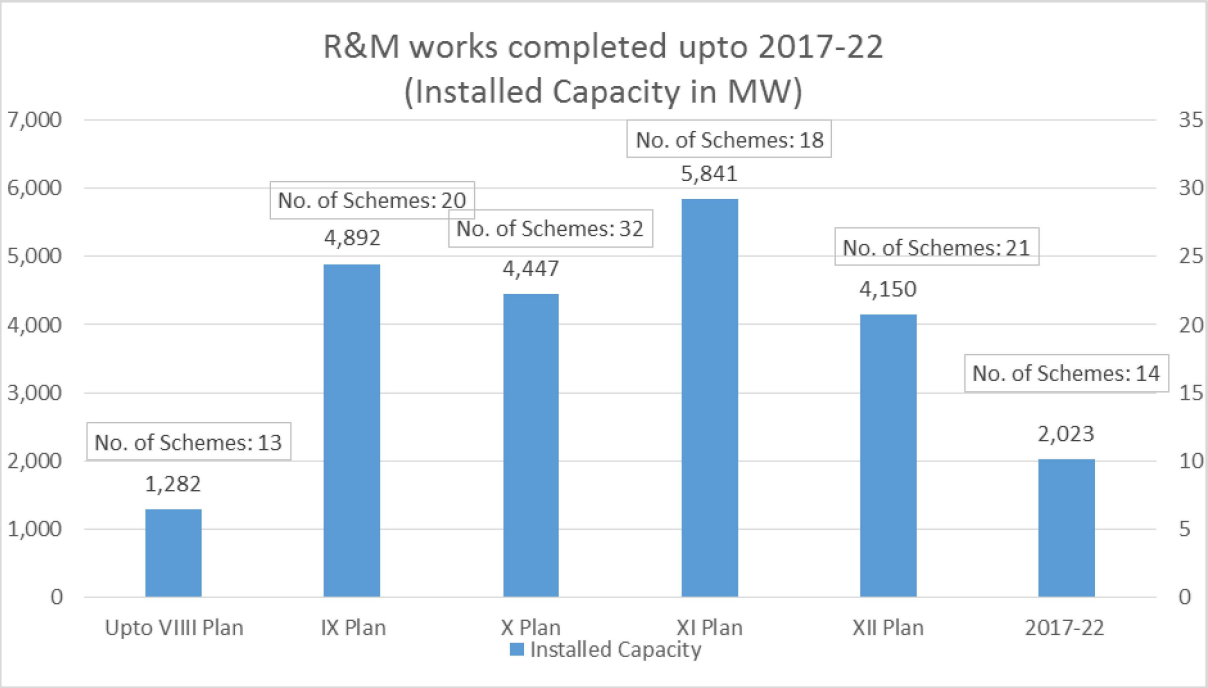
The Renovation, Modernization, Uprating and Life Extension works at 23 Hydro Electric Plants (HEPs) with an aggregate installed capacity of 3129.20 MW is programmed for completion during 2027-32 through Life Extension and Uprating. The State-wise list of hydro R&M schemes expected for completion during 2027-32 is given at Annex-9.8.

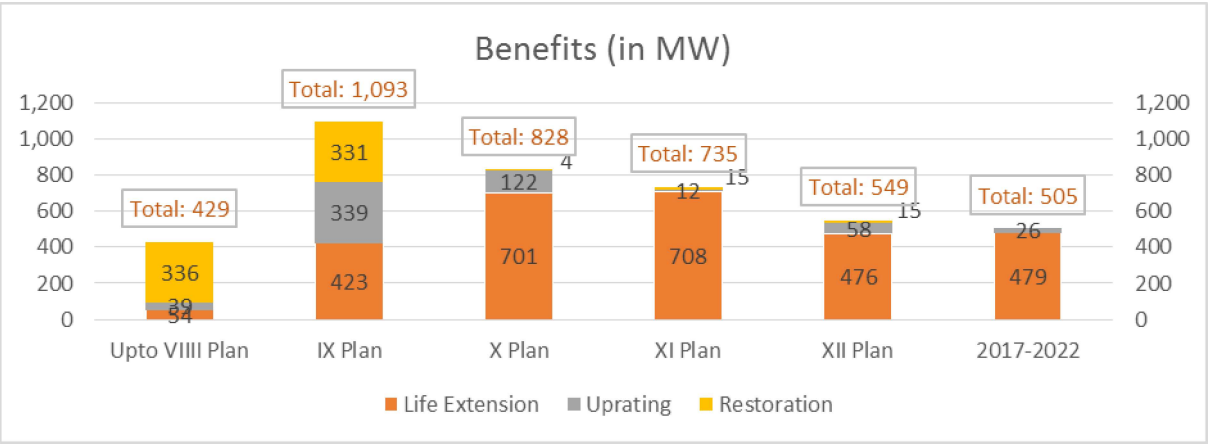
Plan-wise summary of R&M of H.E. Projects starting from VIII Plan is given below:

9.7 Summary of R&M of Hydro Electric Projects (As on 31.03.2024)

I Hydro R&M schemes completed up to 2017-22

Sl. No.	Plan Period	No. of Projects			Installed Capacity (MW)	Actual Expenditure (Rs. in Crs)	Benefit (MW)
		Central Sector	State Sector	Total			
1.	Upto VIII Plan Schemes	2	11	13	1282.00	127.37	429.00 [39.00(U) + 54.00LE+ 336.00(Res.)]
2.	IX Plan Schemes	8	12	20	4892.10	570.16	1093.03 [339.00(U)+ 423.00(LE) + 331.03(Res.)]
3.	X Plan Schemes	5	27	32	4446.60	1029.24	827.73 [122.05(U) + 701.25 (LE) + 4.43(Res.)]
4.	XI Plan Schemes	4	14	18	5841.20	294.84	735 [12 (U) + 708 (LE) + 15 (Res.)]
5.	XII Plan Schemes	2	19	21	4149.60	1146.02	549.40 [58 (U)+ 476.40 (LE)+15(Res.)]
6.	2017-2022	5	9	14	2023.2	848.68	505.4 [479.2(LE) + 26.2(U)]
	Total	26	92	118	22634.7	4016.31	4139.56 [596.25 (U)+ 2841.85 (LE)+ 701.46 (Res.)]





II Programme & Completion of R&M works during 2022-27

Sl. No.	Category	No. of Projects			Capacity covered under RMU&LE (MW)	Benefit (MW)
		Central Sector	State Sector	Total		
1.	Programmed	8	49	57	10583.9	8794.60 [8542.1(LE)+ 252.5(U)]
2.	Completed	1	9	10	2300.8	1191 [1101 (LE)+ 90(U)]
3.	Under Implementation	4	19	23	3599.75	2905.25 [2857.75(LE)+ 47.5(U)]
4.	Under Tendering	1	5	6	810	736 [710(LE)+26(U)]
5.	Under DPR Preparation/ Finalisation/ Approval	0	5	5	1385	1391 [1385(LE)+ 6(U)]
6.	Under RLA Studies	2	11	13	2488.35	2571.35 [2488.35(LE)+ 83(U)]

III Programme of R&M works during 2027-32

Sl. No.	Category	No. of Projects			Capacity covered under RMU&LE (MW)	Benefit (MW)
		Central Sector	State Sector	Total		
1.	Programmed	3	20	23	3129.2	3140.03 [3129.2(LE)+ 10.83(U)]
2.	Under Implementation	0	0	0	0	0
3.	Under Tendering	0	1	1	115	125.83 [115(LE)+ 10.83(U)]
4.	Under DPR Preparation/Finalisation/ Approval	0	2	2	250	250 [250(LE)+ 0(U)]
5.	Under RLA Studies	3	17	20	2764.2	2764.2 [2764.2(LE)+ 0(U)]

9.8 Achievement during the year 2023-24

R&M works of the following Three (3) Schemes with an aggregate installed capacity of about 831 MW have been completed during the year 2023-24 which has resulted in benefit of 591 MW through Life Extension and 90 MW through Uprating:

S. No.	Name of Scheme, Utility/Agency	Capacity under R&M (No. x MW)	Category	Cost (in Rs. Crores)	Benefit (MW)
1	Bhakra LB, BBMB	5x108	RMU&LE	583.86	540.00(LE)+ 90.00 (U)
2	Dhalipur, UJVNL	3x17	RM&LE	110.13	51 (LE)
3	Gerusoppa Dam Power House, KPCL	4x60	R&M	2.026	-

Abbreviations:

R&M – Renovation & Modernisation,
RM&U – Renovation Modernisation & Uprating, RM&LE – Renovation, Modernisation & Life Extension,
RMU&LE – Renovation, Modernisation, Uprating & Life Extension,
Res. – Restoration
RLA- Residual Life Assessment

9.9 Programme for the year 2024-25

For the year 2024-25, it is programmed to complete following 10 schemes having an installed capacity of 1268 MW, which will result in benefit of extension of operational life for installed capacity of 783 MW and also increase in installed capacity by 6 MW.

S. No.	Name of Scheme, Utility/Agency	Capacity under R&M (No.	Category	Estimate Cost (in Rs. Crores)	Benefit (MW)

		MW)			
1	Obra, UPJVNL	3x33	RM&LE	58.80	99 (LE)
2	Shivasamudram, KPCL	6x3+4x6	RM&LE	169.18	42 (LE)
3	Kadra Dam Power House, KPCL	3x50	R&M	44.47	-
4	Kodasalli Dam Power House, KPCL	3x40	R&M	50.60	-
5	Moyar PH, TNPGCL	3x12	RMU&LE	121.127	36 (LE)+ 6(U)
6	Sabarigiri (Unit- 6 & Unit 2), KSEB	1x55+1x60	R&M	-	-
7	Balimela, OHPCL	6x60	RM&LE	382.91	360(LE)
8	Kopili Power Station, NEEPCO	4x50	RM&LE	1075.19	200(LE)
9	Khandong Power Station, NEEPCO	2x23	RM&LE	277.74	46 (LE)
10	Supa Dam Power House, KPCL	2x50	R&M	47.91	-

Annex-9.1

State-wise List of Hydro RMU&LE schemes completed upto the VIII Plan

Sl. No.	Project, Agency	CS/ SS	Inst. Cap. (MW)	Est. Cost (Rs. in Crs.)	Actual Exp. (Rs. in Crs.)	Benefits (MW)	Category	Year of Completion
Himachal Pradesh								
1	Bairasiul, NHPC	CS	3x60	25.98	25.98	18 (U)	RM&U	1991-92
2	Giri, HPSEB	SS	2x30	9.85	7.90	6 (U)	RM&U	1995-96
Punjab								
3	UBDC-I, PSPCL	SS	3x15	11.00	8.00	11 (Res)	R&M+Res.	1991-92
Uttar Pradesh								
4	Rihand, UPJVNL	SS	6x50	1.43	1.43	100(Res.)	R&M+Res.	1995-96
Karnataka								
5	Nagjhari, U-2, KPCL	SS	1x135	11.97	11.32	15 (U)	RM&U	1995-96
6	Shivasamudram, VVNL	SS	6x3 + 4x6	8.00	8.00	18 (LE)	RM&LE	N.A.
Kerala								
7	Sholayar, KSEB	SS	3x18	7.58	7.58	-	R&M	1996-97
Tamil Nadu								
8	Kadamparai (Units 3&4), TANGEDCO	SS	2x100	23.17	33.69	200(Res.)	R&M+Res.	1993-95
9	Kundah III (Units 1&2), TANGEDCO	SS	2x60	5.45	3.20	-	R&M	1991-92
10	Moyar, TANGEDCO	SS	3x12	1.62	1.30	36.00 (LE)	RM&LE	1990-91
11	Sholayar-I, TANGEDCO	SS	2x35	1.40	0.85	-	R&M	1994-95
Assam								
12	Khandong, U-1, NEEPCO	CS	1x25	0.62	0.62	25 (Res)	R&M+Res.	1991-92
Tripura								
13	Gumti, TPGL	SS	3x5	17.50	17.50	-	R&M	1994-95
Total			**1282**	**125.57**	**127.37**	**429 [39 (U) + 54(LE) + 336(Res)]**		

Abbreviations: R&M – Renovation & Modernisation;. U – Uprating; LE – Life Extension; Res – Restoration; MW – Mega Watt; CS-Central Sector: SS- State Sector

Annex-9.2
(Sheet 1/2)

State-wise List of Hydro RMU&LE schemes completed in the IX Plan

Sl. No.	Project, Agency	CS/ SS	Inst. Cap. (MW)	Est. Cost (Rs. in Crs.)	Actual Exp. (Rs. in Crs.)	Benefits (MW)	Category	Year of Completion
Himachal Pradesh								
1	Bhakra RB BBMB	CS	5x132	88.45	90.68	125.00 (U)	RM&U	2000-01
2	Dehar U-2 BBMB	CS	1x165	10.74	10.74	25.00 (Res.)	R&M+Res.	1998-99
3	Bairasiul, NHPC	CS	3x66	18.45	18.45	-	R&M	2000-01
4	Bassi, HPSEB	SS	4x15	5.35	4.34	-	R&M	2000-01
Jammu & Kashmir								
5	Salal St.I, NHPC	CS	3x115	51.50	51.50	-	R&M	2000-01
6	Chenani, J&KSPDC	SS	5x4.66	11.00	11.00	0.93 (Res)	R&M+Res.	2000-01
Punjab								
7	Ganguwal, U-2 BBMB	CS	1x24.2	18.90	15.00	22.00 (LE)+ 2.20 (Res)	RM&LE+Res	1997-98
8	Kotla, U-3, BBMB	CS	1x24.2	18.90	16.90	22.00 (LE)+ 2.20 (Res)	RM&LE+Res	1998-99
9	Ganguwal U-3, BBMB	CS	1x24.2	25.00	43.40	22.00 (LE)+ 2.20 (Res)	RM&LE+Res	2000-01
10	Kotla U-2, BBMB	CS	1x24.2	25.00		22.00 (LE)+ 2.20 (Res)	RM&LE+Res	2001-02
Uttarakhand								
11	Chilla U-1, 3& 4, UJVNL	SS	3x36	4.25	4.11	-	R&M	1998-99
12	Tiloth, UJVNL	SS	3x30	8.02	5.51	6.00 (U)	RM&U	1998-99
Andhra Pradesh								
13	Lower Sileru, APGENCO	SS	4x115	13.35	9.30	24.00 (Res)	R&M+Res.	2001-02
14	Srisailam RB, APGENCO	SS	7x110	16.32	11.40	-	R&M	2001-02
Karnataka								
15	Sharavathy, U-1 to 8, KPCL	SS	8x89.1	65.00	63.49	115.20 (U) +178.20 (Res)	RM&U+Res	1997-98
16	Sharavathy, U-9&10, KPCL	SS	2x89.1	17.96	14.68	28.80(U) +19.10 (Res)	RM&U+Res	1997-98

Annex-9.2
(Sheet 2/ 2)

Sl. No	Project, Agency	CS/ SS	Inst. Cap. (MW)	Est. Cost (Rs. in Crs.)	Actual Exp. (Rs. in Crs.)	Benefits (MW)	Category	Year of Completion
Orissa								
17	Hirakud-I, U1&2, OHPC	SS	2x37.5	95.10	95.10	24.00(U) +75.00(LE)	RMU&LE	1997-98
Gujarat								
18	Ukai,U-1&3, GSECL	SS	2x75	24.99	24.99	75.00 (Res.)	R&M+Res.	1997-98
Maharashtra								
19	Koyna I&II, MSPGCL	SS	4x65+ 4x75	74.91	74.91	40.00(U) + 260.00(LE)	RM&U of St-I & II & LE of St-I	1999-2000
20	Koyna III, U-10, 11 &12, MSPGCL	SS	3x80	4.65	4.65	-	R&M	1997-98
Total			**4892.10**	**597.84**	**570.16**	**1093.03 [339.0(U) + 423.0(LE) + 331.03(Res.)]**		

Abbreviations: R&M – Renovation & Modernisation;. U – Uprating; LE – Life Extension;
Res – Restoration; MW – Mega Watt; CS-Central Sector: SS- State Sector

Annex- 9.3
(Sheet 1/ 3)

State-wise List of Hydro RMU&LE schemes completed in the X Plan

Sl. No.	Project, Agency	CS/ SS	Inst. Cap. (MW)	Est. Cost (Rs. in Crs.)	Actual Exp. (Rs. in Crs.)	Benefits (MW)	Category	Year of Completion
Himachal Pradesh								
1	Pong, BBMB	CS	6x60	17.70	17.79	36.00(U)	RM&U	2003-04
Punjab								
2	Ganguwal,U-1, BBMB	CS	1x29.25	51.28	81.99	25.89 (LE) +2.10	RM&LE+Res.	2006-07
2	Kotla, U-1, BBMB	CS	1x29.25	51.28		2.33 (Res.)	RM&LE+Res.	2006-07
4	Shanan Ph.A, PSPCL	SS	4x15+ 1x50	11.35	10.93	-	R&M	2003-04
5	Shanan, Ph.B, PSPCL	SS	4x15+ 1x50 $	35.95	13.34	60.00(LE)	RM&LE(LE for 15 MW units+R&M for 50 MW unit	2006-07
6	Anandpur Sahib, PSPCL	SS	4x33.5	3.68	1.04	-	R&M	2006-07
7	UBDC I&II, PSPCL	SS	3x15+ 3x15.45	7.89	2.44	45.00 (LE)	RM&LE(LE for 3x15MW&R &M for 3x15.45 MW	2006-07
8	Mukerian St.I, PSPCL	SS	3x15	6.04	4.38	-	R&M	2006-07
Uttarakhand								
9	Chibro, UJVNL	SS	4x60	10.45	10.52	-	R&M	2006-07
Karnataka								
10	Nagjhari, U-1&3,KPCL	SS	2x135	26.12	21.62	30 (U)	RM&U	2002-03
11	Supa PH, KPCL	SS	2x50	2.64	2.47	-	R&M	2002-03
12	Mahatma Gandhi, VVNL	SS	4x12+ 4x18	44.66	43.13	19.20 (U) +120.00 (LE)	RMU&LE	2002-03
13	Munirabad, VVNL	SS	2x9+ 1x10.3	3.64	3.53	28.30 (LE)	RM&LE	2002-03

Annex- 9.3
(Sheet 2/3)

Sl. No	Project, Agency	CS/ SS	Inst. Cap. (MW)	Est. Cost	Actual Exp	Benefits (MW)	Category	Year of Completion
				(Rs. in Crs.)				
14	Mani Dam, KPCL	SS	2x4.5	1.00	1.00	-	R&M	2002-03
15	Shivasamudram, VVNL	SS	6x3+ 4x6	68.38	73.17	42.00 (LE)	RM&LE	2004-05
16	Bhadra, Ph.II, KPCL	SS	1x2	3.30	2.51	2.00 (LE)	RM&LE	2005-06
17	Varahi, KPCL	SS	2x115	2.57	2.66	-	R&M	2006-07
18	Sharavathy, Ph.A, KPCL	SS	10x103.5	5.22	3.52	-	R&M	2006-07
Kerala								
19	Neriamanga-lam KSEB	SS	3x15	58.00	53.05	7.65 (U) +45.00(LE)	RMU&LE	2006-07
20	Pallivasal, KSEB	SS	3x5+ 3x7.5	94.00	371.71	37.50 (LE)	RM&LE	2002-03
21	Sengulam, KSEB	SS	4x12	114.00		48.00 (LE)	RM&LE	2002-03
22	Panniar, KSEB	SS	2x15	62.00		30.00 (LE)	RM&LE	2002-03
Tamilnadu								
23	Pykara, TANGEDCO	SS	3x6.65+ 1x11+2x	26.06	20.147	58.95(LE)	RM&LE	2004-05
24	Papanasam, TANGEDCO	SS	4x7	27.05	22.61	4.00 (U) + 28.00 (LE)	RMU&LE	2005-06
Orissa								
25	Hirakud-I (Sw.yard), OHPC	SS		9.85	15.88	-	R&M	2006-07
26	Hirakud-I,U-3&4, OHPC	SS	2x24	126.14	108.86	16.00(U)+ 48.00(LE)	RMU&LE	2005-06
West Bengal								
27	Maithon, U-2, DVC	CS	1x20	42.08	36.94	3.20(U)+ 20.00(LE)	RMU&LE	2004-05
Maharastra								
28	Bhira Tail Race, MSPGCL	SS	2x40	1.60	0.70	-	R&M	2003-04
29	Tillari, MSPGCL	SS	1x60	4.50	4.24	6.0 (U)	RM&U	2004-05

Annex- 9.3

(Sheet 3/3)

Sl. No	Project, Agency	CS/ SS	Inst. Cap. (MW)	Est. Cost (Rs. in Crs.)	Actual Exp (Rs. in Crs.)	Benefits (MW)	Category	Year of Completion
30	Koyna Gen. Complex, MSPGCL	SS	4x70+4x 80+4x80	12.00	11.50	-	R&M	2004-05
Meghalaya								
31	Umium St.I, MePGCL	SS	4x9	81.88	84.21	36(LE)	RM&LE	2002-03
Assam								
32	Khandong, NEEPCO	CS	2x25	4.00	3.35	-	R&M	2003-04
Total			**4446.60**	**1016.31**	**1029.24**	**827.73 [122.05(U) +701.25(LE) + 4.43(Res.)]**		

$ - Installed Capacity of Shanan, Ph.B, at Sl. No. 5 not included in the total, as the same has been accounted for at Sl. No. 4.

Abbreviations: R&M – Renovation & Modernisation;. U – Uprating; LE – Life Extension; Res – Restoration; MW – Mega Watt; CS-Central Sector: SS- State Sector

Annex- 9.4
(Sheets 1 of 2)

State-wise List of Hydro RMU&LE schemes completed in the XI Plan

Sl. No	Project, Agency	CS/ SS	Inst. Cap. (MW)	Est. Cost (Rs . in crs)	Actual Exp (Rs . in crs)	Benefits (MW)	Category	Year of Completion
Himachal Pradesh								
1	Dehar Ph. A BBMB	CS	6x165	11.00	6.94	-	R&M	2010-11
2	Dehar Ph. B BBMB	CS	6x165	49.00	24.45	330(LE)	RM&LE	2009-10
Uttarakhand								
3	Tanakpur, NHPC	CS	3x31.4	10.77	11.95	-	R&M	2007-08
4	Khodri Ph.A, UJVNL	SS	4x30	5.25	6.39	-	R&M	2008-09
5	Chilla Ph.A, UJVNL	SS	4x36	23.55	21.24	-	R&M	2008-09
Andhra Pradesh								
6	Upper Sileru, APGENCO	SS	4x60	4.20	3.34	-	R&M	2009-10
Karnataka								
7	Nagjhari, U1 to 6, KPCL	SS	5x150 + 1x135	14.75	15.31	-	R&M	2009-10
8	Sharavathy Ph.B, KPCL	SS	10x103.5	20.50	11.14	-	R&M	2009-10
9	Supa, KPCL	SS	2x50	3.45	4.90	-	R&M	2009-10
10	Bhadra, KPCL	SS	2x12	1.44	0.85	-	R&M	2009-10
11	Lingnamakki, KPCL	SS	2x27.5	3.81	2.62	-	R&M	2010-11
Tamil Nadu								
12	Mettur Dam, TANGEDCO	SS	4x10	30.17	24.16	10 (U) + 40 (LE)	RMU&LE	2007-08
Maharashtra								
13	Koyna St.I&II, MSPGCL	SS	4x70 + 4x80	87.50	81.82	-	R&M	2008-09

Annex- 9.4

(Sheets 2 of 2)

Sl. No	Project, Agency	CS/ SS	Inst. Cap. (MW)	Est. Cost (Rs . in crs)	Actual Exp (Rs . in crs)	Benefits (MW)	Category	Year of Completion
14	Vaitarna, MSPGCL	SS	1x60	16.00	0.14	-	R&M	2009-10
15	Koyna Dam PH, MSPGCL	SS	2x18	5.78	0.25	-	R&M	2009-10
16	Koyna St.III, MSPGCL	SS	4x80	16.65	5.79	320 (LE)	RM&LE	2011-12
Manipur								
17	Loktak, NHPC	CS	3x30 derated	18.55	17.88	15.00 (Res.)	R&M + Res.	2011-12
Meghalaya								
18	Umium St.II, MePGCL	SS	2x9	90.46	55.67	2(U)+18.00(LE)	RMU&LE	2011-12
Total			**5841.2**	**412.83**	**294.84**	**735 [12.00(U) +708.00 (LE)+15.00 (Res)]**		

Abbreviations: R&M – Renovation & Modernisation;. U – Uprating; LE – Life Extension; Res – Restoration; MW – Mega Watt; CS-Central Sector: SS- State Sector

Annex- 9.5
(Sheet 1 of 2)

State-wise list of Hydro RMU&LE schemes completed in the XII Plan

Sl. No	Project, Agency	CS/ SS	Inst. Cap. (No.x.MW)	Est. Cost (Rs . in Crs)	Actual Exp (Rs . in Crs)	Benefits (MW)	Capacity after RMU&LE (MW)	Category	Year of Completion
Himachal Pradesh									
1	Bassi, HPSEB	SS	4x15	124.25	158.26	6.0(U)+ 60(LE)	66	RMU&LE	2013-14
Jammu & Kashmir									
2	Lower Jhelum, J&KSPDC	SS	3x35	101.3	96.10	15.00(Res)	105	R&M+ Res.	2014-15
3	Sumbal Sindh, J&KSPDC	SS	2x11.3	25.00	24.59	-	22.6	R&M	2016-17
Uttarakhand									
4	Pathri, UJVNL	SS	3x6.8	113.25	108.3	20.40(LE)	20.4	RM&LE	2014-15
5	Khatima, UJVNL	SS	3x13.8	256.77	148.88	41.40 (LE)	41.4	RM&LE	2016-17
Uttar Pradesh									
6	Matatila, UPJVNL	SS	3x10.2	10.29	7.21	30.6 (LE)	30.6	RM&LE	2015-16
Andhra Pradesh									
7	Lower Sileru, APGENCO	SS	4x115	8.75	6.77	-	460	R&M	2013-14
8	Srisailam RB, APGENCO	SS	7x110	16.70	17.60	-	770	R&M	2015-16
Telangana									
9	Nagarjuna Sagar Ph-I works, TSGENCO	SS	1x110+ 7x100.8	33.35	13.90	-	815.6	R&M	2012-13
Karnataka									
10	Supa, KPCL	SS	2x50	3.45	3.88	-	100	R&M	2014-15
11	Nagjhari,U-1 to 6, KPCL	SS	1x135 (U-6)	69.21	64.49	15 (U)	150	RM&U	2015-16
12	Sharavathy Genarating Station (Ph B), KPCL	SS	10x103.5	20.00	29.27	-	1035	R&M	2016-17
Kerala									
13	Idamalayar, KSEB	SS	2x37.5	14.50	13.22	-	75	R&M	2012-13

Annex- 9.5

(Sheet 2 of 2)

Sl. No	Project, Agency	CS/ SS	Inst. Cap. (No.x.MW)	Est. Cost (Rs . in Crs)	Actual Exp (Rs . in Crs)	Benefits (MW)	Capacity after RMU&LE	Category	Year of Completion
14	Sabarigiri, U-4 KSEB	SS	1x55	52.20	50.41	5(U)	60	RM&U	2014-15
15	Poringalkuthu, KSEB	SS	4x8	88.63	51.90	4 (U)+ 32.00 (LE)	36	RMU&LE	2015-16
Tamil Nadu									
16	Periyar, TANGEDCO	SS	4x35	161.18	133.68	28.00(U)+ 140(LE)	168	RMU&LE	2015-16
Odisha									
17	Rengali Unit-1 OHPC	SS	1x50	47.50	36.76	50(LE)	50	RM&LE	2012-13
18	Rengali Unit-2 OHPC	SS	1x50	25.20	20.73	50(LE)	50	RM&LE	2013-14
West Bengal									
19	Jaldhaka St.I, WBSEDCL	SS	3x9	88.62	79.97	27 (LE)	27	RM&LE	2016-17
Assam									
20	Khandong, NEEPCO	CS	1x25	25.05	29.18	25(LE)	25	RM&LE	2014-15
21	Kopili, NEEPCO	CS	2x50	50.22	50.92	-	100	R&M	2014-15
Total			**4149.60**	**1335.42**	**1146.02**	**549.40 [58(U)+ 476.40 (LE) + 15 (Res)]**	**4207.6**		

State-wise list of Hydro RMU&LE schemes completed during 2017-22

Sl. No	Name of Project, Agency, Inst. Cap. (No. x MW)	CS/ SS	Capacity Covered Under RMU&LE (No.x MW)	Est. Cost (Rs. in Crs.)	Actual Exp. (Rs. in Crs.)	Benefits (MW)	Capacity after RMU&LE (MW)	Category	Year of Completion
A. COMPLETED SCHEMES IN 2017-22									
Jammu & Kashmir (UT)									
1	Salal, NHPC (6x115)	CS	5x115	58.01	51.08	-	575	R&M	Completed in 2019-20
2	Chenani, J&KSPDC (5x4.66)	SS	5x4.66	34.28	21.84	23.30 (LE)	23.3	RM&LE	Completed in 2021-22
3	Ganderbal, (Unit-3) J&KSPDC (2x3+2x4.5)	SS	1x4.5	18.00	3.26	4.5 (LE)	4.5	RM&LE	Completed in 2021-22
Panjab									
4	Ganguwal, BBMB (1x29.25+2x24.2) & Kotla, BBMB (1x29.25+2x24.2)	CS	1x24.2 (U-2) 1x24.2 (U-3)	14.19	9.58	48.4 (LE)	48.4	RM&LE	Completed in 2017-18
Himachal Pradesh									
5	Dehar Power House (Unit-6), BBMB (6x165)	CS	1x165	19.87	16.00	-	165	R&M	Completed in 2017-18
6	Dehar Power House (Unit-3), BBMB (6x165)	CS	1x165	23.00	18.67	-	165	R&M	Completed in 2021-22
7	Baira Siul, NHPC (3x60)	CS	3x60	341.41	330	180 (LE)	180	RM&LE	Completed in 2021-22
Gujarat									
8	Ukai, GSECL (4x75)	SS	3x75 (U-1,2,&4)	7.30	7.30	-	225	R&M	Completed in 2021-22
Karnataka									
9	Bhadra River Bed units, KPCL (2x12)	SS	2x12	23.55	20.12	-	24	R&M	Completed in 2019-20
Tamil Nadu									
10	Sholayar-I, TANGEDCO (2x35)	SS	2x35	90.44	66.94	70 (LE) + 14(U)	84	RMU&LE	Completed in 2019-20
Kerala									
11	Sholayar, KSEB (3x18)	SS	3x18	199.55	84.26	54 (LE)	54	RM&LE	Completed in 2020-21
12	Idukki 1st stage, KSEB (3x130)	SS	3x130	89.90	65.76	-	390	R&M	Completed in 2020-21
Odisha									
13	Hirakud-I OHPCL (2x37.5)	SS	2x37.5 (U5&6)	158.77	101.83	75.00 (LE) + 12.2 (U)	87.2	RMU&LE	Completed in 2021-22
14	Hirakud-II (Chiplima), OHPCL (3x24)	SS	1x24 (U-3)	65.67	52.04	24.00 (LE)	24	RM&LE	Completed in 2019-20
Sub Total (A)			**2023.20**	**1143.94**	**848.68**	**505.4 [479.2(LE) + 26.2(U)**	**2049.40**		

@ This cost includes Scheme I only i.e. Rehabilitation of damaged/burnt equipments.

Abbreviations: R&M – Renovation & Modernisation;. U – Uprating; LE – Life Extension; Res – Restoration;

MW – Mega Watt; CS-Central Sector: SS- State Sector

State-wise List of Hydro RMU&LE schemes programmed for completion during 2022-27

Sl. No	Name of Project, Agency Inst. Cap. (No.x MW)	CS/ SS	Capacity Covered Under RMU&LE (No.x MW)	Est. Cost (Rs. in Crs.)	Actual Exp. (Rs. in Crs.)	Benefits (MW)	Capacity after RMU&LE	Category	Year of Completion
A. Completed Schemes									
Himachal Pradesh									
1	Bhabha Power House, HPSEB (3x40)	SS	3x40	90.14	43.01	120 (LE)	120	RM&LE	Completed in 2022-23
2	Bhakra LB, BBMB (5x108)	CS	5x108	489.77	583.86	540.00(LE)+ 90.00 (U)	630	RMU&LE	Completed in 2023-24
Uttarakhand									
3	Tiloth (Maneri Bhali - I), UJVNL (3x30)	SS	3x30	384.66	189.45	90 (LE)	90	RM&LE	Completed in 2022-23
4	Dhalipur, UJVNL (3x17)	SS	3x17	152.65	110.13	51 (LE)	51	RM&LE	Completed in 2023-24
Uttar Pradesh									
5	Rihand, UPJVNL (6x50)	SS	6x50	132.20	129.67	300 (LE)	300	RM&LE	Completed in 2022-23
Telangana									
6	Nagarjuna Sagar Phase-II works, TSGENCO (1x110+7x100.8)	SS	1x110+7x100.8	21.67	14.34	-	815.6	R&M	Completed in 2022-23
7	Nagarjuna Sagar Left Canal Power House, TSGENCO (2x30.6)	SS	2x30.6	30.99	1.50	-	61.2	R&M	Completed in 2022-23
Karnataka									
8	Munirabad Dam Power House, KPCL (2x9 + 1x10)	SS	2x9 + 1x10	4.60	2.20	-	28	R&M	Completed in 2022-23
9	Linganamakki Dam Power House, KPCL (2x27.5)	SS	2x27.5	2.75	2.75	-	55	R&M	Completed in 2022-23
10	Gerusoppa Dam Power House (Sharavathy Tail Race), KPCL (4x60)	SS	4x60	59.66	2.026	-	240	R&M	Completed in 2023-24
Sub Total(A)			**2300.80**	**1369.09**	**1078.94**	**1191 [1101(LE)+ 90(U)]**	**2390.80**		
B. Ongoing Schemes – Under Implementation									
Uttarakhand									
11	Chilla (Ph B), UJVNL (4x36)	SS	4x36	490.56	7.39	144(LE)+ 12(U)	156	RMU&LE	2025-26
12	Dhakrani, UJVNL (3x11.25)	SS	3x11.25	137.31	10.69	33.75 (LE)	33.75	RM&LE	2025-26
Uttar Pradesh									
13	Obra, UPJVNL (3x33)	SS	3x33	58.80	48.15	99 (LE)	99	RM&LE	2024-25
Telangana									
14	Pochampad HPS Stage -1, TSGENCO (3x9)	SS	3x9	8.44	-	-	27	R&M	2026-27
Andhra Pradesh									
15	Upper Sileru Power House, APGENCO (4x60)	SS	4x60	10.53	4.53	-	240	R&M	2026-27
16	Nagarjunasagar Right Canal Power House, APGENCO (3x30)	SS	3x30	10.1	4.54	-	90	R&M	2025-26
17	Tungabhadra Dam, APGENCO (4x9)	SS	4x9	6.65	2.517	36 (LE)	36	RM&LE	2025-26
18	Hampi Canal PH, APGENCO (4x9)	SS	4x9	-	-	36 (LE)	36	RM&LE	2025-26
Karnataka									
19	Nagjhari (Unit-1 to 3) KPCL (6x150)	SS	3x150 (U-1 to 3)	266.00	80.5	450 (LE)	450	RM&LE	2025-26
20	Shivasamudram, KPCL (6x3+4x6)	SS	6x3+4x6	169.18	3.27	42 (LE)	42	RM&LE	2024-25
21	Kadra Dam Power House,	SS	3x50	44.47	2.627	-	150	R&M	2024-25
22	Kodasalli Dam Power House,	SS	3x40	50.60	2.654	-	120	R&M	2024-25
23	Sharavathy Generating Station, KPCL (10x103.5)	SS	10x103.5	196.56	-	1035 (LE)	1035	RM&LE	2025-26

Sl. No	Name of Project, Agency Inst. Cap. (No.x MW)	CS/ SS	Capacity Covered Under RMU&LE (No.x MW)	Est. Cost	Actual Exp.	Benefits (MW)	Capacity after RMU&LE	Category	Year of Completion
				(Rs. in Crs.)					
Jharkhand									
24	Panchet U-1, DVC (2x40)	CS	1x40 (U-1)	121.85	2.19	40(LE) + 6(U)	46	RMU&LE	2025-26
Tamil Nadu									
25	Moyar PH, TNPGCL (3x12)	SS	3x12	121.127	74.02	36 (LE)+ 6(U)	42	RMU&LE	2024-25
26	Kodayar PH-I, TNPGCL (1x60)	SS	1x60	80.96	2.3	60 (LE)+ 10 (U)	70	RMU&LE	2025-26
Kerala									
27	Kuttiyadi, KSEB (3x25)	SS	3x25	377.41	31.43	75.00 (LE) + 7.5 (U)	82.5	RMU&LE	2025-26
28	Sabarigiri (Unit- 6 & Unit 2), KSEB (4x55+2x60)	SS	1x60 +1 x 55	-	-	-	115	R&M	2024-25
Odisha									
29	Balimela, OHPCL (6x60)	SS	6x60	382.91	167.60	360(LE)	360	RM&LE	2024-25
Assam									
30	Kopili Power Station, NEEPCO (4x50)	CS	4x50	1075.19	1207.25	200(LE)	200	RM&LE	2024-25
31	Khandong Power Station, NEEPCO (2x23)	CS	2x23	277.74	84.5	46 (LE)	46	RM&LE	2024-25
Manipur									
32	Loktak, NHPC (3x35)	CS	3x35	273.59	69.72	105 (LE)	105	RM&LE	2025-26
Meghalaya									
33	Umiam St.III, (Kyrdemkulai) MePGCL (2x30)	SS	2x30	408.00	53.15	60(LE) + 6(U)	66	RMU&LE	2026-27
Sub Total (B)			**3599.75**	**4567.98**	**1859.03**	**2905.25 [2857.75(LE)+ 47.50(U)]**	**3647.25**		
C. Ongoing Schemes – Under Tendering									
Himachal Pradesh									
34	Giri, HPSEBL (2x30)	SS	2x30	440.12	-	60.00 (LE)	60	RM&LE	2025-26
Uttarakhand									
35	Ramganaga, UJVNL (3x66)	SS	3x66	455.20	-	198 (LE)	198	RM&LE	2026-27
Gujarat									
36	Kadana PSS, GSECL (4x60)	SS	4x60	750.25	-	240 (LE) + 20 (U)	260	RMU&LE	2025-26
Rajasthan									
37	Rana Pratap Sagar	SS	4x43	548.11	-	172 (LE) +6 (U)	178	RMU&LE	2026-27
Karnataka									
38	Supa Dam Power House, KPCL (2x50)	SS	2x50	47.91	-	-	100	R&M	2024-25
West Bengal									
39	Maithon, DVC (2x20+1x23.2-U#2)	CS	2x20 (U-1&3)	109.29	7.76	40.00 (LE)	40	RM&LE	2025-26
Sub Total (C)			**810**	**2350.88**	**7.76**	**736 [710(LE)+26(U)]**	**836.00**		

Annex- 9.7

(Sheet 3 of 4)

Sl. No	Name of Project, Agency Inst. Cap. (No.x MW)	CS/ SS	Capacity Covered Under RMU&LE (No.x MW)	Est. Cost (Rs. in Crs.)	Actual Exp (Rs. in Crs.)	Benefits (MW)	Capacity after RMU&LE	Category	Year of Completion
D. Ongoing Schemes – Under DPR Preparation/ Finalisation/ Approval									
Uttarakhand									
40	Kulhal, UJVNL (3x10)	SS	3x10	115.24	-	30(LE)	30	RM&LE	2026-27
Tamil Nadu									
41	Kodayar PH-II, TNPGCL (1x40)	SS	1x40	-	-	40.0(LE)+ 6(U)	46	RMU&LE	2026-27
Kerala									
42	Idukki 1st and 2nd stage, KSEB (6x130)	SS	6x130	-	-	780 (LE)	780	RM&LE	2026-27
43	Idamalayar, KSEB (2x37.5)	SS	2x37.5	-	-	75 (LE)	75	RM&LE	2026-27
Andhra Pradesh									
44	Lower Sileru, APGENCO (4x115)	SS	4x115	698.94	1.8	460(LE)	460	RM&LE	2026-27
Sub Total (D)			**1385.00**	**814.18**	**1.80**	**1391 1385(LE)+ 6(U)]**	**1391.00**		
E. Ongoing Schemes – Under RLA Studies									
Jammu & Kashmir (UT)									
45	Salal Stage-I, (Unit 1,2 &3) NHPC (3x115)	CS	3x115	-	-	345 (LE)	345	RM&LE	2026-27
Himachal Pradesh									
46	Pong Power House, BBMB (6x66)	CS	6x66	402.00	-	396 (LE) + 54 (U)	450	RMU&LE	2026-27
Punjab									
47	Anandpur Sahib Hydel Project, PSPCL (4x33.5)	SS	4x33.5	-	-	134 (LE)	134	RM&LE	2026-27
48	Mukerian St.I, St.II, St.III & St.IV, PSPCL (3x15, 3x15, 3x19.5& 3x19.5)	SS	3x15, 3x15, 3x19.5& 3x19.5	2.5	-	207 (LE)	207	RM&LE	2026-27
49	Shanan HEP, PSPCL (1x50+ 4x15)	SS	1x50+ 4x15	8.02	-	110 (LE)	110	RM&LE	2026-27
50	UBDC St.I & St.II, PSPCL (3x15+ 3x15.45)	SS	3x15+ 3x15.45	1.71	-	91.35 (LE)	91.35	RM&LE	2026-27
Madhya Pradesh									
51	Bansagar Ton-I, MPPGCL (3x105)	SS	3x105	-	-	315 (LE)	315	RM&LE	2026-27
Maharashtra									
52	Vaitarna, MSPGCL (1x60)	SS	1x60	-	-	60 (LE)	60	RM&LE	2026-27
53	Koyna Dam foot (Right Bank), MSPGCL (2x20)	SS	2x20	-	-	40 (LE)	40	RM&LE	2026-27
54	Koyna St-3, MSPGCL (4x80)	SS	4x80	-	-	320 (LE)	320	RM&LE	2026-27
Andhra Pradesh									
55	Machkund St.I & St.II, APGENCO (3x17+ 3x23)	SS	3x17+ 3x23	1.98	-	120 (LE) +9 (U)	129	RMU&LE	2026-27
Kerala									
56	Sabarigiri, (Unit-1,2,3, & 5) KSEB (4x55+2x60)	SS	4x55 (Unit-1,2, ,3, & 5)	-	-	220(LE) + 20 (U)	240	RMU&LE	2026-27

Annex- 9.7

(Sheet 4 of 4)

Sl. No	Name of Project, Agency Inst. Cap. (No.x MW)	CS/ SS	Capacity Covered Under RMU&LE (No.x MW)	Est. Cost (Rs. in Crs.)	Actual Exp. (Rs. in Crs.)	Benefits (MW)	Capacity after RMU&LE	Category	Year of Completion
Jharkhand									
57	Subernrekha, JUUNL (2x65)	SS	2x65	-	-	130(LE)	130	RM&LE	2026-27
Sub Total (E)			**2488.35**	**416.21**	**0.00**	**2571.35 [2488.35(LE)+ 83(U)]**	**2571.35**		
Total (A+B+C+D+E)			**10583.90**	**9518.34**	**2947.53**	**8794.60**	**10836.40**		

Abbreviations: R&M – Renovation & Modernisation;. U – Uprating; LE – Life Extension; Res – Restoration;
MW – Mega Watt; CS-Central Sector: SS- State Sector

State-wise List of Hydro RMU&LE schemes programmed for completion during 2027-32

Sl. No	Name of Project, Agency Inst. Cap. (No.X MW)	CS/ SS	Capacity Covered Under RMU&LE (No.x MW)	Est. Cost (Rs. in Crs.)	Actual Exp. (Rs. in Crs.)	Benefits (MW)	Capacity after RMU&LE	Category	Completion Target
A.Ongoing Schemes – Under Tendering									
Madhya Pradesh									
1	Gandhi Sagar, MPPGCL (5x23)	SS	5x23	433.68	4.17	115 (LE) + 10.83 (U)	125.83	RMU&LE	2029-30
Sub Total(A)			**115**	**433.68**	**4.17**	**125.83 115 (LE) + 10.83 (U)**	**125.83**		
B. Ongoing Schemes – Under DPR Preparation/ Finalisation/ Approval									
Madhya Pradesh									
2	Pench, MPPGCL (2x80)	SS	2x80	-	-	160 (LE)	160	RM&LE	2026-28
3	Bargi, MPPGCL (2x45)	SS	2x45	-	-	90 (LE)	90	RM&LE	2026-28
Sub Total(B)			**250**	**0**	**0**	**250**	**250**		
C. Ongoing Schemes – Under RLA Studies									
Jammu & Kashmir (UT)									
4	Salal Stage-II, (Unit 4,5 &6) NHPC (6x115)	CS	3x115	-	-	345 (LE)	345	RM&LE	2027-32
Himachal Pradesh									
5	Chamera-I, NHPC (3x180)	CS	3x180	-	-	540 (LE)	540	RM&LE	2027-32
Uttarakhand									
6	Tanakpur, NHPC (3x31.4)	CS	3x31.4	-	-	94.2 (LE)	94.2	RM&LE	2027-32
7	Chibro, UJVNL (4x60)	SS	4x60	184.88	-	240 (LE)	240	RM&LE	2027-32
8	Khodri, UJVNL (4x30)	SS	4x30	169.63	-	120 (LE)	120	RM&LE	2027-32
Tamil Nadu									
9	Kundah-I, TNPGCL (3x20)	SS	3x20	-	-	60 (LE)	60	RM&LE	2027-32
10	Kundah-II, TNPGCL (5x35)	SS	5x35	-	-	175 (LE)	175	RM&LE	2027-32
11	Kundah-III, TNPGCL (3x60)	SS	3x60	-	-	180 (LE)	180	RM&LE	2027-32
12	Kundah-IV, TNPGCL (2x50)	SS	2x50	-	-	100 (LE)	100	RM&LE	2027-32
13	Kundah-V, TNPGCL (2x20)	SS	2x20	-	-	40 (LE)	40	RM&LE	2027-32
14	Mettur Tunnel, TNPGCL (4x50)	SS	4x50	-	-	200 (LE)	200	RM&LE	2027-32
14	Sarkarpathy, TNPGCL (1x30)	SS	1x30	-	-	30 (LE)	30	RM&LE	2027-32
16	Sholayar-II, TNPGCL (1x25)	SS	1x25	-	-	25 (LE)	25	RM&LE	2027-32
17	Suruliyar, TNPGCL (1x35)	SS	1x35	-	-	35 (LE)	35	RM&LE	2027-32
18	Kadamparai PH, TNPGCL (4x100)	SS	4x100	-	-	400 (LE)	400	RM&LE	2027-32
18	Aliyar, TNPGCL (1x60)	SS	1x60	-	-	60 (LE)	60	RM&LE	2027-32
20	Lower Mettur-I , TNPGCL (2x15)	SS	2x15	-	-	30 (LE)	30	RM&LE	2027-32
21	Lower Mettur-II , TNPGCL (2x15)	SS	2x15	-	-	30 (LE)	30	RM&LE	2027-32
22	Lower Mettur-III , TNPGCL	SS	2x15	-	-	30 (LE)	30	RM&LE	2027-32
23	Lower Mettur-IV , TNPGCL (2x15)	SS	2x15	-	-	30 (LE)	30	RM&LE	2027-32
Sub Total (C)			**2764.20**	**354.51**	**0.00**	**2764.20**	**2764.20**		
Total (A+B+C)			**3129.20**	**788.19**	**4.17**	**3140.03 [3129.20 (LE)+ 10.83(U)]**	**3140.03**		

Abbreviations: R&M – Renovation & Modernisation;. U – Uprating; LE – Life Extension; Res – Restoration;
MW – Mega Watt; CS-Central Sector: SS- State Sector

CHAPTER-10

DEFINITIONS AND ABBREVIATIONS

CHAPTER-10

DEFINITIONS AND ABBREVIATIONS

10.1 DEFINITIONS

The definitions of different performance indices and other terms referred to in this review are as under:

a) **Capacity:** Capacity in MW is the Installed or Uprated/Derated capacity of the unit.

b) **Forced Outage Non-Availability (FO) (%)**

$$= \frac{(Cf1 \times hf1 + Cf2 \times hf2 \ldots\ldots\ldots\ldots\ldots\ldots + Cfn \times hfn) \times 100}{C \times H}$$

Where Cf1, Cf2 …… Cfn are the capacities in MW of the generating units of the station on forced outage and hf1,hf2……hfn are the duration of each outage in hours during the year. C is the total installed capacity of the station in MW and H is the total period in hours during the year.

c) **Planned Maintenance Non-Availability (PM) (%)**

$$= \frac{(Cp1 \times hp1 + Cp2 \times hp2 + \ldots\ldots\ldots\ldots\ldots\ldots + Cpn \times hpn) \times 100}{C \times H}$$

Where Cp1, Cp2 …… Cfn are the capacities in MW of the generating units of the station on planned shutdown and hp1, hp2 …… are the duration of each shutdown in hours during the year. C is the total installed capacity of the station in MW and H is the total period in hours during the year.

d) **Operating availability (OA) (%) = (100-FO-PM)**

e) **Miscellaneous Non-Availability:** Non-Availability of generating units due to one or more of the following factors:

- Low reservoir level/poor inflow
- Transmission line faults/constraints
- Excess weeding/silting
- No/reduced system demand
- Too high tail water level
- No irrigation demand
- Grid disturbance/failure
- Reserve shutdown/spinning reserve

f) **Design Energy:** The quantum of energy which could be generated in a 90% dependable year with 95% availability of installed capacity of the generating station.

g) **Targeted Energy:** Estimated energy generation during the year based on the likely rainfall data, storage position of the reservoirs and past records of energy generation etc.

h) **Full Reservoir Level (FRL):** The maximum level up to which the water could normally be stored in the reservoir for conservation and regulation for power generation.

i) **Minimum Draw Down Level (MDDL):** The minimum level up to which the reservoir could be depleted under normal operating conditions.

j) **Types of H.E. Scheme:** The H.E. Schemes have been classified into following four categories:

- Run-of-River without pondage
- Run-of River with pondage
- Storage Schemes
  - Purely power
  - Multipurpose projects
- Pumped Storage Schemes

10.2 Abbreviations

MW	Mega Watt	(10^6 Watts)
KWH	Kilo Watt hour (1 unit)	(10^3 Watts-hrs)
MU	Million Units	(10^6 Units)
MCM	Million Cubic Meters	(10^6 Cu.M.)
FRL	Full Reservoir Level	
MDDL	Minimum Draw Down Level	
HRT	Head Race Tunnel	
F.O.	Forced Outage	
P.M.	Planned Maintenance	

Abbreviations of Agencies

Northern Region			
1	Himachal Pradesh	ADHPL	Allain Duhangan Hydro Power Limited
		BVPC Limited	Beas Valley Power. Corp. Ltd. (BVPC)
		EPPL	Everest Power Private Limited
		GBHPPL	Greenko Budhil Hydro Power Pvt. Limited
		HBPCL	Himachal Baspa Power Company Limited
		HPPCL	Himachal Pradesh Power Corporation Limited
		HPSEB Limited	Himachal Pradesh State Electricity Board Limited
		HSPCL	Himachal Sorang Power Private Limited
		IAEPL	IA Hydro Energy Pvt Ltd
		JSW	JSW Energy Ltd.
		GMR BHHPL	GMR Bajoli Holi Hydro Power Private Limited
		MPCL	Malana Power Company Limited
		NTPGPL	Tidong Power Generation Private Limited
		NHPC Limited	National Hydro Power Corporation Limited
		NTPC Limited	National Thermal Power Corporation Limited
		SJVN Limited	Satluj Jal Vidyut Nigam Limited
2	Jammu & Kashmir	JKSPDC	J&K State Power Development Corporation.
3	Punjab	BBMB	Bhakra Beas Management Board
		PSPCL	Punjab State Power Corporation Limited
4	Rajasthan	RRVUNL	Rajasthan Rajya Vidyut Utpadan Nigam Limited
5	Uttar Pradesh	UPJVNL	Uttar Pradesh Jal Vidyut Nigam Limited
6	Uttarakhand	THDC	Tehri Hydro Development Corporation
		UJVNL	Uttarakhand Jal Vidyut Nigam Limited
		JPPVL	Jaiprakash Power Pvt. Venture Limited
		AHPC	Alaknanda Hydro Power Company
Western Region			
1	Gujarat	GSECL	Gujarat State Electricity Corporation Limited
		SSNNL	Sardar Sarovar Narmada Nigam Limited
2	Madhya Pradesh	MPPGCL	Madhya Pradesh Power Generation Co. Limited
		NHDC	Narmada Hydroelectric Development Co. Limited
3	Chhatisgarh	CSPGCL	Chhatisgarh State Power Generation Co. Limited
4	Maharashtra	DLHPPL	Dodson-Lindblom Hydro Power Private Limited

		MSPGCL	Maharashtra State Power Generating Co. Limited
		TPCL	Tata Power Company Limited
Southern Region			
1	Andhra Pradesh	APGENCO	Andhra Pradesh Power Generation Corporation Ltd.
2	Karnataka	KPCL	Karnataka Power Corporation Limited
3	Kerala	KSEBL	Kerala State Electricity Board Limited
4	Telangana	TSGENCO	Telangana State Power Generation Corporation Ltd.
5	Tamil Nadu	TANGEDCO	Tamil Nadu Generation & Distribution Co. Limited
Eastern Region			
1	Jharkhand	JUUNL	Jharkhand Urja Utpadan Nigam Limited
		DVC	Damodar Valley Corporation
2	Odisha	OHPC	Odisha Hydro Power Corporation
3	Sikkim	GIPL	Gati Infrastructure Pvt. Limited
		DEPL	Dans Energy Private Limited
		TUL	Teesta Urja Limited
		SKPPPL	Sneha Kinetic Power Projects Pvt. Limited
		SEPL	Shiga Energy Pvt. Limited
4	West Bengal	WBSEDCL	West Bengal State Electricity Distribution Co. Limited
North Eastern Region			
1	Assam	APGCL	Assam Power Generation Co. Limited
		NEEPCO	North Eastern Electric Power Corporation Limited
2	Meghalaya	MePGCL	Meghalaya Power Generation Corporation Limited