



Pondage: Legal Analysis 2

Dr Cameron Miles

*Indus Waters Treaty (Pakistan v
India), PCA Case No 2023-01*

**Hearing for the
Second Phase on the Merits**

3 February 2026





Outline of submissions

- **Part I:** Taking account of installed capacity and anticipated load.
- **Part II:** Taking account of future grid developments.
- **Part III:** Confronting India's case.
- **Part IV:** Environmental flow.



Part I

Taking account of installed capacity and anticipated load in calculating Pondage



STEP 1

- Calculate MMD under Para D.2(i).

STEP 3

- Schedule inflow according to a "realistic, well-founded and defensible" projection of installed capacity and anticipated load under Para D.2(c).

STEP 5

- Check that the Step 3 schedule incorporates the applicable e-flow for the HEP site that India must provide under customary international law and moderate as required.

STEP 7

- Double "Pondage required for Firm Power" under Para D.8(c) to fix outer limit of HEP Operating Pool.

STEP 2

- Fix reservoir inflow at MMD for the period of a Para D.16 week.

STEP 4

- Check that Step 3 schedule complies with Para D.15 daily and weekly limits and moderate if exceeded.

STEP 6

- Select largest amount of Pondage required to meet moderated schedule as "Pondage required for Firm Power".



Part II

Taking account of future grid developments in calculating Pondage



Court questions

- **Professor Minear:** T1 / 147 / 21–149 / 3; T1 / 162 / 10–165 / 1
- **Professor Buytaert:** T1 / 165 / 10–168 / 12
- **The Chairman:** T1 / 168 / 16–171 / 5, T1 / 171 / 10–172 / 11

“What happens if India perceives at the point of design that its needs may change to require a different anticipated load in the future?”



Guiding principles from the General Issues Award

Installed capacity is the total capacity of a HEP's turbines; anticipated load is the expected daily and weekly load on the HEP.

Installed capacity and anticipated load must be determined on the basis of a *"realistic, well-founded, and defensible"* projection.

India bears the burden of proving its projections by reference to Paragraph D.9 and Appendix D.II material.

Installed capacity and anticipated load must reflect how the HEP will *"actually be operated"* and cannot be used to inflate the Pondage allocation.

"Realistic, well-founded, and defensible" (I)



PCA Case No. 202
IN THE MATTER
THE INDUS WATERS WESTERN R
- before -
THE COURT OF ARBITRATION
IN ACCORDANCE WITH THE INDUS
- between -
THE ISLAMIC REPUBLIC
- and -
THE REPUBLIC OF
AWARD ON ISSUES OF GENERAL
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COURT OF ARBITR
Professor Sean D. Murphy
Professor Wouter Bu
Professor Jeffrey P. M
Judge Awn Shawkat AL-F
Dr. Donald Blackn
SECRETARIA
The Permanent Court of
8 August 2025

Power and Secondary Power”.¹²⁵⁰ Thus, to fulfill its Treaty obligations, India must include information and an explanation relating to its calculation of maximum Pondage pursuant to Paragraph 8(c). India’s notification must give Pakistan sufficient time to respond with its views as to whether the design is compliant with the Treaty. In this respect, the deadline of *at least* six months before construction in Paragraph 9 of Annexure D should be seen as a minimum, and notification provided earlier (indeed, potentially much earlier) as necessary to enable India still to modify its design in the face of valid concerns. If Pakistan raises timely objections, India must give them careful consideration and both Parties must proceed in a spirit of cooperation and good faith. Ultimately, if a difference emerges in this regard between the Parties, it is for India, as the proponent of the design and construction of the HEP, to establish that the proposed maximum Pondage satisfies the requirements of Paragraph 8(c), bearing in mind any Pakistani position that a more Treaty-compliant alternative exists.

"Realistic, well-founded, and defensible" (II)



PCA Case No. 2023-01
IN THE MATTER OF
THE INDUS WATERS WESTERN RIVERS ARBITR

- before -

THE COURT OF ARBITRATION CONSTITUTED
IN ACCORDANCE WITH THE INDUS WATERS TREATY

- between -

THE ISLAMIC REPUBLIC OF PAKISTAN

- and -

THE REPUBLIC OF INDIA

AWARD ON ISSUES OF GENERAL INTERPRETATION
OF THE INDUS WATERS TREATY

COURT OF ARBITRATION:

Professor Sean D. Murphy (Chairman)
Professor Wouter Buytaert
Professor Jeffrey P. Minear
Judge Awn Shawkat Al-Khasawneh
Dr. Donald Blackmore

SECRETARIAT:

The Permanent Court of Arbitration

8 August 2025

689. Yet that supposition is not persuasive, as Appendix II can be read as requiring the provision of information as necessary to understand the plant's installed capacity and anticipated load. Paragraph 3(b) of Appendix II directs that India provide "calculations for the Operating Pool", and Paragraph 4 of Appendix II directs that India provide the aggregate capacity of power units and expected variations in turbine discharge on the account of load fluctuations. Such provisions are consistent with an interpretation of the ordinary meaning of Paragraph 8(c) that calls for calculating maximum Pondage using, in part, the plant's installed capacity and anticipated load. Such provisions are fully capable of being understood as requiring India, when notifying Pakistan of its intention to construct an Annexure D, Part 3 HEP, to inform Pakistan of the plant's installed capacity and anticipated load, given that such information would be necessary to calculate the Operating Pool and would be relevant to the expected variations in the turbine discharge.

”Realistic, well-founded, and defensible” (III)

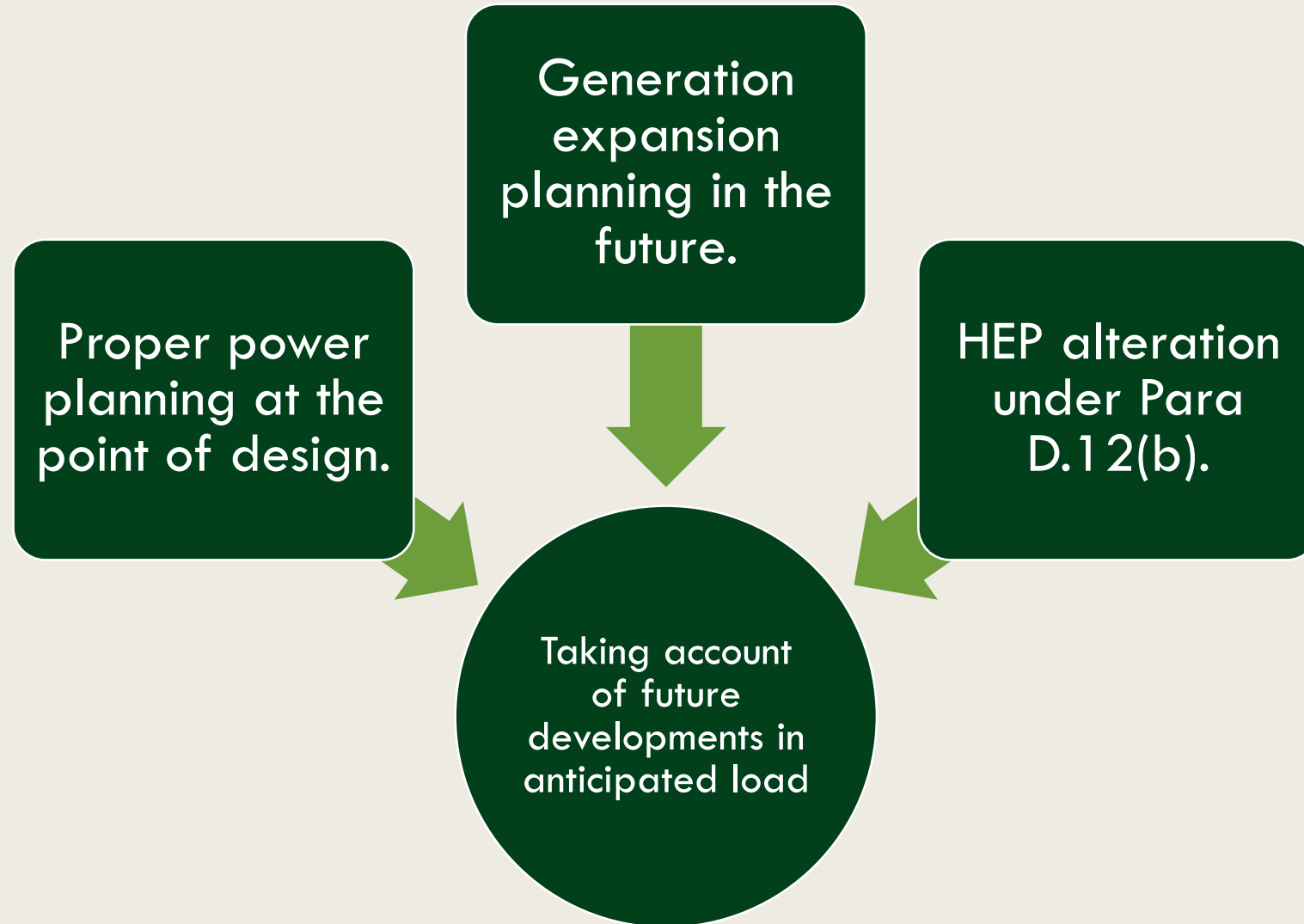


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743. *Second*, as Pakistan has maintained that the proposed HEP’s installed capacity and anticipated load is not relevant to the determination of “maximum Pondage”, the Court does not address in detail in this Award whether and how the Treaty regulates the basis upon which India may determine such installed capacity and anticipated load. The neutral expert in the *Baglihar* Neutral Expert Proceedings addressed the question of the appropriate projection of load with respect to the Baglihar HEP,¹²⁵¹ but his determination is not controlling outside of that proceeding. If a question has arisen or arises between the Parties in this regard, either generally or in the specific context of the KHEP or RHEP, Pakistan or India may seek to pursue the matter through the Treaty’s dispute resolution procedures, including a further phase of these proceedings. As a general matter, the plant’s installed capacity and anticipated load must correspond to how the plant will actually be operated; it cannot be hypothesized in a manner that serves to inflate the amount of maximum Pondage.



India's power planning options (I)



India's power planning options (II)



No. 6032

INDIA, PAKISTAN and INTERNATIONAL BANK FOR
RECONSTRUCTION AND DEVELOPMENT

The Indus Waters Treaty 1960
Karachi, on 19 September 1960
Protocol to the above-mentioned Treaty
November, 2 and 23 December 1960

Official text: English.
Registered by India on 16 January 1962

INDE, PAKISTAN et BANQUE
INTERNATIONALE DE RECONSTRUCTION

Traité de 1960 sur les eaux de l'Indus
à Karachi, le 19 septembre 1960
Protocole relatif au Traité de 1960
novembre, 2 et 23 décembre 1960

Texte officiel: anglais.
Enregistrés par l'Inde le 16 janvier 1962

12. (a) If any alteration proposed in the design of a Plant before it comes into operation would result in a material change in the information furnished to Pakistan under the provisions of Paragraph 9, India shall immediately communicate particulars of the change to Pakistan in writing and the provisions of Paragraphs 10 and 11 shall then apply, but the period of three months specified in Paragraph 10 shall be reduced to two months.

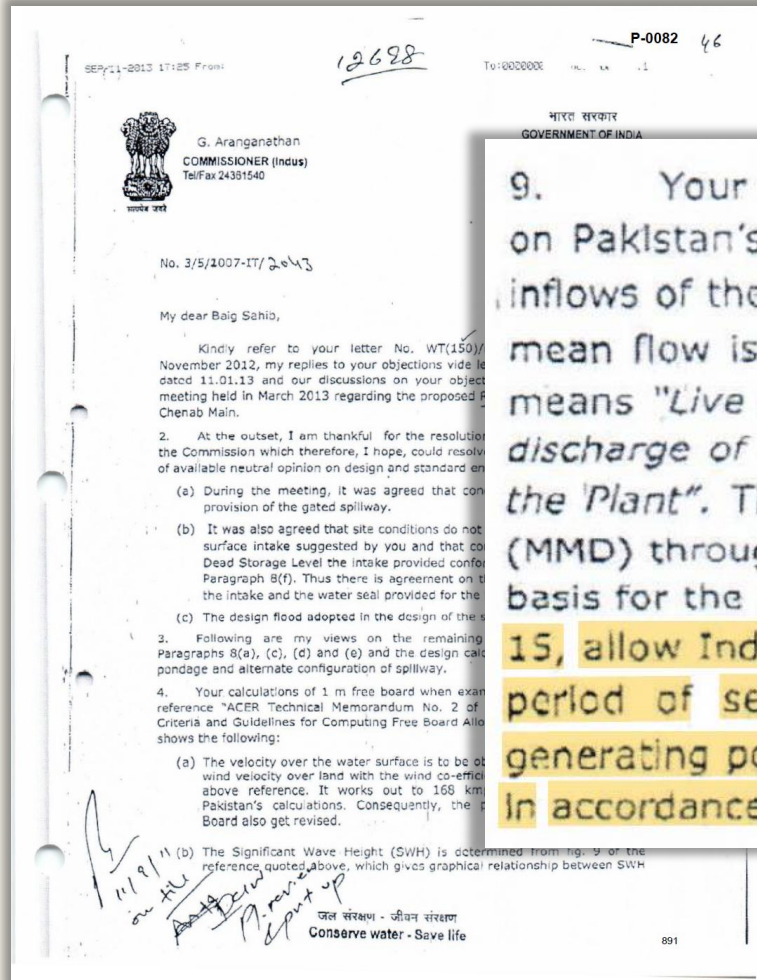
(b) If any alteration proposed in the design of a Plant after it comes into operation would result in a material change in the information furnished to Pakistan under the provisions of Paragraph 9, India shall, at least four months in advance of making the alteration, communicate particulars of the change to Pakistan in writing and the provisions of Paragraphs 10 and 11 shall then apply, but the period of three months specified in Paragraph 10 shall be reduced to two months.



Part III

Deficiencies in India's
approach to Pondage
calculation

India's approach (I)



9. Your objection to the volume of Pondage in Rattle HEP once again rests on Pakistan's view of the determination of Pondage to meet fluctuations in the inflows of the river Chenab over a period of consecutive seven days in which the mean flow is close to MMD. To the contrary, as per Paragraph 2(c), "Pondage" means *"Live storage of only sufficient magnitude to meet the fluctuations in the discharge of the turbines arising due to variations in daily and weekly loads of the Plant"*. The requirement of continuous release of Minimum Mean Discharge (MMD) through the turbine, as you state, is nowhere stated in the Treaty as the basis for the determination of Pondage. Further, the operation rules in Paragraph 15, allow India to hold or release water within a band of 50% to 130% within a period of seven days. Therefore, there can be no objection to the Plant generating power in any pattern, including peaking, so long as it releases water in accordance with Paragraph 15.



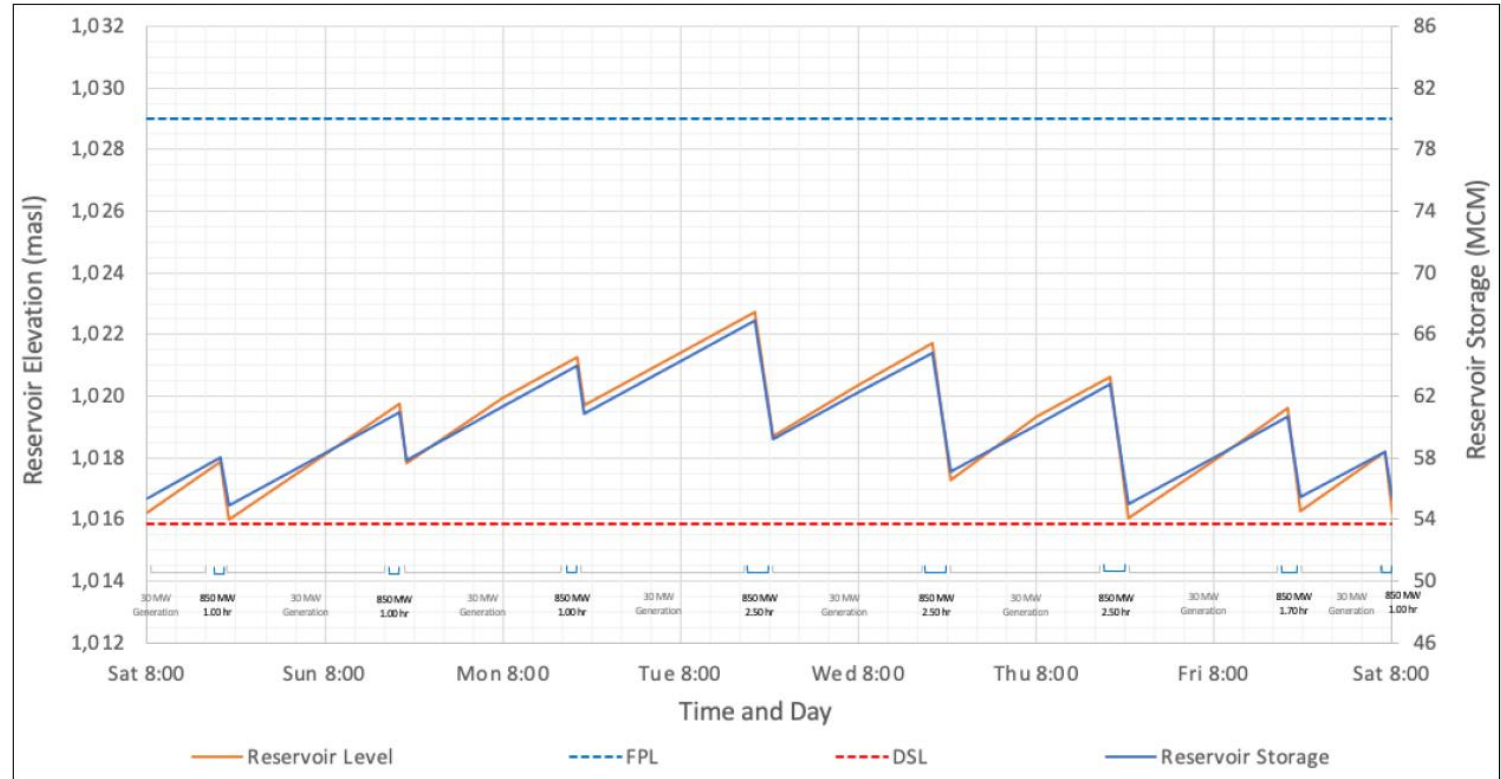
Professor Minear's question [T1/179/1-19]

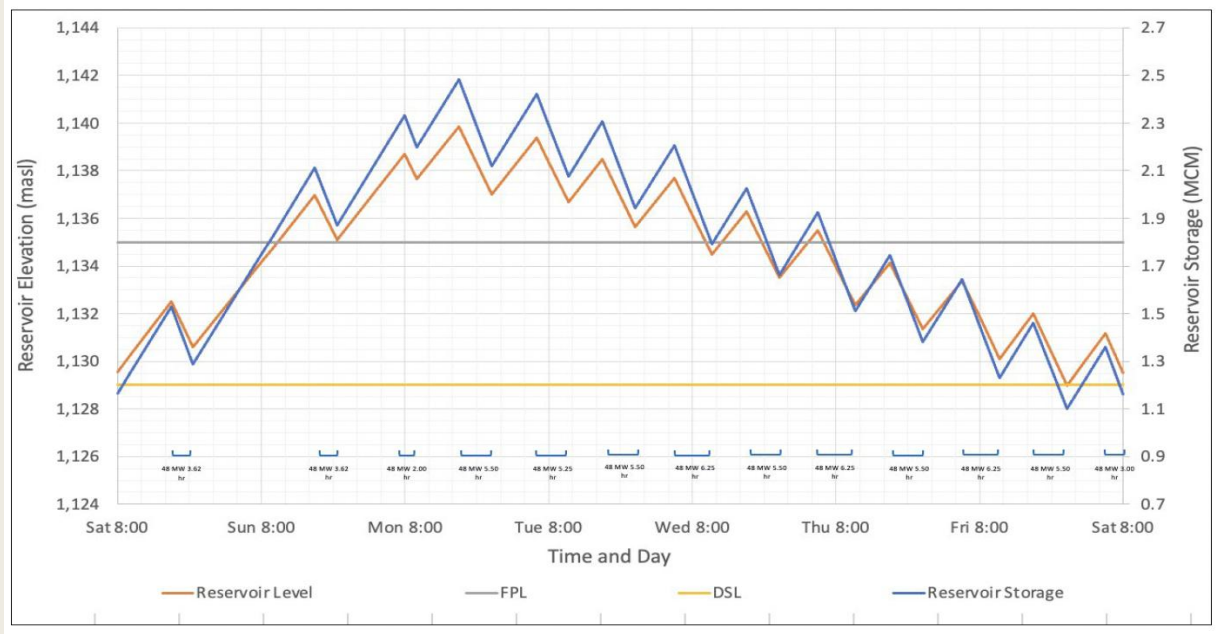
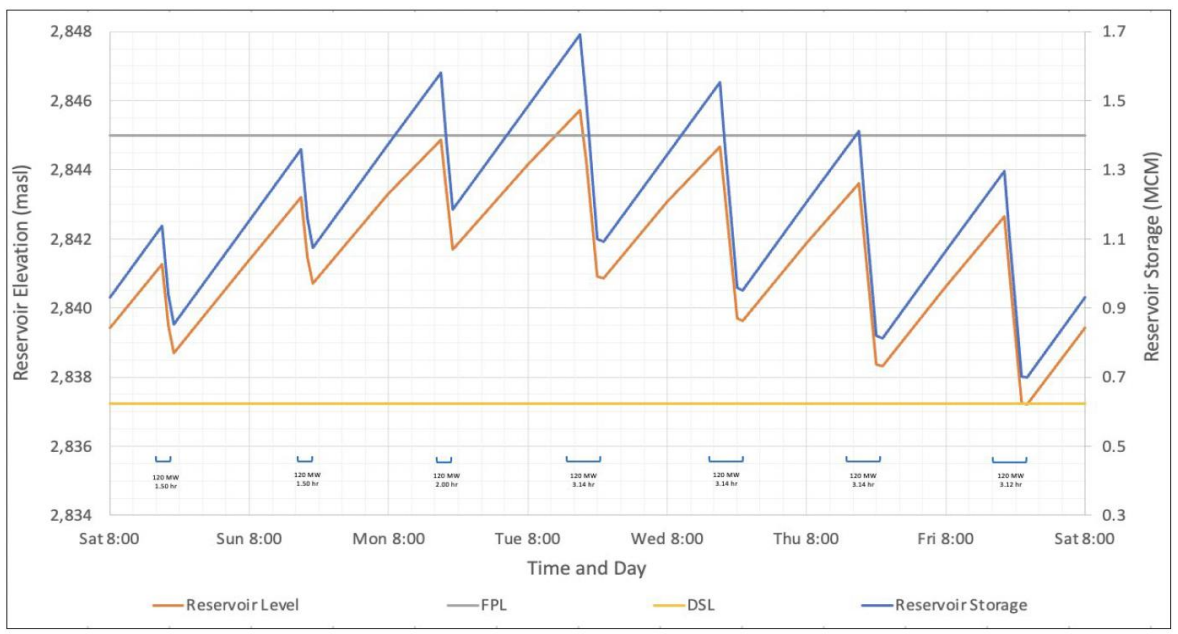
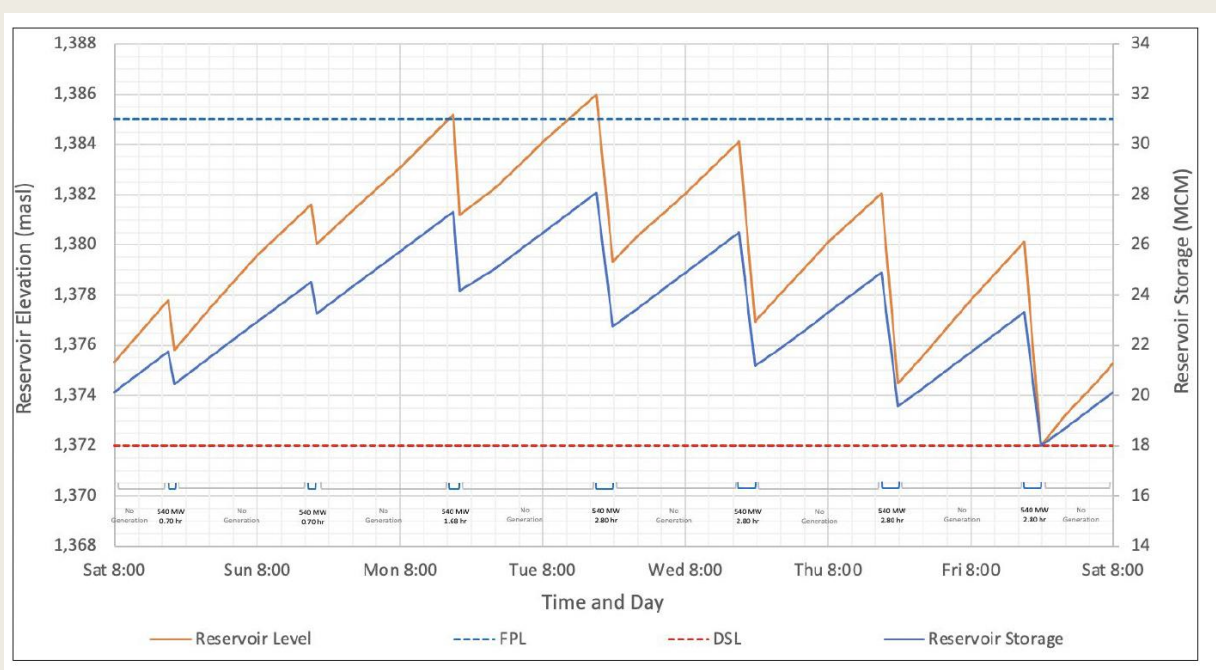
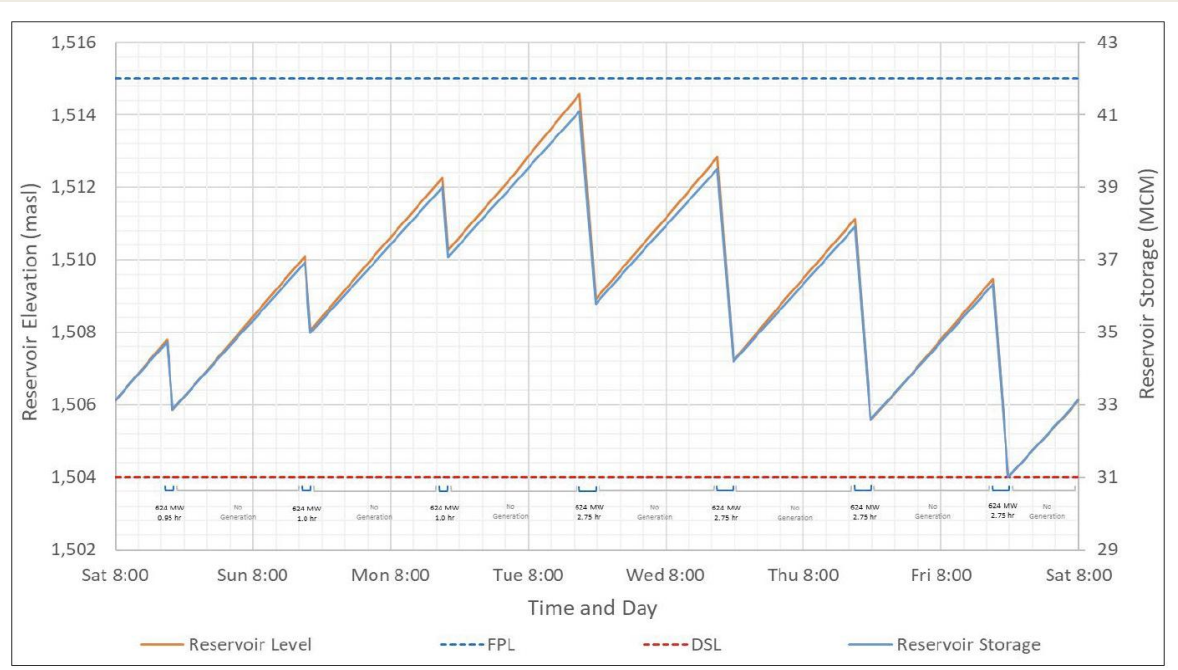
- **Issue 1:** Para D.15 is a limit on anticipated load, not a substitute for it.
- **Issue 2:** India must establish anticipated load as “*realistic, well-founded, and defensible*” independently of Para D.15 by reference to actual evidence.
- **Issue 3:** A failure by India to adequately justify anticipated load in the face of Pakistan's protests will result in a HEP that is presumptively inconsistent with Para D.8(c).
- **However:** If India meets the applicable burden with respect to anticipated load, Pakistan must accept it.

India's approach (II)

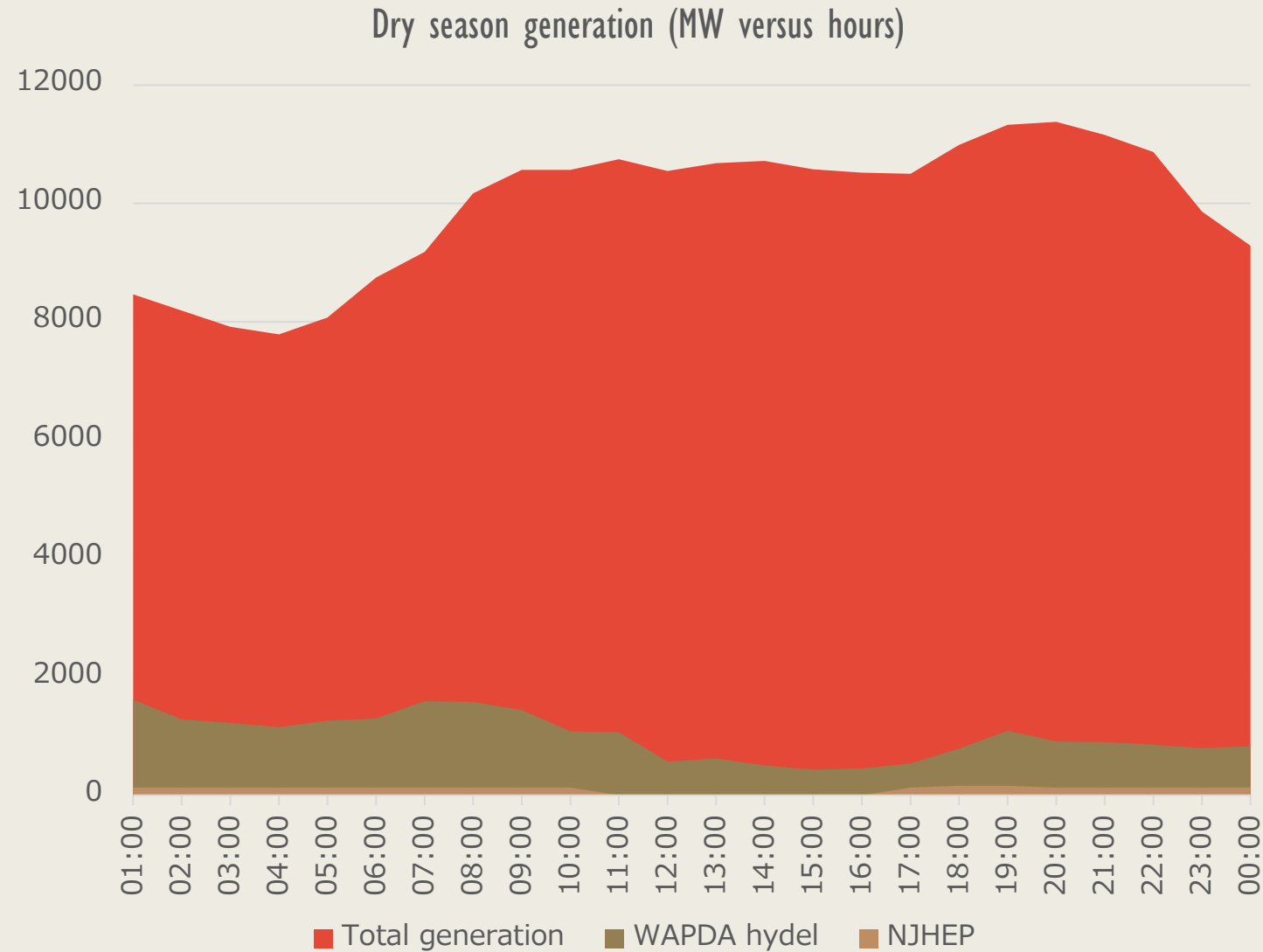


Day	Time [hours]	Cumulated Volume				Difference $V_e - V_i$ [MCM]
		inflow V_e [MCM]	outflow through 30 MW turbine V_{i30} [MCM]	Main Plant outflow (820MW) V_{i820} [MCM]	Overall outflow of the plant $V_t = V_{i30} + V_{i820}$ [MCM]	
1	Saturday	8	0.50	0.00	0.00	0.50
		18	4.33	1.20	0.00	3.13
	Sunday	19	4.72	1.32	3.34	0.05
2		32	9.70	2.89	3.34	3.47
	Sunday	42	13.54	4.09	3.34	6.10
	Monday	43	13.92	4.21	6.68	3.03
3		56	18.90	5.78	6.68	6.45
	Monday	66	22.74	6.98	6.68	9.08
	Tuesday	67	23.12	7.10	10.02	6.00
4		80	28.11	8.67	10.02	9.42
	Tuesday	90	31.94	9.87	10.02	12.05
	Wednesday	92.5	32.90	10.17	18.41	4.32
5		104	37.31	11.55	18.41	7.35
	Wednesday	114	41.14	12.76	18.41	9.98
	Thursday	116.5	42.11	13.05	26.80	2.25
6		128	46.51	14.44	26.80	5.27
	Thursday	138	50.35	15.05	26.80	7.91
	Friday	140.5	51.31	15.95	35.18	0.18
7		152	55.71	17.33	35.18	3.20
	Friday	162	59.55	18.53	35.18	5.83
	Saturday	163.7	60.20	18.74	40.86	0.60
		175	64.53	20.10	40.86	3.57
		176	64.92	20.22	44.20	0.50
Pondage : =						12.05
= 2 x 12.05 MCM						
Permissible Pondage =						24.10 MCM
Pondage Provided =						23.86 MCM





P-0546 (Kiru), P-0649.1817 (Kwar), P-0649.1337 (Miyar), P-0649.1340 (Lower Kalnai), Pakistan's First Phase PHB, §B.2



Pakistan's HEP operation

- A snapshot of Pakistan's power system in the dry season on **23 December 2023**.
- Shows the use of the NJHEP as **intermediate power**.



The Chairman's question [T1/179/14–174/9]

- **Part 1:** Does the fact the KHEP was a full Part D.15(iii) diversion work alter the e-flow analysis?
- **Part 2:** Do concerns about e-flow have to be addressed in the context of HEP operations, or does downstream re-regulation play a role?

