Ref. SKHPL/NEPRA/25/12-537
December 23, 2025

The Registrar,
National Electric Power Regulatory Authority,
NEPRA Tower, Attaturk Avenue, G-5/1,
Islamabad.

Subject: **Application for Licensee Proposed Modification of Generation Licence No. IGSPL/21/2009 for Sukl Kinari Hydropower Project**

Dear Sir,

I, Jiang Min, Chief Executive Officer of S K Hydro (Private) Limited, having its registered office at 15, Peshawar Block, Fortress Stadium Lahore ("SKHPL"), being the duly authorized representative of SKHPL, by virtue of the Board Resolutions dated 18 December, 2025 (attached), hereby apply to the National Electric Power Regulatory Authority ("NEPRA") for the approval of the 'Licensee Proposed Modification' of Generation Licence No. IGSPL/21/2009 pursuant to Section 26 of the Regulation of Generation, Transmission and Distribution of Electric Power Act (XL of 1997), as amended, read with Regulations 9 and 10 of the National Electric Power Regulatory Authority Licensing (Application, Modification, Extension and Cancellation) Procedure Regulations, 2021.

I hereby certify that the documents-in-support attached to this Application are prepared and submitted in conformity with the provisions of the National Electric Power Regulatory Authority Licensing (Application, Modification, Extension and Cancellation) Procedure Regulations 2021, as amended, and undertake to abide by the terms and provisions of the above said regulations. I further undertake and confirm that the information provided in the attached documents-in-support is true and correct to the best of my knowledge and belief and no material omission has been made.

A Pay Order No: C0000052401 dated 18 December 2025 drawn on ICBC Lahore Branch in the sum of Rs. 2,910,149.00 (Pak. Rupees Two Million Nine Hundred Ten Thousand One Hundred Forty Nine only) being the license application fee calculated in accordance with Schedule II to the National Electric Power Regulatory Authority Licensing (Application, Modification, Extension and Cancellation) Procedure Regulations 2021, as amended, is also attached herewith.

Yours Sincerely,

Jiang Min
Chief Executive Officer
For & on behalf of S K Hydro (Pvt) Limited

S K Hydro (Private) Limited
15 Peshawar Block, Fortress Stadium, Lahore, Pakistan
Phone: +(92) 42 36675595 Fax: +(92) 42 36673960
www.skhydro.com

Encl:

1. Board Resolution,
2. Affidavit,
3. Pay Order for NEPRA Application Fee,
4. One original and two copies of Application for Licensee Proposed Modification of Generation Licence

S K Hydro (Private) Limited
15 Peshawar Block, Fortress Stadium, Lahore, Pakistan
Phone: +(92) 42 36675595 Fax:+(92) 42 36673960
www.skhydro.com

SKHYDRO

BOARD OF DIRECTORS' RESOLUTION OF
S K HYDRO (PRIVATE) LIMITED
PASSED THROUGH CIRCULATION ON December 18th, 2025

S K Hydro (Private) Limited ("**SKHPL**" or the "**Company**") is required to modify the Generation License due to various important changes resulting from the following instances: (i) changes in the manufacturers of hydro-turbines, generators and certain other equipment (ii) design changes in the layout and structure of the Project, and (iii) other changes. These changes are described in detail in the attached "Application for Licensee Proposed Modification of Generation Licence for the Suki Kinari Hydropower Project."

The Board of Directors of the Company have considered the matter related to the proposed modification of generation license and hereby resolves as under:

RESOLVED THAT the Directors of the Company have reviewed the attached "Application for Licensee Proposed Modification of Generation Licence for the Suki Kinari Hydropower Project" and hereby approve that the Authorized Person shall do all acts necessary for the completion of the same.

FURTHER RESOLVED THAT Mr. Jiang Min, Chief Executive Officer (the "**Authorized Person**") be and is hereby authorized to act in the name or on behalf of the Company and shall review and sign the "Application for Licensee Proposed Modification of Generation Licence for the Suki Kinari Hydropower Project", and ancillary documents such as schedules, affidavits, notices, annexure, letters, forms, communications, certificates, deeds, acknowledgements, or any other documents made or delivered thereto; and shall take all actions as required for and relating thereto.

FURTHER RESOLVED THAT, all acts, deeds, and actions taken by the Authorized Person pursuant to the above resolutions for and on behalf of and in the name of the Company shall be binding acts, deeds and actions done by the Company.

Jiang Min
(CEO & Director)

Haseeb Khan
(Director)

王志力
Wang Zhili
(Director)

S K Hydro (Private) Limited
15-Peshawar Block, Fortress Stadium, Lahore, Pakistan
Tel: +92 42 36675595 Fax: +92 42 36664349
www.skhydro.com

285511 ONLY USED FOR ISLAMABAD

500 Rupees ۵۰۰ روپیہ

AFFIDAVIT

Regarding Application for Licensee Proposed Modification of Generation Licence for Suki Kinari Hydropower Project of Mr. Jiang Min s/o Jiang YouCheng, Passport No: PE3218560, resident of Peoples Republic of China, Chief Executive Officer of S K Hydro (Private) Limited, having its registered office at 15-Peshawar Block, Fortress Stadium, Lahore Cantt.

I, Jiang Min s/o Jiang YouCheng, Deponent, do hereby solemnly affirm and declare that:

1. I am the Chief Executive, the principal and the authorized representative/attorney of S K Hydro (Private) Limited ("SKHPL");
2. I intend to file the accompanying 'Application for the Licensee Proposed Modification of Generation Licence for S K Hydropower Project' together with supporting documents before the learned Authority, and the contents of the same may kindly be read as an integral part of this affidavit;
3. the contents of the accompanying 'Application for the Licensee Proposed Modification of Generation Licence for S K Hydropower Project' are true and correct to the best of my knowledge and belief, according to the information received by the Deponent and that nothing material or relevant thereto has been concealed or withheld therefrom; and
4. all further documentation and information, if required to be provided by me, in connection with the aforesaid Application shall be true to the best of my knowledge and belief and according to the information received by me.

Jiang Min
DEPONENT

VERIFICATION

Verified on oath on this 18th day of December, 2025 that the contents of this affidavit are true and correct to the best of my knowledge and belief and that nothing material or relevant thereto has been concealed or withheld.

Jiang Min
DEPONENT

ATTESTED
IQBAL MAHER
High Court
Notary Public
ISLAMABAD

BEFORE THE NATIONAL ELECTRIC POWER REGULATORY AUTHORITY

APPLICATION FOR LICENSEE PROPOSED MODIFICATION TO GENERATION LICENCE # IGSPL/21/2009

ON BEHALF OF

S K HYDRO (PRIVATE) LIMITED

FOR

884 MW (INSTALLED CAPACITY) HYDRO-ELECTRIC POWER GENERATION COMPLEX IN KAGHAN VALLEY, DISTT. MANSEHRA, KHYBER PAKHTUNKHWA

---

23 December 2025

S K Hydro (Private) Limited
15-Peshawar Block, Fortress Stadium, Lahore, Pakistan
Phone: +(92) 42 36675595; Fax: +(92) 42 36673960
Website: www.skhydro.com

APPLICATION FOR LICENSEE PROPOSED MODIFICATION OF GENERATION LICENCE No. IGSPL/21/2009 OF SUKI KINARI HYDROPOWER PROJECT

Applicant
S K Hydro (Private) Limited
15, Peshawar Block, Fortress Stadium,
Lahore Cantonment, Pakistan
Phone: +(92) 42 36675595
Fax: +(92) 42 36673960
Website: www.skhydro.com
Email: sk@ceecoic.com
Company Registration No: 0052397

Project Company and the Project

1. S K Hydro (Private) Limited ("**SKHPL**") is a private limited company, registered under the Companies Act 2017 (replacing the Companies Ordinance 1984) and was established to develop and implement Suki Kinari Hydropower Project on Kunhar River, Kaghan Valley, District Mansehra, KPK (the "**Project**" or "**SKHPP**") on Build, Own, Operate and Transfer ("**BOOT**") basis under the GOP's 'Policy for Power Generation Projects, 2002'.

2. The Letter of Interest ("**LOI**") for conducting feasibility study of the Project was issued on 15 November 2005. Mott MacDonald, a renowned consulting firm in the UK, conducted the feasibility study of the Project from May 2006 to November 2007. It was progressively reviewed and approved by the PPIB's Panel of Experts ("**POE**") as conveyed by PPIB vide its letter dated 15 April 2008. The feasibility stage design envisaged a hydro-electric power generation plant of 840 MW, an estimated average annual energy generation of 2958.1 GWh and a plant factor of 40.2%. The Project included a 3.1 km long reservoir enabling the plant to perform daily peak operations, a value added and distinctive advantage of this Project, for two hours in the morning and two hours in the evening or as required by the System Operator/Power Purchaser.

3. The Water Use Agreement (**WUA**") for construction of the Project on Kunhar River and use of water of this river for electric power generation was signed with the GOKPK on 31 October 2011. The Implementation Agreement ("**IA**") for the Project was signed on 11 April 2014. The Power Purchase Agreement ("**PPA**") was signed on 03 October 2014 with National Transmission and Despatch Company ("**NTDC**") (currently called the National Grid Company of Pakistan Limited ("**NGC**")) and was subsequently novated to the Central Power Purchasing Agency Guarantee Limited "**CPPA-G**", (the "**Power Purchaser**") through the Novation Agreement to the PPA, executed on 22 June 2020.

4. The Financial Closing of the Project was achieved on 31 December 2016 and the work at Project site commenced immediately thereafter. According to the IA and the PPA, the Required Commercial Operations Date ("**RCOD**"), as originally envisaged, was 31 December 2022. However, due to the spread of COVID-19 pandemic in 2019, SKHPL declared Force Majeure under the IA and the PPA and requested extension in RCOD due to difficulties in construction activities. NGC also declared Force Majeure on COVID-19

pandemic in connection with construction of 500 kV interconnection facilities for evacuation of power from the Project due to COVID impact on construction activities. After due consideration of the circumstances and agreement of all parties, CPPA-G, through its letter No. CPPA-G/CTO/DGM-R/SKHPL/11818-24 dated 07 July 2022 (Attachment VI), confirmed to extend RCOD up to 30 November 2024, thereby deferring the Power Purchaser interconnection timing as well. Following the course, PPIB vide its letter No. 1(101)/PPIB/2010-03/22/PRJ/O-57604 dated 28 July 2022 (Attachment VII), confirmed that the agreed RCOD to be 30 November 2024, to be read as the RCOD as contemplated in the IA.

CPEC Project

5. The Suki Kinari Hydropower Project is classified as an Early Harvest Project under the strategic framework of the China-Pakistan Economic Corridor (CPEC), a flagship initiative under China's Belt and Road Initiative (BRI). As an Early Harvest Project, Suki Kinari was prioritized for fast-track development to deliver immediate benefits to Pakistan's energy sector and demonstrate early success of the CPEC collaboration.

EPC Contractors

6. The EPC Contract for the Project was signed on 09 December 2013 with the following companies:

(a)	Equipment Supply Contract ("**ESC**")	China Gezhouba Group International Engineering Company Limited, Tower F, Ocean International Centre, Chaoyang District, Beijing 10025, China; and
(b)	Contract for Project Construction ("**CPC**")	China Gezhouba Group Company Limited, House No: 1, Hill Road, F/6-2, Islamabad, Pakistan.

ESC and CPC together constitute the EPC Contract.

7. Before bidding for the EPC Contract, NGC (Formerly NTDC) assured SKHPL in June 2012 that it would handle the procurement and installation of Shunt Reactors at the Complex Switchyard, so this responsibility was excluded from SKHPL's EPC Contract scope and the PPA. However, in 2019, NGC claimed that SKHPL must undertake this responsibility. SKHPL objected, and after protracted correspondence and multiple meetings, NGC acknowledged its responsibility but advised that SKHPL should install the Shunt Reactors at its own cost, to be adjusted in tariff at the COD. Therefore, as advised by CPPA-G and NGC, and after issuance of guidance from NEPRA (Attachment VIII), SKHPL agreed to undertake this work at the additional cost on the condition that this will not be linked to the COD of the Project.

8. To assess the requirement and rating of Shunt Reactors at SKHPP end for the interim and permanent power evacuation arrangements, NGC arranged an advanced technical study on PSCAD through NESPAK. The study, inter-alia, recommended installation of 2 x 66 MVAR line reactors at SKHPP end to reduce the open-end line voltages. Accordingly, SKHPL undertook installation of two banks of Shunt Reactors for NGC's interim interconnection scheme for the Project involving 500 kV transmission lines from (i) SKHPP to Neelum–Jhelum (NJHPP), and (ii) SKHPP to 500kV Karot Substation, at 500kV GIS Switchyard of SKHPP for feed-in/dispersal of power from/to the Grid System.

9. After completing an international competitive bidding process, with NESPAK as the supervisory consultant, M/s Northwest Electric Power Design Institute Co. Ltd (NWEPDI) of China were selected and awarded contract in March 2024 for engineering, procurement and construction/installation of two 3×22 MVAR Shunt Reactor Banks at the Complex Switchyard. Details in this regard are being submitted separately through our Petition for Modification of EPC Stage Tariff Determination. This work is in progress and expected to be completed by December 2025. After its completion/commissioning, the Shunt Reactor Banks shall become an integral part of the Complex.

Grant of Generation Licence

10. In July 2008, SKHPL applied to NEPRA for the grant of the Generation Licence. After completing due process, NEPRA, in terms of Section 14B (previously Section 15) of the Regulation of Generation, Transmission and Distribution of Electric Power Act, 1997, as amended (the "**NEPRA Act**") granted Generation Licence bearing No. IGSPL/21/2009 on 27 May 2009 (Attachment III) for an installed capacity of 840 MW (as per feasibility stage design). The Generation Licence was based on the information and data given in the Feasibility Study report of the Project as at that time the EPC Contracts were not yet executed. The Commissioning Date and the COD as anticipated and incorporated in the Generation Licence are 15 December 2015 and 15 April 2016, respectively. The expiry date as per Generation Licence is 14 April 2046. SKHPL is thus a bonafide Licensee under the NEPRA Act since 27 May 2009. SKHPL is now applying for modification of the Generation Licence (Licensee Proposed Modifications) based on the modified design, increased installed capacity and other changes that occurred during implementation of the Project.

Licensee Proposed Modifications in Generation Licence

11. The Generation Licence requires certain modifications due to (i) the milestones incorporated in the Project documents (IA, PPA, EPC Contract, etc.), executed after the grant of the Generation Licence; and (ii) the changes/improvements in the plant parameters pursuant to detailed design carried out under the EPC Contract. Accordingly, pursuant to Section 26 of the NERPA Act, read with Regulation 10 of the National Electric Power Regulatory Authority Licensing (Application, Modification, Extension and Cancellation) Procedure Regulations 2021 (as amended) (the "**Regulations**"), SKHPL hereby submits this application for the Licensee Proposed Modifications in the Generation Licence for consideration and approval by the Authority.

12. The information as required under Regulation 10(1) of the aforesaid Regulations is given in the following paragraphs.

(a) **Type or Category of Licence Proposed to be Modified**
Category: New Generation Facility (Hydel)
Type: Run-of-River.

(b) **Text of the Proposed Modification**
The text of the proposed modifications is as under:

(i) **Modifications of Plant Parameters**
The installed capacity of the Complex is proposed to be enhanced from 840.00 MW to 884.00 MW, with corresponding changes to the other plant parameters.

(ii) **Change of Manufacturers of Hydro Turbines, Generators, Main Inlet Valve and Governors**

The manufacturer of Turbine indicated as "VA Tech Hydro Gmbh, Austria or Equivalent" in Table 2 under Plant Details of Schedule II to the Generation Licence is proposed to be changed as "Joint Venture of Andritz Hydro China & Harbin Electric Machinery Co.

(iii) **Details of Interconnection Scheme**

Based on the latest studies carried out by NGC, the details of the interconnection scheme for dispersal of power from the Complex to the Grid System are proposed to be added to Schedule I to the Generation Licence.

(iv) **Amendment of Expiry Date of Licence**

The expiry date of the Licence is proposed to be amended from 14 April 2046 to 13 September 2054.

(v) **Change of Name of Province**

The province name listed on Page 1 of the Generation Licence, is proposed to be changed from "North West Frontier Province" to "Khyber Pakhtunkhwa".

(c) **Reasons in Support of the Proposed Modifications**

(i) **Modifications of Plant Parameters**

The installed capacity of the Suki Kinari Hydro-Electric Power Generation Complex is proposed to be enhanced from 840.00 MW to 884.00 MW, along with corresponding changes to other plant parameters. During the detailed design phase, the EPC Contractor proposed certain modifications to the plant layout and structures, which were subsequently reviewed and approved by the Owner's Engineer and the Panel of Experts (POE) in 2018–2019. PPIB conveyed the POE's approval via letter dated 06 December 2019, attached as Attachment V.

The approved modifications resulted in the following key changes:

Description	As per Feasibility Study Design	As per PPA Contract Design	As per Approved Design Modifications
Parameters at Reference Hydrological Conditions			
Installed Capacity, Each Unit	210.000 MW	217.563 MW	**221.0 MW**
Installed Capacity, Total	840.000 MW	870.250MW	**884.0 MW**
Av. Annual Energy	2958.1 GWh	3081.25 GWh	**3129 GWh**
Plant Factor	40.4%	40.4%	**40.4%**

The modifications included an increase in the installed capacity of the Complex by 13.75 MW compared to that specified in NEPRA EPC Stage Tariff Determination and the PPA.

(ii) **Change of Manufacturers of Hydro Turbines, Generators, Main Inlet Valve and Governors**

Originally, the Equipment Supply Contract (ESC) signed on 09 December 2013 listed Alstom Hydro China Co. Ltd. as the manufacturer of the

vertical shaft Pelton turbines and accessories. However, following the acquisition of Alstom Hydro by General Electric (GE) in 2015, prolonged restructuring and regulatory approvals led to significant uncertainty about Alstom/GE's ability to supply the required equipment on time.

As permitted under Chinese law, the ESC Contractor initiated a rebidding process after the contract remained unfirm for over three years. Based on technical and financial evaluation, Andritz Hydro China, a subsidiary of the Austrian-based Andritz Group, in joint venture with Harbin Electric Machinery Co., was selected.

Consequently, the manufacturers were changed as follows:

- **Hydro Turbines & Generators:** From Alstom Hydro China Co. Ltd to Andritz Hydro China & Harbin Electric Machinery Co. (JV)
- **Main Inlet Valve (MIV):** From Hubei Hongcheng to HEC
- **Governors:** From Wuhan Sanlian Hydropower Equipment Co. Ltd or equivalent to Andritz Hydro

It is international best practice to source governors and MIVs from the same manufacturer supplying the turbines and generators due to design and operational integration. Accordingly, the Company applied to PPIB for approval, which was granted via letter dated 09 July 2019, (Attachment IV).

The manufacturer of Turbine indicated as "VA Tech Hydro Gmbh, Austria or Equivalent" in Table 2 under Plant Details of Schedule II to the Generation Licence is proposed to be modified by specifying the manufacturer of Hydro Turbines and Generators as "Joint Venture of Andritz Hydro China & Harbin Electric Machinery Co".

(iii) Details of Interconnection Scheme

Based on the updated studies carried out by NGC, the following interconnection scheme was proposed for the Project.

(a) **Permanent Interconnection Scheme**

- A 500 kV Switch Station (S/S) at Maira;
- A 500 kV D/C transmission line, approx. 165 km long, from Suki Kinari HPP to the proposed Maira S/S by constructing the remaining 90 km from Neelum Jhelum HPP to Maira S/S; and
- A 500 kV D/C transmission line, approx. 130 km long, from the proposed Maira 500 kV S/S to Islamabad West 500 kV substation.

(b) **Interim Interconnection Scheme**

- Pending the completion of the permanent arrangement, an interim interconnection arrangement for connection to Neelum Jhelum HPP (about 80 km from the Complex) and Karot HPP (about 150 km from the Complex) was provided by NGC.
- The interim interconnection arrangement lacked N-1 contingency. To cater for this situation, a cross-trip scheme triggering the tripping of two generation units on the

occurrence of any contingency has been provided at the Complex on demand of NGC.

Pursuant to Schedule I to the Generation Licence, the above detail of the interconnection scheme is submitted for incorporating in the said Schedule I.

(iv) Amendment of Expiry Date of Licence

The current expiry date of the Generation Licence is 14 April 2046, based on the originally projected COD of 15 April 2015. However, due to delays in project implementation, including litigation initiated by the Government of Khyber Pakhtunkhwa and the COVID-19 pandemic, the actual COD was achieved on 14 September 2024.

In line with Article 4.1 of the Generation Licence, which provides for a 30-year operational term post-COD, the expiry date is proposed to be amended as 13 September 2054.

(v) Change of Name of Province

The province name listed on Page 1 of the Generation Licence, as "North West Frontier Province" is proposed to be changed to "Khyber Pakhtunkhwa", reflecting the constitutional amendment under the **Eighteenth (18th) Amendment to the Constitution of Pakistan**, enacted in **April 2010** that officially changed the province's name.

(d) Impact, if any, of the Proposed Modification on Tariff, Quality of Service or Fulfillment of Licence Obligations

The impact of Licensee Proposed Modification on tariff, quality of service and the performance of its obligations under the Generation Licence is as under:

(i) Impact on Tariff

Due to design changes, the capacity of the Complex increased but the EPC Contractor agreed to enhance the ratings of hydro-turbines, generators, etc. without any additional cost. As regards other modifications, there will be no impact on the tariff except in respect of the following items which involve variation in costs due to the increase in the scope of work beyond that specified in the original PPA :

(a) Design changes in layout and structure of project proposed by the EPC Contractor and approved by the POE,
(b) Additional work of procurement and installation of Shunt Reactors at 500 kV Switchyard of the Complex,
(c) Additional cost for infrastructure required by Security Agencies during operation period.
(d) Additional costs incurred to mitigate the effects of COVID-19 pandemic, etc.

Regarding the cost variations/additions due to the above stated items, the matter is being submitted to NEPRA through a separate petition for modification of the EPC Stage Tariff Determination for consideration and deliberation on merit of prudently incurred costs. The modified tariff as determined by NEPRA after due process shall be applicable to the Project and no additional cost beyond the

modified tariff shall be charged to the Power Purchaser.

(ii) **Impact on Quality of Service**
There will be no adverse impact on the quality of the equipment and the services from the Project.

(iii) **Impact on Performance by the Licensee of its Obligations under the Generation Licence**
There will be no adverse impact on the performance by the Licensee of its obligations under the Generation Licence as modified.

(iv) **Affirmation**
SKHPL affirms that the Licensee Proposed Modifications to the Generation Licence are:

a. not in any manner contrary to the NEPRA Act or the Rules or Regulations made thereunder;
b. beneficial to the Power Purchaser and the electricity consumers as explained in this Application; and
c. reasonably necessary for the Licensee to optimize design of the project and perform its obligations effectively and efficiently under the Generation Licence.

Modifications in Schedules to Generation Licence

13. Following modifications are required in the Schedules to the Generation Licence:

(a) **Schedule I**

(i) **As-Built Drawings**
The existing drawings are proposed to be replaced with the attached As-Built drawings.

(ii) **Interconnection Scheme for Power Dispersal of the Plant**
The existing text under the title "Interconnection Scheme for the Power Dispersal of the Plant" under Schedule 1 of the Licence is proposed to be substituted by the following:

"The power generated by S K Hydro (Private) Limited from its Hydro-Electric Power Generation Complex shall be dispersed to the Grid System through 500 kV voltage. NGC shall provide the following interconnection scheme for the Project:

Permanent Interconnection Scheme

- A 500 kV Switch Station (S/S) at Maira;
- A 500 kV D/C transmission line, approx. 165 km long, from Suki Kinari HPP to the proposed Maira S/S by constructing the remaining 90 km from Neelum Jhelum HPP to Maira S/S; and
- A 500 kV D/C transmission line, approx. 130 km long, from the proposed Maira 500 kV S/S to Islamabad West 500 kV substation.

Interim Interconnection Scheme

- Pending completion of the permanent arrangement, an interim interconnection arrangement for connection to Neelum Jhelum HPP (about 80 km from the Complex) and Karot HPP (about 150 km from the Complex) has been provided by NGC.

- The interim interconnection arrangement lacked N-1 contingency. To cater for this situation, a cross-trip scheme triggering tripping of two generation units on the occurrence of any contingency has been provided at the Complex on demand of NGC."

(iii) **Plant Details**

The Plant details given at pages 10 & 11 of Schedule I to Article 3.1 of the Generation Licence are proposed to be modified based on As-Built conditions as given below:

1. "General Information

Item No.	Description	Existing Provision	As-Built Conditions
(iii)	Plant Location	1.5 km Upstream of Paras Town, Kaghan Valley, District of Mansehra, NWFP	1.5 km Upstream of Paras Town, Kaghan Valley, District of Mansehra, **Khyber Pakhtunkhwa Province**

2. Plant Configuration

Item No.	Description	Existing Provision		As-Built Conditions	
(i)	Plant Size; Installed Capacity (Gross)	840.00 MW		**884.00 MW**	
(v) [1]	Number of Units & Size	4 × 210 MW		**4 × 221 MW**	
(vi)	Turbine/Generator Make & Model	VA Tech Hydro Gmbh, Austria or Equivalent		**Joint venture of Andritz Hydro, China and Harbin Electric Machinery Co., China (Andritz/HEC JV)**	
(vii)	[2] ~~[De-rated Capacity at Mean Site Conditions]~~ Gross Capacity at Reference Hydrological Conditions-	840.00 MW		**884.00 MW**	
(viii)	Auxiliary Consumption	8.40 MW		**8.84 MW** [3]	
(ix)	Expected Commissioning and Commercial Operations Date (COD)	Commissioning	COD	Commissioning (Tests)	COD
		December 15, 2015	April 15, 2016	August to September, 2024	September 14, 2024 **(Actual)**

Notes: (1) Sr. No. "(v)" is written twice in the original Table under Schedule I. It has been corrected.
(2) To be deleted.
(3) Actual auxiliaries are slightly higher, but these have been maintained at 1% of the Installed Capacity, as previously approved. Details are provided in Attachment X.
(4) The Contract Capacity shall be determined in accordance with the provisions of the PPA.

3. Plant Head & Tunnels Details

Item No.	Description		Existing Provision	As-Built Conditions
(i)	Head	Maximum Net Head	824.2 Meter	922.72 Meter
		Minimum Net Head	814.2 Meter	845.76 Meter
		Rated Head	823.4 Meter	859.20 Meter
(ii)	Tunnel (Headrace)	Length	19.5 km	23.1 km
		Diameter	6.0 m	6.2 meter
		Shape	Circular	Horse-Shoe
(iii)	Tunnel (Tailrace)	Length	2.47 km	1.568 km
		Dimensions (W x H)	5.4 x 6.2 m	5.0 m x 5.5 m
(iv)	Diversion & Intake Structure (DIS) – Type		Concrete Gravity	Asphalt Concrete Core Rock-fill (ACCR)
(v)	DIS Crest Elevation		2,277 masl	2,239.5 masl
(vi)	DIS Crest Length		317 meters	258 meters
(vii)	Reservoir Length		3,000 meters	3,100 meters
(viii)	Reservoir Total Volume (Approx.)		9.0 million meter^3	9.93 million meter^3
(ix)	Active Storage (within operating range)		2.7 million meter^3	5.15 million meter^3"

(b) **Schedule II**

The Installed Capacity, Auxiliary Consumption and Net Capacity of the Licensee's Generation Facilities set out in the table at page 2 under Schedule II to Article 3.2 of the Generation Licence are proposed to be modified as under:

Item No.	Description	Existing Provision	As-Built Conditions
"1	Plant Size: Installed Capacity (Gross)	840.00 MW	884.00 MW
2	~~De-rated~~ Gross Capacity at ~~Mean Site Conditions~~ Reference Hydrological Conditions	840.00 MW	884.00 MW
3	Auxiliary Consumptions	8.40 MW	8.84 MW
4	Net Capacity of the Plant at ~~Mean Site Conditions~~ Reference Hydrological Conditions	831.60 W	875.16 MW"

14. Schedule I and Schedule II to the Generation Licence as revised by incorporating the modifications proposed above and named Schedule I (Rev 1) and Schedule II (Rev 1), are appended as Attachment - I and Attachment II respectively and are proposed to be annexed with the Amendment to Generation Licence.

Compliance with Provisions of the Licence

15. The submissions in this application also fulfil the requirements of Section 3.3 of the Licence.

Other Terms & Conditions of Generation Licence

16. Other terms and conditions of the Generation Licence shall remain un-changed.

Supporting Documents

17. The supporting documents as required under Regulation 10(2) of the National Electric Power Regulatory Authority Licensing (Application, Modification, Extension and Cancellation) Procedure Regulations, 2021, have already been submitted with our Application for Generation Licence unless revised, replaced or amended by the Attachments to this Application. Any additional information or documents, as and when required by the Authority in connection with this application, shall be supplied as soon as possible.

PRAYER

18. SKHPL humbly prays that the Authority may kindly approve the Licensee Proposed Modifications to NEPRA Generation Licence No: IGSPL/21/2009 dated 27th May 2009 for the Project as described above, and issue necessary modifications/amendments to the Generation Licence.

ATTACHMENTS

No.	Description
I	Schedule-I (Rev 1) to Generation Licence
II	Schedule-II (Rev 1) to Generation Licence
III	Generation Licence No. IGSPL/21/2009 dated 27 May 2009
IV	PPIB letter No. 1(101) PPIB-2010-03/19/PRJ/O-53209 dated 09 July 2019
V	PPIB letter No. 1(101) PPIB-2010-03/O-53915 dated 06 December 2019
VI	CPPA-G letter- CPPA-G/CTO/DGM- R/SKHPL/11819-24 dated 07 July 2022
VII	PPIB letter No. 1(101)/PPIB/2010-03/22/PRJ/O-57604 dated 28 July 2022
VIII	NEPRA letter No. NEPRA/Director (Tech)/TRF-232/SKHPL-2013/78-8 dated 05 January 2023
IX	SK COD 14-09-2024
X	Plant Auxiliaries and Transformer Losses

SCHEDULE-I (Rev. 1)

The location, size (capacity in MW), technology, interconnection arrangement, technical limits, technical functional specifications and other details specific to the Generation Facilities of the Licensee.

SCHEDULE-I (Rev. 1)

List of As-Built Drawings

1. General Layout of Conveyance
2. Project Area Map
3. Layout of Asphalt Concrete Rockfill Dam
4. Headworks – Upstream & Downstream Works
5. Power House – Cross Section at Centerline of Units
6. Power House – Layout of Operating Floor
7. 500 kV System Single Line Diagram
8. 500 kV Switchyard – Overall Equipment Layout

INTERCONNECTION SCHEME FOR THE POWER DISPERSAL OF THE PLANT

The power generated by S K Hydro (Private) Limited from its Hydro-Electric Power Generation Complex shall be dispersed to the Grid System through 500 kV voltage. NGC shall provide the following interconnection scheme for the Project:

i. **Permanent Interconnection Scheme**

- A 500 kV Switch Station (S/S) at Maira;
- A 500 kV D/C transmission line, approx. 165 km long, from Suki Kinari HPP to the proposed Maira S/S by constructing the remaining 90 km from Neelum Jhelum HPP to Maira S/S; and
- A 500 kV D/C transmission line, approx. 130 km long, from the proposed Maira 500 kV S/S to Islamabad West 500 kV substation.

ii. **Interim Interconnection Scheme**

- Pending completion of the permanent arrangement, NGS has provided an interim arrangement for connection to Neelum Jhelum HPP (about 80 km from the Complex) and Karot HPP (about 150 km from the Complex).
- The interim interconnection arrangement lacked N-1 contingency. To cater for this situation, a cross-trip scheme triggering the tripping of two generation units on the occurrence of any contingency has been provided at the Complex,

Plant Details

1. General Information

(i)	Name of Applicant	S K Hydro (Private) Limited
(ii)	Registered/Business Office	15-Peshawar Block, Fortress Stadium, Lahore Cantonment, Punjab, Pakistan
(iii)	Plant Location	1.5 km Upstream of Paras Town, Kaghan Valley, District Mansehra, Khyber Pakhtunkhwa
(iv)	Type of Generation Facility	Hydropower Plant - Run-of-River

2. Plant Configuration

(i)	Plant Size Installed Capacity (Gross)	884.000 MW	
(ii)	Plant Type	Run of River Hydropower Plant	
(iii)	Water Resource	Kunhar River	
(iv)	Type of Technology	Pelton Wheel Turbines	
(v)	Number of Units & Size	4 × 221.000 MW	
(vi)	Turbine Make & Model	Andritz/HEC JV	
(vii)	~~De-rated~~ Gross Capacity at Reference Hydrological Conditions	884.000 MW	
(viii)	Auxiliary Consumption	7.826 MW (Annexure X)	
(ix)	Commissioning and Commercial Operations Date (COD)	Commissioning (Tests)	COD
		August-September, 2024	September 14, 2024 (Actual)
(x)	Expected Life of the Facility from COD	More than 30 years	

3. **Plant Head & Tunnel Details**

(i)	Head	Maximum Net Head	922.72 meters
		Minimum Net Head	845.76 meters
		Rated Head	959.20 meters
(ii)	Tunnel (Head Race)	Length	Diameter/Shape
		23.1 km	6.2 meter/Horse-Shoe
(iii)	Tunnel (Tail Race)	Length	Dimensions
		1.568 km (Twin)	5.0 m x 5.5 m
(iv)	Diversion & Intake Structure (Type)	Asphalt Concrete Core Rock-fill (ACCR)	
(v)	DIS Crest Elevation	2,239.5 masl	
(vi)	DIS Crest Length	258 meters	
(vii)	Reservoir Length	3,100 meters	
(viii)	Reservoir Total Volume (Approx.)	9.93 million meter^3	
(ix)	Active Storage (Within Operating Range)	5.15 million meter^3	

4. **Plant Characteristics**

(i)	Generation Voltage	18 kV
(ii)	Frequency	50 Hz
(iii)	Power Factor	0.8 lagging to 0.9 leading
(iv)	Automatic Generation Control	Yes
(v)	Ramping Rate	72 MW/min; shall be reviewed by the Operating Committee based on performance during 1st Agreement Year.
(vi)	Time Required to Synchronize to Grid and loading the Complex to full load	• 15 min for synchronization to Grid under normal operating conditions and 30 minutes in the event the turbine has involved shutdown of the turbine oil systems, provided the reason for load rejection has been removed. • 12 – 18 min for loading the Complex to full load (time will depend on Grid System conditions).

AS BUILT

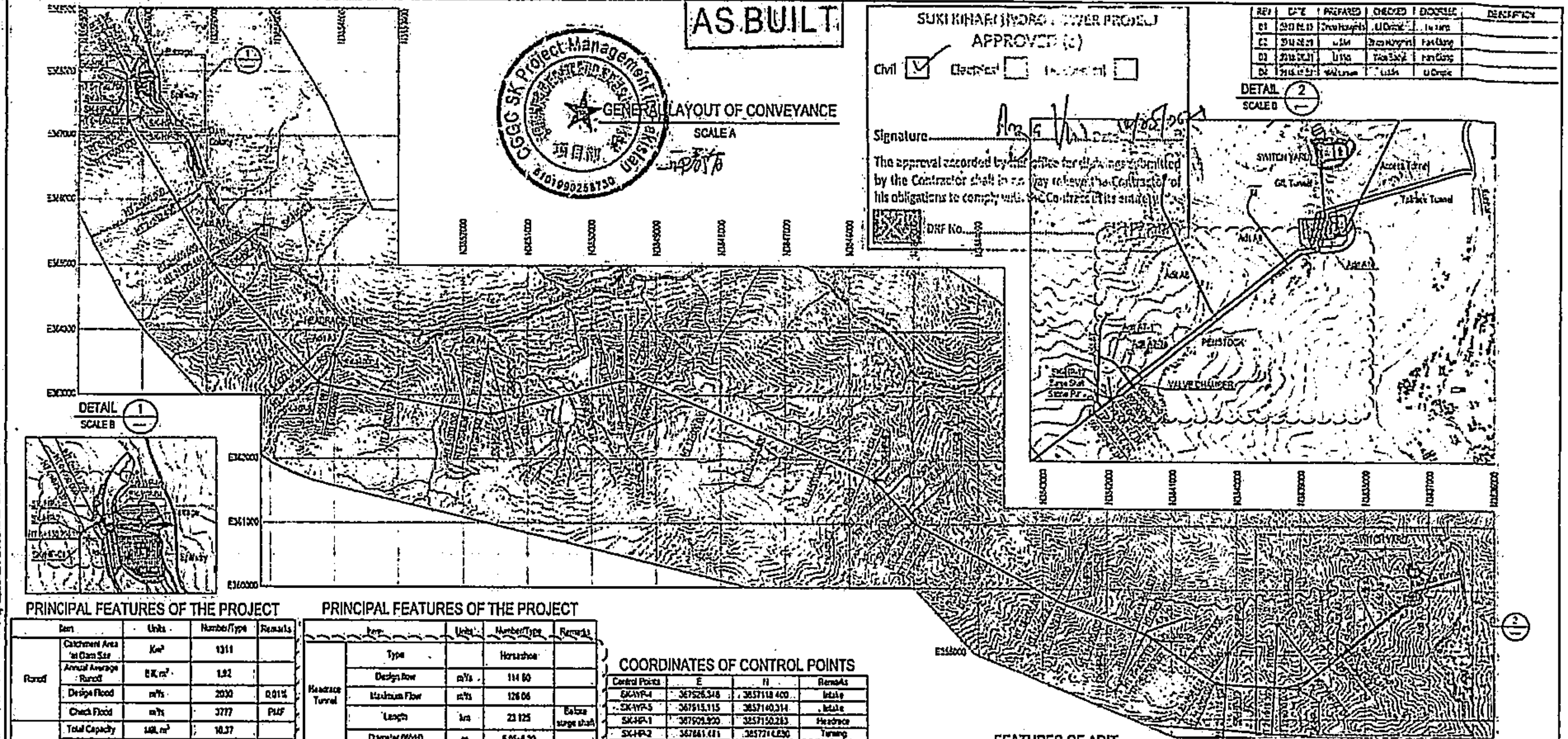
SUKI KINARI HYDRO POWER PROJECT
APPROVED (c)
Civil ☑ Electrical ☐ Mechanical ☐

Signature.......... Date..........

The approval accorded by this office for drawings submitted by the Contractor shall in no way relieve the Contractor of his obligations to comply with the Contract in its entirety.

DRF No..........

REV	DATE	PREPARED	CHECKED	DOCKSEC	DESCRIPTION
01	[illegible]	[illegible]	[illegible]	[illegible]	
02	[illegible]	[illegible]	[illegible]	[illegible]	
03	[illegible]	[illegible]	[illegible]	[illegible]	
04	[illegible]	[illegible]	[illegible]	[illegible]	



PRINCIPAL FEATURES OF THE PROJECT

Item		Units	Number/Type	Remarks
Runoff	Catchment Area at Dam Site	Km²	1311	
	Annual Average Runoff	BK m³	1.92	
	Design Flood	m³/s	2030	0.01%
	Check Flood	m³/s	3777	PMF
Reservoir	Total Capacity	MIL m³	10.37	
	Maximum Operating Level	m. asl.	2233	
	Minimum Operating Level	m. asl.	2223	
Barrage	Dam Type	Asphalt Concrete Core Rockfill Dam		
	Max. Dam Height	m	54.50	
	Crest Length	m	258.0	
	Dam Crest Elevation	m asl.	2238.50	
Spillway	Type	Gravity Dam		
	Spillway Width	m	38.50	
	Crest Top Elevation of Spillway	m	2229.00	
	Number & Size of Spillway	m	5-Wide=4.5	
	Invert Elevation of Bottom Outlet	m	2198.00	
	Number & Size of Bottom Outlet	m	5-4.5x5.0	
Intake	Type		Bank Tower	
	Number		1	
	Invert Elevation	m	2213.00	

PRINCIPAL FEATURES OF THE PROJECT

Item			Units	Number/Type	Remarks
Headrace Tunnel	Type			Horseshoe	
	Design flow		m³/s	114.80	
	Maximum Flow		m³/s	126.06	
	Length		km	23.125	Below surge shaft
	Diameter (WxH)		m	6.05x6.30	
Surge Shaft	Type		The Surge Shaft of Double Chamber		
	Section Shape			Circular	
	Dia. of Upper Chamber		m	Circular	
				22	
	Size of Lower Chamber		m	U Type	
				5.5x4.75~7.25	
	Shaft Height		m	239.7	
Penstock	Main	Section Type		Circular	
		Length	m	1862/1899	-
		Diameter	m	3.16	
	Branch	Section Type	m	Circular	
		Length	m	20.16/28.10/33.43/39.38	
		Diameter	m	2.12/1.68	
Power House	Type			Underground Power House	
	Size of Power House (LxWxH)		m	134.8x24.0x54.8	
Switchyard	Type			Ground Switchyard	
	Voltage Level			500kv	

COORDINATES OF CONTROL POINTS

Control Points	E	N	Remarks
SK-YP-4	367526.318	3857118.400	Intake
SK-YP-5	367515.115	3857140.314	Intake
SK-HP-1	367909.920	3857150.283	Headrace
SK-HP-2	367661.471	3857214.830	Turning
SK-HP-3	367247.501	3857237.330	Turning
SK-HP-4	365029.425	3855113.909	Turning
SK-HP-5	363153.467	3854238.350	Turning
SK-HP-6	362197.838	3851581.268	Turning
SK-HP-7	363161.562	3849372.524	Turning
SK-HP-8	361690.611	3845606.001	Turning
SK-HP-9	361017.229	3845300.000	Turning
SK-HP-9a	359791.758	3842714.959	Turning
SK-HP-9b	359126.844	3841413.349	Turning
SK-HP-10	358548.607	3840304.980	Turning
SK-HP-11	358476.361	3839040.407	Turning
SK-HP-12	359010.449	3838365.083	Surge Shaft
SK-HP-C1	367631.122	3857194.505	Center of Circle
SK-HP-C2	367303.761	3857008.053	Center of Circle
SK-HP-C3	365625.833	3855105.288	Center of Circle
SK-HP-C4	363432.734	3853391.765	Center of Circle
SK-HP-C5	363718.445	3851819.432	Center of Circle
SK-HP-C6	367209.907	3849448.664	Center of Circle
SK-HP-C7	361021.511	3846079.995	Center of Circle
SK-HP-C8	361658.681	3844458.903	Center of Circle
SK-HP-C9	360706.310	3842302.138	Center of Circle
SK-HP-C10	358432.653	3841877.213	Center of Circle
SK-HP-C11	359039.668	3840134.245	Center of Circle
SK-HP-C12	359456.465	3839362.703	Center of Circle

FEATURES OF ADIT

Adit	Station	Length (m)	Inlet Elevation (m)	Cross Elevation (m)	Slope (%)	Upstream Length (m)	Downstream Length (m)
A1	HT 2+332.430	345.997	2210.000	2193.764	-4.905	2332.430	1545.617
A3	HT 5+423.863	584.711	2179.000	2170.731	-1.507	1545.617	1313.988
A4	HT 8+051.838	373.564	2135.000	2151.150	1.704	1313.988	1305.771
A5	HT 10+863.180	1031.975	2173.000	2140.872	-3.247	1305.771	2216.410
A6a	HT 15+096.000	455.549	2104.700	2108.904	0.984	2216.410	327.000
A6b	HT 15+750.000	353.388	2139.000	2108.904	-9.453	327.000	1970.049
A7a	HT 19+690.097	781.622	2030.000	2077.638	6.296	1970.049	1685.275
A7	HT 23+060.847	495.268	2045.000	2050.532	1.189	1685.275	99.840
A7-1	PS 0+070.000	204.923	2046.762	2054.000	3.532	99.840	30.000
A7-1a	PS 0+130.000	148.733	2050.956	2041.490	-9.678	30.000	348.110
A8	PS 0+822.230	400.525	1835.000	1792.160	-5.706	348.110	316.445
A9	PS 0+1455.110	441.105	1617.000	1569.760	-11.906	316.445	

NOTE:
1. STATIONS, DIMENSIONS AND ELEVATIONS ARE GIVEN IN METERS EXCEPT AS NOTED.
2. SCALE:

SCALE A 0 300 600 900 1200 1500m

SCALE B 0 100 200 300 400 500m

Dwg No.	DRAWING TITLE
REFERENCE DRAWINGS	

EMPLOYER:
SK HYDRO (PRIVATE) LIMITED

OWNER'S ENGINEER:
MM Pakistan (Pvt.) Ltd
Mott MacDonald Limited
Yellow River Engineering Consulting Co.,Ltd

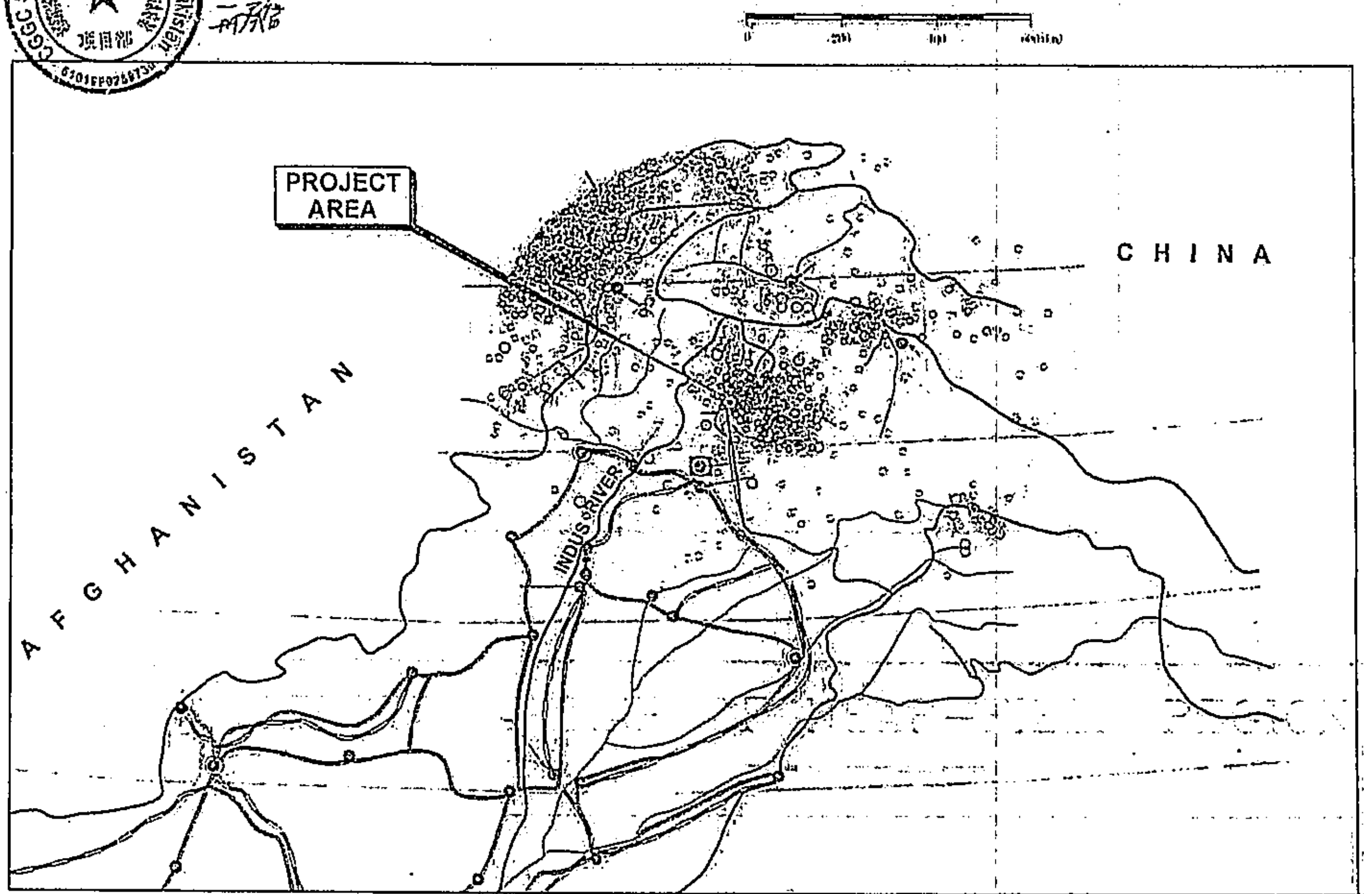
CONTRACTOR:
中国葛洲坝集团巴基斯坦SK项目部

CHINA WATER RESOURCES BEIFANG INVESTIGATION, DESIGN AND RESEARCH CO, LTD

PAKISTAN
SUKI KINARI HYDROPOWER PROJECT

DESIGNED	[illegible]	[illegible]	GENERAL LAYOUT OF CONVEYANCE
CHECKED	[illegible]	[illegible]	
EXAMINED	[illegible]	[illegible]	
VERIFIED			
APPROVED	[illegible]		DETAIL DESIGN / HYDRAULIC SECTION
SCALE	SEE DRAWING		DRAWING NO. [illegible]

SEISMOTECTONIC MAP OF NEAR–FIELD REGION



SUKI KINARI HYDRO POWER PROJECT
APPROVED (a)
Civil ☐ Electrical ☐ Mechanical ☐
Signature .... Date 10/05/2024
The approval accorded by this office for drawings submitted by the Contractor shall in no way relieve the Contractor of his obligations to comply with the Contract in its entirety.
DRF No. .... SKHYDRO

Legend

Symbol	Magnitude
·	ML<1
○ (small)	1<ML≤5
○	ML>5

EMPLOYER: SK HYDRO (PRIVATE) LIMITED

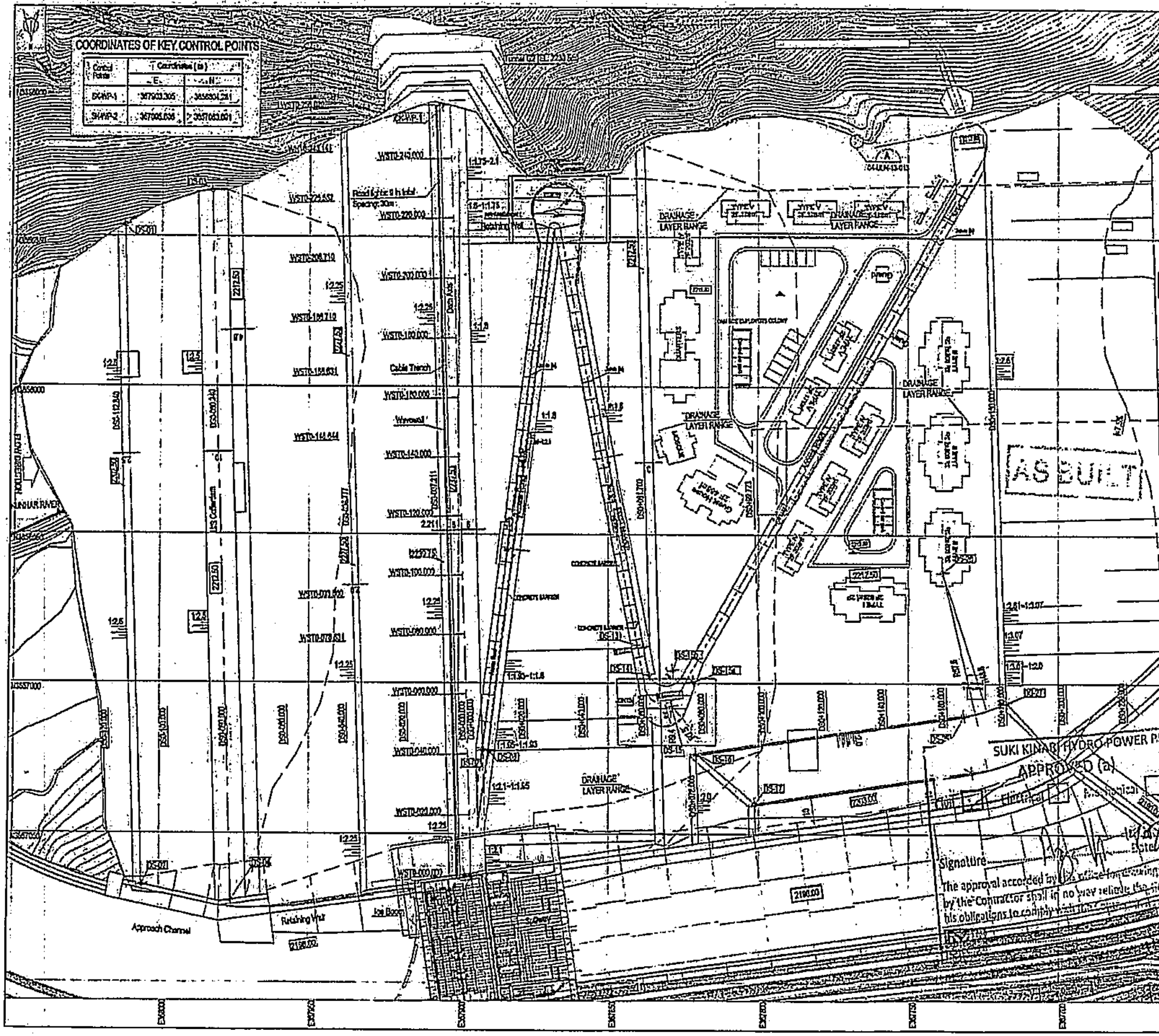
OWNER'S ENGINEER: MOTT MACDONALD UK, YELLOW RIVER CONSERVANCY COMMISSION, MOTT MACDONALD PAKISTAN JOINT VENTURE

CONTRACTOR: 中国葛洲坝集团巴基斯坦SK项目部 CGGC SUKI KINARI PROJECT MANAGEMENT IN PAKISTAN

CHINA WATER RESOURCES BEIFANG INVESTIGATION, DESIGN AND RESEARCH CO. LTD.

PAKISTAN
SUKI KINARI HYDROPOWER PROJECT

DESIGNED			
CHECKED			
EXAMINED			
VERIFIED			
APPROVED		BASIC DESIGN	GEOLOGY SECTION
SCALE	SEE DRAWING		



Control Points	Coordinates (m) E	Coordinates (m) N
SKWP-1	367903.305	3356304.261
SKWP-2	367093.036	3357063.001

FCR File No	Date	Remark
FCR-2024-10	July 19, 2024	Approved

COORDINATES OF CONTROL POINTS

Control Points	Coordinates (m) E	Coordinates (m) N	Control Points	Coordinates (m) E	Coordinates (m) N
DS-01	367012.463	3356548.100	DS-16	367720.832	3357023.555
DS-02	367005.979	3357066.077	DS-17	367801.343	3357032.935
DS-03	367902.760	3356834.612	DS-18	367722.814	3356836.220
DS-04	367973.820	3357071.878	DS-19	367722.859	3356822.110
DS-05	367007.153	3356763.829	DS-20	367720.427	3356802.817
DS-06	367005.960	3356805.861	DS-21	367653.577	3356082.311
DS-07	367791.901	3357022.237	DS-22	367650.546	3356062.750
DS-08	367802.918	3357022.454	DS-23	367650.560	3356061.072
DS-09	367803.047	3356347.370	DS-24	367666.223	3356272.703
DS-10	367808.027	3356847.902	DS-25	367731.531	3357010.700
DS-11	367806.143	3356836.502	DS-26	367725.830	3357022.855
DS-12	367863.206	3356862.533	DS-27	367717.291	3357006.400
DS-13	367838.164	3356987.843	DS-28	367733.416	3356062.840
DS-14	367836.467	3356007.066	DS-29	367654.067	3356317.414
DS-15	367822.036	3357007.722	DS-30	367657.053	3356317.800
DS-15a	367821.829	3356997.521	DS-31	367063.036	3356452.570
DS-15b	367828.530	3356995.801	DS-32	367062.706	3356062.480
DS-15c	367734.715	3356544.907	DS-33	367650.187	3356083.542

CHARACTERISTICS OF DAM

Item	Unit	Particulars
Dam Type	Asphalt Concrete Core Rockfill Dam	
Maximum Dam Height	m	54.5
Dam Crest Level	m	2229.50
Crest Length	m	250.02
Width of Dam Crest	m	10.0
Maximum Operation Level	m	2230.00
Minimum Operating Level	m	2223.00
Dam Upstream Slope		1:2.25
Dam Downstream Slope		1:1.8

NOTES:

1. THE DRAWING WAS APPLICABLE FOR THE SUBJECT AS GIVEN IN THE TITLE AND ANY OTHER INFORMATION SHOULD BE OBTAINED FROM RELEVANT APPROVED DRAWING/DOCUMENT.
2. THE GENERAL LAYOUTS OF HEADWORKS REFER TO DRAWINGS SKP-CGGC-AB-04-UUN-13-001-006.
3. ALL DIMENSIONS WERE GIVEN IN METER EXCEPT AS NOTED. SLOPES WERE MENTIONED AS VERTICAL : HORIZONTAL.
4. SCALE: 0 6.0 12.0 18.0 24.0 30.0m

Dwg. No.	DRAWING TITLE
REFERENCE DRAWINGS	

EMPLOYER: SK HYDRO (PRIVATE) LIMITED

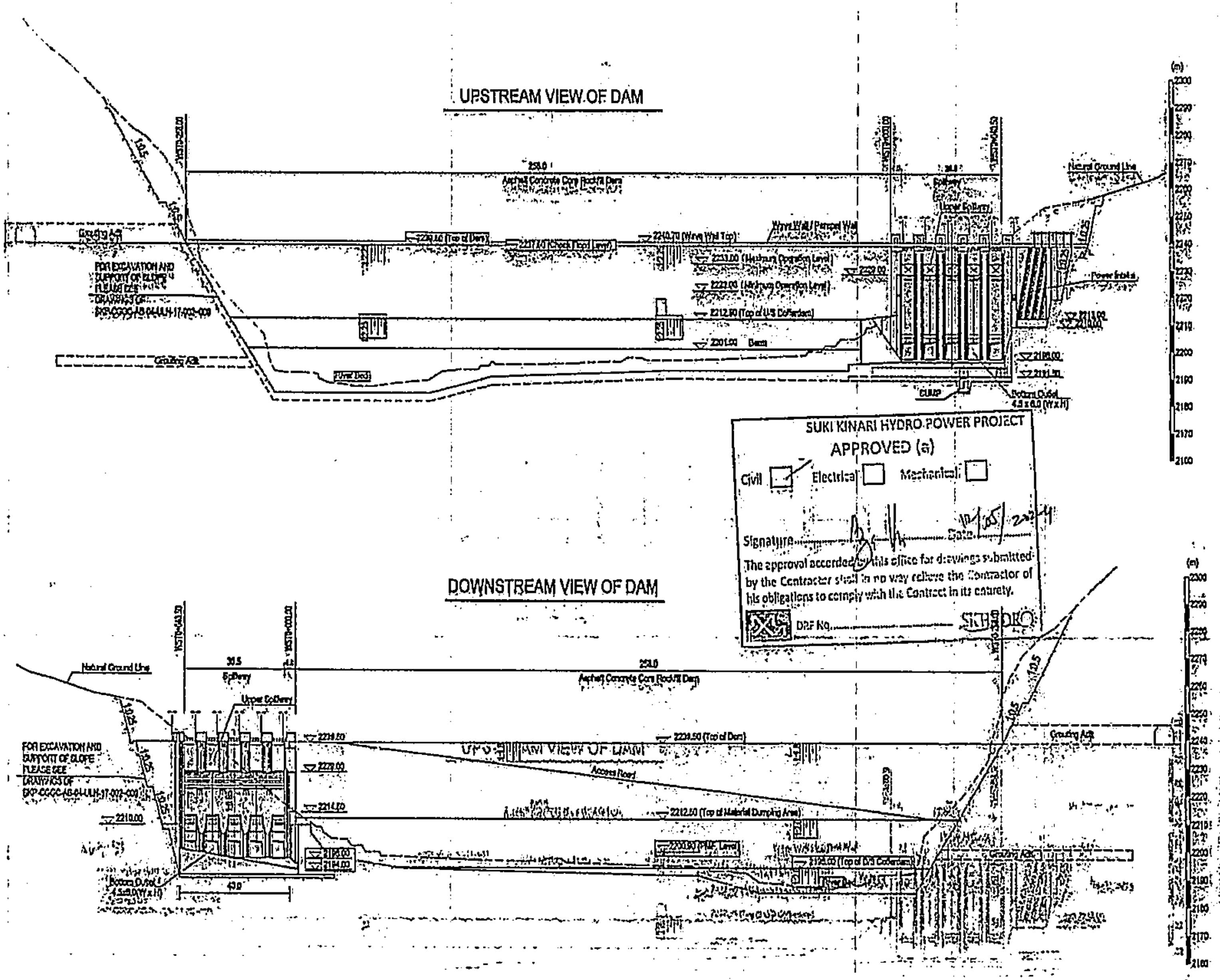
OWNER'S ENGINEER: MM Pakistan (Pvt.) Ltd
Mott MacDonald Limited
Yellow River Engineering Consulting Co.,Ltd

CONTRACTOR: 中国葛洲坝集团巴基斯坦SK项目部
CGGC SUKI KINARI PROJECT MANAGEMENT IN PAKISTAN

CHINA WATER RESOURCES BEIFANG INVESTIGATION, DESIGN AND RESEARCH CO. LTD

SUKI KINARI HYDROPOWER PROJECT
PAKISTAN

DESIGNED	Luo Shuai	2024.08.13	Layout of Asphalt Concrete Rockfill Dam
CHECKED	Zhao Jiang	2024.08.13	
EXAMINED	Liu Yici	2024.08.13	
VERIFIED			
APPROVED	[signature]		AS-BUILT DRAWING DESIGN / HYDRAULIC SECTION
SCALE	SEE DRAWING		DRAWING No. SKP-CGGC-AB-04-UUN-13-007-02



SUKI KINARI HYDRO POWER PROJECT
APPROVED (a)
Civil ☑ Electrical ☐ Mechanical ☐
Signature .... Date ....
The approval accorded by this office for drawings submitted by the Contracter shall in no way relieve the Contractor of his obligations to comply with the Contract in its entirety.
DRF No. ....

AS BUILT

NOTES:

1. DIMENSIONS, ELEVATIONS AND CHAINAGES WERE IN METERS EXCEPT AS NOTED.

Dwg. No.	DRAWING TITLE
REFERENCE DRAWINGS	

EMPLOYER: SK HYDRO (PRIVATE) LIMITED

OWNER'S ENGINEER: MM Pakistan (Pvt.) Ltd, Mott MacDonald Limited, Yellow River Engineering Consulting Co.,Ltd

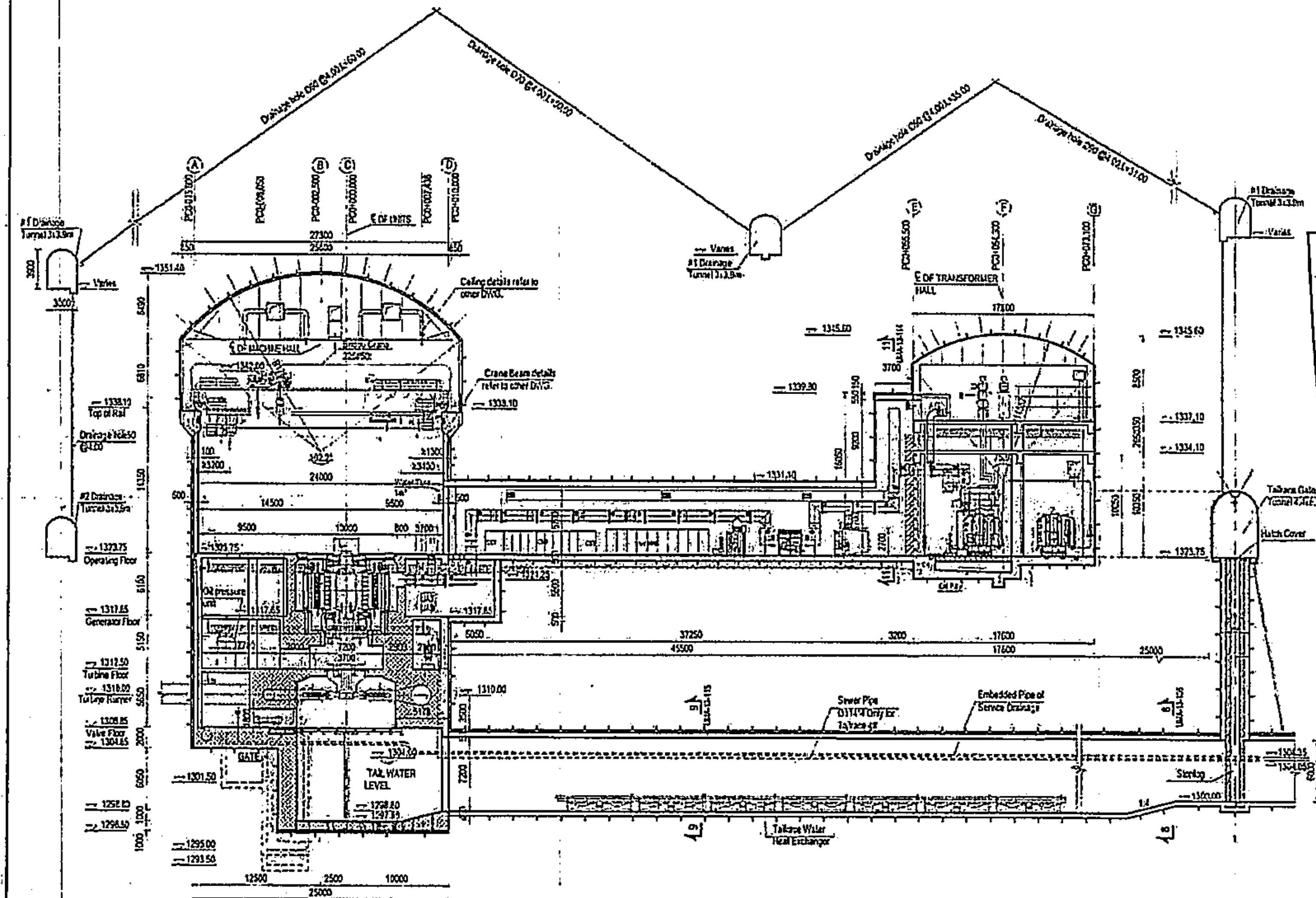
CONTRACTOR: 中国葛洲坝集团巴基斯坦SK项目部 CGGC SUKI KINARI PROJECT MANAGEMENT IN PAKISTAN

CHINA WATER RESOURCES BEIFANG INVESTIGATION, DESIGN AND RESEARCH CO. LTD

SUKI KINARI HYDROPOWER PROJECT PAKISTAN

DESIGNED			Head Works Upstream & Downstream Views
CHECKED	Zhao Jianli		
DRAWN	Liu Yai		
VERIFIED			
APPROVED			AS-BUILT DRAWING DESIGN / HYDRAULIC SECTION
SCALE	SEE DRAWING		DRAWING No. SKP-CCGC-AB-04-ULN-15-002-02

CROSS SECTION OF POWERHOUSE



NOTES
1. ALL DIMENSIONS ARE IN MILLIMETERS AND ELEVATIONS ARE IN METERS, UNLESS OTHERWISE NOTED
2. SCALE:

SUKI KINARI HYDRO POWER PROJECT

Civil ☑ Electrical ☐ Mechanical ☐

Signature ______ Date 12/06/2024

The approval recorded by the office for drawings submitted by the Contractor shall in no way relieve the Contractor of his obligations to comply with the Contract in its entirety.

DRF No. ______ SKHYDRO

AS BUILT

Drg. No.	DRAWING TITLE
REFERENCE DRAWINGS	

EMPLOYER:
SK HYDRO (PRIVATE) LIMITED

OWNER'S ENGINEER:
MM Pakistan (Pvt.) Ltd
Mott MacDonald Limited
Yellow River Engineering Consulting Co.,Ltd

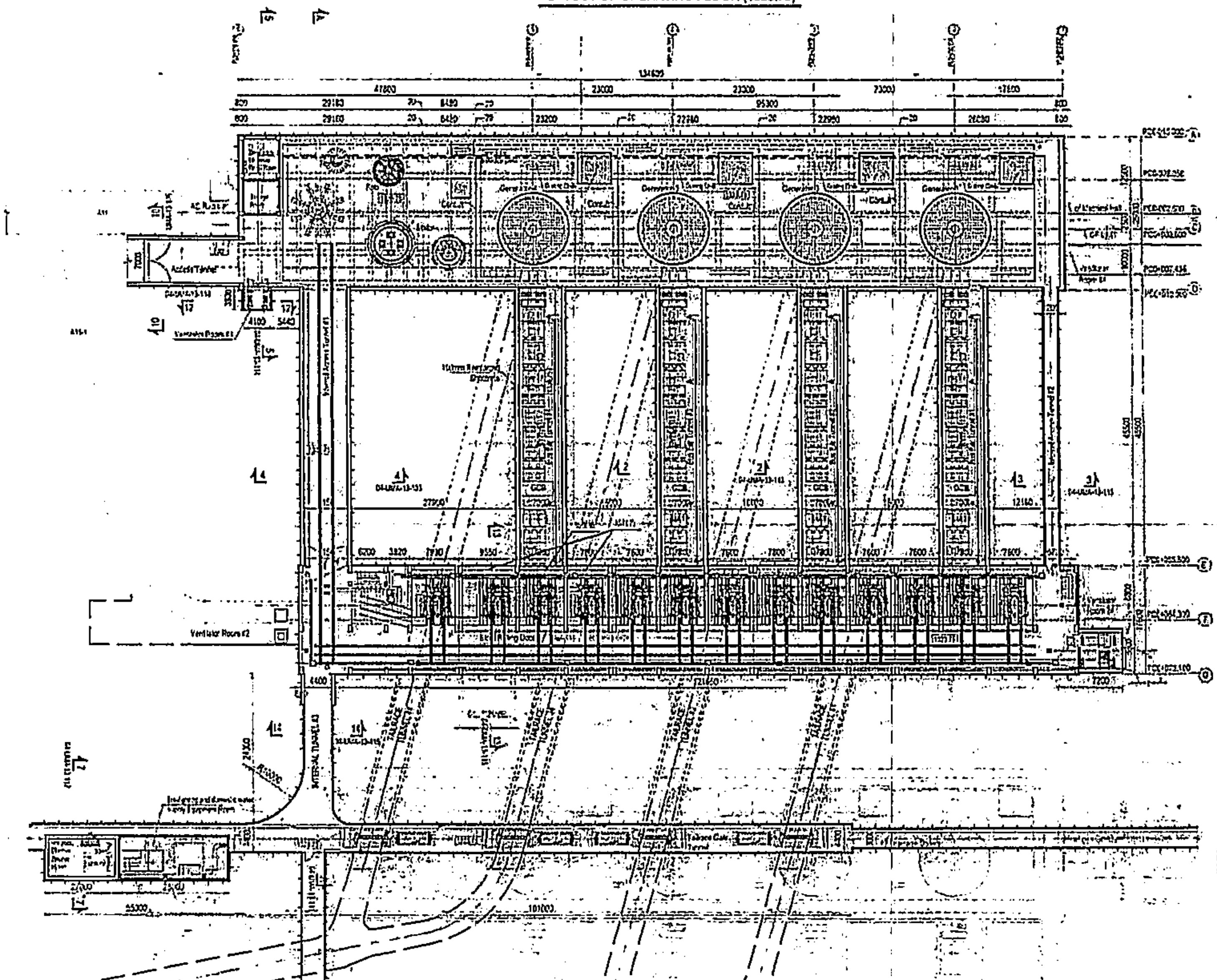
CONTRACTOR:
中国葛洲坝集团巴基斯坦SK项目部
CGGC SUKI KINARI PROJECT MANAGEMENT IN PAKISTAN

CHINA WATER RESOURCES BEIFANG INVESTIGATION, DESIGN AND RESEARCH CO. LTD

SUKI KINARI HYDROPOWER PROJECT
PAKISTAN

DESIGNED	Luo Shuo	2024.05.21	POWER HOUSE CROSS SECTION AT CENTRERLINE OF UNITS
CHECKED	Zhao Jianli	2024.05.21	
EXAMINED	Zhao Chunxia	2024.05.21	
VERIFIED			
APPROVED	[illegible]	2024.05.21	AS-BUILT DRAWING DESIGN / HYDRAULIC SECTION
SCALE	SEE DRAWING	DRAWING No.	SKP-CGGC-AB-04-UEN-10-91-00

LAYOUT OF OPERATING FLOOR (1323.75)



NOTES

1. ALL DIMENSIONS ARE IN MILLIMETERS AND ELEVATIONS ARE IN METERS, UNLESS OTHERWISE NOTED.

SUKI KINARI HYDRO POWER PROJECT

APPROVED (a)

Civil [ ] Electrical [ ] Mechanical [ ]

Con.J.— Contraction Joint

C.J.— Construction Joint

Signature .... Date 12/05/2024

The approval accorded by this office for drawings submitted by the Contractor shall in no way relieve the Contractor of his obligations to comply with the Contract in its entirety.

DRF No. .... SK HYDRO

AS BUILT

	Dwg. No.	DRAWING TITLE
REFERENCE DRAWINGS		

EMPLOYER:

SK HYDRO (PRIVATE) LIMITED

OWNER'S ENGINEER:

MM Pakistan (Pvt.) Ltd

Mott MacDonald Limited

Yellow River Engineering Consulting Co.,Ltd

CONTRACTOR:

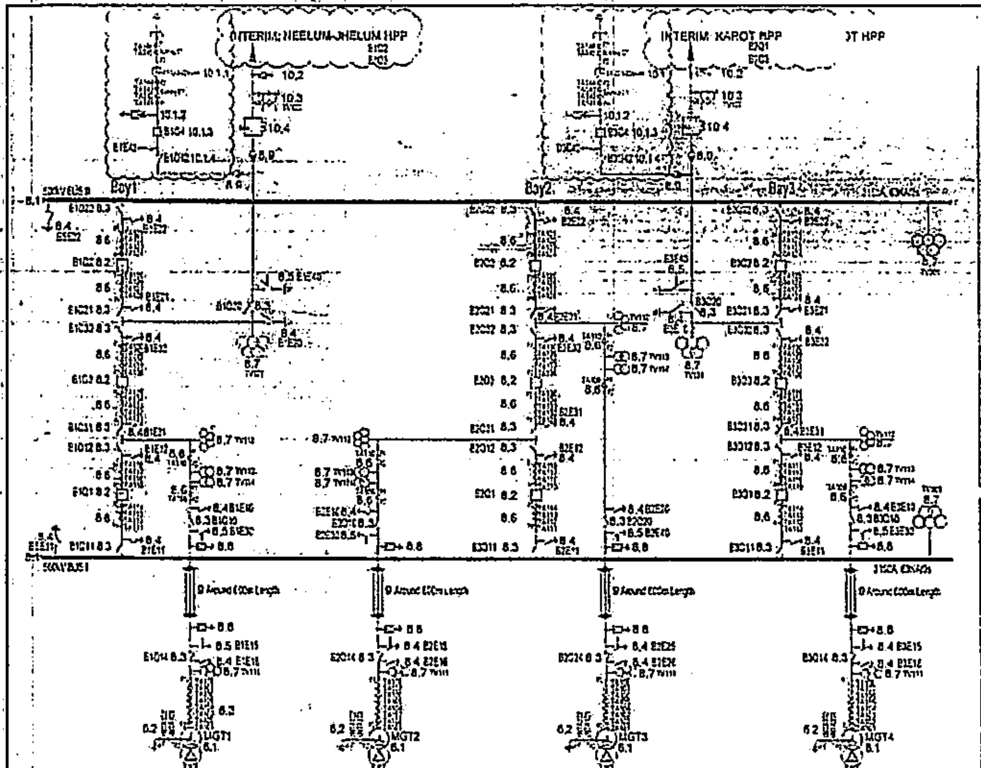
中国葛洲坝集团巴基斯坦SK项目部

CHINA WATER RESOURCES BEIFANG INVESTIGATION, DESIGN AND RESEARCH CO. LTD

SUKI KINARI HYDROPOWER PROJECT
PAKISTAN

POWER HOUSE
LAYOUT OF OPERATING FLOOR
(1323.75)

DESIGNED
CHECKED
DRAWN
VERIFIED
APPROVED
SCALE: SEE DRAWING



TRANSFORMER RATINGS 主变压器额定值:

SN	DESCRIPTION	MGT
1	RATED CAPACITY	[illegible]
2	RATED VOLTAGE OF PRIMARY WINDING	[illegible]
3	RATED VOLTAGE OF SECONDARY WINDING	[illegible]
4	RATED FREQUENCY	[illegible]
5	TAP CHANGER	[illegible]
6	VECTOR GROUP	YNd1
7	PERCENTAGE SHORT CIRCUIT REACTANCE	[illegible]
8	RATED LIGHTING IMPULSE WITHSTAND VOLTAGE(HV)	1550kV
9	POWER FREQUENCY WITHSTAND LEVEL	[illegible]

MAIN SWITCHGEAR RATINGS 主要开关设备额定值:

SN	DESCRIPTION	GIS
1	NORMAL SYSTEM VOLTAGE	500kV
2	RATED SYSTEM VOLTAGE	550kV
3	RATED FREQUENCY	50Hz
4	RATED LIGHTING IMPULSE WITHSTAND VOLTAGE	1550kV
5	POWER FREQUENCY WITHSTAND LEVEL	740kV
6	RATED CURRENT	4000A
7	RATED SHORT-TIME WITHSTAND CURRENT	63kA/3s

MAIN CONDUCTOR RATINGS 主要导体额定值:

SN	DESCRIPTION	GIL
1	RATED CURRENT	4000A
2	RATED SYSTEM VOLTAGE	550kV
3	RATED FREQUENCY	50Hz
4	RATED LIGHTING IMPULSE WITHSTAND VOLTAGE	1550kV
5	POWER FREQUENCY WITHSTAND LEVEL	740kV
6	RATED SHORT-TIME WITHSTAND CURRENT	63kA/3s
7	CONDUCTOR TYPE	AL TUBE

SUKI KINARI HYDRO POWER PROJECT

APPROVED (a)

Civil ☐ Electrical ☑ Mechanical ☐

Signature .... Date ....

The approval accorded by this office for drawings submitted by the Contractor shall in no way relieve the Contractor of his obligations to comply with the Contract in its entirety.

DRF No. .... SKHYDRO

BUSHING TYPE CURRENT TRANSFORMER 套管式电流互感器

TA1[illegible]	INSTRUMENT	[illegible]	0.2	[illegible]
TA1[illegible]	INSTRUMENT	[illegible]	0.5	[illegible]
TA1[illegible]	GSU Protection Set I	[illegible]	5P20	15VA
TA1[illegible]	GSU Protection Set I	[illegible]	5P20	15VA
TA1[illegible]	GSU Protection Set II	1000-1250/1	5P20	15VA
TA1[illegible]	GSU Protection Set II	1000-1250/1	5P20	15VA
TA1[illegible]	GC CURRENT DIFFERENT	[illegible]	TPY [illegible]	[illegible]
TA1[illegible]	GC CURRENT DIFFERENT	[illegible]	TPY [illegible]	[illegible]

TPY TRANSIENT CHARACTERISTICS, Tp=100ms C-100ms(40ms)O-500ms-C-100ms(40ms)-O

NEUTRAL CURRENT TRANSFORMER 中性点电流互感器

SERIES	APPLICATION	RATIO	CLASS	BURDEN
NTA101	PROTECTION	1000-500/1	5P20	15VA
[illegible]	PROTECTION	1000-500/1	5P20	15VA

VOLTAGE TRANSFORMER 电压互感器

NO.	RATIO(kV)	CLASS	Burden(VA)
TV1[illegible]	500/√3 0.1/√3 0.1/√3 0.1/√3 0.1	[illegible]	[illegible]
TV1[illegible]	500/√3 0.1/√3 0.1/√3 0.1/√3 0.1	[illegible]	[illegible]
TV1[illegible]	500/√3 0.1/√3 0.1/√3 0.1/√3 0.1	[illegible]	[illegible]
TV1[illegible]	500/√3 0.1/√3 0.1/√3 0.1/√3 0.1	[illegible]	[illegible]
TV1[illegible]	500/√3 0.1/√3 (DEDICATED METERING)	0.2	[illegible]
TV1[illegible]	500/√3 0.1/√3 (DEDICATED METERING)	0.2	[illegible]
TV1[illegible]	500/√3 0.1/√3 0.1/√3 0.1/√3 0.1	[illegible]	[illegible]
TV1[illegible]	500/√3 0.1/√3 0.1/√3	[illegible]	[illegible]

BUSHING TYPE CURRENT TRANSFORMER OF SHUNT REACTOR 并联电抗器套管式电流互感器

TA1[illegible]	Large Current Cut Protection	[illegible]	5P20	[illegible]
TA1[illegible]	REF	[illegible]	5P20	[illegible]
TA1[illegible]	INSTRUMENT	[illegible]	[illegible]	[illegible]
TA1[illegible]	CENTER	[illegible]	5P20	[illegible]
TA1[illegible]	REF	[illegible]	5P20	[illegible]
TA1[illegible]	Large Current Cut Protection	[illegible]	5P20	[illegible]

BOQ LIST 1 OF MAIN EQUIPMENT 主要设备工程量表1

SN	Name	Specification	Unit	Qty	Remark
6	主变压器及附件 Main Transformer & Accessories		set	4	
6.1	主变压器 Main Transformer	[illegible] YNd1 [illegible]	set	4	[illegible]
[illegible]	[illegible] Neutral Bushing CT	[illegible]	[illegible]	[illegible]	
[illegible]	[illegible] HV Bushing CT	[illegible]	[illegible]	[illegible]	
[illegible]	[illegible]	[illegible]	[illegible]	1	
7.1	主母线 Main Bus	20kV, [illegible]	Lump sum	1	
7.2	分支母线 Branch Bus	20kV, [illegible]	Lump sum	1	
8	500kV GIS Equipment	[illegible] connection	Lump sum	1	
8.1	500kV GIS母线 GIS Busbar	550kV, 4000A, 63kA/3s	set	1	
8.2	500kV GIS断路器 GIS CB	550kV, 4000A, 63kA/3s	set	[illegible]	three phases
8.3	500kV GIS隔离开关 GIS DS	550kV, 4000A, 63kA/3s	set	[illegible]	three phases
8.4	500kV GIS接地开关 GIS ES	550kV, 4000A, 63kA/3s	set	[illegible]	three phases
8.5	500kV GIS快速接地开关 GIS FES	550kV, 4000A, 63kA/3s	set	[illegible]	three phases
8.6	500kV GIS电流互感器 GIS CT	[illegible]	set	[illegible]	three phases
8.7	500kV GIS电压互感器 GIS PT	[illegible]	set	[illegible]	three phases
8.8	500kV GIS避雷器 500kV GIS Surge Arrester	[illegible], 20kA, CAV Discharge counter	set	[illegible]	three phases
8.9	500kV GIS空气套管 500kV GIS SF6 to Air Bushing	550kV, 4000A, 63kA/3s	set	12	single phases
9	500kV GIL Equipment	550kV 4000A 63kA/3s	Set	4	three phases
10	500kV出线设备 500kV Outgoing Equipment		bay	[illegible]	
10.1	500kV 并联电抗器间隔 Shunt Reactor Branch	[illegible]	Lump sum	1	As per Notes 1, Refer to BOQ List 2
10.2	500kV 避雷器 Surge Arrester	Y20W-444/1063, 20kA, discharge counter attached	pcs/bay	3	
10.3	500kV 电容式电压互感器 CVT	[illegible]	pcs/bay	3	3 CCVT
10.4	500kV 阻波器 Line Trap	[illegible]	pcs/bay	3	
11	[illegible] Stranded Conductor	Condorss AAC 1590 KCM [illegible]	As per design	-	
12	Connectors	[illegible]	As per design	-	
13	Disc Insulator	Fog Type	As per design	-	

CURRENT TRANSFORMER 电流互感器

CORE NO	APPLICATION	RATIO	CLASS	BURDEN
TA133	CURRENT DIFFERENT	3000-2500-2000-1250-750/1	TPY Kssc=20	Rs=7.5/7.5Ω/500
TA13[illegible]	CURRENT DIFFERENT	3000-2500-2000-1250-750/1	TPY Kssc=20	Rs=7.5/7.5Ω/500
TA13[illegible]	BREAKER FAIL PROT, OVERCURRENT PROT, DISTURBANCE RECOR.	3000-2500-2000-1250-750/1	5P20	30VA (at lowest tap)
TA13[illegible]	BREAKER FAIL PROT, OVERCURRENT PROT, DISTURBANCE RECOR.	3000-2500-2000-1250-750/1	5P20	30VA (at lowest tap)
TA13[illegible]	INSTRUMENT	3000-2500-2000-1250-750/1	0.2	15VA
TA13[illegible]	INSTRUMENT	3000-2500-2000-1250-750/1	0.2	15VA
TA134	BREAKER FAIL PROT, OVERCURRENT PROT, DISTURBANCE RECOR.	3000-2500-2000-1250-750/1	5P20	[illegible]
TA133	BREAKER FAIL PROT, OVERCURRENT PROT, DISTURBANCE RECOR.	3000-2500-2000-1250-750/1	5P20	[illegible] (at lowest tap)
TA132	CURRENT DIFFERENT	3000-2500-2000-1250-750/1	TPY Kssc=20	Rs=7.5/7.5Ω/500
TA131	CURRENT DIFFERENT	3000-2500-2000-1250-750/1	TPY Kssc=20	Rs=7.5/7.5Ω/500
TA12[illegible]	CURRENT DIFFERENT	3000-2500-2000-1250-750/1	5P20	30VA (at lowest tap)
TA127	CURRENT DIFFERENT	3000-2500-2000-1250-750/1	5P20	30VA (at lowest tap)
TA126	BREAKER FAIL PROT, OVERCURRENT PROT, DISTURBANCE RECOR.	3000-2500-2000-1250-750/1	5P20	30VA (at lowest tap)
TA12[illegible]	INSTRUMENT	3000-2500-2000-1250-750/1	0.2	15VA
TA124	BREAKER FAIL PROT, OVERCURRENT PROT, DISTURBANCE RECOR.	3000-2500-2000-1250-750/1	5P20	30VA (at lowest tap)
TA123	BREAKER FAIL PROT, OVERCURRENT PROT, DISTURBANCE RECOR.	3000-2500-2000-1250-750/1	5P20	30VA (at lowest tap)
TA122	CURRENT DIFFERENT	3000-2500-2000-1250-750/1	TPY Kssc=20	Rs=7.5/7.5Ω/500
TA121	CURRENT DIFFERENT	3000-2500-2000-1250-750/1	TPY Kssc=20	Rs=7.5/7.5Ω/500
TA118	CURRENT DIFFERENT	3000-2500-2000-1250-750/1	5P20	30VA (at lowest tap)
TA117	CURRENT DIFFERENT	3000-2500-2000-1250-750/1	5P20	30VA (at lowest tap)
TA116	BREAKER FAIL PROT, OVERCURRENT PROT, DISTURBANCE RECOR.	3000-2500-2000-1250-750/1	5P20	30VA (at lowest tap)
TA115	INSTRUMENT	3000-2500-2000-1250-750/1	0.2	15VA
TA114	BREAKER FAIL PROT, OVERCURRENT PROT, DISTURBANCE RECOR.	3000-2500-2000-1250-750/1	5P20	30VA (at lowest tap)
TA113	BREAKER FAIL PROT, OVERCURRENT PROT, DISTURBANCE RECOR.	3000-2500-2000-1250-750/1	5P20	30VA (at lowest tap)
TA112	CURRENT DIFFERENT	3000-2500-2000-1250-750/1	TPY Kssc=20	Rs=7.5/7.5Ω/500
TA111	CURRENT DIFFERENT	3000-2500-2000-1250-750/1	TPY Kssc=20	Rs=7.5/7.5Ω/500
TA1[illegible]	METERING	1000-500/1	0.2S	15VA
TA1[illegible]	METERING	1000-500/1	0.2S	15VA

TPY TRANSIENT CHARACTERISTICS, Tp=100ms C-100ms(40ms)O-500ms-C-100ms(40ms)-O

AS BUILT

REV	DATE	PREPARED	CHECKED	ENDORSED	DESCRIPTION
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	Unit Reactor [illegible]
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]

NOTES:

1. Shunt Reactor and allied equipment (10.1) shall be supplied installed tested by SK Hydro. However as per NEPRA's letter NEPRA/Director(Tech)/TRF-232/SKHPL 2013/78-80 dated January 5, 2023, "The COD of the project shall remain intact and will not linked with the procurement and installation of Shunt Reactor.
2. According to the interconnection study report provided by NTDC, SKHPP will temporarily connect to the existing NJHPP and KRHPP as a interim interconnection scheme.
For phase II interconnection scheme, SKHPP will be connected to 500kV MAIRA S/S after its commissioning, the final accessing distance is about 158km.
3. One unit of 11kV, 2000kVA emergency diesel generator will be equipped for the project which could be used for black start.
4. The detailed technical data for conductor/connector/Disc insulator shall be subject to NTDC specification/Requirement.

BOQ LIST 2 OF MAIN EQUIPMENT 主要设备工程量表2

SN	Name	Specification	Unit	Qty	Remark
10.1.1	并联电抗器及附件 Shunt Reactor & Accessories		set	7	
	并联电抗器 Shunt Reactor	BKD-[illegible] [illegible]MVA @500kV [illegible]MVA @550kV ONAN	[illegible]	1	[illegible]
	中性点套管电流互感器 Neutral Bushing CT		pcs/set	1	
	高压套管电流互感器 HV Bushing CT		pcs/set	1	
	中性点连接 Neutral Point Connection	[illegible]	Lump sum	1	
10.1.2	500kV 避雷器 Surge Arrester	Y20W-444/1063, 20kA, discharge counter attached	set	6	Single Phase
10.1.3	500kV 断路器 CB	550kV 4000A 63kA/3s	set	2	3 Phases
10.1.4	500kV 隔离开关 DS	[illegible]	set	2	3 Phases

Drg No.	DRAWING TITLE

REFERENCE DRAWINGS

EMPLOYER:
SK HYDRO (PRIVATE) LIMITED

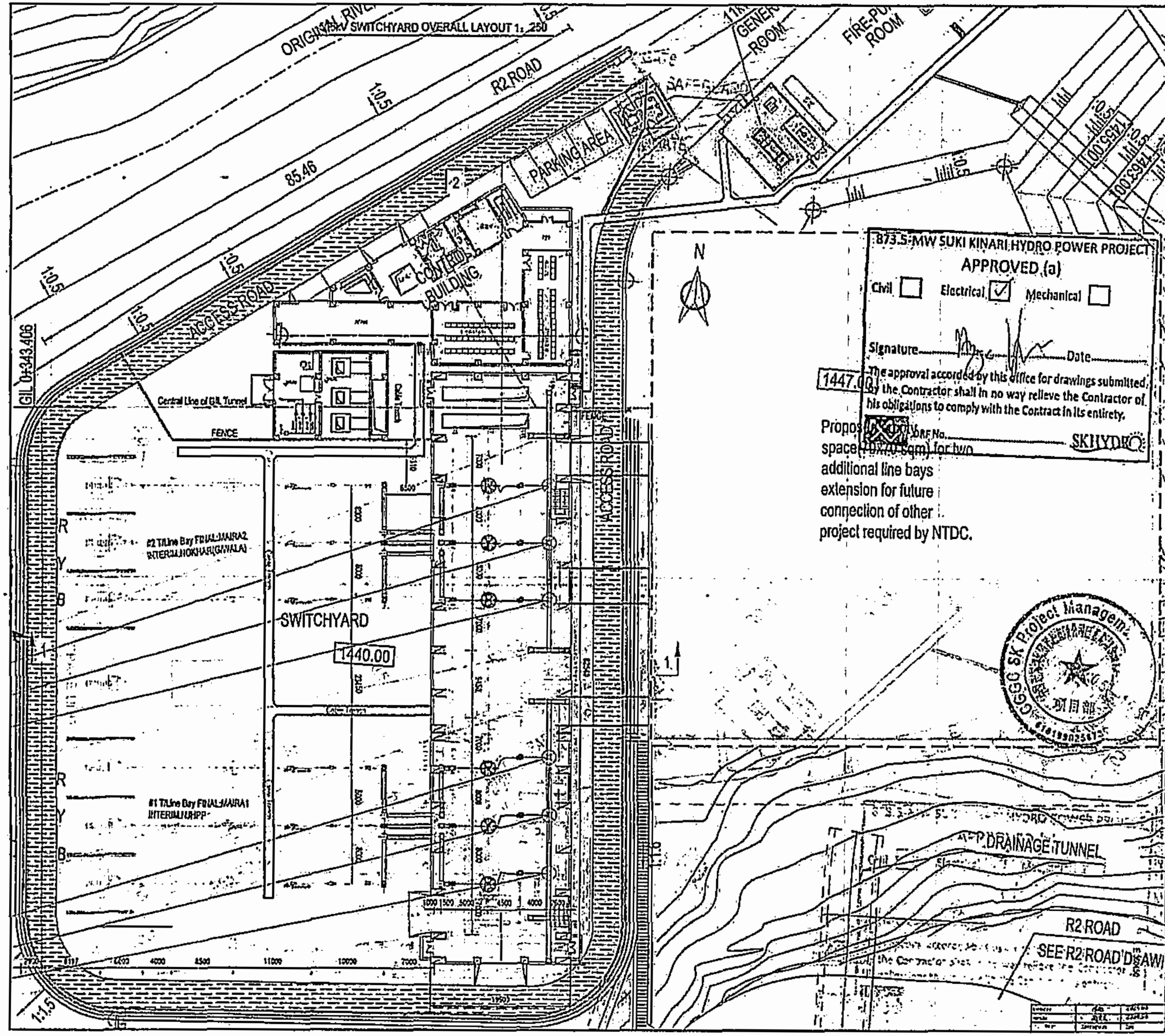
OWNER'S ENGINEER:
MM Pakistan (Pvt.) Ltd
Mott MacDonald Limited
Yellow River Engineering Consulting Co.,Ltd

CONTRACTOR:
中国葛洲坝集团巴基斯坦SK项目部
CGGC SUKI KINARI PROJECT MANAGEMENT IN PAKISTAN

CHINA WATER RESOURCES BEIFANG INVESTIGATION, DESIGN AND RESEARCH CO. LTD

SUKI KINARI HYDROPOWER PROJECT
PAKISTAN

DESIGNED	[illegible]	[illegible]	500kV System Single Line Diagram
CHECKED	[illegible]	[illegible]	
DRAWN	[illegible]	[illegible]	
VERIFIED			
APPROVED			DETAILED DESIGN / ELECTRIC SECTION
SCALE	SEE DRAWING		DRAWING No. [illegible]



FCR		
File No.	Date	Remark

NOTES:

1. All dimensions are in "mm" and elevations are in "m" unless otherwise noted.
2. This drawing is for switchyard overall layout, detailed dimension of GIS, GIL, AIS equipment and connections subject to related equipment layout drawing.
3. Civil and structural layout and dimensions shall be subject to HYDRAULIC drawings.
4. The Gantry design shall be as per the requirement in the letter "CESSO/M-PPIO-142/12932-31 Date: 18/11/2020"
5. The creepage distance of external insulation shall be not less than 31mm/kV(for highest operation voltage).
6. The phase sequence of the outgoing lines shall be confirmed by NTDC or T/Line designer.
7. The dotted line area(70x70sqm) could be used for the additional line bays extension, the final civil design and electrical design and implementation of the additional line bays extension is not under the scope of the this project.
8. The coordinate of the terminal tower of the 500kV T/Line is X:3?9184.84, Y:3837193.5 provided by NESPAK.

ABBREVIATION LIST:

S/N	Name	Abbr.	S/N	Name	Abbr.
1	Disconnector	DS	7	Line Trap	LT
2	Circuit Breaker	CB	8	Gantry	G
3	Current Transformer	CT	9	Earth Mat	EM
4	Capacitive Voltage Transformer	CVT	10	Phase "R"	R
			11	Phase "Y"	Y
5	Surge Arrester	SA	12	Phase "B"	B
6	Shunt Reactor	SR	13		

500kV System Outdoor Minimum Clearance(Corrected according to 1500m elevation)

Coding	Name	Abbr.	DATA
A1	Phase to earth clearance	PE	4150mm
A2	Phase to phase clearance	PP	4650mm
C	Safety clearance (Vertical)	SCV	7500mm
D	Safety clearance (Horizontal)	SCH	6150mm
	Ground clearance	GC	2300mm

500kV System Ratings

S/L	Name	Rating	Remarks
A	System Ratings		
1	Nominal system voltage	500kV	
2	Highest operation voltage	550kV	
3	Rated frequency	50Hz	
4	Rated lighting impulse withstand voltage	1675kVp	
5	Power frequency withstand voltage	740kV	
9	Rated short-time withstand current	63kA/3s	
10	Rated peak withstand current	160kA	
11	Minimum Creepage Distance	31mm/kV	
12	Altitude Level	1500m	
13	Seismic Acceleration	0.3g	
14	Outdoor Ambient Air Temperature	-25°C~+45°C	

AS BUILT

EMPLOYER:
SK HYDRO (PRIVATE) LIMITED

OWNER'S ENGINEER:
MM Pakistan (Pvt.) Ltd
Mott MacDonald Limited
Yellow River Engineering Consulting Co.,Ltd

CONTRACTOR:
中国葛洲坝集团巴基斯坦SK项目部

CHINA WATER RESOURCES BEIFANG INVESTIGATION, DESIGN AND RESEARCH CO. LTD

SUKI KINARI HYDROPOWER PROJECT PAKISTAN

DESIGNED	Li Ong	2024.08	500kV SWITCHYARD OVERALL EQUIPMENT LAYOUT (1/2)
CHECKED	Lin Shan	2024.08	
EXAMINED	Liu Lin	2024.08	
VERIFIED			
APPROVED		2024.08	AS-BUILT DRAWING DESIGN / ELECTRIC SECTION
SCALE	SEE DRAWING	DRAWING No.	SKP-CGGC-AB-CH-UAA-25-431-00

SCHEDULE-II (REV 1)

The Installed, De-Rated, Auxiliary and Net Capacity of the Licensee's Generation Facility

SCHEDULE II (REV 1)

1.	Plant Size – Installed Capacity	884.000 MW
2.	Gross Capacity at Reference Hydrological Conditions	884.000 MW
3.	Auxiliary Consumptions & Transformer Losses	8.840 MW
4.	Net Capacity of the Plant at Reference Hydrological Conditions	875.160 MW

Note

The above figures are based on the information as provided by the Licensee. The Net Capacity available to System Operator for Despatch will be determined through the procedures contained in the Power Purchase Agreement or the relevant Grid Code.

National Electric Power Regulatory Authority

Islamic Republic of Pakistan

2nd Floor, OPF Building, G-5/2, Islamabad.
Ph: 9207200, 9205225 Fax : 9210215
E-mail: office@nepra.org.pk

No. NEPRA/R/LAG-116/ 3651 -53

May 27, 2009

Chief Executive/Director
SK Hydro (Pvt.) Limited
15 Peshawar Block,
Fortress Stadium
Lahore

Subject: **Generation Licence No. IGSPL/21/2009**
Licence Application No. LAG-116
SK Hydro (Pvt.) Limited (SKHPL)

References: *Your letter No. SKH-NEPRA-09-010, dated July 11, 2008*

Enclosed please find herewith Generation Licence No. IGSPL/21/2009 granted by the Authority to SK Hydro (Pvt.) Limited (SKHPL) pursuant to Section 15 of the Regulation of Generation, Transmission and Distribution of Electric Power Act (XL of 1997).

2. Please quote above mentioned Generation Licence No. for future correspondence.

Enclosure: **Generation Licence**
(No. IGSPL/21/2009)

NATIONAL ELECTRIC POWER REGULATORY AUTHORITY
REGISTRAR
NEPRA

(Engr. Arshad Mehmood)

Copy to:

1. Chief Executive Officer, Peshawar Electric Supply Company Limited (PESCO), Sakhi Chashma, Shami Road, Peshawar
2. Director General, Pakistan Environmental Protection Agency, House No. 311, Main Margalla Road, F-11/3, Islamabad.

National Electric Power Regulatory Authority
(NEPRA)
Islamabad – Pakistan

GENERATION LICENCE

No. IGSPL/21/2009

In exercise of the Powers conferred upon the National Electric Power Regulatory Authority (NEPRA) under Section 15 of the Regulation of Generation, Transmission and Distribution of Electric Power Act, 1997 (XL of 1997), the Authority hereby grants a Generation Licence to:

S K HYDRO (PRIVATE) LIMITED

Incorporated under the Companies Ordinance, 1984
Under Certificate of Incorporation

No. 0000015277/20050902 dated September 8, 2005

For its Hydel Power Plant located at 1.5 Km Up stream of Paras Town, Kaghan Valley, District of Mansehra, North West Frontier Province

(Installed Capacity: 840.00 MW Gross)

to engage in generation business subject to and in accordance with the Articles of this Licence.

Given under my hand this 27th day of May, Two Thousand & Nine, and expires on 14th day of April Two Thousand & Forty Six.

Registrar

NATIONAL ELECTRIC POWER REGULATORY AUTHORITY
REGISTRAR
NEPRA

Article-1
Definitions

1.1 In this Licence

(a) "Act" means the Regulation of Generation, Transmission and Distribution of Electric Power Act, 1997 (XL of 1997);

(b) "Authority" means the National Electric Power Regulatory Authority constituted under section 3 of the Act;

(c) "Licensee" means S. K. HYDRO (PRIVATE) LIMITED;

(d) "Rules" mean the National Electric Power Regulatory Authority Licensing (Generation) Rules, 2000.

1.2 Words and expressions used but not defined herein bear the meaning given thereto in the Act or in the Rules.

Article-2
Application of Rules

This Licence is issued subject to the provisions of the Act and Rules, as amended from time to time.

Article-3
Generation Facilities

3.1 The location, size (capacity in MW), technology, interconnection arrangements, technical limits, technical functional specifications and other details specific to the power generation facilities of the Licensee are set out in Schedule-I to this Licence.

NATIONAL ELECTRIC POWER REGULATORY AUTHORITY
REGISTRAR
NEPRA

3.2 The net capacity of the Licensee's generation facilities is set out in Schedule-II hereto.

3.3 The Licensee shall provide the final arrangement, technical and financial specifications and other details specific to generation facilities before commissioning of the generation facilities.

Article-4
Term of Licence

4.1 The Licence is granted for a term of thirty (30) years after the Commercial Operation Date.

4.2 Unless revoked earlier, the Licensee may ninety days (90) days prior to the expiry of the term of the Licence, apply for renewal of the Licence under the Licensing (Application and Modification Procedures) Regulation, 1999

Article-5
Licence fee

After the grant of the Generation Licence, the Licensee shall pay to the Authority the Licence fee, in the amount and manner and at the time set out in National Electric Power Regulatory Authority (Fees) Rules, 2002.

Article-6
Tariff

The Licensee shall charge only such tariff which has been approved or specified by the Authority.

NATIONAL ELECTRIC POWER REGULATORY AUTHORITY
REGISTRAR
NEPRA

Article-7
Competitive Trading Arrangement

7.1 The Licensee shall participate in such measures as may be directed by the Authority from time to time for development of a Competitive Trading Arrangement. The Licensee shall in good faith work towards implementation and operation of the aforesaid Competitive Trading Arrangement in the manner and time period specified by the Authority. Provided that, any such participation shall be subject to any contract entered between the Licensee and another party with the approval of the Authority.

7.2 Any variation or modification in the above-mentioned contracts for allowing the parties thereto to participate wholly or partially in the Competitive Trading Arrangement shall be subject to mutual agreement of the parties thereto and such terms and conditions as may be approved by the Authority.

Article-8
Maintenance of Records

For the purpose of sub-rule (1) of Rule 19 of the Rules, copies of records and data shall be retained in standard and electronic form and all such records and data shall, subject to just claims of confidentiality, be accessible by authorized officers of the Authority.

Article-9
Compliance with Performance Standards

The Licensee shall conform to the relevant NEPRA rules on Performance Standards as may be prescribed by the Authority from time to time.

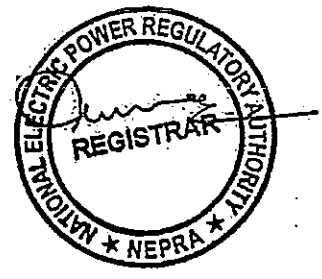
Article-10
Compliance with Environmental Standards

The Licensee shall conform to the environmental standards as may be prescribed by the relevant competent authority from time to time.

NATIONAL ELECTRIC POWER REGULATORY AUTHORITY
REGISTRAR
NEPRA

SCHEDULE-I

The location, size (capacity in MW) technology, interconnection arrangements, technical limits, technical functional specifications and other details specific to the Generation Facilities of the Licensee.



Article-11
Power off take Point and Voltage

The Licensee shall deliver power to the power purchaser or procurer (on behalf of purchaser(s)) at 132KV/220KV or any other voltage level (as the case may be) at the door step of its generation facility. The Up-gradation (step up) of generation voltage up to 132 KV/220 KV or any other voltage will be the responsibility of the Licensee.

Article-12
Provision of Information

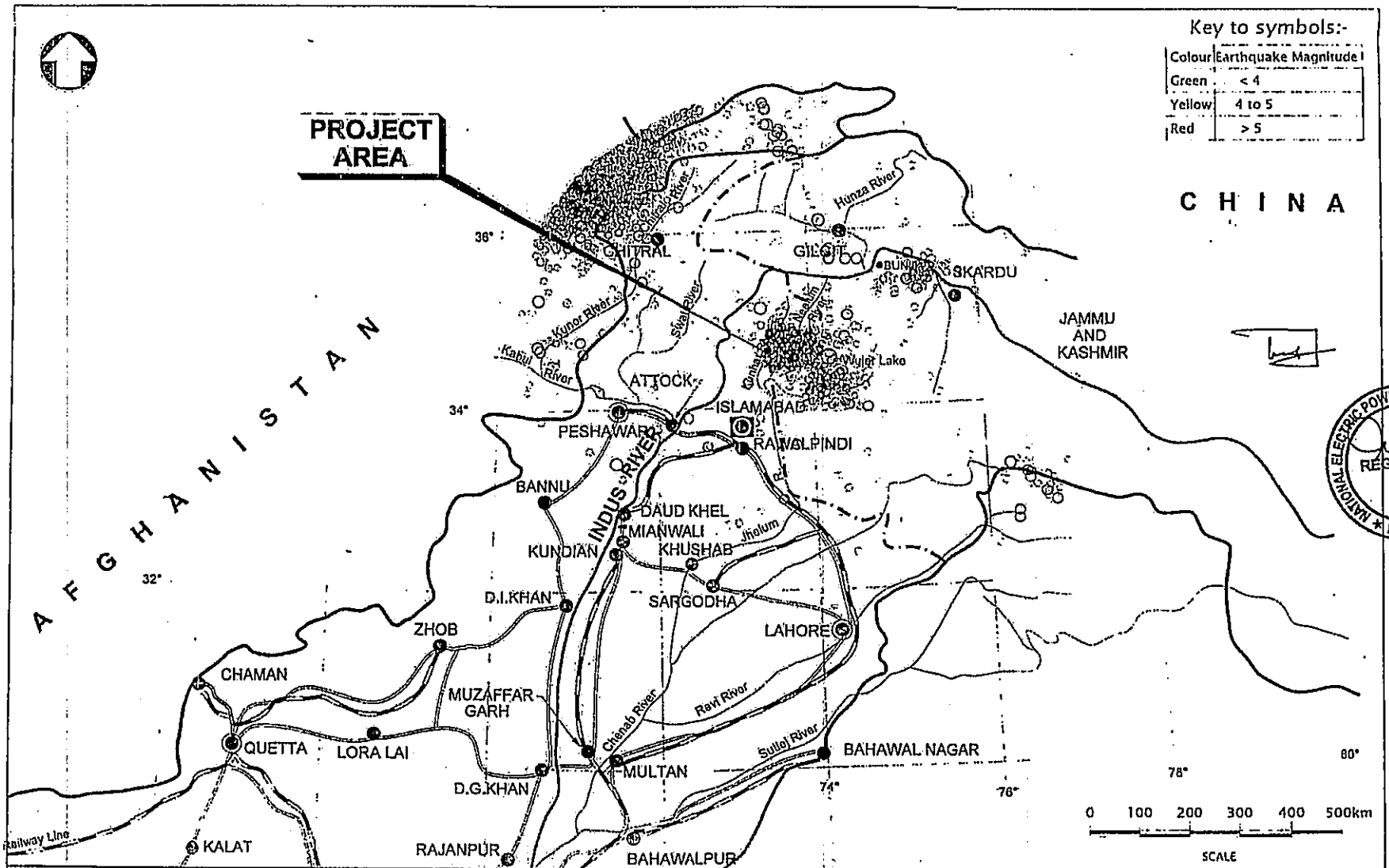
12.1 The obligation of the Licensee to provide information to the Authority shall be in accordance with Section 44 of the Act.

12.2 The Licensee shall be subject to such penalties as may be specified in the relevant rules made by the Authority for failure to furnish such information as may be required from time to time by the Authority and which is or ought to be or have been in the control or possession of the Licensee.

Article-13
Emissions Trading /Carbon Credits

The Licensee shall process and obtain emissions/carbon credits expeditiously and credit the proceeds to the Power Purchaser/Procurer on behalf of purchaser(s), as per policy issued by the Government on the subject and agreed terms between the Licensee and the Power Purchaser.

NATIONAL ELECTRIC POWER REGULATORY AUTHORITY
REGISTRAR
NEPRA

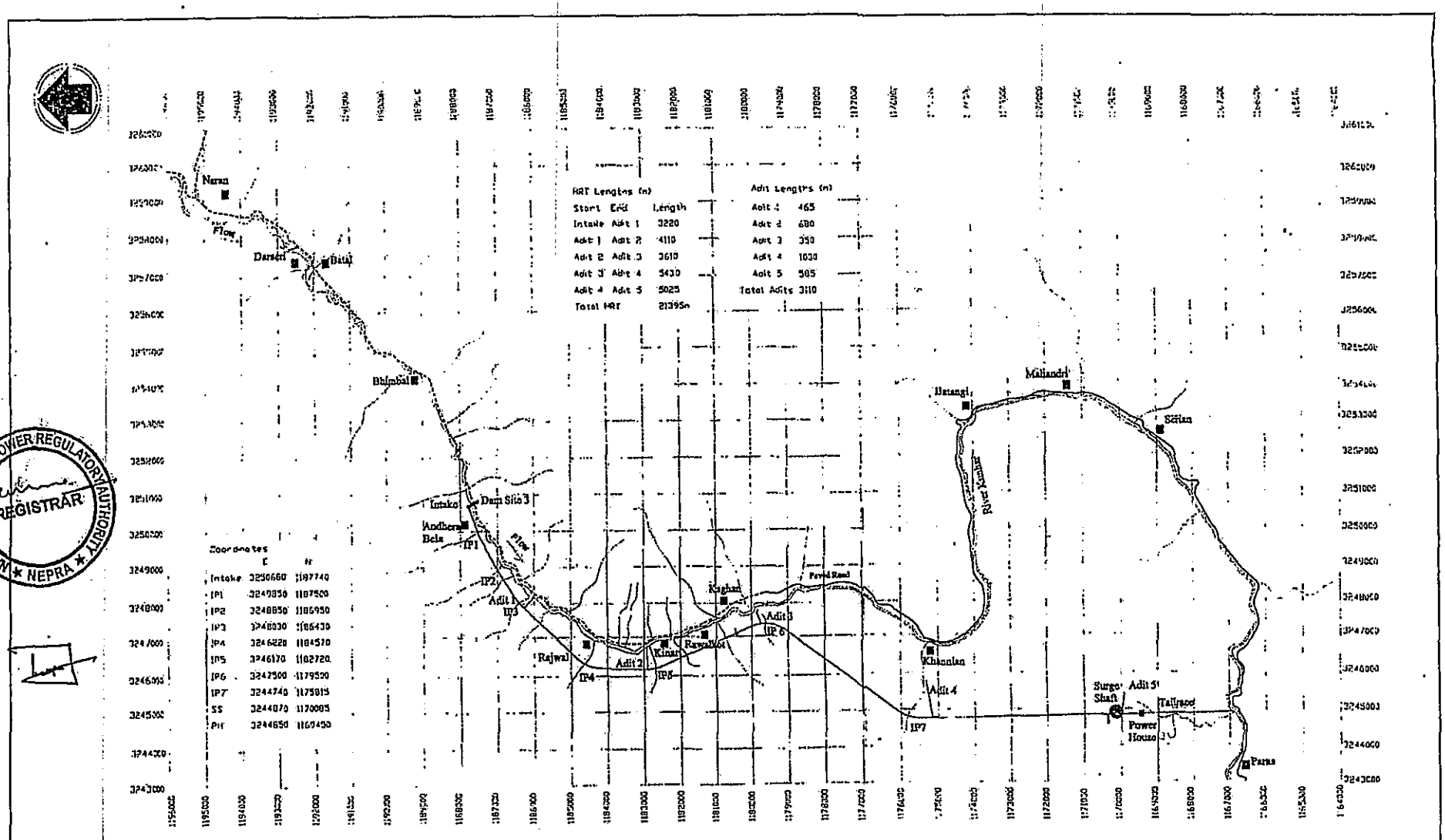


Mott MacDonald TEL +44 (0)1273-365000 FAX +44 (0)1273-365244 www.motmac.com	Victory House Trafalgar Place Brighton BN 1 4FY, England	CLIENT S.K.HYDRO (Lit.) 15-Peshawar Block, Fortress Stadium Lahore Cantt.	REV.	DATE	DRAWN	DESCRIPTION	CHECKED	APPROVED
			P1					
			P2					
			P3					

Title: Feasibility study Of 840MW Suki Kinari Hydropower project
Seismic Map: Historical Events around Project Area

DWG NO. 222977/SKHPP/0005

DRAWN	A. KING
DESIGN	N. PANT
CHECKED	B. SHARMA
APPROVED	E. DELGADO
SCALE:	AS SHOWN
REV.	0
STATUS	PRE



Mott MacDonald
Victory House
Trafalgar Place,
Brighton
BN1 4FY England.
TEL +44 (0) 1273-365000
FAX +44 (0) 1273-365244
www.mottmac.com

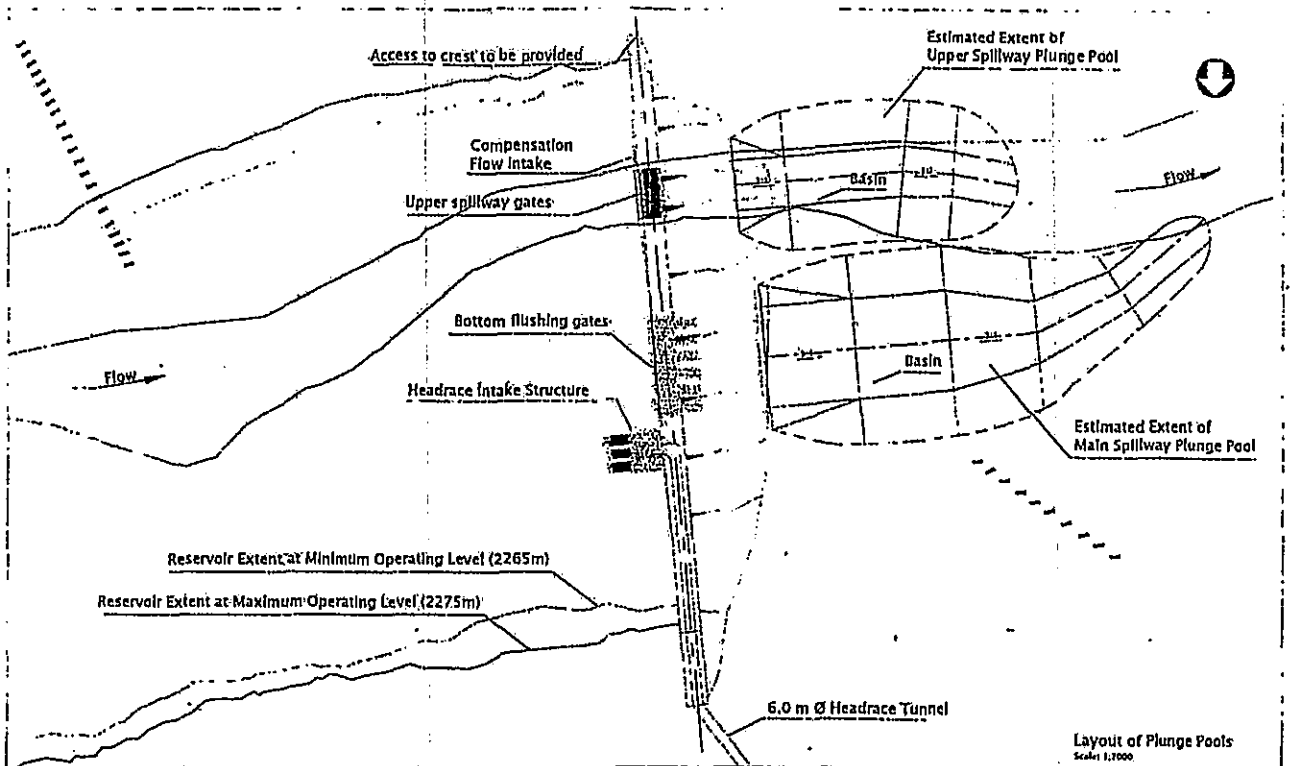
CLIENT
S.K.Hydro (PVT.) Ltd.
15-Peshawar Block Fortress Stadium
Lahore Cantt.

REV.	DATE	DRAWN	DESCRIPTION	CHECKED	APPROVED
P1	20/08/07	Bishnu	Tunnel Alignment Changed	Bishnu	Elomar
P2					
P3					

TITLE:
Feasibility study Of 840MW
Suki Kinari Hydropower Project
Project Layout

DWG NO. 222977/SKHPP/0004

DRAWN	Shafiq
DESIGN	Jeff Keff
CHECKED	Arash
APPROVED	Elomar
SCALE:	1:10000
REV.	P1
STATUS	PRE.



Mott MacDonald
Demeter House, Station Road, Cambridge, CB1 2RS, United Kingdom
Tel +44(0) 1223 463500
Fax +44(0) 1223 461007
Web www.mottmac.com

Client
S.K.Hydro (PVT) Ltd.
15-Peshawar Block,Fortress Stadium
Lahore Cantt.

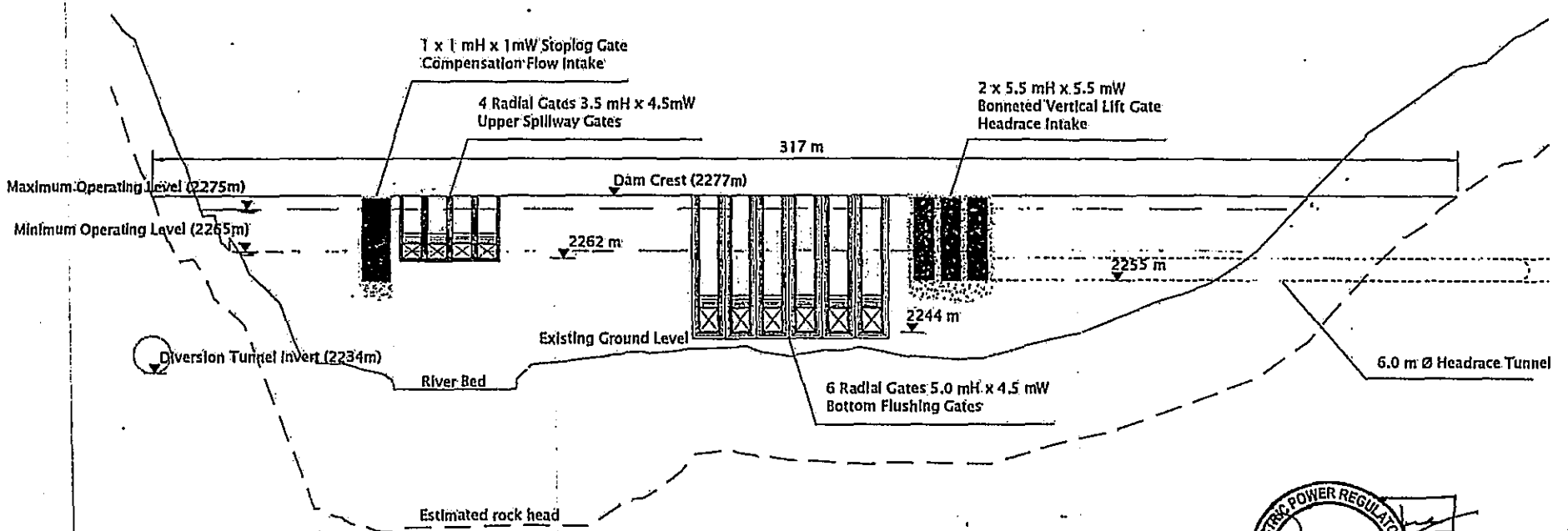
Rev	Date	Drawn	Description	Ch'k'd	App'd
P1	17/12/07	CJE	PRELIMINARY ISSUE	KJC	ED

Title: Feasibility Study OF 840MW Suki Kinari Hydropower Project
Headworks - Option DS3
Layout

Drawn	CJE
Checked	KJC
Approved	ED
Scale at A3	1:2000
Drawing No.	222977/SKHPP/1002
Rev	P1
Status	PRE

NATIONAL ELECTRIC POWER REGULATORY AUTHORITY ★ NEPRA ★ REGISTRAR

Generation Licence
S.K. Hydro (Private) Limited
District Mansehra
NWFP



NATIONAL ELECTRIC POWER REGULATORY AUTHORITY
REGISTRAR
NEPRA

2165

Surface	2321	2305	2280	2266	2252	2237	2235	2230	2230	2230	2233	2237	2236	2240	2240	2240	2239	2239	2240	2239	2238	2238	2240	2242	2245	2249	2253	2257	2264	2275	2286	2295	2302	2309	2314	2320
Chainage	0	10	20	30	40	50	60	70	80	90	100	110	120	130	140	150	160	170	180	190	200	210	220	230	240	250	260	270	280	290	300	310	320	330	340	350

Upstream Elevation
Horiz. 1:1000 Vert. 1:1000

Mott MacDonald
Demeter House
Station Road
Cambridge, CB1 2RS
United Kingdom
t(0) 1223 463500
f(0) 1223 461007
www.mottmac.com

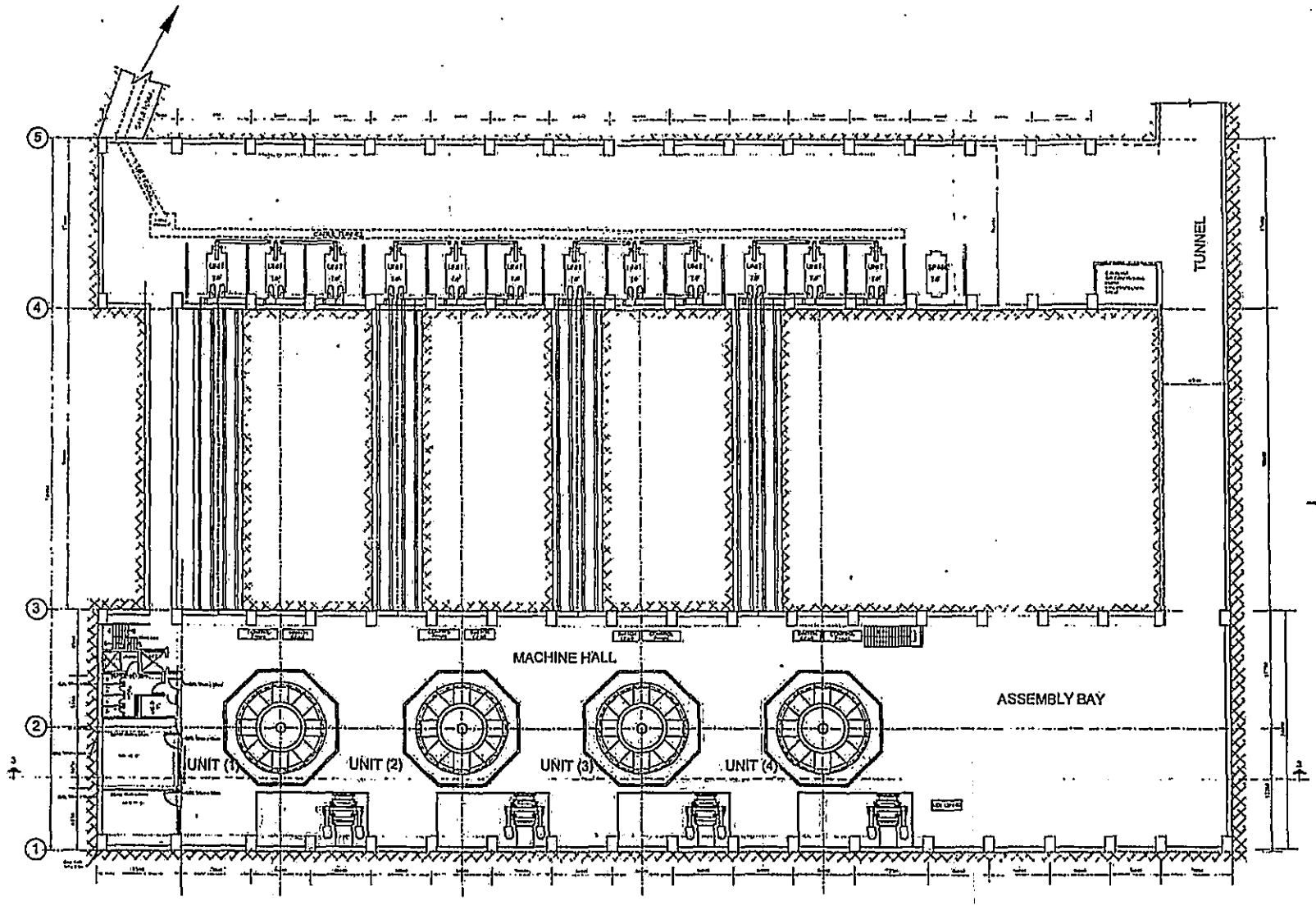
Client.
S.K.Hydro (PVT.) Ltd.
15-Peshawar Block, Fortress Stadium
Lahore Cantt.

Rev	Date	Drawn	Description	Ch'k'd	App'd
P1	17/12/07	CJE	PRELIMINARY ISSUE	KJC	ED

Title
Feasibility Study OF 840MW
Suki Kinari Hydropower Project
Headworks - Option DS3
Section through dam axis

Drawn	CJE
Checked	KJC
Approved	ED
Scale at A3	1:1000
Drawing No.	222977/SKHPP/1003
Rev	P1
Status	PRE

District Mansehra
NWFP



OPERATING FLOOR P L A N

NATIONAL ELECTRIC POWER REGULATORY AUTHORITY ★ NEPRA ★ REGISTRAR

Mott MacDonald

Victory House
Trafalgar Place,
Brighton
BN1 4FY, England

(0) 1273-365000
f (0) 1273-365244
mmac.com

Client

S.K.Hydro (PVT) Ltd.,
15-Peshawar Block Fortress Stadium
Lahore Cantt.

REV.	DATE	DRAWN	DESCRIPTION	CHECKED	APPROVED
P1	20.07.07	Mr Amin Ch.		Jeff Kerr	
P2	25.07.07	Mr Naseem.shaz		Jeff Kerr	
P3	24.08.07	Mr Naseem.shaz		Jeff Kerr	
P4	25.08.07	Mr Naseem.shaz		Jeff Kerr	
P5	27.08.07	Mr Naseem.shaz	Finalized drawings	Jeff Kerr	ED

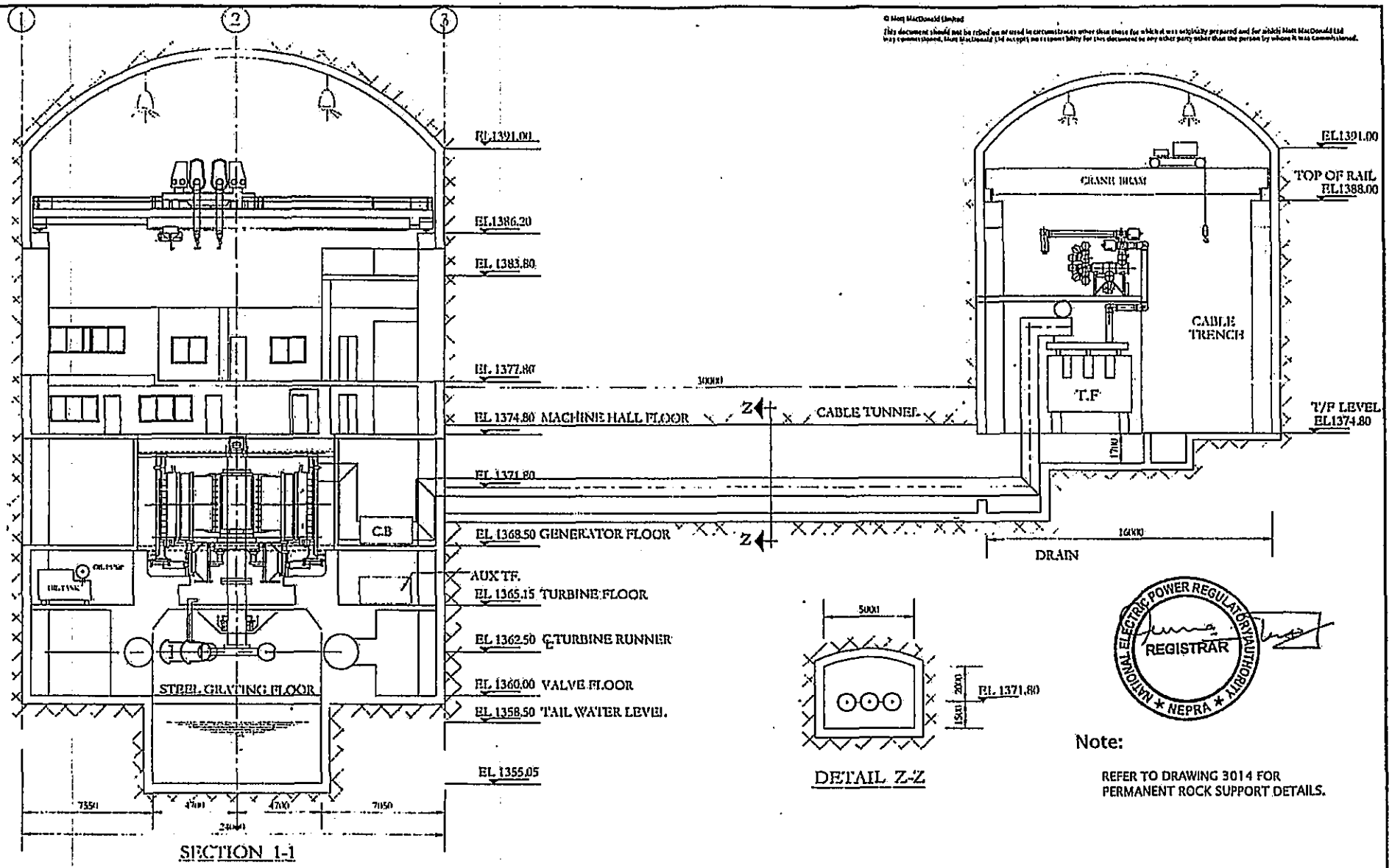
Title

Feasibility Study of 840MW
Suki Kinari Hydropower Project
Operating Floor And Assembly Bay

DWG NO. 222977/SKHPP/3004

DRAWN	Mr. Amin Ch.
DESIGN	Mr.ARASH HAZRATI
CHECKED	Jeff Kerr
APPROVED	E. Delgado
SCALE:	1:400
REV.	P5
STATUS	PRE.

S. K. Hydro (Private) Limited
District Mansehra
NWFP



Note:

REFER TO DRAWING 3014 FOR PERMANENT ROCK SUPPORT DETAILS.

Mott MacDonald
Victory House
Trafalgar Place
Brighton
BN1 4FY, England
+44 (0)1273-365000
+44 (0)1273-365244
w.mottmac.com

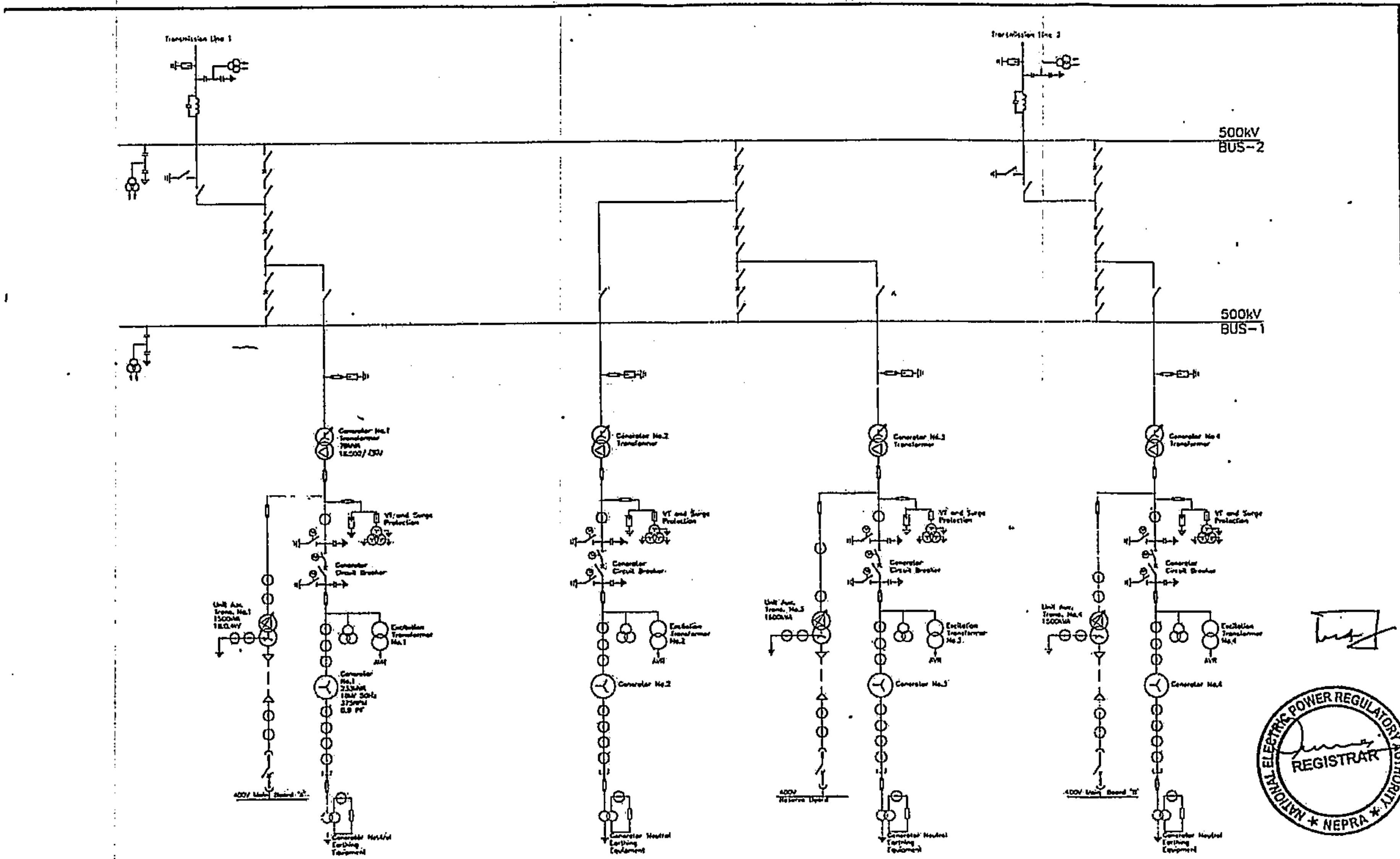
CLIENT
S.K.HYDRO (Ltd.)
15-Peshawar Block Fortress Stadium
Lahore Cantt.

REV.	DATE	DRAWN	DESCRIPTION	CHECKED	APPROVED
P1	20.07.07	Amin Ch.		Jeff Kerr	
P2	02.08.07	Amin Ch.		Jeff Kerr	
P3	15.08.07	Amin Ch.		Jeff Kerr	
P4	25.08.07	BADAR		Jeff Kerr	
P5	27.08.07	Naseem.shaz	Finalized drawings	Jeff Kerr	
P6	10.12.07	BS	Tailwater level changed	BS	ED

Title
Feasibility Study of 840MW
Suki Kinari Hydropower Project
Power House
Section (1-1)

DWG No. 222977/SKHPP/3005

DRAWN	Mr.AMIN CH.
DESIGN	Mr.ARASH HAZRATI
CHECKED	Jeff Kerr
APPROVED	E Delgado
SCALE:	1:200
REV. P6	STATUS PRE.



NATIONAL ELECTRIC POWER REGULATORY AUTHORITY
REGISTRAR
★ NEPRA ★

REV.	DATE	DRAWN	DESCRIPTION	CHECKED	APPROVED
P1	18/07/07	JAVED			
P2	25/07/07	Naeem.shaz			
P3					
P4					

Mott MacDonald
Victory House
Trafalgar Place,
Brighton
BN1 4FY, England
273-365000
273-365244
.com

Client
S.K.Hydro (PVT) Ltd.
15-Peshawar Block Fortress Stadium
Lahore Cantt.

Title
Feasibility study of 840MW
Suki Kinari Hydropower project
Single Line Diagram

DWG NO. 222977/SKHPP/3015

DRAWN	JAVED
DESIGN	N Galvin
CHECKED	
APPROVED	Jeff Kerr
SCALE:	N.T.S
REV. P2	STATUS PRE.

INTERCONNECTION SCHEME FOR THE POWER DISPERSAL OF THE PLANT

The Power generated by the S.K. Hydro (Private) Limited (SKHPL) from its Hydel Generation Facility shall be dispersed to the National Grid through 132 KV/220/500 kV or any other voltage level.

The final details Interconnection and Transmission Arrangement(s), for the dispersal of power, as proposed and recommended by NTDC and agreed by SKHPL shall be communicated to NEPRA in due course of time.

NATIONAL ELECTRIC POWER REGULATORY AUTHORITY
REGISTRAR
NEPRA

Plant Details*

1. General Information

(i).	Name of Applicant	S. K. Hydro (Private) Limited
(ii).	Registered/Business Office	15, Peshawar Block, Fortress Stadium, Lahore, Punjab, Pakistan
(iii).	Plant Location	1.5 Km Up stream of Paras Town, Kaghan Valley, District of Mansehra, NWFP
(iv).	Type of Generation Facility	Hydel Power Plant

2. Plant Configuration

(i).	Plant Size Installed Capacity (Gross)	840.00 MW	
(ii).	Plant type	Run of River	
(iii).	Water Source	Kunhar River	
(iv).	Type of Technology	Pelton Wheel Turbines	
(v).	Number of Units & Size(MW)	4 x 210 MW	
(v).	Turbine Make & Model†	VA Tech Hydro Gmbh, Austria or Equivalent	
(vi).	De-rated Capacity at Mean Site Conditions	840.00 MW	
(vii).	Auxiliary Consumption	8.40 MW	
(viii).	Expected Commissioning and Commercial Operation Date (COD)	Commissioning	COD
		December 15, 2015	April 15, 2016
(xix).	Expected Life of the Facility from COD	More than 30 years	

* As provided by the Applicant

† Hydro turbines of such rating are designed and manufactured to meet the specific requirements of each site and are not available off the Shelf as per strand models.

NATIONAL ELECTRIC POWER REGULATORY AUTHORITY
REGISTRAR
NEPRA

3. Plant Head & Tunnel Details

(i).	Head	Maximum Net Head	824.2 Meter
		Minimum Net Head	814.2 Meter
		Rated Head	823.4 Meter
(ii).	Tunnel (Head Race)	Length	Diameter
		21.4 Km	6.0 Meter
(iii).	Tunnel (Tail Race)	Length	Dimensions
		2.47 Km	5.4x6.2 Meter Horse shoe shape
(iv).	Diversion & Intake structure (DIS) type	Concrete Gravity	
(v).	DIS Crest Elevation	2 277 masl	
(vi).	DIS Crest Length	317 Meter	
(vii).	Reservoir Length	3,000 Meter	
(viii).	Reservoir Total Volume (approx)	9.00 Million Meter^3	
(ix).	Active Storage (Within operating range)	2.7 Million Meter^3	

4. Plant Characteristics

(i).	Generation Voltage	18 kV
(ii).	Frequency	50 Hz
(iii).	Power Factor	0.9 lagging to 0.90 leading
(iv).	Automatic Generation Control	Yes
(v).	Ramping Rate	To be provided later
(vi).	Time required to Synchronize to Grid and loading the Complex to full load.	-do-

NATIONAL ELECTRIC POWER REGULATORY AUTHORITY
REGISTRAR
NEPRA

SCHEDULE-II

The Installed, De-Rated, Auxiliary and Net Capacity of the Licensee's Generation Facilities

NATIONAL ELECTRIC POWER REGULATORY AUTHORITY
REGISTRAR
NEPRA

SCHEDULE-II*

1.	Plant Size Installed Capacity (Gross)	840.00 MW
2.	De-rated Capacity at Mean Site Conditions	840.00 MW
3.	Auxiliary Consumption	8.40 MW
4.	Net Capacity of the Plant at Mean Site Conditions	831.60 MW

Note

All the above figures are indicative as provided by the Licensee. The Net Capacity available to NTDC for dispatch and other purchasers will be determined through procedures contained in the Agreements or Grid Code.

* As provided by the applicant

NATIONAL ELECTRIC POWER REGULATORY AUTHORITY
REGISTRAR
NEPRA

PRIVATE POWER & INFRASTRUCTURE BOARD
MINISTRY OF ENERGY (POWER DIVISION)
GOVERNMENT OF PAKISTAN

No. 1(101) PPIB-2010-03/19/PRJ/0-53209 4th July 2019

Mr. Zhang Shiyun
Chief Executive Officer
M/s SK Hydro (Private) Limited
Lahore

Subject: 870 MW SUKI KINARI HYDROPOWER PROJECT – NOC UNDER SECTION 6.2(b) OF IMPLEMENTATION AGREEMENT FOR POROPOSED MATERIAL AMENDMENT TO THE EPC CONTRACT

WHEREAS:

(a) An Implementation Agreement dated 11th April 2014 was executed by and between M/s SK Hydro (Private) Limited (the "**Company**") and the President of Islamic Republic of Pakistan for and on behalf of Islamic Republic of Pakistan (the "IA");

(b) PPIB through its letter No. 1(101)PPIB-2010-03/15/PRJ dated 24th February 2015 issued its no-objection for appointment of China Gezhouba Group International Engineering Co. Ltd, a company organized and existing under the laws of People's Republic of China (PRC) having its registered office at 21 F, Tower A, Gemdale Plaza No. 91 Jianguo Road, Chaoyang District, Beijing, PRC as the Equipment Supply Contractor pursuant to the terms of Section 6.2(c) of the IA;

(c) The Company through its letter No. SKHPL/PPIB/18/11-756 dated 23rd November 2018 requested for issuance of no objection in relation to change the manufacturer of hydro turbines and generators from Alstom Hydro China Co. Ltd. to a joint venture of Andritz Hydro China Ltd (the "Andritz Hydro') and Harbin Electric Machinery Co. Ltd (the "HEC") (Andritz Hydro and HEC jointly referred to as the "Andritz/HEC JV") and further the purchase of main inlet valve (MIV) and governors has been proposed to be changed from Hubei Hongcheng to HEC and from Wuhan Sanlian Hydropower Equipment Co Ltd or equivalent to Andritz Hydro, respectively, and

(d) The Company through its letter No. SKHPL/PPIB/18/11-756 dated 23rd November 2018 and letter No. SKHPL/PPIB/19/2-882 dated 22nd February 2019, amongst others has made various representations to PPIB which will be deemed to have been incorporated herein by reference.

NOW THEREFORE: the GOP/PPIB, based on the representations of the Company, hereby grants it's No Objection to the Company pursuant to Section 6.2 (b) of the IA in relation to change the manufacturer of hydro turbines and generators from Alstom Hydro China Co Ltd to Andritz/HEC JV" and further for the purchase of MIV from HEC instead of Hubei Hongcheng and governors from Andritz Hydro instead of Wuhan Sanlian Hydropower Equipment Co Ltd., subject to the following terms and conditions:

(i) Issuance of this No Objection shall not:
   a. increase or affect GOP or Power Purchaser's obligations or liabilities under the IA or the Power Purchase Agreement (PPA) including the payment obligations by the Power Purchaser, as the case may be;
   b. relieve the Company of its obligations under the IA or the PPA;
   c. waive any requirements under the applicable Laws of Pakistan, including applicable tax laws;

Contd....P/2

Ground & 2nd Floors, Emigration Tower, Plot No. 10, Mauve Area, G-8/1, Islamabad - Pakistan.
Tel: (92-51) 9264034-41 Fax: (92-51) 9264030-31
Email: ppib@ppib.gov.pk Internet: http:// www.ppib.gov.pk

d. entitle the Company to claim any increase in costs as a result of the proposed change in the major piece of equipment or of the manufacturer of the equipment, however, any cost saving due to such change shall be fully passed on to the Power Purchaser;
e. construe as an approval of or no objection to the Equipment Supply Contract or EPC Contract any amendments thereto executed or to be executed by and between the Company and the Equipment Supply Contractor or EPC Contractor, as the case may be.

(ii) The proposed equipment/machinery to be purchased from Andritz/ HEC JV shall not be of lesser standard than ICE standard or equivalent or of inferior quallty than the equlpment to be purchased from previous manufacturers/suppliers;

(iii) Procurement of equipment from proposed manufactures/suppliers shall not affect the construction schedule and achievement of Required Commercial Date (RCOD) by the Company; and

(iv) This No Objection shall stand withdrawn in case NEPRA does not approve amendment in the Generation License incorporating the changes as proposed by the Company in respect of this No Objection.

2. In the event the terms and conditions as aforesaid are breached, or representations are found to be incorrect or false at any stage, this No Objection shall stand withdrawn.

3. Capitalized terms not defined herein shall have meanings attributed thereto in Implementation Agreement.

Best Regards.

(Shah Jahan Mirza)
Managing Director

Cc:
i. **Chairman,** NEPRA, Islamabad.
ii. **The Chief Executive Officer,** CPPA-G, Islamabad.
iii. **Managing Director,** NTDC, Lahore.

PRIVATE POWER & INFRASTRUCTURE BOARD
MINISTRY OF ENERGY (POWER DIVISION)
GOVERNMENT OF PAKISTAN

No. 1(101) PPIB-2010-03/19/PRJ/O-53915 6th December 2019

The Chief Executive Office
M/s SK Hydro (Private) Limited
Lahore

Subject: DESIGN CHANGE IN LAYOUT AND STRUCTURES OF SUKI KINARI HYDROPOWER PROJECT

Reference is invited to M/s SK Hydro (Pvt.) Limited (the Company) letter No. SKHPL/MD-PPIB/11-518 dated 2nd November 2017 and PPIB's letter No. 1(101) PPIB-2010-03/19/PRJ/O-53170 dated 28th June 2019 related to the subject matter.

2. PPIB is pleased to convey that your request on the subject matter was considered by the Panel of Experts (POE) of PPIB and proposed design change of Suki Kinari Hydropower Project was approved as follows:

I. The POE reconfirmed its approval for the Technical Part of the proposed Design Changes at powerhouse as well as changes in the weir (listed in Annex-II) with the condition that no increase in the Project cost will be claimed by SK Hydro Private Limited in the tariff against this change and any reduction in the cost will be 100% pass on to the consumers of the electricity.

II. The POE approved the elimination of sand trap structure subject to the condition that SK Hydro Private Limited at its own risk and cost shall be responsible for assuring proper type of equipment installation from the EPC Contractor/Equipment manufacturer and if required it may get additional guarantees from the EPC contactor for that matter.

III. 100% cost of the sandtrap structure shall be deducted from the EPC cost of the Project however; cost associated with the addition in the length of headrace tunnel equal to the length of eliminated sandtrap may be added to the cost.

IV. The Project Company, on its own cost, shall install suitable sediment measuring equipment on the reservoir site and prepare a comprehensive data collection strategy for the Project and prepare the operation rules of the reservoir based on representative gradation curve.

Ground & 2nd Floors, Emigration Tower, Plot No. 10, Mauve Area, G-8/1, Islamabad - Pakistan.
Tel: (92-51) 9264034-41 Fax: (92-51) 9264030-31
Email: ppib@ppib.gov.pk Internet: http:// www.ppib.gov.pk

O-53915

No. 1(101) PPIB-2010-03/19/PRJ/ O-53170

ANNEX-II

LIST OF MAJOR CHANGES IN DESIGN APPROVED BY THE POE

****

1. The dam type is changed from asphalt concrete faced rock-fill dam to asphalt concrete core rock-fill dam
2. The left bank upper spillway and right bank lower spillway are changed to right bank double Layered spillway.
3. The location of power intake is shifted from 70 m upstream to close to the spillways.
4. The location of powerhouse moved out toward riverside. The buried depth of powerhouse is changed from 850 m to 400 m.
5. The headrace tunnel is increased from 19.5 Km to 22.6 Km, and the penstock is increased from 960 m to 1885 m; but the access tunnel is shortened from 4200 m to 700 m long
6. The GIL tunnel length decreased from 2123 m to 360 m
7. The tailrace tunnel is relocated downstream, increasing the head of the project
8. Due to powerhouse shift, the setting elevation of turbine unit is lowered due to which head is increased from 910.85 m to 922.7 m
9. The Turbine unit size increased from 218.375 MW to 221 MW and overall installed capacity of the power plant is increased to 884 MW (i.e. 221 MW x 4) with corresponding increase of annual energy to 3129 GWh (plant factor remains the same as 40.4 %).

Central Power Purchasing Agency Guarantee Limited
A Company of Government of Pakistan

Office of the Chief Technical Officer

No. CPPA-G/CTO/DGM-R/SKHPL/1819-24 Dated: 07/07/2022

M/s Suki Kinari Hydro (Pvt). Limited,
15-Peshawar Block, Fortress Stadium,
Lahore.

Subject: - RCOD Extension Due to COVID-19 of M/s Suki Kinari Hydro Private Limited (SKHPL) in Respect of 870 MW Suki Kinari Hydropower-Project

Ref: [i] M/s Suki Kinari letter No. SKHPL /CPPA-G/22/1-2 dated 04.01.2022
[ii] Dy.MD (AD&M),NTDC Letter No DMD(AD&M)/NTDC/4582-87 dated 02.06.2022

With reference to letter referred at (i) vide which M/s SKHPL served the cessation notice of Other Force Majeure Event (OFME) and requested for the 23 Months extension in Required Commercial Operation Date (RCOD). In this regard the subject project is extended for the period of 23 Months under the section 1.1 of the PPA, as allowed by the Competent Authority.

It is to inform that after seeking approval of BOD CPPA-G, the RCOD of M/s Suki Kinari Hydro Power Project which was 31-12-2022 is hereby extended for a period of 23 Months. By granting 23 Months OFME to the company due to COVID-19, therefore the new RCOD of the M/s SKHPL after extension of 23 Months is **30-11-2024.**

Chief Technical Officer
CPPA-G

Copy to:

1. Chief Executive Officer, CPPA, Islamabad.
2. Managing Director, NTDC,414, WAPDA House Lahore.
3. Managing Director, PPIB, Islamabad
4. Chief Financial Officer, CPPA-G
5. Chief Legal Officer, CPPA-G

- Master File

PRIVATE POWER & INFRASTRUCTURE BOARD
MINISTRY OF ENERGY (POWER DIVISION)
GOVERNMENT OF PAKISTAN

No. 1(101)/PPIB/2010-03/22/PRJ/O-57604

28th July, 2022

Mr. He Xiongfei
Chief Executive Officer
M/s SK Hydro (Private) Limited
Lahore

Subject: 884 MW SUKI KINARI HYDROPOWER PROJECT - EXTENSION IN REQUIRED COMMERICAL OPERATION DATE

Reference M/s SK Hydro (Pvt.) Ltd. (the 'Company') letter No. SKHPL/PPIB/22/7-189 dated 19th July 2022 whereby the Company has informed that the Board of Central Power Purchasing Agency (the "Power Purchaser") has approved the extension in the Required Commercial Operations Date of Suki Kinari Hydropower Project (the 'Project') until 30th November 2024 due to Other Force Majeure Event ('OFME'), and requested PPIB to issue concurrence to the extended Required Commercial Operations Date of the Project.

2. Kindly note that as per the GOP Implementation Agreement dated 11th April 2014 (the "GOPIA"), Required Commercial Operations Date is defined as "*the date that is two thousand one hundred and ninety-two (2192) days that is seventy-two (72) months following the date on which the Financial Closing occurs, as such date may be extended pursuant to Section 6.5 or Section 8.1(b) of the Power Purchase Agreement or by reason of a Force Majeure Event affecting the Company thereunder* [emphasis added]."

3. In view of the above, PPIB understands that the extension in the Required Commercial Operations Date is primarily dealt under the applicable provisions of the Power Purchase Agreement. Since the Power Purchaser has already granted requisite extension in the Required Commercial Operations Date of the Project until 30th November, 2024 vide letter dated 7th July 2022, PPIB confirms that aforesaid date is the Required Commercial Operations Date as contemplated in the GOPIA.

4. Notwithstanding the aforesaid confirmation as to the extension in the Required Commercial Operations Date, the Company shall not be entitled to claim any additional cost in the Tariff Determination and or under the Power Purchase Agreement arising out of or in connection with such extension on account of the OFME.

Capitalised terms not otherwise defined herein shall have meaning as ascribed thereto in the GOPIA.

Best Regards,

(Adil Sharif)
Director General (Law)

Ground & 2nd Floors, Emigration Tower, Plot No. 10, Mauve Area, G-8/1, Islamabad - Pakistan.
Tel: (92-51) 9264034-41 Fax: (92-51) 9264030-31
Email: ppib@ppib.gov.pk Internet: http:// www.ppib.gov.pk

National Electric Power Regulatory Authority
Islamic Republic of Pakistan

NEPRA Tower, Attaturk Avenue (East), G-5/1, Islamabad
Ph: +92-51-9206500, Fax: +92-51-2600026
Web: www.nepra.org.pk, E-mail: registrar@nepra.org.pk

Registrar

No. NEPRA/Director(Tech)/TRF-232/SKHPL-2013/78-80 January 5, 2023

Chief Executive Officer S K Hydro (Pvt.) Ltd. 15 – Peshawar Block, Fortress Stadium, Lahore	Managing Director National Transmission & Despatch [illegible]e, 23030648711
Chief Executive Officer Central Power Purchasing Agency Guarantee Limited (CPPA-G) Shaheen Plaza, 73-West, Fazl-e-Haq Road, Islamabad	

Subject: 870 MW SUKI KINARI HYDROPOWER PROJECT – PROCUREMENT AND INSTALLATION OF SHUNT REACTORS

Reference is made to letter of Suki Kinari (SK) Hydro dated September 29, 2022 seeking guidance of the Authority on the subject matter.

2. It is apprised that in order to procure and install shunt reactor at SK Hydro Power Plant, SK Hydro to file a petition for modification of tariff if it desires to incorporate the additional cost of shunt reactor in the reference tariff of the project. SK can simultaneously procure and install shunt reactor following NEPRA's (Selection of Engineering, Procurement and Construction Contractor by Independent Power Producers) Guidelines, 2017.

3. Further, the COD of the project shall remain intact and will not be linked with the procurement and installation of Shunt Reactor.

5/1/23

(Shakil Ahmed)
Additional Director
Registrar Office

10.01.23

Central Power Purchasing Agency Guarantee Limited

A Company of Government of Pakistan

Office of Chief Executive Officer

No. DGMT-II/SMT-V/SKHPL/ 11582-93 Dated: 26 / 9 / 2024

S K Hydro (Private) Limited,
15-Peshawar Block, Fortress Stadium,
Lahore.

Project: 884 MW M/s S K Hydro (Private) Limited

Subject: **Notification of Commercial Operations Date of Complex**

In accordance with Section 8.3 and Schedule 7 of Power Purchase Agreement (PPA) signed between CPPA (the "Power Purchaser") and M/s S K Hydro (Private) Limited (the "Company"), Commissioning Tests including Reliability Run Test (RRT) and Initial Tested Capacity (ITC) of M/s S K Hydro (Private) Limited have been successfully completed on 13.09.2024 at 13:00 Hrs. Subsequently, the Company has notified vide its letter dated 13.09.2024 regarding the readiness of the Complex for the Commercial Operations and the Engineer (Joint Venture REEE (Pvt) Ltd, Pakistan, Integral S.A Colombia & Renewable Resources (Pvt) Ltd.,) has also issued the Certificate of Commissioning of the Complex No. SKHPP-06-8.3/2024 dated 13-09-2024 along with other certificates as per the provisions of PPA, which are pre-requisites for the notification of the Commercial Operations Date (COD).

Hence, pursuant to issuance of "Certificate of Commissioning of Complex" by the Engineer, the Commercial Operations Date (COD) of M/s S K Hydro (Private) Limited is notified with effect from **14-09-2024** at 00:00 Hrs. having Initial Tested Capacity of **883.017 MW.**

This is issued with the approval of Chief Executive Officer, CPPA dated 25.09.2024.

Chief Technical Officer
CPPA-G

Copy to:

1. Chief Executive Officer, CPPA-G Islamabad
2. Chief Financial Officer, CPPA-G Islamabad
3. Chief Legal Officer, CPPA-G Islamabad
4. Registrar NEPRA, NEPRA Tower, Attaturk Avenue Section G-5/1, Islamabad
5. Managing Director, PPIB, Islamabad
6. Managing Director, NTDC, 414-WAPDA House, Lahore
7. DMD (AD&M) NTDC, 413-WAPDA House, Lahore
8. DMD (P&E) NTDC, 419-WAPDA House, Lahore.
9. DMD (SO), NPCC, NTDC, H-8/1, Islamabad.
10. General Manager (System Operation), NPCC, NTDC, Sector H-8/1, Islamabad.
11. J.V REEE (Private) Ltd, Pakistan, Integral S.A Colombia & Renewable Resources (Pvt) Ltd. ("the Independent Engineer"), 20, Street-10, Sector F-8/3, Islamabad.
- Master File.

Attachment X

884 MW Suki Kinari Hydropower Project
Plant Auxiliaries and Transformer Losses

a.	**Plant Auxiliaries**		
	(i)	Plant Auxiliaries as per detail attached	6.384 MW
	(ii)	Army Residential Colony and Observation Posts to be built in a year	1.442 MW
		Sub-Total	7.826 MW
b.	**Generator Transformer Losses for 12 Single Phase Transformers**		
	(i)	Iron Losses @ 60 kW per Transformer	0.720 MW
	(ii)	Copper Losses @ 230 kW per Transformer averaged over the year @40% (Unit values are as given in PPA Schedule 3)	1.004 MW
		Sub-Total	1.724 MW
•	**Total Plant Auxiliaries and Transformer Losses**		9.550 MW (1.08% of Installed Capacity)
•	**Value adopted as per original Generation Licence**		8.840 MW (1.00% of Installed Capacity)

			Plan Auxiliary							
						Essential loads				
序号	用电设备名称		单台额定容量(kW)(kVA)	台数	设备总容量(kW)	是否计入保安负荷	参加保安负荷总容量	是否计入黑启动负荷	参加黑启动负荷总容量	备注
S. No.	Motive Load		Single rated capacity (kW) (kVA)	Number of installed units	Total rated capacity of equipment (kW)	Whether to calculate the security load	Total capacity of participating security loads	Whether to calculate the black start load	Total capacity of load participating in black start (kW)	Remarks
一	机组自用电	Unit self use power								
1	推力外循环油泵启动柜	Starting cabinet of thrust external	55.00	4	220.00			Yes (calculated by 1 set)	55.00	
2	调速器机械柜	Governor mechanical cabinet	1.00	1×4	4.00			Yes (calculated by 1 set)	1.00	
3	调速器油压装置油泵	Oil pump of governor oil pressure device	75.00	2×4	600.00			Yes (calculated by 1 set)	75.00	
4	球阀油压装置油泵	Oil pump of ball valve oil pressure device	55.00	2×4	440.00			Yes (calculated by 1 set)	55.00	
5	球阀油压装置机械柜	Mechanical cabinet of ball valve oil pressure device	1.00	1×4	4.00			Yes (calculated by 1 set)	1.00	
6	离心泵	centrifugal pump	250	2×4	1000.00			Yes (calculated by 1 set)	250.00	
7	电动滤水器减速机	Electric water filter reducer	1.1	2×4	4.40			Yes (calculated by 1 set)	1.10	
8	DN500电动球阀	DN500 electric ball valve	1.1	2×4	4.40			Yes (calculated by 1 set)	1.10	
9	机组交直流分盘（交流电源）	Unit AC/DC sub panel (AC power supply)	15kVA	4	60.00			Yes (calculated by 1 set)	12.00	AC220V
10	机组机旁盘（风机等）	Unit side panel (fan, etc.)	3kVA	4	12.00			Yes (calculated by 1 set)	2.40	
11	保安辅助设备动力箱	Auxiliary equipment power box	30	4	120.00			Yes (calculated by 1 set)	30.00	
12	离相封闭母线微正压装置	Micro positive voltage device of isolated phase enclosed bus	4	2×4	16.00			Yes (calculated by 1 set)	4.00	
二	地下厂房公用电	Utility of the powerhouse								
1	排水泵	Drain pump	22.00	3	66.00	Yes	66.00	Yes (calculated by 3 set)	66.00	
2	渗漏潜水排污泵	Leakage submersible sewage pump	2.2	1	2.20	Yes	2.20			
3	中压空气压缩机	Medium pressure air compressor	22	2	44.00			Yes (calculated by 1 set)	22.00	
4	中压气水分离器排污阀	Blowdown valve of intermediate pressure water separator	0.25	2	0.50			Yes (calculated by 2 set)	0.50	
5	中压冷冻式干燥机	Medium pressure freeze dryer	1	1	1.00			Yes (calculated by 1 set)	1.00	
6	低压空气压缩机	Low pressure air compressor	15	3	45.00			Yes (calculated by 1 set)	15.00	
7	低压气水分离器排污阀	Blowdown valve of low pressure gas	0.25	1	0.25			Yes (calculated by 1 set)	0.25	
8	技动式顶转子油泵	Movable jacking rotor oil pump	30	1	30.00			Yes (calculated by 1 set)	30.00	
9	雨淋阀组	Deluge valve group	2	12	24.00			Yes (calculated by 3 set)	6.00	
10	厂房220VDC I段充电装置（2套互备）	Power house 220VDC section I charging device (2 sets for mutual backup)	50kVA	2	50.00			Yes (calculated by 1 set)	40.00	
11	厂房220VDC II段充电装置（2套互备）	Power house 220VDC section II charging device (2 sets for mutual backup)	50kVA	2	50.00			Yes (calculated by 1 set)	40.00	
12	厂房公用交直流分盘（交流电源）	Plant public AC/DC sub panel (AC power supply)	18kVA	1	18.00			Yes (calculated by 1 set)	14.40	AC220V
13	厂房通信电源	Plant communication power supply	10kVA	1	10.00			Yes (calculated by 1 set)	8.00	
三	开关站用电负荷	Switchyard power load								
1	开关站220VDC I段充电装置（2套互备）	Switching station 220VDC section I charging device (2 sets for mutual backup)	50kVA	2	50.00			Yes (calculated by 1 set)	40.00	

序号	用电设备名称		总容量/额定容量(kW)/(kVA)	台数	设备总容量(kW)	是否计入保安负荷	参加保安负荷总容量	是否计算入需要系数组负荷	参加需要系数组负荷总容量	备注
2	开关站220VDC II段充电装置（2套互备）	Switching station 220VDC-section II charging device (2 sets for mutual backup)	50kVA	2	50.00			Yes (calculated by 1 set)	40.00	
3	开关站UPS电源	Switchyard UPS power supply	20kVA	1	20.00			Yes (calculated by 1 set)	16.00	AC220V
4	开关站500kV交直流分盘（交流电源）	500kV AC/DC switchyard sub-panel (AC power supply)	20kVA	1	20.00			Yes (calculated by 1 set)	16.00	AC220V
5	开关站通信电源	Switchyard communication power supply	20kVA	1	20.00			Yes (calculated by 1 set)	16.00	
		Subtotal					68.2+20kw emergency lighting=88.2		88.20	
		Total							946.95	
		SK	SK		OE		IE			

					Non-essential loads		
序号	用电设备名称		单台额定容量(kW)	安装台数	计入台数	总容量	备注
S. No	Motive Load		Single rated capacity (kW)	Number of installation units	Counted units	Total capacity (KW)	Remarks
一	机组自用电	Unit self use power					
1	发电机动力柜	Generator power cabinet	125.00	4	4.0	500.00	
2	推力外循环油泵启动柜	Starting cabinet of thrust external circulating oil pump	55.00	4	3.0	165.00	
3	高压油顶起控制柜	High pressure oil jacking control cabinet	20.00	4	4.0	80.00	
4	调速器机械柜	Governor mechanical cabinet	1.00	1×4	3.0	3.00	
5	调速器油压装置油泵	Oil pump of governor oil pressure device	75.00	2×4	7.0	525.00	
6	球阀油压装置油泵	Oil pump of ball valve oil pressure device	55.00	2×4	7.0	385.00	
7	球阀油压装置机械柜	Mechanical cabinet of ball valve oil pressure device	1.00	1×4	3.0	3.00	
8	离心泵	centrifugal pump	250	2×4	3.0	750.00	
9	离心泵	centrifugal pump	11	2×4	4.0	44.00	

序号	用电设备名称		单台额定容量(kW)	装机台数	计入台数	总容量	备注
10	电动滤水器减速机	Electric water filter reducer	1.1	2×4	3.0	3.30	
11	电动滤水器排污阀	Drain valve of electric water filter	0.5	2×4	4.0	2.00	
12	DN500电动球阀	DN500 electric ball valve	1.1	2×4	3.0	3.30	
13	机组交直流分盘（交流电源）	Unit AC/DC sub panel (AC power supply)	15kVA	4	3.0	36.00	AC220V
14	机组机旁盘（风机等）	Unit side panel (fan, etc.)	3kVA	4	3.0	7.20	
15	制动变压器	Brake transformer	100KVA	4	4.0	320.00	
16	配套辅助设备动力箱	Auxiliary equipment power box	30	4	3.0	90.00	
17	离相封闭母线微正压装置	Micro positive voltage device of isolated phase enclosed bus	4	2×4	3.0	12.00	
二	地下厂房公用电	Utility of the powerhouse					
1	排水泵	Drain pump	22.00	3	0.0	0.00	
2	渗漏潜水排污泵	Leakage submersible sewage pump	2.2	1	0.0	0.00	
3	油水分离器	Oil water separator	10	1	1.0	10.00	
4	检修潜水排污泵	Maintenance of submersible sewage pump	11	2	2.0	22.00	

序号	用电设备名称		单台额定容量(kW)	装机台数	计入台数	总容量	备注
5	中压空气压缩机	Medium pressure air compressor	22	2	1.0	22.00	
6	中压移动式吹扫空压机	Medium pressure mobile purging air compressor	18.50	1	1.0	18.50	
7	中压气水分离器排污阀	Blowdown valve of intermediate pressure water separator	0.25	2	0.0	0.00	
8	中压冷冻式干燥机	Medium pressure freeze dryer	1	1	0.0	0.00	
9	低压空气压缩机	Low pressure air compressor	15	3	2.0	30.00	
10	低压移动式吹扫空压机	Low pressure mobile purge air compressor	4	1	1.0	4.00	
11	低压气水分离器排污阀	Blowdown valve of low pressure gas water separator	0.25	1	0.0	0.00	
12	绝缘油系统精密过滤机	Precision filter for insulating oil system	2.2	1	1.0	2.20	
13	绝缘油系统真空滤净油机	Vacuum oil filter of insulating oil system	27.09	1	1.0	27.09	
14	绝缘油系统油泵	Insulating oil system oil pump	2.20	2	2.0	4.40	
15	绝缘油系统移动式加油车	Insulating oil system mobile tanker	1.1	1	1.0	1.10	
16	透平油系统精密过滤机	Turbine oil system precision filter	2.2	1	1.0	2.20	
17	透平油系统透平油过滤机	Turbine oil filter of turbine oil system	58.7	1	1.0	58.70	

序号	用电设备名称		单台额定容量(kW)	装机台数	计入台数	总容量	备注
18	透平油系统油泵	Turbine oil system oil pump	2.2	2	2.0	4.40	
19	透平油系统移动式加油车	Turbine oil system mobile tanker	1.1	1	1.0	1.10	
20	移动式顶转子油泵	Movable jacking rotor oil pump	30	1	0.0	0.00	
21	雨淋阀组	Deluge valve group	2	12	9.0	18.00	
22	油水分离器	Oil water separator	10	1	1.0	10.00	
23	主厂房单小车桥式起重机	Single trolley bridge crane for main power house	150	1	1.0	150.00	
24	GIS室电动单梁起重机	GIS room electric single beam crane	18.00	1	1.0	18.00	
25	厂房原水取水泵	Plant raw water intake pump	18.5	2	1.0	18.50	
26	厂房生活水处理供水设备	Plant domestic water treatment and supply equipment	1.5	1	1.0	1.50	
27	厂房消防水池供水泵	Power house fire pool water supply pump	4.00	2	1.0	4.00	
28	厂房消防供水泵	Plant fire water supply pump	90.00	2	1.0	90.00	
29	厂房消防供水泵增压稳压装置	Pressurization and pressure stabilization device of fire water	5.50	1	1.0	5.50	
30	厂房厂房内一体化污水处理设备	Integrated sewage treatment equipment in the plant	10.00	1	1.0	10.00	

序号	用电设备名称		单台额定容量(kW)	装机台数	计入台数	总容量	备注
31	厂房风机（合计）	Plant fan (total)	75.00	1	1.0	75.00	
32	厂房空调（合计）	Plant air conditioning (total)	30.00	1	1.0	30.00	
33	厂房220VDC I段充电装置（2套互备）	Power house 220VDC section I charging device (2 sets for mutual	50kVA	2	0.0	0.00	
34	厂房220VDC II段充电装置（2套互备）	Power house 220VDC section II charging device (2 sets for mutual	50kVA	2	0.0	0.00	
35	厂房公用交直流分盘（交流电源）	Plant public AC/DC sub panel (AC power supply)	18kVA	1	0.0	0.00	AC220V
36	厂房通信电源	Plant communication power supply	10kVA	1	0.0	0.00	
37	厂房电工实验室电源	Power supply for workshop electrician Laboratory	30KVA	1	1.0	24.00	
38	照明	lighting	100.00	1	1.0	100.00	
39	台式钻床	Bench drilling machine	0.55	1	1.0	0.55	
40	直流焊机	DC welder	20.00	2	1.0	20.00	
41	交流焊机	AC welder	26.00	2	2.0	52.00	
42	落地式砂轮机	Floor grinder	3.00	2	1.0	3.00	
43	台式砂轮机	Bench grinder	0.20	2	1.0	0.20	

序号	用电设备名称		单台额定容量(kW)	总机台数	计入台数	总容量	备注
44	软轴砂轮机	Flexible shaft grinder	1.50	2	1.0	1.50	
45	风砂轮	Wind wheel	1.50	2	1.0	1.50	
三	开关站用电负荷	Switchyard power load					
1	开关站原水取水泵	Switchyard raw water intake pump	15.00	2	1.0	15.00	
2	开关站控制楼生活水处理供水设备	Domestic water treatment and supply equipment for switchyard control	3.00	1	1.0	3.00	
3	开关站消防水池供水泵	Switch station fire pool water supply pump	3.00	2	1.0	3.00	
4	开关站消防供水泵	Switchyard fire water supply pump	55.00	2	1.0	55.00	
5	开关站消防供水泵增压稳压装置	Pressurization and pressure stabilization device of fire water	5.50	1	1.0	5.50	
6	开关站埋地式一体化污水处理	Buried integrated sewage treatment in switchyard	7.50	1	1.0	7.50	
7	开关站控制楼潜水排污泵	Submersible sewage pump of switchyard control building	1.50	2	1.0	1.50	
8	开关站供水泵房潜水排污泵	Submersible sewage pump of switchyard water supply pump house	0.75	2	1.0	0.75	
9	开关站GIS负一层潜水排污泵	Submersible sewage pump of switchyard GIS B1	1.50	2	1.0	1.50	
10	开关站制冷机房	Switchyard refrigeration room	500.00	1	1.0	500.00	

序号	用电设备名称		单台额定容量(kW)	装机台数	计入台数	总容量	备注
11	开关站风机房	Switchyard fan room	40.00	1	1.0	40.00	
12	开关站GIS地下一层风机	Switch station GIS basement fan	11.00	1	1.0	11.00	
13	开关站GIS室风机	Switch station GIS room fan	0.37	15	15.0	5.55	
14	开关站控制楼各个设备房内风机	Fans in equipment rooms of switchyard control building	1.50	20	20.0	30.00	
15	开关站控制楼电缆夹层风机	Switch station control building cable mezzanine fan	1.50	4	4.0	6.00	
16	开关站控制楼地下楼梯间加压送风机系统	Pressurized forced draft fan system in underground staircase of switchyard	4.00	1	1.0	4.00	
17	开关站控制楼低温风冷热泵空调系统	Low temperature air cooled heat pump air conditioning system for	70.00	1	1.0	70.00	
18	开关站220VDC I段充电装置（2套互备）	Switching station 220VDC section I charging device (2 sets for mutual	50kVA	2	0.0	0.00	
19	开关站220VDC II段充电装置（2套互备）	Switching station 220VDC section II charging device (2 sets for mutual	50kVA	2	0.0	0.00	
20	开关站UPS电源	Switchyard UPS power supply	20kVA	1	0.0	0.00	AC220V
21	开关站500kV交直流分盘（交流电源）	500kV AC/DC switchyard sub panel (AC power supply)	20kVA	1	0.0	0.00	AC220V
22	开关站通信电源	Switchyard communication power supply	20kVA	1	0.0	0.00	
23	照明	lighting	70.00	1	1.0	70.00	

序号	用电设备名称		单台额定容量(kW)	装机台数	计入台数	总容量	备注
	合计	TOTAL				4599.04	
24	永久营地供电（kVA	Residential Colony Load (kVA)*	1745.0	3	0.6	837.60	
25	永久营地供电（kVA	Army Residential Colony Load (kVA)**	630.0	2	0.6	604.80	
					Total Essential	**946.95**	
					Total Non-Essential	**4599.04**	
					Total	**6383.59**	
						1442.40	
					Total (Essential,Non-essential,Residential Colony, Army Residence)	**7825.99**	

*Residential Colony not Operational now.

**Army Resdential and Colony Load (The load for the proposed Army Facilities for 300 + soldiers & observation posts etc

SK SK OE IE