

PCA Case No. 2023-01

IN THE MATTER OF AN ARBITRATION

-before-

THE COURT OF ARBITRATION CONSTITUTED  
IN ACCORDANCE WITH THE INDUS WATERS TREATY 1960

-between-

THE ISLAMIC REPUBLIC OF PAKISTAN

-and-

THE REPUBLIC OF INDIA

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CERTIFIED TRANSCRIPT  
(HEARING FOR THE FIRST PHASE ON THE MERITS)

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COURT OF ARBITRATION:

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

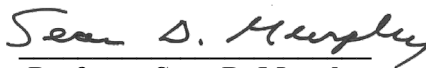
SECRETARIAT:

The Permanent Court of Arbitration

ON BEHALF OF THE COURT OF  
ARBITRATION:

CERTIFIED PURSUANT  
TO  
PARAGRAPH 19 OF ANNEXURE G

12 July 2024

  
\_\_\_\_\_  
Professor Sean D. Murphy  
Chairman

In the matter of an arbitration  
pursuant to Article IX and Annexure G  
of the Indus Waters Treaty 1960  
PCA Case No. 2023-01

Permanent Court of Arbitration  
Peace Palace  
The Hague  
The Netherlands

Day 5

Friday, 12 July 2024

Hearing of the First Phase on the Merits

Before:

PROFESSOR SEAN D MURPHY  
HE JUDGE AWN AL-KHASAWNEH  
DR DON BLACKMORE  
MR JEFFREY P MINEAR  
PROFESSOR WOUTER BUYTAERT

---

BETWEEN:

THE ISLAMIC REPUBLIC OF PAKISTAN  
-and-  
THE REPUBLIC OF INDIA

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Transcript produced by Trevor McGowan  
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1 Friday, 12 July 2024  
 2 (9.34 am)  
 3 THE CHAIRMAN: Welcome back, everyone. This is the fifth  
 4 day of our hearing on the first phase of the merits.  
 5 I see that Dr Miles is at the podium -- unless,  
 6 Sir Daniel, there's any opening issues we need to  
 7 address?  
 8 SIR DANIEL: I think I did my opening last night, so it's  
 9 really up to Dr Miles.  
 10 THE CHAIRMAN: Very good. In that case, Dr Miles, whenever  
 11 you're ready, please proceed.  
 12 SIR DANIEL: Actually -- sorry, Mr Chairman -- my colleague  
 13 reminds me: I think we put in an application to you in  
 14 writing this morning for one new document which we would  
 15 hope to use after lunch. It's an Indian document, so  
 16 they have it, and it's responsive to one of your written  
 17 questions which Dr Miles will be addressing in his  
 18 submissions after lunch. So at some point if you could  
 19 give us your directions on that, that would be helpful.  
 20 THE CHAIRMAN: Very good. We will consider the matter,  
 21 hopefully over the coffee break, and let you know in due  
 22 course.  
 23 SIR DANIEL: Thank you very much.  
 24 THE CHAIRMAN: Dr Miles.  
 25 (9.35 am)

Page 1

09:36 1 diving a bit deeper into its text, and the text of the  
 2 provisions surrounding it, to determine the proper  
 3 approach to the calculation of maximum pondage for  
 4 India's new run-of-river HEPs on the Western Rivers.  
 5 (Slide 5) Now, in order to do this, I propose to  
 6 proceed in five parts, and I'll ask you to bear with me.  
 7 As you can probably appreciate, there's a bit of  
 8 complexity involved in the subject and, as Pakistan has  
 9 throughout the week, we're going to be sort of building  
 10 the pyramid before we reach the final summit.  
 11 So with that in mind, first, I will briefly revisit  
 12 the concept of pondage and explain its role in  
 13 a run-of-river HEP generally, picking up on some of the  
 14 concepts discussed by Dr Morris and Mr Rae earlier in  
 15 the hearing.  
 16 Second, I will address you on the various provisions  
 17 of the Treaty that are relevant to pondage in  
 18 an Annexure D.3 HEP and explain how, properly  
 19 interpreted, they reflect a clear design philosophy on  
 20 the part of the Treaty's drafters, and that design  
 21 philosophy is to minimise the storage of water by India  
 22 as pondage on the Western Rivers.  
 23 Third, with that philosophy in mind, I will explain  
 24 the correct approach to the calculation of maximum  
 25 allowable pondage under the Treaty; and more

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09:34 1 Submissions on the Calculation of Maximum Allowable Pondage  
 2 DR MILES: (Slide 1) Mr Chairman, members of the Court,  
 3 today I will be on my feet for slightly longer than  
 4 yesterday, addressing you on the calculation of maximum  
 5 allowable pondage under paragraph 8(c) of Annexure D of  
 6 the Treaty.  
 7 (Slide 3) As the Court will recall, this is the  
 8 subject of the question set out in PO6, paragraph 35(d),  
 9 which is on the slide:  
 10 "With respect to Annexure D, paragraph 8(c), what is  
 11 to be taken into account for the purposes of calculating  
 12 maximum allowable pondage for a plant, and what is to be  
 13 excluded?"  
 14 (Slide 4) So on the slide we have the critical  
 15 provision, which is paragraph 8(c) of Annexure D itself.  
 16 So first we've got our common paragraph 8 chapeau:  
 17 "Except as provided in Paragraph 18, the design of  
 18 any new Run-of-River Plant ... shall conform to the  
 19 following criteria: ..."  
 20 And then of course we've got the text of the  
 21 provision itself:  
 22 "The maximum Pondage in the Operating Pool shall not  
 23 exceed twice the pondage required for Firm Power."  
 24 Sir Daniel has already situated this provision  
 25 within the framework of the Treaty, and today I will be

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09:37 1 specifically, the approach to the question of how to  
 2 determine pondage required for firm power under  
 3 paragraph 8(c), which is then doubled to fix the volume  
 4 of the operating pool.  
 5 Fourth, I will address you on India's approach to  
 6 the calculation of maximum pondage and explain why  
 7 it cannot be correct.  
 8 And finally, I will tie all of this together to  
 9 answer -- shortly, I hope -- the Court's question set  
 10 out in PO6, paragraph 35(d) on the calculation of  
 11 maximum pondage.  
 12 (Slide 6) So with all that said, let's turn to the  
 13 concept of pondage itself.  
 14 The concept of pondage is tied to the concept of  
 15 a run-of-river plant generally. As we know, and as its  
 16 name suggests, the power production potential of  
 17 a run-of-river HEP is tied to the flow of the particular  
 18 river on which it is situated at a particular time. If  
 19 the flow of the river is high at the particular time,  
 20 the HEP may produce considerable power when that flow,  
 21 or part thereof, is diverted through its turbines. If  
 22 the flow of the river is low at that particular time,  
 23 the HEP will produce less power.  
 24 (Slide 7) Now, run-of-river HEPs on Himalayan rivers  
 25 are particularly vulnerable to this, given the extent to

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09:38 1 which the flow of those rivers varies throughout the  
 2 year. So on the slide I've got for you the hydrograph  
 3 for the Neelum River, which dictates the operations of  
 4 the Neelum-Jhelum plant that we visited earlier this  
 5 year.  
 6 As we can see there, in the wet season, water is  
 7 plentiful due to snow and glacial melt, as well as  
 8 rainfall. And in the dry season, the situation is  
 9 reversed: the water is locked up high in the mountains  
 10 and there is relatively little rain, decreasing the  
 11 river flow significantly.  
 12 From the HEP's perspective, this creates something  
 13 of a feast-or-famine situation. And you'll see on the  
 14 hydrograph a red dotted line, and that line reflects the  
 15 HEP's design discharge: the flow necessary for it to  
 16 generate power at its installed capacity.  
 17 Where the flow exceeds the design discharge, the HEP  
 18 may be run constantly at full power 24 hours a day. For  
 19 the NJHEP, as you can see, this will be the case only  
 20 during the summer wet season, with meltwater and monsoon  
 21 rains.  
 22 But where the flow falls below the design discharge,  
 23 which is 280 metres a second for the NJHEP, continuous  
 24 operation at full power will not be possible. While the  
 25 HEP will still produce power -- potentially considerable

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09:40 1 power -- constantly over those 24 hours, the power so  
 2 produced will be less -- perhaps much less -- than the  
 3 installed capacity of the plant. There will simply not  
 4 be enough flow for the plant to be run full blast.  
 5 This is yet another problem that must be tackled  
 6 during the HEP's design phase. And engineers being the  
 7 ingenious people they are, there are multiple solutions.  
 8 (Slide 8) So we have three basic solutions for you  
 9 on the slide, and that slide has been adapted from  
 10 presentation 5, as explained by Mr Farooq during the  
 11 site visit.  
 12 First, our designer can attach the HEP to a storage  
 13 work with a massive reservoir. And that reservoir will  
 14 retain a colossal volume of water during the wet season,  
 15 which can then be used to supplement the natural flow of  
 16 the river during the dry season, enabling the production  
 17 of near constant power year-round at the HEP's installed  
 18 capacity, or, as a minimum, providing at least  
 19 an enhanced amount of power during the dry season.  
 20 And that's what Pakistan has done for the 4,888 MW  
 21 Tarbela HEP on the Indus River. And the reservoir of  
 22 that HEP stores a portion of the monsoon water in the  
 23 wet season, for use in the dry season, for both power  
 24 production and irrigation supply. Now, of course such  
 25 a storage HEP is no longer a run-of-river HEP: it's

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09:41 1 a storage work.  
 2 Second, the designer can reconcile themselves to  
 3 their fate and build a pure run-of-river plant. That is  
 4 a HEP that simply takes what the river provides at any  
 5 given moment, and produces power accordingly. Such  
 6 a HEP is still very useful, and may have a significant  
 7 installed capacity, such as India's Salal HEP, which is  
 8 rated for 690 MW.  
 9 Third -- and this is where Annexure D comes in --  
 10 the design can turn part of the HEP's reservoir, which  
 11 is ordinarily used for the creation of generating head,  
 12 into an operating pool. The Court is obviously familiar  
 13 with such a design because it was deployed at the 969 MW  
 14 NJHEP which was the subject of the site visit. And this  
 15 is India's preferred HEP design.  
 16 In such a scenario, rather than running the HEP  
 17 constantly, the operator will shut down or reduce  
 18 production for part of the day that corresponds to low  
 19 power demand, enabling water to be stored in the  
 20 operating pool during that time. For the rest of the  
 21 day, the water stored in the operating pool will be  
 22 released through the HEP's turbines at times of peak  
 23 demand, thus temporarily supplementing the natural river  
 24 inflow with water releases from storage. And that's  
 25 commonly termed "power peaking".

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09:42 1 The result of power peaking is that for the part of  
 2 the day in which water in the operating pool is  
 3 released, the HEP operator will be able to produce power  
 4 at a higher rate than they otherwise could with the  
 5 river's natural flow, and potentially as high as the  
 6 HEP's installed capacity. And that stored water is  
 7 called "pondage".  
 8 (Slide 9) On the slide, you can see we have  
 9 an accepted engineering definition of the term, taken  
 10 from a recognised industry text called the Hydropower  
 11 Engineering Handbook (P-477). And there you will see it  
 12 says that "pondage" is:  
 13 "... short-term storage of water, usually on a daily  
 14 basis, to meet the diurnal variations in power demand."  
 15 Just to continue with our introduction to the  
 16 concept in view, how does the HEP operator determine  
 17 when to store and when to release pondage in the  
 18 operating pool?  
 19 (Slide 10) As you will remember from  
 20 Hameedullah Khan's presentation on power production  
 21 during the site visit, in a country like Pakistan, the  
 22 plant operator will be told when to operate the plant by  
 23 the power system's dispatch operator. The system  
 24 operator may call on power from all generating units  
 25 connected to the grid, including the HEP, to meet the

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09:44 1 time-variant demands of power consumers -- which is  
 2 reflected in the load curve -- at the lowest generating  
 3 cost.  
 4 On the slide, we have a sample load curve on the  
 5 left from the US Army Corps of Engineers' Hydropower  
 6 Manual (P-302). It's a daily load curve. And we can  
 7 see here that the HEP operator is likely to be directed  
 8 to store water when demand is low overnight, and then  
 9 release it during the day when demand is higher. Not  
 10 only will the HEP operator get a better price for their  
 11 electricity during this time, they will assist in  
 12 meeting peak demand.  
 13 Now, of course, it's not enough for a HEP to meet  
 14 demand or part of demand for a day: it must meet it for  
 15 the next day as well, and the day after that, and the  
 16 day after that. But humans are predictable. On most  
 17 days, they will display the same behaviour: rising in  
 18 the morning, working during the day and sleeping at  
 19 night.  
 20 On the working days, Monday through Friday, they  
 21 will be broadly consistent, resulting in maybe one or  
 22 two daily peak periods. On the weekend days of Saturday  
 23 and Sunday, they will also be consistent, but the peaks  
 24 may be lower as people are not going to work. And that  
 25 can be seen reflected in the weekly load curve on the

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09:46 1 24-hour period, it will store water in the operating  
 2 pool, and then come online to meet the peak demand for  
 3 a limited time, say a few hours, before returning to  
 4 storage mode once more.  
 5 And in the middle, we have something that we call  
 6 "intermediate power", or an "intermediate plant". This  
 7 is something of an in-between option. Using pondage, it  
 8 can provide power for longer than a peaking plant, but  
 9 less time than a baseload plant.  
 10 Now, all of these HEPs may play a meaningful role in  
 11 a power system, provided their role in that system is  
 12 carefully planned, with a view to their limitations as  
 13 HEPs.  
 14 (Slide 11) This basic division is recognised by the  
 15 US Army Corps of Engineers in its Hydropower Engineering  
 16 Manual, to which Mr Khan referred, and we see the  
 17 division there on the slide. A baseload plant is  
 18 producing power 24 hours a day; a HEP with intermediate  
 19 loading is producing power for 8 to 14 hours a day; and  
 20 a HEP with a peak loading is producing power for 8 hours  
 21 a day or less. And this is reflected in the associated  
 22 load curve, which we saw here as the daily load curve on  
 23 the previous slide.  
 24 (Slide 12) Now, just to take this point a little bit  
 25 further, I now have for you on the slide, side by side,

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09:45 1 right. As can be appreciated from this, the power  
 2 system will be required to meet the same broad pattern  
 3 from Monday to Friday, and then a similar but less acute  
 4 pattern on Saturday and Sunday.  
 5 Now, obviously the size of the peaks may differ  
 6 throughout the year, depending on different power  
 7 requirements. Power demand in Pakistan and India in the  
 8 summer is much higher, for example, owing to the use of  
 9 air-conditioning. But the basic diurnal pattern, with  
 10 people sleeping at night and being active during the  
 11 day, will remain the same.  
 12 What the weekly load curve therefore shows is really  
 13 seven daily load curves. Provided that the demand for  
 14 each individual day is met, the weekly demand will also  
 15 be taken care of from a power system perspective. In  
 16 basic terms, what pondage will do, therefore, is grant  
 17 a Himalayan run-of-river plant greater flexibility in  
 18 operation.  
 19 As Mr Khan and Arshad Malik explained on the site  
 20 visit, in the wet season the run-of-river HEP with  
 21 pondage will operate as a baseload plant. As the flow  
 22 is plentiful, the plant can run constantly at its  
 23 installed capacity.  
 24 In contrast, during the dry season it will operate  
 25 as a peaking plant. For part or even most of the given

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09:48 1 two load duration curves. Now, you'll remember Mr Rae  
 2 referred to these.  
 3 You'll recall from Mr Khan's presentation to you on  
 4 the site visit that load duration curves are derived  
 5 from load curves, rearranging them from showing the  
 6 demand within a power system at a particular time to  
 7 showing how much power is required as a percentage of  
 8 a given time period; so over 24 hours, which is what  
 9 these are showing.  
 10 So baseload power is going to be required for 100%  
 11 of the period. The plant providing it, therefore, is  
 12 going to be at or near the bottom of the curve. Peaking  
 13 power will be required for far less time, and therefore  
 14 it's going to be at or near the top of the curve. And  
 15 intermediate power will be somewhere in between.  
 16 In the duration curve on the right, we see the HEP  
 17 being used for baseload power. And you'll see from the  
 18 Y-axis that that's not providing very much of that  
 19 power: maybe 20 MW or so, it's hard to tell. But it's  
 20 doing it continuously throughout our 24-hour period.  
 21 In the duration curve on the left, we have the same  
 22 HEP being used for peaking power. And you can see that  
 23 using its pondage, it's able to service a much deeper  
 24 slice of the curve: I think that's maybe 100 MW. But  
 25 the time in which it's able to do so is limited to 40%

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09:49 1 of the relevant 24-hour period, being limited by the  
 2 volume of water that the river delivers into the  
 3 reservoir over 24 hours. So in this case it's providing  
 4 intermediate power: it's about 9.6 hours, I think.  
 5 Now, even a run-of-river HEP with limited pondage is  
 6 still extremely useful from a system planning  
 7 perspective. It will still be operating as a baseload  
 8 plant during the wet season; and in the dry season, it  
 9 will still function as a useful peaking plant, just with  
 10 peaks of a shorter duration.  
 11 Now, with careful planning, in the context of  
 12 an entire power system with hundreds of plants all over  
 13 the place, this is not going to pose a significant  
 14 impediment. And in the context of our left-hand  
 15 duration curve, this means that the HEP will still be  
 16 occupying a meaningful slot at the top of the curve, and  
 17 a power system operator will still be grateful for its  
 18 presence and ability to serve as a peaking plant.  
 19 Now, this brings me to my final introductory point  
 20 on pondage, which is how the maximum pondage of a HEP --  
 21 the size of the operating pool -- is fixed in the course  
 22 of the HEP's design.  
 23 Now, one could ask the question: why do you need to  
 24 fix the operating pool as part of the HEP's design?  
 25 Can't you just expand it or contract it in accordance

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09:52 1 what elements of design would cause him to pick  
 2 a capacity at the red line? Or why isn't it higher or  
 3 lower, given that there's a very significant shift in  
 4 hydrology, particularly at this -- at any site, but at  
 5 this site?  
 6 So I'm just wondering whether you have any insight  
 7 on why the plant designer decided to set the plant  
 8 capacity for this site at that line, and whether pondage  
 9 was an influence.  
 10 DR MILES: Are you referring to the Neelum-Jhelum plant in  
 11 particular?  
 12 DR BLACKMORE: I'm referring to this one here. It doesn't  
 13 matter whether -- I think it's the same issue whether  
 14 it's Neelum-Jhelum --  
 15 DR MILES: You're asking as a general --  
 16 DR BLACKMORE: It's a general question related. But seeing  
 17 you put up a slide of a plant without a name on it,  
 18 I'm assuming it's Neelum-Jhelum.  
 19 DR MILES: It is indeed Neelum-Jhelum.  
 20 I'm not an engineer, that seems like quite  
 21 a detailed question, so I will speak, as always, under  
 22 the control of my engineering colleagues. But  
 23 a number of factors will go into that, it seems to me.  
 24 Obviously your installed capacity is going to be  
 25 determined by: what are you going to put in the grid,

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09:50 1 with need? And the answer to this is: no. And it's  
 2 a "no" because fixing the size of the operating pool  
 3 means fixing the dead storage level within the  
 4 reservoir, and therefore fixing where your intake is  
 5 going to be.  
 6 And as we heard from Professor Webb yesterday, in  
 7 her presentation on outlets, spillways and intakes, all  
 8 of these design elements, which are self-evidently not  
 9 capable of being moved once you render them in concrete,  
 10 are situated at, around or otherwise relative to the  
 11 dead storage level. Thus, the HEP designer must fix the  
 12 volume of the operating pool ab initio.  
 13 (Slide 13) So what are the ordinary design  
 14 principles that are applicable to pondage? Pakistan  
 15 dealt with this in its Memorial at paragraph 4.67.  
 16 THE CHAIRMAN: Just a moment, Dr Miles.  
 17 Dr Blackmore.  
 18 DR BLACKMORE: I thought I'd ask a question before we get  
 19 into the whole presentation, because we've had a couple  
 20 of slides that I just would like some clarification on.  
 21 So can we go back to slide 7, please. (Pause)  
 22 I'm just interested in your view, given we're going  
 23 to talk about pondage and we're talking about the total  
 24 environment of a river system.  
 25 So why would a designer pick the red line at that --

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09:53 1 what's the demand in the grid. It's also going to be  
 2 fixed by the hydrology -- I mean, how reliably am  
 3 I going to be able to generate power above that  
 4 installed capacity throughout the year -- and things of  
 5 that nature.  
 6 But I can get a more precise answer for you during  
 7 the coffee break and get back to you.  
 8 DR BLACKMORE: Well, my specific question is: does whatever  
 9 the calculation of pondage, which we're getting to,  
 10 wherever that takes us to a conclusion on pondage,  
 11 influence the selection of the red line? That's my  
 12 question.  
 13 DR MILES: Not under the Treaty, is the answer. The Treaty  
 14 fixes pondage by reference to one thing, and one thing  
 15 only, and that's the minimum mean discharge. The  
 16 installed capacity of the plant does not feature into  
 17 the calculation.  
 18 DR BLACKMORE: So my second question goes to slide 12.  
 19 I've hopefully got this one right.  
 20 When you were introducing this, you -- it's a small  
 21 point, but it's important, I think, just in the context  
 22 of scale. I think you said the hydro on the right-hand  
 23 one was 20 MW. When I'm reading it, I've got 200. I'm  
 24 just wondering whether that was an oversight or I've  
 25 read it wrong.

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09:55 1 DR MILES: I mean, I read -- this is just me. If the load  
 2 is from 0 to 6 in the Y-axis, I read that as 0 at the  
 3 very bottom of the Y-axis being zero power and the top  
 4 of the axis being 1,000, it's only sort of a tiny slice  
 5 of that. So 200 would be about a fifth of the way up.  
 6 DR BLACKMORE: Well, the increments are in 1,000 MW. So the  
 7 1 is 1,000 MW.  
 8 DR MILES: Oh, I read that differently. I read that as the  
 9 total load being 1,000 MW. But if that's the case, then  
 10 you're right: it would be 200 MW.  
 11 DR BLACKMORE: Okay. I'm just trying to understand it,  
 12 because it affects the way you translate it to the left  
 13 side.  
 14 DR MILES: I'm happy to be corrected.  
 15 DR BLACKMORE: Okay, thank you.  
 16 DR MILES: (Slide 13) So we can just go back to this. If  
 17 you recall, the answer that I gave -- or the Memorial  
 18 gave (paragraph 4.67) -- for the ordinary principles  
 19 applicable to the calculation of pondage:  
 20 "Under ordinary principles of design -- a point that  
 21 requires emphasis in the context of the present case --  
 22 there is no fixed methodology for determining how much  
 23 pondage a HEP will require or be permitted to have.  
 24 However, the provision of pondage, and ensuring that it  
 25 remains free of sediment, will incur both capital and

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09:57 1 it was a point made, perhaps implicitly, by Mr Minear on  
 2 the site visit -- and it's the role of legal regulation  
 3 in the HEP's design. As Dr Hayat pointed out in his  
 4 presentation on HEP design and planning, legal  
 5 regulation is one of the major factors to be taken into  
 6 account as part of the HEP design process.  
 7 The principles I have just discussed, as Mr Minear  
 8 pointed out, are free of such regulation, reflecting the  
 9 approach taken if the HEP designer is left to their own  
 10 devices. But where there is legal regulation, the  
 11 designer will need to change -- perhaps drastically --  
 12 their approach to the design of the operating pool.  
 13 And this is not a hardship for the designer, or at  
 14 any rate not an unexpected hardship. For the designer,  
 15 legal regulation is not the only or even the most  
 16 constraining element of HEP design. Like hydrology or  
 17 geology or project financing, designing within the  
 18 framework of the existing regulations is simply  
 19 a reality of the challenging process in which they have  
 20 chosen to engage. And the regulation of pondage is one  
 21 such design constraint that we are here today to  
 22 discuss, as reflected in the Indus Waters Treaty.  
 23 (Slide 15) With that in mind, I turn to the second  
 24 part of my submissions, on the relevant provisions of  
 25 the Treaty and its Annexure D.

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09:56 1 operational costs. Thus, the rational selection of  
 2 pondage capacity will usually balance these capital and  
 3 operational costs against the income anticipated from  
 4 delivery of power during peak hours when energy prices  
 5 are higher."  
 6 Now, put it another way: pondage is expensive. It's  
 7 expensive to build and it's expensive to maintain. As  
 8 Mr Farooq pointed out on the site visit, a large  
 9 operating pool may entail having to build either  
 10 a taller dam or undertake greater excavation at the site  
 11 of the HEP's construction, which will entail capital  
 12 costs at the outset of the project. And it will need to  
 13 be kept free of sediment, entailing the use of sediment  
 14 management processes, which in turn will entail  
 15 operational costs over the lifetime of the HEP.  
 16 So a HEP's designer doesn't incorporate pondage into  
 17 a HEP's design purely for the sake of having pondage.  
 18 Their lives may be much easier without it.  
 19 A cost/benefit analysis is required to determine just  
 20 how much pondage is required, and this will vary from  
 21 site to site, and indeed from power system to power  
 22 system. As I said yesterday in relation to freeboard,  
 23 there's no one-size-fits-all in relation to these  
 24 issues.  
 25 (Slide 14) Of course, there's a further point -- and

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09:58 1 (Slide 16) There can be no doubt that the Treaty  
 2 regulates pondage. Paragraph 8(c) of Annexure D, now  
 3 back on the slide, makes that abundantly clear. The  
 4 maximum pondage in the operating pool is limited by  
 5 paragraph 8(c), in the same way that paragraph 8(d)  
 6 limits the placement of outlets and paragraph 8(e)  
 7 limits the design of spillways, and so on and so forth.  
 8 But as I alluded to yesterday, unlike those other  
 9 subparagraphs of paragraph 8, paragraph 8(c) does not  
 10 allow for any margin of appreciation based on "sound and  
 11 economical design", "satisfactory operation of the  
 12 works", or any other kind of cognate concept. It is  
 13 a criterion of HEP design that India limit the size of  
 14 its HEP's operating pool to "twice the Pondage required  
 15 for Firm Power". The seriousness of this criterion is  
 16 made clear when we step back and look at its wider  
 17 context, and I'll take you through that now.  
 18 (Slide 17) We start with familiar ground, which is  
 19 Article III of the Treaty proper, which is now back on  
 20 the slide. Professor Webb has already addressed you on  
 21 Article III in detail, but it is important that we hit  
 22 on some key points.  
 23 Again I'd like to draw your attention to  
 24 Article III(1), which is the core promise of the Treaty  
 25 so far as Pakistan is concerned:

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<p>10:00 1 "Pakistan shall receive for unrestricted use all 2 those waters of the Western Rivers which India is under 3 an obligation to let flow under the provisions of 4 Paragraph (2)." 5 Now let's go on to paragraph (2): 6 "India shall be under an obligation to let flow all 7 the waters of the Western Rivers, and shall not permit 8 any interference with those waters, except for the 9 following uses ..." 10 Now, as Professor Webb noted, and as Pakistan has 11 made clear in its Memorial in many places, this language 12 constitutes the rule. Everything that comes after it is 13 necessarily and unavoidably an exception; an exception, 14 moreover, for which the context of Article III, and the 15 wider history of the Treaty, mandates a narrow 16 interpretation. 17 As the Court is aware, one of those narrow 18 exceptions is set out in Article III(2)(d), which refers 19 to "Generation of hydroelectric power, as set out in 20 Annexure D". But there is of course a further 21 prohibition in Article III, and this is set out in 22 Article III(4): 23 "Except as provided in Annexures D and E, India 24 shall not store any water of, or construct any storage 25 works on, the Western Rivers."</p> <p style="text-align: center;">Page 21</p>	<p>10:02 1 paragraph 8(c) and the subject of my submissions today. 2 As an aside, it commented on Annexure E in the 3 process, perhaps answering -- at least in part -- some 4 of your questions, Mr Chairman, on that annexure 5 yesterday, and whether Annexure E allows India 6 considerable storage. In short, in the view of the 7 Kishenganga Court, it does not. And at paragraph 504 of 8 the partial award (PLA-3), the Kishenganga Court said: 9 "... one of the primary objectives of the Treaty is 10 to limit the storage of water by India on the Western 11 Rivers (and, correspondingly, to prohibit entirely the 12 storage of water by Pakistan on the upper reaches of the 13 Eastern Rivers). Annexure E to the Treaty strictly 14 limits the volume of General Storage, Power Storage, and 15 Flood Storage that India may develop on each of the 16 Western Rivers." 17 Now, Pakistan agrees with this, obviously. A core 18 animus of the Treaty, as reflected in Article III, is 19 the need to prevent India from retaining the waters of 20 the Western Rivers. Only in this way could Pakistan's 21 interests and the hydrology of the Western Rivers be 22 protected. 23 The Kishenganga Court continued, addressing the 24 question of maximum pondage directly. It said: 25 "For new Run-of-River Plants, Annexure D likewise</p> <p style="text-align: center;">Page 23</p>
<p>10:01 1 As with Articles III(1) and (2), Article III(4) sets 2 out the rule with respect to storage of waters -- which 3 self-evidently includes pondage -- by India on the 4 Western Rivers. The rule is: no storage, subject again 5 to the exception of Annexures D and E, both of which 6 fall, in Pakistan's submission, to be narrowly 7 interpreted. 8 Now, I won't dwell on it overmuch, as Ms Rees-Evans 9 has already addressed it. But this understanding of 10 Article III(4) is amplified by the travaux 11 préparatoires. An analysis of the relevant part of the 12 travaux is provided in Appendix A to the Memorial, 13 particularly insofar as that analysis concerns the 14 negotiations from August to September 1959 onwards. And 15 for your note, you can find that at paragraph 115 of 16 Appendix A and following. 17 This was the point in the negotiations where India's 18 hydroelectric use of the waters of the Western Rivers 19 came into sharp focus. And a persistent feature of the 20 negotiations throughout that time was Pakistan's 21 agitation at India using the reservoirs of its HEPs to 22 prevent water from reaching Pakistan. 23 (Slide 18) In view of this, the Kishenganga Court 24 held as follows, in terms that Pakistan considers 25 essential background to the interpretation of</p> <p style="text-align: center;">Page 22</p>	<p>10:04 1 restricts the permissible volume of pondage, and pegs 2 this limit to power generation at the minimum mean 3 discharge calculated at the site." 4 We will return to this presently, but suffice to 5 say, this reflects Pakistan's position on maximum 6 pondage and the proper interpretation of paragraph 8(c). 7 It does not reflect India's. 8 The Kishenganga Court went on: 9 "These are not generous limits -- the volume of 10 storage permitted to India on the Jhelum Main, for 11 example, is zero ..." 12 That's storage under Annexure E: 13 "... and even the limited available record of the 14 Treaty's negotiating history suggests that these amounts 15 of storage were a key point of contention between the 16 Parties. The outcome was significant in that it 17 achieved a careful balance between the Parties' 18 respective negotiating positions, allowing India 19 hydro-electric use of the waters of the Western Rivers 20 while protecting Pakistan against the possibility of 21 water storage on the upstream reaches of those Rivers 22 having an unduly disruptive effect on the flow of water 23 to Pakistan." 24 So what this passage shows is that the Kishenganga 25 Court well understood the key role of Article III(4),</p> <p style="text-align: center;">Page 24</p>

10:05 1 and the limitations on Indian storage on the Western  
 2 Rivers that it imposes, within the Treaty. This refers  
 3 not only to India's capacity to construct storage works  
 4 under Annexure E, but the amount of live storage --  
 5 pondage -- that India is entitled to when constructing  
 6 HEPs under Annexure D.  
 7 So the key insight of the Kishenganga Court in this  
 8 respect is that the Treaty, while not entirely  
 9 anti-storage insofar as India's rights on the Western  
 10 Rivers are concerned, is certainly deeply suspicious  
 11 of it.  
 12 To the extent that there is any -- yes, Mr Chairman.  
 13 THE CHAIRMAN: Dr Miles, just so I can perhaps clarify  
 14 a little bit the interest at least I was expressing in  
 15 Annexure E.  
 16 It wasn't so much pushing back on the idea that  
 17 there are limits on storage in Annexure E; there clearly  
 18 are. It was more a question of: when one takes into  
 19 account Annexure E, and perhaps when one takes into  
 20 account an ability to have unlimited dead storage even  
 21 in Annexure D plants, is the differential in the pondage  
 22 that Pakistan is advancing in this proceeding versus  
 23 what India might be advancing if it was here, is that  
 24 differential significant when we're talking about the  
 25 risk that Pakistan perceives, given these other

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10:08 1 an interpreter of the Treaty is faced with a situation  
 2 in which it considers two readings of its provisions to  
 3 be open to it on a question related to Indian storage on  
 4 the Western Rivers, either under Annexure D or E for  
 5 that matter, the interpreter is, in Pakistan's  
 6 submission, duty-bound -- and consistent with the  
 7 principle of effectiveness in treaty interpretation --  
 8 to select that interpretation that minimises the storage  
 9 available to India or India's physical ability to  
 10 interfere with the flows into Pakistan.  
 11 So that's Article III: the essential framing for  
 12 Annexure D and, by extension, paragraph 8(c).  
 13 So with this framing set out, I'll take you now to  
 14 Annexure D. As we journey back to paragraph 8(c), we'll  
 15 stop first -- as we must -- by paragraph 2, and consider  
 16 some of the key definitions that construct that design  
 17 criterion. We saw some of these yesterday, but I'll  
 18 just give you a quick refresher now.  
 19 (Slide 19) So on the slide we've got our initial  
 20 series, and I've selected here the definitions that set  
 21 various critical levels in an Annexure D.3 HEP's  
 22 reservoir.  
 23 So paragraph 2(a), our first critical definition:  
 24 "Dead Storage" and the "Dead Storage Level".  
 25 Then we have paragraph 2(b), "Live Storage", which

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10:07 1 possibilities for storage?  
 2 That's really what at least I was trying to  
 3 drive at.  
 4 DR MILES: I see. Thank you for that clarification.  
 5 I think that may have to await more developed  
 6 submissions on Annexure E in the second round.  
 7 Professor Buytaert has a question.  
 8 THE CHAIRMAN: Dr Buytaert.  
 9 PROFESSOR BUYTAERT: Yes, just as a quick follow-up to the  
 10 question of Mr Chairman.  
 11 If you make that development, I think I would be  
 12 particularly interested in putting that in the context  
 13 of the values for storage that the Treaty permits under  
 14 Annexure E at paragraph 7. There you have the table  
 15 with values for both non-power and power storage.  
 16 I think that would be very useful, to take that into  
 17 account and, for example, redo the exercise or the  
 18 simulation that Dr Morris presented, taking that  
 19 potential storage or that allowance of storage into  
 20 account in that exercise, just to make that more  
 21 specific.  
 22 DR MILES: Thank you, Professor Buytaert. I hear pens  
 23 furiously scribbling to my right.  
 24 Now, returning to paragraph 504. More to the point,  
 25 members of the Court, in Pakistan's submission, if

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10:09 1 means "all storage above Dead Storage" and the dead  
 2 storage level.  
 3 Then we've got paragraph 2(d), which deals with the  
 4 "Full Pondage Level", which is:  
 5 "... the level corresponding to the maximum Pondage  
 6 provided in the design in accordance with  
 7 Paragraph 8(c)."  
 8 And then we have paragraph 2(f), which is the  
 9 "Operating Pool". That's:  
 10 "... the storage capacity between [the] Dead Storage  
 11 level and [the] Full Pondage Level."  
 12 (Slide 20) So back on the slide, we have again our  
 13 cocktail napkin longitudinal profile. The dam wall is  
 14 on the left of the slide, with the river flowing from  
 15 right to left. And then we've got our various levels:  
 16 dead storage level, dead storage beneath it; live  
 17 storage reaches to the top of the dam wall; and then  
 18 intersecting the live storage zone, we have our full  
 19 pondage level; and then between that and the dead  
 20 storage level, we've got the operating pool.  
 21 (Slide 21) Now, what this doesn't do is tell you  
 22 what the live storage is. And that's on this slide.  
 23 First of all, we have paragraph 2(g). Now, this  
 24 defines the kind of HEP with which paragraph 8 is  
 25 concerned, which is a run-of-river plant. This is a HEP

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10:10 1 that develops power without live storage as an integral  
 2 part of the plant, except for pondage and surcharge  
 3 storage.  
 4 So what are these? Well, we're given the answer in  
 5 paragraphs 2(c) and (e).  
 6 Paragraph 2(e) tells us what "Surcharge Storage" is,  
 7 and that's:  
 8 "... uncontrollable storage occupying space above  
 9 the Full Pondage Level."  
 10 You'll recall we discussed this yesterday in  
 11 relation to the HEP's freeboard. It is essentially  
 12 where floodwater is temporarily stored until it can be  
 13 evacuated through the spillway, preventing the dam from  
 14 being overtopped. And the fact that it's uncontrolled  
 15 is essential to prevent the HEP design from breaching  
 16 paragraph 8(a), which we considered yesterday.  
 17 Then paragraph 2(c) tells us about "Pondage". And  
 18 this is:  
 19 "... Live Storage of only sufficient magnitude ..."  
 20 Mark those words:  
 21 "... to meet fluctuations in the discharge of the  
 22 turbines arising from variations in the daily and weekly  
 23 loads of the plant."  
 24 So the definition of "Pondage" refers to live  
 25 storage that could potentially meet fluctuations in

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10:12 1 turbine discharge arising from changes in the daily and  
 2 weekly load.  
 3 Now, this is, to an extent, consistent with the  
 4 usual understanding of pondage which we've already  
 5 discussed. That load, as we've already seen, is  
 6 determined by the power users. And the power system  
 7 operator dispatches power from each generator -- so  
 8 hydro, fossil fuel, solar, nuclear -- to continuously  
 9 supply this load as it varies throughout the day.  
 10 But the definition, critically, does not guarantee  
 11 that the HEP will have live storage sufficient to meet  
 12 the load so set. It provides, quite deliberately, that  
 13 the live storage in any event will be of only sufficient  
 14 magnitude to meet the load on the plant.  
 15 Paragraph 2(c), therefore, does not preclude the  
 16 possibility that another provision of Annexure D could  
 17 place an additional limitation on pondage. And that  
 18 additional limitation may mean that India does not have  
 19 sufficient pondage to meet its unilaterally determined  
 20 HEP load.  
 21 THE CHAIRMAN: Mr Minear.  
 22 MR MINEAR: Dr Miles, could you address the significance of  
 23 the term "loads of the plant"? Previously we were  
 24 talking about load in terms of basically consumer  
 25 consumption, but here we are talking about "loads of the

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10:13 1 plant". Is this significant or important, in your  
 2 interpretation?  
 3 DR MILES: It's a very important question. The distinction  
 4 is: a load on the system is the kind of thing done by  
 5 a load curve; the load on the plant is the portion of  
 6 that load curve that's been assigned by the system  
 7 operator to the plant to meet. So the two are linked,  
 8 in the sense that the load on the plant will be part of  
 9 the overall load curve assigned to it by the operator.  
 10 MR MINEAR: How will the designer know the load on the  
 11 plant?  
 12 DR MILES: Well, I mean -- subject to correction from my  
 13 engineering colleagues -- they won't. They can maybe  
 14 have a sense of what's going to be required: they may be  
 15 provided with a load curve by the plant operator ahead  
 16 of time. But obviously what they're going to be doing  
 17 on a particular day is not necessarily known. Because  
 18 everyone shows up at 6.00 am, they say, "Hello, we're  
 19 here, we've got this much power to put into the system",  
 20 and then they're assigned a portion of the load.  
 21 So the load on the plant is going to vary from day  
 22 to day and season to season, which is what I think  
 23 Mr Rae informed you in his presentation.  
 24 MR MINEAR: Yes, but we're talking here about design  
 25 criteria. So I just want to be clear that at the design

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10:14 1 stage, we will not know what the load on the plant will  
 2 be on a day-to-day basis, right?  
 3 DR MILES: That's entirely correct. And that's because 2(c)  
 4 is not a design criterion, it's a definition. And that  
 5 distinction -- I'm happy to pull it up -- is actually  
 6 critical to Pakistan's case.  
 7 MR MINEAR: Okay, thank you.  
 8 THE CHAIRMAN: Dr Blackmore.  
 9 DR BLACKMORE: Just to follow in the same vein.  
 10 This is the first time we've introduced daily and  
 11 weekly loads. So where do they fit in, the selection of  
 12 daily and the weekly loads? Are they to be seen as  
 13 a criterion of some form together? Or are they, daily  
 14 and weekly, to be seen as criteria or factors in design  
 15 to be considered separately?  
 16 DR MILES: I'm going to park that question, if I may,  
 17 Dr Blackmore. And once we've gone through the provision  
 18 in a little more detail, if I've not answered your  
 19 question, please ask it again and I'll do my best to  
 20 answer it. It's a very good question. There's a few  
 21 more things I would like to unpack before we get to it,  
 22 if that's alright. Thank you.  
 23 (Slide 22) Now, with all our relevant definitions in  
 24 place, we can return to our longitudinal representation  
 25 of the Annexure D.3 HEP reservoir.

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10:16 1 We now have more complete information as pertains to  
 2 live storage. We can see that surcharge storage lies  
 3 above the full pondage level and is considered  
 4 uncontrollable. And pondage is stored in the operating  
 5 pool, reflecting the fact that it is controllable and to  
 6 be used for power production.  
 7 Now -- and this is the important point -- if the  
 8 volume of the operating pool is increased, one of  
 9 two things could potentially happen.  
 10 First, the full pondage level could be raised. As  
 11 Mr Farooq noted, this may not be desirable, as it's  
 12 going to entail a higher freeboard, and therefore a more  
 13 expensive dam wall. So there's going to be a capital  
 14 expense.  
 15 Secondly, the dead storage level could be lowered.  
 16 Again, per Mr Farooq, in the ordinary course of events,  
 17 this may not also be desirable. Dead storage is going  
 18 to be acting as a sediment trap, keeping the live  
 19 storage free from sediment even as the Treaty prohibits,  
 20 in express terms, its depletion. And the less dead  
 21 storage you have, the smaller the trap, and the harder  
 22 it will be to preserve live storage, absent active and  
 23 potentially expensive sediment management. So this  
 24 represents an operational expense.  
 25 That's the conventional logic. And it's resolved

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10:17 1 via a kind of cost/benefit analysis of the type  
 2 I addressed you on at start of my presentation, dealing  
 3 with a non-Treaty project.  
 4 As Commissioner Shah observed in his evidence to you  
 5 on Day 2, however, India is given, under the Treaty,  
 6 an additional and perhaps perverse incentive to maximise  
 7 its pondage, and therefore the size of the operating  
 8 pool, which is to push the dead storage level lower in  
 9 the reservoir.  
 10 And as Professor Webb has shown, a lower dead  
 11 storage level will drive India to situate various other  
 12 important HEP components -- outlets, spillways and power  
 13 intakes -- lower in the reservoir. And although the  
 14 normal operational volume lies above the dead storage  
 15 level, the physically controllable volume --  
 16 controllable storage, which Dr Morris was addressing you  
 17 on -- is that which lies above the bottom of the lowest  
 18 outlet, which can be substantially greater than the  
 19 designated operating pool.  
 20 So by lowering the dead storage level, India is  
 21 given greater control over the waters of the Western  
 22 Rivers; water that, as the Court is aware, has been  
 23 reserved by Article III(1) for Pakistan's exclusive use.  
 24 By equal measure, any additional control of such  
 25 water by India makes Pakistan apprehensive, as it means

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10:18 1 that India has the potential to make water not  
 2 immediately available for Pakistan's use. In the worst  
 3 case, that means that the water so stored can be  
 4 weaponised by India, either by withholding it -- as was  
 5 done in April 1948 -- or by releasing it suddenly  
 6 through low-level spillways designed to release the  
 7 design flood. And Dr Morris gave you a taste of what  
 8 that might look like yesterday.  
 9 Furthermore, if excessive live storage is multiplied  
 10 across the multiple HEPs that India has planned for the  
 11 Western Rivers, the cumulative picture becomes very grim  
 12 indeed.  
 13 (Slide 23) It's worth recalling what  
 14 Professor Briscoe of Harvard University, who worked on  
 15 both sides of the Line of Control, had to say about  
 16 this, and we've got that on the slide (P-325):  
 17 "Second, there is the permanent threat, which would  
 18 be a consequence of substantial cumulative live storage,  
 19 which could store about one month's worth of low-season  
 20 flow on the Chenab. If, God forbid, India so chose, it  
 21 could use this cumulative live storage to impose major  
 22 reductions on water availability in Pakistan during the  
 23 critical planting season."  
 24 Professor Briscoe, however, was writing in 2010,  
 25 well before the full scale of India's plans became

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10:20 1 known. If India were to realise its entire scheme of  
 2 HEP construction on the Western Rivers set out in  
 3 chapter 5 to Pakistan's Memorial, the vision that  
 4 Professor Briscoe charts would no longer be accurate:  
 5 it would be considerably worse. And it's for that  
 6 reason that Pakistan says that the provision for the  
 7 calculation of maximum pondage in paragraph 8(c) must be  
 8 taken very seriously indeed.  
 9 Yes, Chairman.  
 10 THE CHAIRMAN: Mr Minear.  
 11 DR MILES: Oh, sorry.  
 12 MR MINEAR: Dr Miles, there's another aspect concerning  
 13 pondage, separate from Pakistan's apprehensions, and  
 14 that's India's interest in optimal operation of its  
 15 reservoirs and its HEPs. Obviously having additional  
 16 live storage gives them greater flexibility.  
 17 Now, how do we balance that concern against the  
 18 concern of Pakistan's what I have to say are fairly  
 19 speculative concerns about weaponisation?  
 20 DR MILES: I'd like to answer that question in three parts.  
 21 The first one is to say that in terms of balancing,  
 22 the Treaty already tells you what the balance is going  
 23 to be. And it does that through Article III, the  
 24 rule-exception structure.  
 25 Second, it also does it through paragraph 8(c),

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10:21 1 which we're going to come on to, when it says that  
 2 India's ability to have pondage is not predicated on its  
 3 ability to optimise its operating pool or its reservoir  
 4 function. It's predicated on a very specific criterion,  
 5 which is the pondage required for firm power. So in  
 6 Pakistan's submission, that balancing act has already  
 7 been done by Treaty.  
 8 But as to the third point I wanted to make, which is  
 9 regarding speculation as to what these concerns are, the  
 10 speculation that you refer to was sort of the modus  
 11 vivendi of the Treaty so far as Pakistan was concerned.  
 12 I mean, its entire negotiating position was formulated  
 13 off the back of 1948, or what it appreciated had  
 14 happened in 1948. So speculation was sufficient for  
 15 Pakistan to come to the table and negotiate the very  
 16 strict limits that we see in Article III and in  
 17 paragraph 8(c) of Annexure D.  
 18 MR MINEAR: I think that all might be true. But our friends  
 19 from India are not here, and I think they would say that  
 20 on their side of the negotiation table, they were  
 21 concerned about developing hydropower, and they ensured  
 22 that in the preamble there was the point of optimal use  
 23 of the resources.  
 24 So I just want to say that, in my mind, this is  
 25 a significant concern with regard to how we view maximum

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10:23 1 pondage. And I just want to make sure you understand  
 2 that we're sensitive to India's concerns on this as  
 3 well.  
 4 DR MILES: That is understood.  
 5 But insofar as the preamble is concerned -- I mean,  
 6 we're well aware of the concerns of our Indian friends;  
 7 it's a shame that they can't be here to express it  
 8 themselves -- the optimum utilisation of the waters of  
 9 the Indus Rivers was achieved through the division. And  
 10 division of the waters in the Eastern and Western Rivers  
 11 gave the Western Rivers to Pakistan, subject again to  
 12 very limited exceptions for Indian use.  
 13 So I just wanted to place that point on the record.  
 14 But I appreciate that India's concerns are very well  
 15 recognised by this Court.  
 16 MR MINEAR: And I just make the point that I think that  
 17 India has a different view of that, of which we need to  
 18 be cognisant.  
 19 DR MILES: Quite understood.  
 20 THE CHAIRMAN: Professor Buytaert.  
 21 PROFESSOR BUYTAERT: Dr Miles, before we move on, can  
 22 I quickly go back to the previous slide (22), and ask  
 23 for a clarification here.  
 24 You mention here "Operating Pool/Pondage". Does  
 25 that mean that we can consider, within the context of

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10:24 1 the Treaty, the operating pool to be the same volume as  
 2 pondage?  
 3 DR MILES: You can indeed.  
 4 PROFESSOR BUYTAERT: Okay, thank you.  
 5 DR MILES: (Slide 24) Before we come on to paragraph 8(c)  
 6 directly, there is another provision to consider, which  
 7 is the rather densely worded paragraph 15.  
 8 As the Court will appreciate, paragraph 15 is not  
 9 an ex facie criterion of Annexure D.3 HEP design: it's  
 10 not contained in paragraph 8. And by purpose and  
 11 effects, it sets the limit of a HEP's operation.  
 12 Now, the chapeau of the provision, together with  
 13 paragraphs 15(i) and 15(ii), defines the limit of the  
 14 HEP's daily operation, whether in terms of a single day  
 15 or a seven-day period. These limit, in terms of the  
 16 percentage of river inflow, the amount of water that  
 17 India is permitted to store and discharge from the  
 18 operating pool of an Annexure D.3 HEP. And that's based  
 19 on the location of the HEP on the Western Rivers.  
 20 So in terms of seven-day operations, the schedule is  
 21 the same for every plant, and it's set by clause (a) of  
 22 the chapeau:  
 23 "... the volume of water received in the river  
 24 upstream of the Plant, during any period of seven  
 25 consecutive days, shall be delivered into the river

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10:25 1 below the Plant during that same seven-day period ..."  
 2 In short, all water that enters the reservoir in  
 3 a given seven-day period must be passed through the HEP,  
 4 whether through the turbines or spillways or any other  
 5 method, within the same seven-day period.  
 6 And paragraph 16, also on the slide, sets the  
 7 seven-day period as running from 8.00 am Saturday to  
 8 7.59 am the following Saturday.  
 9 In terms of daily operations, the storage and  
 10 discharge schedule becomes a little bit more  
 11 complicated. And that's the element that depends on  
 12 location.  
 13 The default schedule, per clause (b) of the chapeau,  
 14 is that in any given 24-hour period, India can either  
 15 retain not more than 70% of the river inflow during that  
 16 24-hour period or discharge not more than 130% of the  
 17 same.  
 18 And in certain circumstances, the periods differ.  
 19 So per paragraph 15(i), if the HEP is on the Chenab  
 20 below Ramban, all water received into the reservoir in  
 21 a 24-hour period must be discharged within that same  
 22 24-hour period. And per paragraph 15(ii), where the HEP  
 23 is located on the Chenab above Ramban, India can retain  
 24 no more than 50% of the flow of the river, and discharge  
 25 no more than 130%, in any given 24-hour period.

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10:27 1 Again, paragraph 16 sets the 24-hour schedule as  
 2 well: it runs from 8.00 am to 7.59 am.  
 3 But the key point for present purposes is that, in  
 4 Pakistan's view, paragraph 15 has little, if anything,  
 5 to do with fixing the volume of the HEP's operating pool  
 6 as a matter of design. Rather, it exists to harmonise,  
 7 on an ongoing basis, India's operational right to store  
 8 water under Annexure D with the let-flow obligation of  
 9 Article III(2).  
 10 Put another way, paragraph 15 limits how the  
 11 operating pool can be used, once designed and  
 12 constructed. But the drafters of the Treaty plainly did  
 13 not intend it to have a determinative impact on that  
 14 design, otherwise they would have mentioned it, or  
 15 something like it, in paragraph 8(c).  
 16 Now, in response, one might say that operational  
 17 criteria should be taken into account as part of the  
 18 design process. Pakistan has no objection to this as  
 19 a matter of principle. But principled agreement has  
 20 objective limits.  
 21 And from the perspective of Treaty interpretation,  
 22 that objective limit is clear: paragraph 15 provides  
 23 context to paragraph 8(c), but the language of the  
 24 Treaty and the usual rules of VCLT Article 31 do not  
 25 allow its use beyond that. To somehow shoehorn the

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10:28 1 operational parameters of paragraph 15 into the design  
 2 parameters in paragraph 8 would not be a legitimate  
 3 interpretation of the Treaty, but rather  
 4 an impermissible rewriting of it.  
 5 So with apologies for that slightly circuitous but,  
 6 I hope the Court will agree, necessary introduction, let  
 7 us now return to paragraph 8(c), which sets out the  
 8 Treaty's approach to the calculation of maximum pondage,  
 9 and thus provides the parties with direction on how to  
 10 fix the size of the operating pool.  
 11 (Slide 25) So for the third time, we can see  
 12 paragraph 8(c) on the slide, and we're now in a position  
 13 to start breaking this down a little bit. Let's start  
 14 with the opening stanza:  
 15 "The maximum Pondage in the Operating Pool ..."  
 16 Now, if we just take those two terms together,  
 17 "Pondage" and "Operating Pool", we might well think that  
 18 the maximum pondage in the operating pool is somehow set  
 19 by the definition of "Pondage" in paragraph 2(c):  
 20 "Live Storage of only sufficient magnitude", variations  
 21 in load, et cetera.  
 22 But we see immediately that paragraph 8(c) has  
 23 another ideas for us. The second and, as a matter of  
 24 language, controlling element of this provision imposes  
 25 a hard ceiling by stating that the storage capacity of

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10:29 1 the operating pool "shall not exceed twice the Pondage  
 2 required for Firm Power".  
 3 Now, this in turn prompts the question: how much  
 4 pondage is required for firm power? And that's really  
 5 the nub of the problem so far as paragraph 8(c) is  
 6 concerned. And before we can answer it, I'm afraid we  
 7 have to go to another critical term in paragraph 8(c),  
 8 which is the definition of "Firm Power" provided in  
 9 paragraph 2(i) of Annexure D.  
 10 THE CHAIRMAN: Dr Miles, before you do that, would it be  
 11 correct to say that India's emphasis in this regard for  
 12 calculation of pondage places a lot of weight on that  
 13 defined term of "Pondage", and uses the definition for  
 14 purposes of saying: we need to look at the load,  
 15 basically of the plant to determine pondage --  
 16 DR MILES: Yes.  
 17 THE CHAIRMAN: -- whereas your argument here, as you're  
 18 about to unfold, is: that's merely a definition telling  
 19 us what "Pondage" means, and this language here, your  
 20 emphasis on the second half of the sentence, is what  
 21 should drive the calculation? Is that correct?  
 22 DR MILES: That's correct, sir.  
 23 MR MINEAR: Dr Miles, can I add just in terms of your  
 24 elaboration on this.  
 25 I sense that one of the principal differences

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10:31 1 between India and Pakistan is what we mean by "required  
 2 for Firm Power". I think India takes a quite different  
 3 view than Pakistan does. So in the course of your  
 4 presentation, I hope you can highlight the differences  
 5 and why Pakistan's argument is such as it is.  
 6 DR MILES: I absolutely will, sir.  
 7 (Slide 26) So paragraph 2(i) is now on the slide.  
 8 The first part of this is crucial. It establishes  
 9 a special meaning for "Firm Power" within the Treaty.  
 10 Now, per VCLT Article 31(4), a special meaning shall  
 11 be given to any term of a treaty if it can be  
 12 established that the parties so intended. And by  
 13 paragraph 2(i), the parties to the Treaty indicated  
 14 unequivocally that they so intended, and that paragraph  
 15 2(i) will provide the definition of "Firm Power" for the  
 16 treaty, irrespective of how that term might be used in  
 17 other contexts.  
 18 Now, in its chapeau, paragraph 2(i) provides that,  
 19 "'Firm Power' means the hydro-electric power  
 20 corresponding to the minimum mean discharge at the site  
 21 of a plant", and then follows a detailed formula for the  
 22 calculation of the minimum mean discharge, or "MMD", as  
 23 it's invariably called.  
 24 Yes, Mr Minear.  
 25 MR MINEAR: I apologise for the frequent interruptions, but

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10:32 1 I think it's best I raise these things as they come up.  
 2 With regard to firm power, maybe this is in some  
 3 ways one of the easier and one of the harder issues that  
 4 we have. With regard to the easy part of it, I think  
 5 that India and Pakistan agree on the measurement of  
 6 minimum mean discharge.  
 7 DR MILES: They do.  
 8 MR MINEAR: There's no dispute on that.  
 9 On the other hand, I think that they take different  
 10 views on the significance of the terminology of "Firm  
 11 Power". As I understand from Professor Webb before --  
 12 I raised the question: are there any vestiges of the  
 13 ordinary meaning of "Firm Power" that carry into the  
 14 defined term? And she told me that in international law  
 15 practice, there is not. But I sense that India does see  
 16 those vestiges in the way that it constructs its  
 17 arguments.  
 18 So again, I'm highlighting what I think will be the  
 19 differences that I will raise as we continue to go on.  
 20 DR MILES: I don't think there are any differences between  
 21 the parties as to what this provision means in terms of  
 22 what is the "Firm Power".  
 23 MR MINEAR: Yes.  
 24 DR MILES: The question becomes, over time: what role does  
 25 "Firm Power" play in paragraph 8(c)? And in Pakistan's

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10:34 1 produce the 25 year average flow for each of our 10-day  
 2 periods. So we've got, ultimately, a series of  
 3 36 averages, each measuring river flow in cubic metres  
 4 per second. And the lowest of those 36 averages is then  
 5 selected as the MMD. And that's invariably going to be  
 6 one of the 10-day periods in the middle of the dry  
 7 season: maybe January or February.  
 8 That perhaps sounds a little bit more complicated  
 9 than it actually is. And to explain a little better,  
 10 Pakistan has included in its Memorial a real-life  
 11 example based on the 25 years of daily flow data that  
 12 India has provided with respect to its proposed Kiru HEP  
 13 on the Chenab. Because under Appendix II of Annexure D,  
 14 this is part of the information that India is required  
 15 to hand over when they notify Pakistan of a new plant  
 16 under paragraph 9 of Annexure D.  
 17 Now, that data is set out at Appendix E1 of the  
 18 Memorial. And after we sort of work through the various  
 19 calculations, it provides an MMD of 65.3 cubic metres  
 20 a second for the Kiru HEP, and that arises from the  
 21 10-day period for 11 to 20 February.  
 22 MR MINEAR: I apologise again for the interruption.  
 23 I believe that you included in I believe it's  
 24 Exhibit P-546 the information that India provided with  
 25 respect to the Kiru plant. In that document, it did not

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10:33 1 submission, it's completely central and indeed the  
 2 raison d'être of the provision. And India takes  
 3 a slightly different view, but we'll come on to India's  
 4 position in a moment.  
 5 MR MINEAR: Very well. Thank you.  
 6 DR MILES: Now, I'll address you only very briefly on the  
 7 MMD formula. As I just answered to Mr Minear, it's  
 8 agreed between the parties, and provokes controversy  
 9 only if the data underpinning it is questioned. We  
 10 consider it in a little more detail at paragraphs 11.45  
 11 to 11.49 of the Memorial.  
 12 But for present purposes, however, the formula  
 13 requires the parties to examine the record of historical  
 14 daily flows at the site of the proposed Annexure D.3 HEP  
 15 for as long as data are available, but limited to  
 16 25 years when dealing with an ordinary -- i.e. not  
 17 small -- HEP.  
 18 Each year of the record is then broken into defined  
 19 10-day periods and the average flow, measured in [cubic]  
 20 metres a second, is calculated over each 10-day period.  
 21 So following this process, we're going to have  
 22 36 periods of 10 days for any given year. And for our  
 23 25-year record, the values of those 10-day periods will  
 24 then be averaged out across the historical record.  
 25 So if the record is 25 years in length, this will

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10:36 1 include Appendix 7, and Appendix 7 was their calculation  
 2 for pondage for that.  
 3 DR MILES: I see.  
 4 MR MINEAR: I wonder if that could be provided to us in due  
 5 course.  
 6 DR MILES: We'll certainly make sure that happens. Thank  
 7 you.  
 8 MR MINEAR: Thank you.  
 9 DR MILES: So 11 to 20 February.  
 10 An important caveat before we move on. As I've just  
 11 explained, the MMD is an average figure, expressed in  
 12 cubic metres per second, and it's an average figure  
 13 produced from a potentially substantial historical  
 14 record.  
 15 So the MMD does not correspond to the lowest flow  
 16 rate at the site of a proposed HEP in any given year; it  
 17 does not correspond to the lowest historical flow rate  
 18 in any recorded year. It reflects a single rate, in  
 19 cubic metres per second, that will be reasonably assured  
 20 throughout any given year. And from this it follows  
 21 that India can expect in a year that the flow in  
 22 question will drop below the MMD at some point in time:  
 23 perhaps for a few hours, perhaps for a few days, perhaps  
 24 for longer in a very dry year.  
 25 So in this respect, the purpose behind the MMD

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10:37 1 formula in paragraph 2(i) is to produce a respectably  
 2 low rate of flow that has been calculated in such a way  
 3 as to iron out daily, weekly and annual aberrations.  
 4 It's not predicated on some kind of a worst case  
 5 scenario, "How low can you go?" kind of analysis. The  
 6 result is a figure that reflects a characteristically  
 7 low flow rate in the river at the location in question,  
 8 typically occurring near the middle of the dry season.  
 9 This makes abundant good sense when we contrast  
 10 "Firm Power" under the Treaty with another concept,  
 11 which is that of "Secondary Power". And that definition  
 12 is at paragraph 2(j), also on the slide. This provides  
 13 that:  
 14 "'Secondary Power' means the power, other than Firm  
 15 Power, available only during certain periods of the  
 16 year."  
 17 What this tells is that, under Annexure D, the HEP  
 18 should be capable of firm power throughout the year, but  
 19 that secondary power is not expected to be available  
 20 continuously.  
 21 And also secondary power is variable. During the  
 22 dry season, it may only be marginally greater than firm  
 23 power. But in the summer wet season, when water is  
 24 plentiful, secondary power will be much greater than  
 25 firm power; and during some months, equal to the

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10:40 1 HEP is 57.65 MW, which is the power that its turbines  
 2 can produce when the Chenab is flowing at the MMD of  
 3 65.3 cubic metres a second. For the Kiru HEP,  
 4 therefore, the pondage required for firm power is the  
 5 pondage required for that HEP's turbines to produce  
 6 57.65 MW.  
 7 Now, stepping back from that for a second; it's  
 8 a bit of technical detail. But ultimately, within this  
 9 calculation, the only number that matters from the point  
 10 of view of pondage is the MMD, because that's your flow  
 11 rate. Pondage is live storage, and live storage can  
 12 only be filled by the flow of a river at a particular  
 13 point in time. And the only figure in this equation  
 14 that's derived from that flow is the MMD. If one were  
 15 to, for example, reduce the assumed generating head of  
 16 the HEP from 100 metres to 50 metres, the firm power  
 17 would be halved; but the MMD, and therefore the pondage  
 18 derived therefrom, would remain the same.  
 19 So for the purposes of calculating firm power, the  
 20 MMD is the only relevant component. And that's why the  
 21 Kishenganga Court said, in the passage we looked at  
 22 earlier (PLA-3, paragraph 504):  
 23 "... Annexure D likewise restricts the permissible  
 24 volume of pondage, and pegs this limit to power  
 25 generation at the minimum mean discharge calculated at

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10:39 1 installed capacity of the plant.  
 2 So that's the MMD. But what does paragraph 2(i)  
 3 mean when it refers to "the hydro-electric power  
 4 corresponding to the [MMD]"?  
 5 (Slide 27) Happily, this is again straightforward.  
 6 You will recall once more Mr Khan's presentation from  
 7 the site visit on the standard formula for calculating  
 8 the hydroelectric power that can be derived from  
 9 a particular river flow, whereby power, in watts, is the  
 10 product of a particular river flow in cubic metres  
 11 a second, multiplied by generating head, in metres,  
 12 multiplied by the density of water, in kilograms per  
 13 metre cubed, which is almost 1,000, multiplied by the  
 14 force of gravity, in metres per second per second, which  
 15 is always 9.81, multiplied by the efficiency of the  
 16 HEP's turbine and generator in converting the energy of  
 17 falling water into electrical energy. Most modern HEPs  
 18 are very efficient and convert about 90% of the energy  
 19 of falling water into electrical energy. And if you  
 20 divide the watts figure so obtained by 1 million, you  
 21 get megawatts.  
 22 (Slide 28) Again, on the slide we see an example of  
 23 this, and we've taken that from data provided by the  
 24 Kiru HEP. Assuming a generating head of 100 metres and  
 25 an efficiency of 0.9 -- 90% -- the firm power of that

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10:42 1 the site."  
 2 Before moving on, I've got one final point that  
 3 needs to be ventilated.  
 4 When we discussed firm power, there is something  
 5 which is not necessarily obvious from reading  
 6 paragraph 2(i) of Annexure D or, for that matter,  
 7 paragraph 8(c), and that's the distinction between firm  
 8 power and firm energy.  
 9 Now, the distinction between power and energy is  
 10 well understood by anyone who has taken a high-school  
 11 physics course. I didn't take high-school physics, so  
 12 this was all quite new to me when I started looking into  
 13 it. But as I say, it's of key importance for present  
 14 purposes.  
 15 (Slide 29) On the slide, we've got the basic  
 16 definitions of these two concepts, which were taken from  
 17 the US Army Corps of Engineers' Hydropower Manual  
 18 (P-302). First, we have the definition of "energy",  
 19 which is "that which is capable of doing work". And  
 20 second, we have the definition of "power", which is "the  
 21 rate at which energy is produced or used".  
 22 So as we've seen, "Firm Power" is the power,  
 23 measured in megawatts, that the turbines of a HEP can  
 24 instantaneously produce when the river on which it is  
 25 located is flowing at the MMD level, and that flow is

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10:43 1 then diverted into the turbines. And that's different  
 2 from "Firm Energy", which refers to power production  
 3 over a defined period of time, be it a minute, an hour  
 4 or 24 hours. And for hydropower, energy is typically  
 5 measured as megawatts of power sustained for an hour,  
 6 which is a megawatt hour.  
 7 THE CHAIRMAN: Dr Miles, I think Mr Minear has a question.  
 8 MR MINEAR: Sorry. Just to clarify this point in my mind.  
 9 Is it fair to say that the water that is stored --  
 10 that the pondage represents energy that's available to  
 11 produce the power which is related to the flow?  
 12 DR MILES: Yes.  
 13 MR MINEAR: Is that fair?  
 14 DR MILES: Yes.  
 15 MR MINEAR: Thank you.  
 16 THE CHAIRMAN: Professor Buytaert.  
 17 PROFESSOR BUYTAERT: Thank you, Dr Miles.  
 18 You mentioned the concept of "Firm Energy".  
 19 DR MILES: Yes.  
 20 PROFESSOR BUYTAERT: Obviously the definitions that you  
 21 present here are more generally about energy and power.  
 22 How common is the concept of "firm energy" in the  
 23 concept of hydroelectric plants?  
 24 DR MILES: Speaking under the control of my engineering  
 25 colleagues, it is fairly common as a general concept,

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10:44 1 "firm energy".  
 2 PROFESSOR BUYTAERT: Okay, thank you.  
 3 DR MILES: "Firm power" refers to the instantaneous rate of  
 4 energy production. I think the next slide (30) might  
 5 actually answer your question.  
 6 "Firm power" thereby refers to the instantaneous  
 7 rate of energy production, while "firm energy" refers to  
 8 the cumulative amount of power produced over a specified  
 9 period of time.  
 10 Paragraph 8(c) on its face, therefore, guarantees  
 11 India only a HEP capable of attaining a particular  
 12 instantaneous rate of production pegged not to the HEP's  
 13 installed capacity, but to a particular instantaneous  
 14 flow rate in the river, the MMD. And that's going to  
 15 result in a rate of power production substantially  
 16 lower, potentially, than the HEP's installed capacity.  
 17 And it doesn't entitle India to a particular amount  
 18 of power in a given period of time: for example, in  
 19 terms of guaranteed hours of energy production. If it  
 20 did, paragraph 2(i) wouldn't be talking about "Firm  
 21 Power"; it would be talking about "Firm Energy".  
 22 What India is guaranteed by paragraph 8(c),  
 23 therefore, is pondage that will allow an Annexure D.3  
 24 HEP to achieve a particular rate of instantaneous power  
 25 production, and nothing more.

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10:45 1 Yes, Mr Chair.  
 2 THE CHAIRMAN: Professor Buytaert.  
 3 DR MILES: Ah, yes.  
 4 PROFESSOR BUYTAERT: Sorry to interrupt.  
 5 But you mentioned several times the word  
 6 "instantaneous". Obviously power is expressed -- is  
 7 a flux, clearly, which varies over time and has  
 8 a maximum of a certain duration. But it's also quite  
 9 commonly referred to as an average over a certain time  
 10 period.  
 11 What's your take on the significance of  
 12 "instantaneous" in this context?  
 13 DR MILES: In this context, we merely refer to  
 14 "instantaneous" to say that when the flow is going  
 15 through the turbines at the MMD rate, the amount of  
 16 power that's produced is going to be firm power in that  
 17 context. So it's not about an averaging amount of time  
 18 or anything like that; it's what's coming out of the HEP  
 19 when the minimum mean discharge is flowing through the  
 20 turbines.  
 21 PROFESSOR BUYTAERT: Thank you.  
 22 DR MILES: So what India is guaranteed by paragraph 8(c),  
 23 therefore, is pondage that will allow its HEP to achieve  
 24 a particular instantaneous rate of power production, and  
 25 nothing more. If it purported to guarantee India firm

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1 power for any particular duration per day or per week,  
 2 it would no longer be reflecting firm power: it would be  
 3 reflecting firm energy. And that would be a basic  
 4 category error.  
 5 (Slide 30) Without wishing to show the knife hidden  
 6 in the napkin too much, the extract on this slide rather  
 7 indicates that India has made precisely that kind of  
 8 error. This is an extract from India's counter-memorial  
 9 in Baglihar (BR-8). What do we see there?  
 10 "Firm power" ... represents the minimum quantum of  
 11 energy that would be available to meet the energy  
 12 component of power demand on all the days throughout the  
 13 year. Being a Run-of-River Plant with weekly Pondage,  
 14 this firm energy is utilised for meeting peak demands of  
 15 the system ..."  
 16 So in a single sentence, India has turned "firm  
 17 power" into "firm energy", and totally changes the  
 18 meaning of paragraph 2(i). None of this stuff is said  
 19 anywhere in there: it's all a fiction of India's own  
 20 devising.  
 21 Now, we'll get on to this in due course,  
 22 anticipating Mr Minear's question.  
 23 India maintains this position today. It insists of  
 24 being given a defined number of hours of firm power  
 25 production per week -- rather, not even firm power

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10:48 1 production, just general production -- as part of its  
 2 pondage calculation. And in so doing, it does not seek  
 3 the pondage required for firm power; it seeks the  
 4 pondage required for firm energy. And that firm energy  
 5 is more than that produced by the MMD, invariably: it  
 6 can be up to the plant's installed capacity, according  
 7 to India.  
 8 Now, that's just one of many errors in India's  
 9 approach, in Pakistan's submission, and we'll get back  
 10 to that in due course. But in the meantime, we're still  
 11 left with our question.  
 12 THE CHAIRMAN: Mr Minear.  
 13 MR MINEAR: Before you pose that question, would it be fair  
 14 to say that the pondage itself represents firm energy?  
 15 DR MILES: It represents energy, but I wouldn't say it was  
 16 firm energy, because firm energy is a concept that's  
 17 linked to demand, so what the power system is doing.  
 18 It's potential energy sitting in the operating pool.  
 19 MR MINEAR: Okay, great.  
 20 DR MILES: Again, I speak under the control of my  
 21 engineering colleagues.  
 22 In the meantime, we are still left with a question.  
 23 We know what the critical inputs for the calculation of  
 24 maximum pondage are: that's paragraphs 8(c) and 2(i).  
 25 And we know that the calculation is dependent on firm

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10:49 1 power, which is a rate of production pegged to the MMD,  
 2 and potentially falling, therefore, well below the HEP's  
 3 installed capacity.  
 4 We also know that this is, at least on Pakistan's  
 5 case, consistent with the Treaty's overarching objective  
 6 of strictly limiting storage of the waters of the  
 7 Western Rivers by India, consistent with Article III(4),  
 8 and with the overall animus of the Treaty as identified  
 9 by the Kishenganga Court in its partial award.  
 10 (Slide 31) But what we don't know, to return to the  
 11 question at hand, is how to define the pondage required  
 12 for firm power. And you'll be happy to know that I turn  
 13 to that now.  
 14 The question posed is potentially a difficult one  
 15 from a treaty interpretive standpoint. And the reason  
 16 that it's difficult is that because the MMD on which  
 17 firm power depends is a flow rate measured in  
 18 cubic metres per second. Maximum pondage, however, is  
 19 an unchanging volume measured in cubic metres. So how  
 20 do we turn that second-by-second flow into a fixed  
 21 volume, is really the question that we're trying to  
 22 determine here.  
 23 Paragraph 8(c), however, doesn't give any overt  
 24 indication as to how to make that work. And therefore,  
 25 determining the correct methodology for the calculation

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10:50 1 of pondage will require a careful act of Treaty  
 2 interpretation, which this Court is well composed to  
 3 carry out.  
 4 (Slide 32) Now, to aid the Court in resolving this  
 5 question, Pakistan has developed a series of six  
 6 sufficiency criteria drawn from the Treaty's guiding  
 7 principles; truths held, we might say, to be  
 8 self-evident. You can find these set out in the  
 9 Memorial at paragraph 11.43, and Pakistan commends them  
 10 to the Court as a useful yardstick against which to  
 11 measure any potential methodology for the calculation of  
 12 maximum pondage. If a particular interpretation of  
 13 paragraph 8(c) fails to meet any of these criteria,  
 14 then -- at least in Pakistan's submission -- this would  
 15 be a strong indication that the interpretation was  
 16 incorrect, and that the interpreter should reconsider  
 17 his or her position.  
 18 First, and perhaps self-evidently, the correct  
 19 interpretation for paragraph 8(c) must produce  
 20 a methodology for pondage calculation that produces  
 21 a unique and fixed volume of maximum pondage, in  
 22 cubic metres or millions of cubic metres, for each  
 23 Annexure D.3 HEP, and should be derived solely from the  
 24 MMD -- that is to say, firm power -- at the site of the  
 25 HEP in question. Paragraph 8(c) itself, speaking as it

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10:52 1 does of a criterion of design, plainly requires no less  
 2 and no more.  
 3 Second, and perhaps less obviously, the correct  
 4 interpretation must produce a pondage calculation  
 5 methodology that can be reasonably executed using tools  
 6 that were available at the time of the Treaty's  
 7 drafting, so shortly before 1960.  
 8 At that time, electronic computers, calculators and  
 9 other advanced forms of computation would have been  
 10 unknown to the Treaty's drafters, and so the correct  
 11 interpretation of paragraph 8(c) cannot rely on  
 12 calculations requiring or being rendered much more easy  
 13 by their use. The correct calculation methodology must  
 14 be capable of being performed using manual or graphical  
 15 plotting, so with a pencil and paper, and possibly with  
 16 a manually operated mechanical desktop calculator.  
 17 And importantly, it's got to be capable of being  
 18 done in a straightforward way. Because if it's  
 19 straightforward, we're going to avoid disagreement  
 20 between the parties as to what the outcome should be,  
 21 what are the parameters of the calculation.  
 22 A computationally dense methodology is not necessarily  
 23 going to meet this criterion.  
 24 Now, third, the methodology produced by the correct  
 25 interpretation should not require or warrant constant

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10:53 1 correction or be rendered unfit for purpose by future  
 2 developments. Given that the volume of maximum pondage  
 3 is a design criterion that is fixed by river's hydrology  
 4 at the outset of the HEP's development, it is imperative  
 5 that the result not need to be tweaked over time to meet  
 6 new or developing conditions.  
 7 Fourth, the correct methodology should not be overly  
 8 sensitive to outliers in the input data, but must be  
 9 straightforward and robust, and not easily knocked  
 10 off-course by spurious data errors or discrepancies.  
 11 Were the situation otherwise, then the methodology used  
 12 would merely propagate disagreements between the parties  
 13 on the volume of maximum pondage, which cannot have been  
 14 the drafters' intent.  
 15 Fifth, the methodology that the correct  
 16 interpretation produces must rely solely on data  
 17 expressly addressed in the Treaty. And in particular,  
 18 it should not rest on data which India is not required  
 19 to provide to Pakistan in the course of notifying  
 20 Pakistan of a new Annexure D.3 HEP under paragraph 9 of  
 21 Annexure D. Put another way, if the interpretation  
 22 relies on information not mentioned in Appendix II to  
 23 Annexure D, then it is ipso facto suspect.  
 24 Finally, and perhaps most importantly, the correct  
 25 methodology should not be such that one party can

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1 period is, we must first look at the broader Treaty.  
 2 As a general rule, the Treaty deals with two  
 3 different kinds of period: it deals with daily  
 4 periods -- or, as sometimes described, 24-hour  
 5 periods -- and weekly time periods. And this is  
 6 apparent from, for example, paragraph 2(c) of  
 7 Annexure D, which, as we have seen, refers to the "daily  
 8 and weekly loads of the plant".  
 9 (Slide 33) There are other time periods mentioned in  
 10 the Treaty. Paragraph 2(i), for example, of Annexure D  
 11 speaks of periods of ten days. Now, Pakistan has  
 12 eliminated those as relevant because they do not match  
 13 the reality of run-of-river HEP operations, which you  
 14 can see on the slide. As we have seen, and as  
 15 paragraph 2(c) reminds us, such plants run in accordance  
 16 with a daily cycle, which can be extended out to seven  
 17 individual days before the cycle begins anew.  
 18 So the two candidates for the applicable period are  
 19 daily and weekly. And of the two of these, Pakistan  
 20 considers that the daily cycle is plainly to be  
 21 preferred.  
 22 Now, the reason why again starts with the practical  
 23 reality of HEP operations. Run-of-river HEPs with  
 24 pondage run on 24-hour cycles, storing during the night  
 25 and then discharging during the day to meet the diurnal

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10:54 1 manipulate the result to suit its own priorities, for  
 2 example by making it dependent on mechanisms that one  
 3 party can influence unilaterally. So the correct  
 4 approach cannot enable India to rely on levers within  
 5 its sole control to increase the amount of maximum  
 6 pondage; and equally, Pakistan cannot rely on similar  
 7 levers to reduce the size of the operating pool of its  
 8 own motion.  
 9 MR MINEAR: Dr Miles, those criteria are all helpful. But  
 10 I do want on focus on where the ambiguity is in the  
 11 Treaty, or the point of disagreement between India and  
 12 Pakistan. Am I right that really the critical phrase  
 13 here is what we mean by "required for Firm Power"?  
 14 DR MILES: That's correct, sir.  
 15 MR MINEAR: Thank you.  
 16 DR MILES: Now, returning to the problem posed by  
 17 paragraph 8(c), which is, as you'll recall, how to turn  
 18 the second-by-second flow of the MMD into a fixed and  
 19 permanent volume of pondage.  
 20 So the starting point of our answer is to establish,  
 21 within the meaning of the provision, the time period  
 22 within which our analysis is going to take place. So  
 23 that's going to be derived from an interrogation of when  
 24 paragraph 8(c) anticipates that India will require  
 25 pondage. So in addressing what the applicable time

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10:57 1 rhythms of consumers.  
 2 And as the slide shows, our weekly load curve is  
 3 composed of seven consecutive daily load curves  
 4 reflecting roughly the same pattern. The HEP operator  
 5 stores water at night for use during the day. If the  
 6 load on the HEP for each of those days is met, then the  
 7 weekly load is also met. And in this scenario, the  
 8 power is firm power because it's available every day.  
 9 This is why --  
 10 MR MINEAR: Excuse me again, Dr Miles. But this is all very  
 11 important, and that's what is prompting my questions  
 12 here.  
 13 It seems to me clear in India's case that the  
 14 distinction between a one-day cycle and a seven-day  
 15 cycle is critical to the way they calculate pondage.  
 16 DR MILES: Yes.  
 17 MR MINEAR: It's not so clear to me how it would affect your  
 18 calculation. So I think you can anticipate a question  
 19 from us of, if you applied your methodology to  
 20 a seven-day period rather than a one-day period, how  
 21 it would be different.  
 22 DR MILES: I can take you to the answer now, or I can take  
 23 you to the answer after I've told you what the full  
 24 methodology is; I'm completely --  
 25 MR MINEAR: Why don't we follow your very organised

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10:58 1 presentation and you can come to it in due course.  
 2 DR MILES: Thank you very much.  
 3 Now, as I've already shown you -- we've got the  
 4 definition on the slide -- "pondage" is defined as  
 5 referring to:  
 6 "... short-term storage of water, usually on a daily  
 7 basis, to meet the diurnal variations in power demand."  
 8 So that's our first reason: pondage is daily.  
 9 (Slide 34) Now, beyond this, there are clues  
 10 calculated within the Treaty itself. On the slide,  
 11 we've got a list of the provisions of the treaty which  
 12 make reference to daily or 24-hourly time periods.  
 13 So we have Article I(15)(b), dealing with  
 14 "interference with the waters". That refers to any  
 15 "man-made obstruction" which causes "a change in the  
 16 volume ... of the daily flow of the waters".  
 17 Article VI(1) requires the exchange of daily data by  
 18 the parties.  
 19 Within Annexure D, we have paragraph 2(c), which  
 20 we've already looked at. We also have paragraph 2(h),  
 21 concerning the need for regulating basins in certain  
 22 HEPs, the purposes of such basins being:  
 23 "... to even out fluctuations in the discharge from  
 24 the turbines arising from variations in the daily and  
 25 weekly loads of the plant."

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11:01 1 And it's worth noting -- this perhaps picks up on  
 2 Dr Blackmore's question -- in these provisions,  
 3 a reference to "weekly" does not appear without  
 4 a reference to "daily", and at no point is priority to  
 5 the weekly time period accorded.  
 6 At any rate, as I noted, from the perspective of  
 7 pondage generally, meeting a weekly load merely requires  
 8 the meeting of seven daily loads.  
 9 Now, there are references also to weekly periods in  
 10 Annexures F and G on difference and dispute resolution  
 11 modalities. They're purely procedural in character and  
 12 I think we can safely consider them irrelevant for  
 13 present purposes.  
 14 Now, there is a further reason as to why a daily  
 15 time period is to be preferred over a weekly time  
 16 period, and that relates to one of the sufficiency  
 17 criteria that I took you to earlier. If a weekly time  
 18 period were to be applied, any calculation would  
 19 necessarily entail consideration of the storage and  
 20 discharge schedules of paragraph 15.  
 21 (Slide 35) As the Kishenganga Court held in its  
 22 partial award (PLA-3) in paragraph 506:  
 23 "... in many instances the Treaty does not simply  
 24 restrict the Parties from taking certain actions, but  
 25 also constrains their entitlement to construct works"

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11:00 1 We have paragraph 15 as well. And in Pakistan's  
 2 submission, this is a provision of particular  
 3 importance, establishing, at least for these purposes,  
 4 the operational parameters of an Annexure D.3 HEP, and  
 5 therefore playing a contextual -- but not determining --  
 6 role in the interpretation of paragraph 8(c). And that  
 7 provision, crucially, is not cast in terms of weekly  
 8 cycle but in terms of "any period of seven consecutive  
 9 days", again reflecting the reality of run-of-river HEP  
 10 operations.  
 11 Now, beyond this, and perhaps less significantly, we  
 12 also have the provisions of paragraphs 2(b) and 4(h) of  
 13 Appendix II to Annexure D. Paragraph 2(b) requires  
 14 India to provide Pakistan with the daily discharge data  
 15 on which its design is based, which data in due course  
 16 will form the basis of the MMD calculation in  
 17 paragraph 2(i) of Annexure D. And paragraph 4(h) refers  
 18 to the daily -- and, it must be said, weekly -- load  
 19 fluctuations.  
 20 On the slide, you will see that we also have a list  
 21 of the references to weekly periods in the Treaty.  
 22 They're far more sparse, and I think we've looked at  
 23 them already.  
 24 We have paragraphs 2(c) and 2(h) of Annexure D, and  
 25 paragraphs 2(b) and 4(h) of Appendix II to Annexure D.

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11:02 1 that would enable such actions to be taken."  
 2 (Slide 36) So paragraph 15, if we're doing a weekly  
 3 time period, would probably need to be referred to,  
 4 simply so that the operating pool wasn't calculated on  
 5 the premise of a reservoir operation that India would  
 6 never be able to carry out.  
 7 The Court will recall that one of the sufficiency  
 8 criteria that Pakistan has deployed for the correct  
 9 methodology is that it must be capable of being  
 10 implemented with calculation methods that were available  
 11 in 1960 in a straightforward way. And this is sort of  
 12 running ahead of myself a little when we talk about  
 13 daily versus weekly calculations in Pakistan's  
 14 methodology. Once paragraph 15 enters the lists, the  
 15 complexity of the calculation increases considerably.  
 16 And whilst it can be done with relative ease using  
 17 a desktop computer, it would become quite dense indeed  
 18 if you had to do it graphically.  
 19 (Slide 37) Now, just to round off this point, I have  
 20 for you on the slide the various points in favour of  
 21 selecting a daily over a weekly period for the  
 22 calculation of maximum pondage.  
 23 First, it is consistent with the ordinary operations  
 24 of a run-of-river HEP with pondage, which will store and  
 25 discharge water from its operating pool on a daily basis"

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11:03 1 to meet the diurnal needs of consumers; and if it can do  
 2 that for seven days in a row, it's met the weekly  
 3 target.  
 4 Second, it's consistent with the language of the  
 5 Treaty, which refers in numerous important provisions --  
 6 notably in Article I(15) and paragraph 15 of  
 7 Annexure D -- to daily interference with the flow of the  
 8 river, or to daily or seven-daily periods for the  
 9 storage and discharge of water.  
 10 Third, it results in a considerably simpler  
 11 calculation for the determination of maximum pondage,  
 12 keeping it within one of the sufficiency criteria that  
 13 I referred to earlier.  
 14 And finally on the slide we have a fourth factor,  
 15 which in Pakistan's submission closes the argument. As  
 16 I've already explained, in circumstances where  
 17 an interpreter of the Treaty is given, with respect to  
 18 India's utilisation of the waters of the Western Rivers,  
 19 multiple potential readings of the Treaty, then  
 20 Article III requires them to pick the option that  
 21 imposes the greater restriction on that utilisation.  
 22 This is also consistent with the principle of  
 23 effectiveness in treaty interpretation more broadly.  
 24 Where multiple interpretive options are open, the  
 25 interpreter must pick the option that best coheres with

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11:06 1 THE CHAIRMAN: Mr Minear.  
 2 DR MILES: Subject to Mr Minear's question, of course.  
 3 MR MINEAR: If I could just ask: it would be instructive for  
 4 us to see the calculation that would be involved for  
 5 a seven-day determination. Is that something that  
 6 Pakistan is able to do in the course of the hearing?  
 7 DR MILES: I don't want to speak for Mr Rae, but I think  
 8 we are in a position and we should be able to provide  
 9 some form of that. Whether we can do it over the  
 10 weekend would be a separate question. But hopefully  
 11 it could be done.  
 12 MR MINEAR: Thank you.  
 13 THE CHAIRMAN: Right. Why don't we proceed with your final  
 14 bits before we take our break.  
 15 DR MILES: Okay. Just to close off this point.  
 16 Again, so far as the Western Rivers are concerned,  
 17 the fact that you will have less pondage under a daily  
 18 calculation than a weekly calculation points towards  
 19 limiting India's use of the water of the Western Rivers,  
 20 and therefore should be preferred. And in Pakistan's  
 21 submission, that means that the answer to the question  
 22 of the applicable time period is clear: it assumes the  
 23 HEP is operating in accordance with the usual 24-hour  
 24 cycle.  
 25 That's my nine lines, Mr Chairman, if now is

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11:05 1 the object and purpose of the provision being  
 2 interpreted.  
 3 THE CHAIRMAN: Dr Miles, two points. One is that we are at  
 4 the point where we might normally take a coffee break,  
 5 so perhaps you could indicate when it is convenient to  
 6 do so.  
 7 Second, I'd be interested, either now or in due  
 8 course, in hearing a bit more about how complex it  
 9 really would be to develop that seven-day analysis.  
 10 It seems to me, even in 1960, the building of  
 11 a hydroelectric plant is a rather complex operation in  
 12 and of itself, and a one-time effort to calculate  
 13 a maximum pondage based on a seven-day cycle, it's not  
 14 obvious to me that that is of such complexity that it's  
 15 an important factor in deciding that that's not the  
 16 approach to take.  
 17 DR MILES: Let me put it this way: it can be done. It can  
 18 be done, but it increases the complexity of the  
 19 calculation. And in Pakistan's submission, the more  
 20 straightforward the calculation, the less likely it is  
 21 to propagate disagreement between the parties, and the  
 22 more likely it is to be a sound, safe and enduring  
 23 formula for the calculation of pondage moving forward.  
 24 As to your other point about the coffee break, I am  
 25 nine lines away from a convenient break.

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11:07 1 a convenient moment.  
 2 THE CHAIRMAN: Very good. Thank you.  
 3 I don't think we have any questions before we break.  
 4 Let's go ahead and take our coffee break, and come back  
 5 at 11.40. Thank you.  
 6 (11.08 am)  
 7 (A short break)  
 8 (11.39 am)  
 9 THE CHAIRMAN: Welcome back, everyone.  
 10 Before we get started with Dr Miles, the Court has  
 11 considered the application that Pakistan made for the  
 12 admission of an additional document, which I believe is  
 13 a letter between the two Commissioners perhaps dated  
 14 2010 or thereabouts, and the application is approved.  
 15 So please do enter that into the record and you're free  
 16 to refer to it.  
 17 SIR DANIEL: Thank you very much, Mr Chairman.  
 18 THE CHAIRMAN: Dr Miles.  
 19 DR MILES: Thank you, Mr Chair. This was a propitious time  
 20 for a coffee break because it now neatly leads me into  
 21 the final part of the analysis, which is: what is  
 22 pondage required for firm power?  
 23 Now, as I've already explained earlier in my  
 24 remarks, although perhaps not precisely in these terms,  
 25 pondage is a battery, and a short-term battery at that.

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11:40 1 It enables the HEP operator to store potential energy  
 2 for part of a day, with the intention of supplementing  
 3 the natural river flow to deliver a particular discharge  
 4 rate, in metres per second, into the turbines for the  
 5 remainder of the day during times of peak demand.  
 6 Thanks to paragraphs 8(c) and 2(i), we know what the  
 7 flow rate is: it's the firm power rate, the MMD. Thanks  
 8 to the exercise in Treaty interpretation I carried out  
 9 before the break, we now know the time period within  
 10 which we're undertaking this exercise: it's 24 hours.  
 11 Our only remaining question is the volume.  
 12 (Slide 39) This gives rise to four important  
 13 realisations, which we will present on the slide. For  
 14 your note, they are drawn from paragraph 11.57 of  
 15 Pakistan's Memorial.  
 16 First, when the river is running at or above the MMD  
 17 at the HEP site, the HEP won't have any need for  
 18 pondage: the natural flow is going to be sufficient for  
 19 the HEP to generate firm power without any additional  
 20 releases from storage; pondage will not be required for  
 21 firm power.  
 22 Second, where the available flow of the river in  
 23 a given 24-hour period is less than the MMD, the HEP  
 24 will not be able to generate firm power without  
 25 supplemental flows at any point in time: pondage will be

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1 Paragraph 8(c) cannot be interpreted to mean that India  
 2 is entitled to whatever pondage may be necessary to  
 3 enable it to generate firm power constantly throughout  
 4 the dry season, irrespective of what the river happens  
 5 to be doing on that particular day.  
 6 THE CHAIRMAN: Professor Buytaert.  
 7 DR MILES: Yes, sir.  
 8 PROFESSOR BUYTAERT: Dr Miles, thank you.  
 9 Let's perhaps go back to the previous slide (38), if  
 10 you don't mind. (Pause)  
 11 It is really this first sentence on "Pondage is  
 12 required". And I prompted you earlier on this word  
 13 "instantaneous" that you used in your definition of  
 14 power.  
 15 I would reply, as an engineer, that it doesn't  
 16 necessarily mean instantaneous power. You could even  
 17 argue that it never means instantaneous power, because  
 18 we can't measure that. We measure at a certain  
 19 frequency, and so there's inevitably a time period  
 20 associated with it over which power is considered: it  
 21 can be a minute, it can be a day, it can be a longer  
 22 period. Obviously it's still a flux, but it just means  
 23 that we talk about the average flux over that time  
 24 period.  
 25 So your assumption is that the power that is being

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11:41 1 required for firm power, supplementing the flow to the  
 2 MMD by releasing water from storage at a given rate.  
 3 Third, for the purposes of the pondage calculation,  
 4 therefore, paragraph 8(c) assumes that pondage will be  
 5 required for firm power where the daily flow of the  
 6 water from the river is less than the MMD.  
 7 As we know from the formula for the calculation of  
 8 the MMD, this, in all probability, will occur only in  
 9 the dry season and with relative lack of frequency. At  
 10 all other times during the year, the flow of the water  
 11 will be above the MMD flow rate, and thus sufficient to  
 12 generate firm power, plus additional secondary power,  
 13 without the need for releases from storage.  
 14 Fourth, the volume of pondage required for firm  
 15 power will therefore depend on the difference between  
 16 the natural flow of the river and the MMD over a 24-hour  
 17 period. And this may vary: on some days, the river may  
 18 be meandering around the MMD level, sometimes being  
 19 above, sometimes below; on other days, the river may  
 20 spend the whole day running below the MMD level. And  
 21 self-evidently, the amount of pondage required for firm  
 22 power in the former case will be less than the amount of  
 23 pondage required in the latter case: the river will  
 24 require less assistance to reach the MMD level.  
 25 These four realisations prompt a fifth.

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11:44 1 generated is instantaneous. But if you would look at  
 2 the literature, you see that firm power is sometimes  
 3 defined as the average power over a critical period,  
 4 including the period over a day. And I believe that  
 5 that might lead to quite a different interpretation,  
 6 perhaps an interpretation that India might put forward.  
 7 Can you comment on why, specifically, you believe  
 8 that it's the instantaneous power, and not power  
 9 averaged over a longer period, including, for example,  
 10 a day?  
 11 DR MILES: With your permission, I think I'll bank that  
 12 question and maybe think about it a little bit more in  
 13 slower time, and perhaps address it in the second round,  
 14 once I've had a chance to speak to colleagues.  
 15 PROFESSOR BUYTAERT: Thank you.  
 16 DR MILES: But we'll proceed on the basis for now that it's  
 17 instantaneous.  
 18 As I was saying, paragraph 8(c) cannot be  
 19 interpreted to mean that India is entitled to whatever  
 20 pondage may be necessary to enable it to generate firm  
 21 power constantly throughout the dry season, irrespective  
 22 of what the river happens to be doing on that particular  
 23 day. And that's because the precise flow of the river  
 24 cannot be predicted with any certainty on a daily,  
 25 weekly or monthly basis; it cannot be known in advance

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11:46 1 how much pondage will be required for firm power.  
 2 Pondage is not permitted simply because there is  
 3 a drop in flow in the river; only when -- and for so  
 4 long as -- the drop falls below the MMD.  
 5 (Slide 40) So we're now closing in on what, in  
 6 Pakistan's submission, the phrase "Pondage required for  
 7 Firm Power" means.  
 8 Bearing in mind the function of pondage as  
 9 a battery, its role is to ensure that where sub-MMD flow  
 10 is provided by the river over a 24-hour period, that  
 11 flow can be effectively utilised to allow the HEP to  
 12 produce firm power for part of that time period.  
 13 Put another way, the storage afforded by pondage  
 14 must be sufficient to allow the HEP operator to  
 15 discharge all the water that enters the reservoir in the  
 16 course of 24 hours through the turbines at the MMD rate  
 17 within that same 24-hour period, because we're  
 18 calculating over a period of 24 hours. And they're  
 19 going to store for that part of the period and they're  
 20 going to discharge for that part of the period.  
 21 But put another way, the pondage required for firm  
 22 power is the storage capacity sufficient to pass the  
 23 entire daily inflow volume through the HEP turbines at  
 24 the MMD rate. And exactly how much this capacity will  
 25 be will be determined by the flow rate on a particular

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11:47 1 day.  
 2 (Slide 41) That's a little bit complicated to  
 3 visualise, so we've got an example for you on the slide.  
 4 So let's assume that our MMD is 100 [cubic] metres  
 5 a second, but that the river flow is at 75 [cubic]  
 6 metres a second for the 24 hours in question. So if  
 7 there's no operating pool, no pondage in the HEP's  
 8 reservoir, what's going to happen? Well, you get no  
 9 firm power. The 75-[cubic]-metres-per-second flow  
 10 passes through the turbines continually for 24 hours,  
 11 but because there's no storage, the HEP can't get the  
 12 extra 25 [cubic] metres a second of flow it needs to get  
 13 to the MMD level, and therefore you don't have the firm  
 14 power.  
 15 But what happens if you've got storage? Well, the  
 16 HEP operator can take that 75 [cubic] metres a second of  
 17 flow and store it for part of the 24 hours in the  
 18 operating pool. And when he or she has stored enough  
 19 water, it can be released through the turbine for the  
 20 remaining part of the 24 hours at 25 [cubic] metres  
 21 a second. When added to the 75 [cubic] metres a second  
 22 of natural flow in the river, the result is 100 [cubic]  
 23 metres a second, the MMD rate.  
 24 So the result of that is going to be that for the  
 25 remaining part of the relevant 24-hour period, the HEP

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11:49 1 operator is producing firm power. And at the end of it,  
 2 they will have discharged all the water that entered the  
 3 reservoir in the course of the applicable 24-hour period  
 4 through the turbines at the MMD rate within that same  
 5 24-hour period.  
 6 Put another way, they will have produced firm power  
 7 for the greatest duration possible within 24 hours,  
 8 using all the flow available in that 24 hours. The  
 9 storage available has provided the HEP with the pondage  
 10 required for firm power.  
 11 Now, this prompts two further corollaries which are  
 12 important.  
 13 If the HEP had less storage than that amount  
 14 available, then the storage would be insufficient for  
 15 firm power. The storage would be filled, it would be  
 16 discharged at the MMD rate, and then it would run out  
 17 before the end of the 24 hours. So there would still be  
 18 a portion of the period in which firm power could not be  
 19 produced. For that period, the HEP operator would need  
 20 to be satisfied by whatever could be produced using the  
 21 natural flow.  
 22 If the HEP had more storage available, then that  
 23 additional storage would not be required for firm power.  
 24 The storage would exceed the specified need. Indeed, if  
 25 used, any additional storage would be counterproductive

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11:50 1 to the mission of providing firm power, because while it  
 2 was in the process of being filled, it would reduce the  
 3 amount of time during the 24 hours that the HEP could be  
 4 producing power. While you're storing, you're not  
 5 producing. So if you're filling that additional  
 6 storage, you're giving up on valuable time that could be  
 7 used producing firm power.  
 8 So if we pull all of this together, we see that the  
 9 question of pondage required for firm power is really  
 10 the search for an equilibrium point, being the point at  
 11 which the storage is sufficient such that, when filled  
 12 for part of the applicable 24 hours, it will allow firm  
 13 power to be produced constantly for the rest of that  
 14 time period; no more, no less.  
 15 The only question remaining is the question of river  
 16 flow rate, which, as I have noted, is not going to be  
 17 known in advance. The only factor that is known is that  
 18 pondage will only be required if the river in question  
 19 is flowing below the MMD.  
 20 But from an engineering perspective, that  
 21 information is sufficient. Knowing the MMD, and knowing  
 22 that pondage will only be required in sub-MMD  
 23 conditions, it is possible to determine the storage  
 24 volume that will be required to ensure that a HEP will  
 25 be able to produce the greatest amount of firm power

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11:51 1 possible in any given 24-hour period from any sub-MMD  
 2 flow.  
 3 That exercise involves balancing the flow volume  
 4 entering the operating pool over any given 24-hour  
 5 period against the passage of this volume through the  
 6 HEP turbines at the MMD rate. And the amount of pondage  
 7 required for any given inflow rate will be that which  
 8 maximises the number of hours that the HEP can be  
 9 operated at firm power.  
 10 (Slide 42) Now, the mathematics of this -- forgive  
 11 the somewhat dense slide -- the mathematics required to  
 12 do this are reflected in a simple water bank balance  
 13 exercise that would have been well understood by the  
 14 Treaty's drafters. The calculations necessary to do  
 15 that are set out in Appendix E of the Memorial. But it  
 16 may be helpful for me to explain how this calculation  
 17 works for a particular flow rate.  
 18 So on any day, the inflow rate is given. So let's  
 19 go back to our inflow rate of 75 [cubic] metres  
 20 a second, and that's the equivalent of 6.48 million  
 21 cubic metres a day.  
 22 Now, the MMD discharge is known, and for this  
 23 example we'll assume once again it's 100 [cubic] metres  
 24 a second. So our inflow rate over the day is going to  
 25 be 75% of our MMD.

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11:54 1 100% of the MMD or higher, the amount of pondage  
 2 required for firm power is going to be zero, as the  
 3 natural flow of the river is sufficient for constant  
 4 firm power.  
 5 Where the river is flowing only a small amount below  
 6 the MMD, so say 90% of the MMD, then relatively little  
 7 pondage will be required, as the natural flow of the  
 8 river requires only minor additional flow to reach the  
 9 MMD level, and it will take very little time to store  
 10 this, given how plentiful the flow already is. So the  
 11 result is a relatively lengthy period of time producing  
 12 firm power over the 24-hour period.  
 13 Now, when the river is flowing somewhat less than  
 14 the MMD, say our favourite 75%, then a relatively large  
 15 amount of pondage will be required, as the river will  
 16 require greater assistance to reach the MMD level. And  
 17 it will require greater time to store this, given that  
 18 the water is entering the reservoir at a slower rate.  
 19 The result is a moderate period of time producing firm  
 20 power over the applicable 24-hour period.  
 21 And finally, when the river is flowing well below  
 22 the MMD, say 50%, a relatively large amount of pondage  
 23 will be required, as the river requires even more  
 24 assistance to reach the MMD level. Again, due to the  
 25 even lower flow of water into the reservoir, even more

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11:52 1 Now, based on the daily inflow together with the MMD  
 2 flow rate, we can compute the number of hours the plant  
 3 can operate at firm power. So in this circumstance,  
 4 we've got our daily inflow, divided by the firm power  
 5 rate, which results in 64,000 seconds, which is  
 6 18 hours. So the daily inflow rate arriving in 24 hours  
 7 is enough to give us 18 hours of firm power production.  
 8 Now, what that means is: if the plant is going to be  
 9 operating for 18 hours, it needs to be collecting water  
 10 for the first 6 hours in the operating pool, prior to  
 11 releasing stored water by turning on the turbines. So  
 12 for an inflow rate of 75 [cubic] metres a second, we  
 13 need a pondage volume that's equivalent to 6 hours of  
 14 inflow; and at the rate of 75 [cubic] metres a second,  
 15 that becomes 1.62 million cubic metres of pondage.  
 16 And because the MMD is fixed, we only need to repeat  
 17 these calculations for a variety of inflows from 0 to  
 18 100% of the MMD, and that will produce different pondage  
 19 volumes required to maximise firm power for every value  
 20 of inflow less than the MMD.  
 21 (Slide 43) And that's going to result in the pattern  
 22 that we see plotted on the slide. So just to describe  
 23 what you're seeing.  
 24 Pondage will only be required if the river is  
 25 flowing below the MMD. So when the river is flowing at

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11:55 1 time for storage is required. The result is a shorter  
 2 period for the production of firm power over the  
 3 applicable 24-hour period.  
 4 Now, somewhere along this continuum of 0 to 100% of  
 5 the MMD, we are going to reach a point, and that point  
 6 will be where, given the available inflow and the need  
 7 to balance time for storage with time for the production  
 8 of firm power, the greatest amount of pondage required  
 9 for firm power will be reached. And that's the largest  
 10 volume of storage that could conceivably be used for the  
 11 production of firm power in a given 24-hour period in  
 12 any sub-MMD hydrological condition. Put another way,  
 13 it's the largest volume of storage that will be required  
 14 if 24 hours of sub-MMD flow is to be: (a) passed through  
 15 the HEP's turbines (b) at the MMD rate, within (c) the  
 16 same 24-hour period.  
 17 It follows that any storage beyond this amount would  
 18 be redundant, as it would not contribute to the amount  
 19 of firm power the HEP could produce within that period.  
 20 And this, therefore, that maximum value, is the pondage  
 21 required for firm power.  
 22 Now, it may -- sorry, Mr Minear.  
 23 MR MINEAR: Dr Miles, actually I found the Memorial clearer  
 24 on this matter than this exposition. That just might be  
 25 a matter of my personal taste here.

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11:57 1 Can I note one small thing, because I know you pay  
 2 close attention to details. In Appendix E in  
 3 paragraph 21, you state -- I think you'll be able to  
 4 pick up on this:  
 5 "The Pondage required for Firm Power happens to be  
 6 when the flow rate is equal to 50% of the MMD."  
 7 That's the point you're just going to get to right  
 8 now.  
 9 DR MILES: That's what I'm building up to, yes, sir.  
 10 MR MINEAR: I think you meant -- don't you mean the maximum  
 11 pondage required?  
 12 DR MILES: Yes, I do mean the maximum.  
 13 MR MINEAR: Yes, maximum --  
 14 DR MILES: No, no, no, I mean that's the pondage required  
 15 for firm power. The maximum pondage required is that  
 16 figure times 2, because the maximum pondage in the  
 17 operating pool shall be double the pondage required for  
 18 firm power. So I'll have to check the paragraph.  
 19 MR MINEAR: Yes, take a look at --  
 20 DR MILES: I'll take a look at that and I'll get back to  
 21 you. Thank you.  
 22 MR MINEAR: Paragraph 21 of that, yes.  
 23 DR MILES: (Slide 44) Now, you found it clearer: in that  
 24 case, let me take you back to the Memorial, Mr Minear.  
 25 You may recognise on the slide, this is in fact from the

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11:59 1 operating pool. And that means that 1.25 million  
 2 cubic metres in stored volume is going to be required  
 3 for firm power. That's how much we are going to be  
 4 needing in order to get the additional 8 hours to put  
 5 through the turbines.  
 6 Now, moving down to 50% of the MMD. The flow is  
 7 less, and so the necessary storage time is going to be  
 8 greater; and equally, a greater volume of pondage will  
 9 be required for firm power.  
 10 So we've got 12 hours here of firm power production,  
 11 meaning that half of our 24-hour period is used for  
 12 storing water and half the 24-hour period is being used  
 13 for releasing it. And this results, in turn, in 6 hours  
 14 of MMD inflow being stored in the operating pool.  
 15 12 hours of storage at 50% of the MMD necessarily  
 16 results in 6 hours of MMD inflow being stored, because  
 17 it's 50% of the MMD times 2: 6 times 2 is 12. And this  
 18 leads to 1.41 million cubic metres in stored volume,  
 19 being again the volume required for firm power in these  
 20 conditions.  
 21 But let's now move down to the bottom entry of the  
 22 table, which we will see is quite revealing, in my  
 23 submission. 33.3% of the MMD: it's really a trickle.  
 24 At that flow rate, we have 8 hours of firm power  
 25 production. Therefore, we've got 16 hours of storage

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11:58 1 Memorial, figure 11.3. And what I've done there is  
 2 I've applied the process I've just described to India's  
 3 Kiru HEP, with its MMD of 65.3 [cubic] metres  
 4 per second. And we've got a table plotting the various  
 5 storage and discharge values in particular sub-MMD  
 6 conditions. And if you look at the table for a moment  
 7 you'll see what I described earlier.  
 8 In the first entry at the top, we see what happens  
 9 when the Chenab is flowing throughout the day at 100% of  
 10 the MMD. So that's when pondage is not required for  
 11 firm power. So in column B we have 24 hours of firm  
 12 power production, which is unsurprising, given the flow  
 13 rate. In column C, the flow rate being what it is, we  
 14 equally have 0 hours of storage. So we don't need to  
 15 store it all. In column D, we have 0 hours of MMD  
 16 inflow stored in the operating pool. And then of course  
 17 in column E, we have 0 cubic metres in stored volume.  
 18 That's all very easy.  
 19 So let's skip down to 66.7% of the MMD. We're below  
 20 the MMD, so we're going to be requiring pondage for firm  
 21 power.  
 22 So we're going to get 16 hours of firm power  
 23 production; pretty respectable. We have 8 hours of  
 24 filling time, being the balance of the 24 hours. That  
 25 results in 5.33 hours of MMD inflow being stored in the

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12:01 1 time: 24 minus 8 is 16. But because of the reduced flow  
 2 of the water, even 16 hours of storage time at that flow  
 3 rate produces only 5.33 hours of MMD storage. And  
 4 that's comparable to 6 hours of MMD flow being capable  
 5 of being stored in 12 hours if the flow is at 50%.  
 6 Therefore, despite the greater storage time, the  
 7 volume of pondage required to maximise firm power in  
 8 these hydrological conditions is actually only  
 9 1.25 million cubic metres. And that's the same volume  
 10 that we require when the river flows at 66.7% of the  
 11 MMD; and that results in 16 hours of firm power  
 12 production, as the flow rate is higher even when the  
 13 storage time is less.  
 14 So what this table shows, and why I've put it on the  
 15 slide, is that the relationship between pondage and flow  
 16 rate is not a linear relationship. It's not simply  
 17 a case of: less flow means more pondage. The need to  
 18 maximise firm power production in a given 24-hour period  
 19 means that eventually the HEP operator is going to need  
 20 to stop storing and start discharging. And that means  
 21 that, at that equilibrium point, a decrease in flow will  
 22 mean a decrease in the amount of pondage required for  
 23 firm power, notwithstanding an increase in storage time.  
 24 (Slide 45) And that's what produces this. Again,  
 25 Mr Minear, you'll recognise this from the Memorial.

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12:03 1 This parabolic curve, considering the Kiru HEP, plots  
 2 out the values that we saw on the previous table while  
 3 filling in the gaps.  
 4 Looking at this from right to left, we can see that  
 5 as the flow rate drops below the MMD of  
 6 65.3 cubic metres a second, the storage required is  
 7 going to increase. The curve is then going to flatten  
 8 as the inflection point is approached, before reversing  
 9 and decreasing, falling away entirely as the flow rate  
 10 reaches zero.  
 11 This reflects the fact that, as I just mentioned,  
 12 beyond a particular flow rate, the HEP is not going to  
 13 get any additional benefit -- at least from a firm power  
 14 production perspective -- from additional pondage. The  
 15 flow rate is going to be insufficient to fill it in the  
 16 time available if firm power production is to be  
 17 maximised.  
 18 Now, critically, and as a matter of simple  
 19 mathematics, as Appendix E shows, the inflection point  
 20 is going to be the same for every HEP applying this  
 21 formula. In other words, it is a unique and fixed value  
 22 for every HEP which can be calculated knowing only the  
 23 value of the MMD. And it reflects the pondage volume  
 24 required to store 12 hours of inflow at 50% of the MMD,  
 25 and that's going to result in the maximum usable pondage

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1 volume on a 24-hour operating schedule. It's the apex  
 2 of the curve.  
 3 THE CHAIRMAN: Professor Buytaert.  
 4 PROFESSOR BUYTAERT: Dr Miles, I would like to unpack this  
 5 a bit further from an engineering perspective.  
 6 I find this figure very informative, but I find  
 7 figure 1 in Appendix E2 of your Memorial even more  
 8 informative. But I quickly went through your slides,  
 9 and I'm afraid I can't find it. I guess you won't bring  
 10 it up?  
 11 DR MILES: Do we have the capability to do that?  
 12 PROFESSOR BUYTAERT: If it is possible to bring it up.  
 13 It directly relates, obviously, to these calculations.  
 14 But I find it easier to hang my questions on that  
 15 figure.  
 16 SIR DANIEL: I don't know whether it's possible to have the  
 17 Registry in control of the screens while Dr Miles's  
 18 slides are already on the screens. He is the one who is  
 19 in control of the screens at the moment.  
 20 THE CHAIRMAN: One possibility is that we all just get that  
 21 in front of us in hard copy.  
 22 PROFESSOR BUYTAERT: Or if it's possible to bring it up  
 23 later, I'm happy to wait; whatever way is most  
 24 convenient. (Pause)  
 25 SIR DANIEL: Professor Buytaert, could you just remind us

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12:06 1 what you are looking at so that we can call it up?  
 2 PROFESSOR BUYTAERT: Yes, let me ... Appendix E2 of  
 3 Pakistan's Memorial. So volume 2, Appendix E2,  
 4 figure 1.  
 5 MR MINEAR: It's at page 4 of Appendix E2.  
 6 PROFESSOR BUYTAERT: Yes.  
 7 DR MILES: Yes, very good. I thought it might be --  
 8 PROFESSOR BUYTAERT: It accompanies the calculations which  
 9 also have the figure which you've got on your slide.  
 10 DR MILES: Yes.  
 11 PROFESSOR BUYTAERT: I understand that Pakistan's  
 12 calculations aim to remove the need for a load curve.  
 13 But from an engineering perspective, the curve that you  
 14 come up with, with 12 hours of power production and then  
 15 12 hours switched off, seems to essentially perform the  
 16 same function of a load curve. You could even consider  
 17 it potentially a synthetic load curve that is used to  
 18 perform the calculations.  
 19 Would you agree with that conceptualisation of your  
 20 calculations?  
 21 DR MILES: I'm not sure I would, because a load curve is  
 22 going to be something that is linked to power demand.  
 23 This isn't linked to power demand; this is linked to  
 24 hydrology, and it's about the ability to store water in  
 25 a given amount of time. It's not directed in terms of

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12:07 1 load on the plant or anything of the sort. It's merely,  
 2 if you want, a sort of "storage schedule", is probably  
 3 the highest that I would put it. It's driven entirely  
 4 by hydrology, not load.  
 5 PROFESSOR BUYTAERT: But the purpose is the same:  
 6 concentrating the power production during a certain  
 7 period of the day, and reducing it, so inducing  
 8 variability in the power production. From  
 9 an engineering perspective, the only reason to do that  
 10 would be to be able to supply the power at the moment of  
 11 high demand.  
 12 DR MILES: Well, except, again, for the point that we're not  
 13 actually meeting demand here in any way, shape or form.  
 14 I mean, the intention here is to produce power at  
 15 a particular rate.  
 16 Now, I suppose you could say that this sort of  
 17 reflects some species of storage and discharge schedule.  
 18 But again, it's based on hydrology, not demand. And  
 19 indeed, it's not placing any operational parameters on  
 20 what could be done at any particular point in time.  
 21 PROFESSOR BUYTAERT: No. But presumably the operator would  
 22 only operate a plant in this way if it would match  
 23 better on to his load, compared to just running it  
 24 without any variation; would you think?  
 25 DR MILES: Well, again, it's not a question of meeting any

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12:09 1 particular species of load. This is a situation in  
 2 which we are trying to figure out: given all the  
 3 possible permutations of the ways in which firm power  
 4 might be produced, what is the greatest amount of firm  
 5 power that somebody is going to be able to produce? And  
 6 that's sort of what drives this particular curve that  
 7 you see in front of you.  
 8 Irrespective of what the inflow rate on a particular  
 9 day is going to be, this is the greatest amount that is  
 10 ever possibly going to be required. Now, it can be  
 11 dispatched in any way that they require, but the storage  
 12 is going to be there so it can be filled and discharged:  
 13 they can fill a little bit, they can drop a little bit,  
 14 they can do whatever they want within these operational  
 15 parameters.  
 16 But I am quite resistant to the idea of calling it  
 17 some species of load curve.  
 18 PROFESSOR BUYTAERT: No, that's what I'm trying to probe you  
 19 on: to take that a bit further, because eventually this  
 20 calculation leads to pondage, and then obviously the  
 21 Treaty is clear on the fact that pondage is used to come  
 22 to daily and weekly load of a plant.  
 23 So we see in pondage, there is a clear link to load.  
 24 Given that this calculation leads to pondage, it seems  
 25 sensible to consider this as a function of load as well,

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12:11 1 that, from a certain point of view, indicates the  
 2 generosity of Pakistan's calculation. Because we  
 3 obviously don't know what the rate below MMD is going to  
 4 be. So the system that we've set up here, or the way in  
 5 which we believe the Treaty is to be interpreted, means  
 6 that no matter what happens, India is going to be  
 7 getting a meaningful amount of firm power production  
 8 every day.  
 9 Now, if we'd optimised it for a higher value,  
 10 a higher MMD, looking against the background of the  
 11 hydrological record, that would result in a situation in  
 12 which we were actually providing for less pondage,  
 13 because obviously you've got a situation in which the  
 14 higher river inflow means that you'll have greater time  
 15 at firm power.  
 16 PROFESSOR BUYTAERT: But it also means that you run your  
 17 system at less than optimal conditions.  
 18 DR MILES: That's true. But that's exactly what 8(c) does:  
 19 it's firm power only.  
 20 PROFESSOR BUYTAERT: Okay, thank you.  
 21 And then a last question related to this.  
 22 Irrespective of whether you consider this a load curve  
 23 or not, you can imagine the operator running a system  
 24 like this, for whatever purposes that you might have in  
 25 mind. In that case, one would consider the peak of this

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12:10 1 if only as a way that the plant eventually will be  
 2 operated.  
 3 DR MILES: Again, it's not something about the way in which  
 4 the plant is going to be operated: it's the way in which  
 5 the pondage is going to be stored. I mean, again, it's  
 6 not something about the way in which energy or flow is  
 7 going to be discharged; it's the way in which we're  
 8 storing or using it.  
 9 So again, I'm resistant to the idea of calling this  
 10 a load curve.  
 11 PROFESSOR BUYTAERT: Okay, thank you.  
 12 As a follow-up question, you identify here that the  
 13 optimum of your system is at a flow which is, I think,  
 14 in this case 32 cubic metres a second, which is half of  
 15 the minimum mean discharge. Again, from a hydrological  
 16 perspective, that is a very low flow. I don't have the  
 17 daily flow of the Kiru, I think, in this case.  
 18 But looking at the calculations which are presented  
 19 in the same annexure, it might even occur to me that  
 20 this flow is never, or very rarely, present in the  
 21 river. Which again from an engineering perspective  
 22 would seem a bit strange: that you optimise a system for  
 23 conditions which are virtually never, or perhaps even  
 24 never, met.  
 25 DR MILES: Well, quite, Professor Buytaert. And I think

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12:12 1 curve, the maximum power that can be produced, which  
 2 would be considered the firm capacity. And I think that  
 3 the textbook which Sir Daniel mentioned or referred to,  
 4 I think, back on Monday, Creager and Justin,  
 5 specifically defined that as "firm capacity".  
 6 I would like to know whether you've got any view on  
 7 the relation between firm power and firm capacity. And  
 8 I think that also comes back to my earlier question  
 9 about the timeframe over which you look at the concept  
 10 of firm power.  
 11 DR MILES: That's something I think I'm going to have to  
 12 consult on with colleagues.  
 13 PROFESSOR BUYTAERT: Okay. Thank you.  
 14 THE CHAIRMAN: Mr Minear.  
 15 MR MINEAR: Dr Miles, I think this colloquy helps to  
 16 illustrate the distinction between India and Pakistan  
 17 with regard to the calculation of pondage. And I think  
 18 going back to something that Sir Daniel said before, the  
 19 pondage here is calculated based on hydrology, rather  
 20 than based on the operation of the plant.  
 21 DR MILES: Yes.  
 22 MR MINEAR: Is it fair to say that that is the critical  
 23 distinction between India's position and Pakistan's  
 24 position? Not to say one or the other is right or  
 25 wrong. But when we're thinking about this conceptually,

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12:14 1 is that a fair way to look at this problem?  
 2 DR MILES: I think it is at a high level, yes. Pakistan's  
 3 position is based on firm power which is based very  
 4 clearly in the treaty on hydrology, and India's position  
 5 is based on the need to meet a load curve. So I think  
 6 that's really putting your finger right on, in point of  
 7 fact, what the difference between the parties is.  
 8 And this formulation that we present to you now --  
 9 as I was very resistant to the characterisation  
 10 beforehand -- is dependent entirely on hydrology and  
 11 nothing else.  
 12 MR MINEAR: I wonder if the term "firm power", introducing  
 13 that into this equation, causes a certain amount of  
 14 confusion from Pakistan's position. We could be calling  
 15 this anything; but by referring to it as "firm power",  
 16 it keeps taking us back into traditional engineering --  
 17 DR MILES: It does. I mean, you could call it the  
 18 "designated rate" or something like that. I mean, the  
 19 concept in contract law of a private dictionary which  
 20 you occasionally find -- now, I'm not saying this is in  
 21 any way reflective of that; it's just an analogy. But  
 22 a private dictionary in a contract would be: well, if  
 23 the parties say a dog is a cat, a dog is a cat.  
 24 MR MINEAR: Again, this is not to say that I've at all  
 25 decided what the correct position is here, but I'm

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12:16 1 exceed twice the Pondage required for Firm Power."  
 2 You ask yourself then: well, what is "required for  
 3 Firm Power"? And when you go to the definition of  
 4 "Firm Power", you see it turns on the MMD at the plant.  
 5 Wouldn't the simplest way to approach this -- and  
 6 I understand that it's neither, I think, Pakistan's or  
 7 India's position, but I'd just like to hear a bit about  
 8 your thoughts on this.  
 9 DR MILES: Sure.  
 10 THE CHAIRMAN: The simplest way would be to take that MMD  
 11 which would be in a, I suppose, cubic-metre-per-second  
 12 volume, and you would, over, say, a course of a day,  
 13 calculate how much total water would be generated by  
 14 that MMD if it was all put into pondage, and then that  
 15 would be what is required for firm power, assuming  
 16 you're using exclusively pondage for running the  
 17 turbines.  
 18 In other words, that's a very simple way of  
 19 interpreting what's meant in that paragraph 8(c), that  
 20 the pondage required for firm power is: if you had to  
 21 use just the pondage to run the plant, how much volume  
 22 would you need to do that?  
 23 DR MILES: So there's two -- for the defined time period,  
 24 I assume you mean?  
 25 THE CHAIRMAN: For that 24-hour period, to run the turbines

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12:15 1 trying to discern what the difference is between the  
 2 two parties with regard to what I think the critical  
 3 language is here, "required for Firm Power".  
 4 DR MILES: Exactly. And if I can pick up on that, and as  
 5 we'll see in due course, the methodology put forward by  
 6 India does not produce firm power. It deliberately  
 7 doesn't produce firm power. But we'll come on to that  
 8 in a moment.  
 9 MR MINEAR: Okay, thank you.  
 10 THE CHAIRMAN: Dr Miles, just because I don't think you'll  
 11 be getting to this in the course of the remainder of  
 12 your presentation, I want to ask you the following  
 13 question.  
 14 You've made a pitch that we should be approaching  
 15 this in a daily context --  
 16 DR MILES: Yes.  
 17 THE CHAIRMAN: -- and you further made a pitch that we  
 18 should- be approaching it in sort of the simplest or the  
 19 easiest way to do a calculation.  
 20 DR MILES: Yes.  
 21 THE CHAIRMAN: It strikes me that there is an even simpler  
 22 way of doing this than what you've advocated here, which  
 23 on some level is simple, on another level it's not, and  
 24 that's that is to interpret paragraph 8(c) to say that:  
 25 "The maximum Pondage in the Operating Pool shall not

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12:18 1 at full speed, what amount of pondage is required to do  
 2 that.  
 3 DR MILES: I've got two initial reactions, but I'll go away  
 4 and think about it some more.  
 5 My first reaction would be that if you're saying  
 6 it's the pondage you need to -- it's basically 24 hours  
 7 of inflow at the MMD level, is what you're talking about  
 8 there. That would imply that the river is somehow  
 9 running at zero, requiring 24 hours of MMD flow.  
 10 THE CHAIRMAN: Well, just to be clear, it would be  
 11 an interpretation of what is meant in the Treaty.  
 12 DR MILES: Understood.  
 13 THE CHAIRMAN: There's all sorts of ways in which  
 14 an engineer would not approach this from an efficiency  
 15 standpoint, but in terms of the simplest way to  
 16 understand what the Treaty is calling for, arguably  
 17 that's one possibility.  
 18 DR MILES: Perhaps. I mean, I would also say: if what  
 19 you're saying is sufficient pondage to produce 24 hours  
 20 of firm power, I mean, that sort of is almost starting  
 21 to talk about firm energy a bit, because you're talking  
 22 about power produced over a period of time.  
 23 But as I said, I'll reflect on it more, and I'll  
 24 hopefully be able to come back at some point with a more  
 25 developed answer. But thank you for the clarification,

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12:19 1 that's helpful.  
 2 THE CHAIRMAN: Very good. Thank you.  
 3 Mr Minear.  
 4 MR MINEAR: Now that the Chair has opened the door to this  
 5 enquiry, there are a number of different ways, once we  
 6 divorce ourselves from engineering principles, to think  
 7 about this language.  
 8 Another possibility -- and again, I'm just putting  
 9 this out for your reaction, I'm not endorsing it at  
 10 all -- is to take a look at: in the minimum mean  
 11 discharge, choose the lowest date in which you might  
 12 have, within that series, a river flow. So in other  
 13 words, take -- I think the lowest number we have here is  
 14 36.6 cubic metres per second, and choose the difference  
 15 between the minimum mean discharge and that lowest or  
 16 worst case scenario, and then do the same calculation  
 17 the Chair is talking about.  
 18 I raise this just to get -- as you think about your  
 19 reaction -- how do we deal with these other potential  
 20 approaches to dealing with this language, once we remove  
 21 ourselves from the engineering perspective that might be  
 22 brought, if we were to look not at hydrology but rather  
 23 at engineering principles for developing the pondage  
 24 level?  
 25 DR MILES: Yes. No, I see that. I mean, rather than sort

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12:22 1 this point, and I appreciate the Court's helpful  
 2 questions in this respect because they really do help  
 3 sharpen the argument on the battlefield. It has taken  
 4 us this long because we've had to undertake  
 5 a Treaty-interpretive exercise and then render it in  
 6 real-world terms.  
 7 But as a matter of mathematics, the equations  
 8 necessary to reach this curve are pretty  
 9 straightforward. Obviously Professor Buytaert has been  
 10 paying close attention to Appendix E2 of the Memorial  
 11 and, as he is aware -- and I'm sure you all are -- that  
 12 sets out the equations over three or four pages, with  
 13 a few explanatory notes. But if we wanted to, the same  
 14 thing could be condensed to a single sheet of paper. So  
 15 it really is, from an engineering perspective, dead  
 16 simple.  
 17 Now, returning to the main flow of my submissions,  
 18 although this methodology may seem like it is generating  
 19 a small quantity of pondage, it actually doesn't when we  
 20 remember that pondage, under paragraph 8(c), is not  
 21 intended to allow an Annexure D.3 HEP to generate power  
 22 at its installed capacity, but only at the firm power  
 23 rate.  
 24 Now, obviously paragraph 8(c) doesn't restrict India  
 25 in its installed capacity, nor does any other provision

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12:20 1 of jump down your throat and give an initial reaction,  
 2 I think that is one that I'll have to go away and  
 3 reflect on.  
 4 MR MINEAR: Of course.  
 5 DR MILES: But absolutely I'll do just that. Thank you.  
 6 So the result always equals 12 hours of storage at  
 7 50% of the MMD, at least on Pakistan's formulation. I'm  
 8 not entirely sure about the two alternatives that have  
 9 now been presented. And as I've said previously, that  
 10 inflection point coincides with the maximum usable  
 11 pondage for daily regulation, and that's the greatest  
 12 amount of pondage that could conceivably be required to  
 13 enable passage-able inflow through the turbines at the  
 14 MMD rate in a 24-hour period, irrespective of how far  
 15 below the MMD the flow in that period falls.  
 16 And therefore, Pakistan says, that's the pondage  
 17 required for firm power: you're going to get the most  
 18 amount of firm power out of any sub-MMD flow rate, no  
 19 matter what the conditions are. This amount of pondage  
 20 will ensure that you will be able to generate meaningful  
 21 firm power no matter what happens, even accepting -- as  
 22 Professor Buytaert did -- that from a statistical and  
 23 hydrological point of view, some of these numbers may be  
 24 less than likely.  
 25 Pausing there. It has taken us a bit of time get to

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12:23 1 of the Treaty. India can install whatever capacity into  
 2 an Annexure D.3 HEP it likes. Firm power, and more  
 3 particularly the hydrology of the river, is merely the  
 4 premise behind the paragraph 8(c) design criterion.  
 5 (Slide 46) So back on the slide, we have for you the  
 6 USACE breakdown of plant loadings. We've got baseload  
 7 power, 24 hours a day; intermediate power, 8 to 14 hours  
 8 a day; and peak load, which is less than 8 hours a day.  
 9 So taking the numbers that we saw earlier for the  
 10 Kiru HEP, if we've got a flow rate at 58.3% of the MMD  
 11 or better -- I think that's, broadly speaking, around  
 12 the numbers that Professor Buytaert was discussing --  
 13 the Kiru HEP is going to be able to produce firm power  
 14 at better than intermediate power. So it's going to get  
 15 close to baseload in some cases; assuming, by the way,  
 16 that the baseload is firm power. And for any flow rate  
 17 between 33.3% of the MMD and 58.3% of the MMD, the  
 18 Kiru HEP is going to be able to produce intermediate  
 19 firm power.  
 20 And at a flow rate of 33% of the MMD -- which really  
 21 is very low when considering the wider hydrology of the  
 22 Western Rivers, so low as to be a truly outlier  
 23 figure -- even below that, paragraph 8(c), on Pakistan's  
 24 interpretation, is still going to give the Kiru HEP the  
 25 capacity to peak for a meaningful duration at the firm

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12:24 1 power rate.  
 2 Now, we don't have the daily data for Kiru on hand.  
 3 I think Pakistan does have it, but it's not in the  
 4 record. But we do have it for the site of the  
 5 Ratle HEP, which is further downstream on the Chenab.  
 6 And this data was provided to us under paragraph 9 of  
 7 Annexure D when India first notified Pakistan that it  
 8 intended to develop the RHEP.  
 9 Now, looking at the entire historical record for  
 10 that site, we can see that in the entire 25 years of  
 11 that record, the lowest recorded available flow for any  
 12 24-hour period was 24.72 cubic metres a second.  
 13 When comparing that to the site's MMD of  
 14 106.51 cubic metres a second, that's an astonishingly  
 15 low 23% of the MMD. When we first looked at it, we  
 16 considered there was a strong possibility that this  
 17 number was actually the result of an Indian data error.  
 18 But nevertheless, applying the formula of  
 19 paragraph 8(c) to this flow rate, it still allows the  
 20 HEP built at that site to produce firm power for 5 hours  
 21 in any 24-hour period, having stored for 19 hours: more  
 22 than enough to meet at least one daily peak.  
 23 From this, we can see that paragraph 8(c) will  
 24 continue to give the HEP a meaningful amount of firm  
 25 power per 24-hour period in even the most adverse

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12:27 1 operate that operating pool in any way it sees fit;  
 2 subject, of course, to the requirements of paragraph 15,  
 3 the operational criterion.  
 4 So at 50% of the MMD, which is the figure that we've  
 5 selected, if India wants to store more than 12 hours of  
 6 inflow so as to produce power for a shorter period of  
 7 time at greater than firm power, or even at the HEP's  
 8 installed capacity, the doubling function will allow it  
 9 to do so. If India wants to keep back some water over  
 10 the weekend to release for the Monday peak, consistent  
 11 with paragraph 15, the doubling function allows it to  
 12 do so.  
 13 How India produces power using its pondage is no  
 14 business of Pakistan's. Indeed, India may use pondage  
 15 on days when inflow greater than MMD occurs, to store  
 16 water to operate the HEP at full capacity during peaking  
 17 hours. In that respect, the Treaty sets only the design  
 18 capacity of the operating pool, not its operational use,  
 19 provided that India complies with paragraph 15.  
 20 And indeed, we can see in this respect how  
 21 paragraph 8(c) must exist as an essential balance to  
 22 paragraph 15.  
 23 MR MINEAR: Dr Miles, sorry, once again, for interrupting  
 24 your presentation.  
 25 I seem to recall that in the Kiru plant, India's

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12:26 1 hydrological conditions. So this is by no means  
 2 unreasonable, in terms of firm power production. And  
 3 that reasonableness is confirmed when we complete the  
 4 task that 8(c) has set for us.  
 5 (Slide 47) If we recall, the provision doesn't  
 6 provide that the maximum pondage in the operating pool  
 7 shall be the pondage required for firm power: it's going  
 8 to be "twice the pondage required for Firm Power". So  
 9 we're going to take our figure and we're going to double  
 10 it. And this means that the maximum pondage for the  
 11 624 MW Kiru HEP is 2.82 million cubic metres.  
 12 Now, again, this is by no means ungenerous. By way  
 13 of rough approximation, when we consider the NJHEP, one  
 14 of the most significant HEPs in Pakistan's grid, with  
 15 a much larger installed capacity of 969 MW, it is  
 16 fulfilling the function that the power system operator  
 17 requires of it with an operating pool of only  
 18 3.8 million cubic metres.  
 19 So what this doubling function of paragraph 8 does  
 20 is to provide our Indian HEP with significant headroom  
 21 as an operational matter.  
 22 So recall in this respect that paragraph 8(c) is  
 23 only a design criterion; it doesn't govern the operation  
 24 of the HEP. But once the volume of the operating pool  
 25 is fixed in accordance with its requirements, India may

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12:29 1 calculation of the storage was around 10?  
 2 DR MILES: I think so, 10.  
 3 MR MINEAR: Yes. So that's about four times what --  
 4 a little over three times what your level is; is that  
 5 correct?  
 6 DR MILES: Correct, yes.  
 7 MR MINEAR: Okay. I just wanted to confirm that.  
 8 THE CHAIRMAN: Professor Buytaert.  
 9 PROFESSOR BUYTAERT: Picking up on paragraph 15, and coming  
 10 back to my question about how realistic, or how  
 11 frequently these conditions occur.  
 12 If you look at the amount of pondage that results  
 13 from the calculation of Pakistan and compare that to the  
 14 typical flow, or even low flows, including the minimum  
 15 mean discharge, I wonder how often actually paragraph 15  
 16 would be relevant. Because it states a range from,  
 17 I think, 30% to 130%.  
 18 Do you have any appreciation of how often the  
 19 situation would occur, given that amount of pondage,  
 20 that actually India would be in a position to release  
 21 less than 30%? Because essentially that means that  
 22 it can maintain 70%. I think that the total pondage  
 23 that results from Pakistan's calculation is about 50% of  
 24 the mean minimum discharge. So that means that even in  
 25 conditions of the mean minimum discharge, there would

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12:30 1 not be a way that India can store sufficient water to  
 2 release less than 30% in a day.  
 3 So I wonder if you already need to go -- the flow  
 4 need to drop considerably below the minimum mean  
 5 discharge to have a pondage that's sufficient to invoke  
 6 the limitations of paragraph 15. And not having access  
 7 to the original data, I wouldn't be surprised if it  
 8 actually hardly ever will occur. That makes me wonder  
 9 to which extent the calculations proposed by Pakistan  
 10 might even make paragraph 15 largely redundant.  
 11 DR MILES: I will say that paragraph 15 is an operational  
 12 requirement; it's not a design criterion. But I'll  
 13 discuss with colleagues and I'll revert to you, because  
 14 that's quite a complicated question.  
 15 PROFESSOR BUYTAERT: Thank you.  
 16 DR MILES: Just to go back.  
 17 So paragraph 15, as you've mentioned, represents the  
 18 essential day-to-day limitation on India's HEP  
 19 operations on the Western Rivers, reflecting both the  
 20 let-flow requirement of Article III(2) and the suspicion  
 21 of storage in Article III(4). And it applies all year  
 22 round, in dry season and in wet, irrespective of  
 23 hydrological conditions.  
 24 When we consider it carefully, we see that  
 25 paragraph 15 sets down an ordinance for the operation of

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12:33 1 falls. And as shown previously, this will inevitably be  
 2 the volume equivalent to 12 hours of storage at 50% of  
 3 the MMD flow rate. Any additional storage cannot  
 4 increase the amount of time the HEP spends producing  
 5 firm power in the course of a 24-hour period, and is  
 6 therefore redundant.  
 7 And third, once you've done that, you're going to  
 8 double the figure so obtained to determine the maximum  
 9 pondage, and thus the volume of the operating pool.  
 10 (Slide 49) I'll draw a line now under this part of  
 11 my remarks by summarising the benefits of what, in  
 12 Pakistan's submission, is the proper reading of  
 13 paragraph 8(c). And there's three of them.  
 14 First and foremost, Pakistan's approach complies  
 15 with the scheme, letter and spirit of the Treaty. It's  
 16 rooted in the critical provisions of paragraph 8(c) and  
 17 2(i) of Annexure D. It understands that paragraph 8(c),  
 18 situated as it is within Annexure D, is an exception to  
 19 the controlling principles of let flow and no storage  
 20 contained in Articles III(2) and (4). And it provides  
 21 an essential check on India's hydropower operations on  
 22 the Western Rivers, ensuring that if India does step  
 23 outside the boundaries of paragraph 15 of Annexure D on  
 24 the Western Rivers, the damage to Pakistan caused  
 25 thereby is limited by the relatively compact operating

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12:32 1 the operating pool of an Annexure D.3 HEP only. The  
 2 HEP's dead storage cannot be used at all -- and I think  
 3 this is the point that Professor Buytaert was getting on  
 4 to. The HEP's dead storage cannot be used at all,  
 5 whilst the only other form of live storage is surcharge  
 6 storage, which is considered temporary and  
 7 uncontrollable floodwater storage, which will drain away  
 8 downstream as the flood recedes.  
 9 Paragraph 8(c) therefore ensures that if India does  
 10 violate the provisions of paragraph 15, storing or  
 11 discharging more water than the applicable schedule  
 12 dictates, then any damage caused thereby is limited by  
 13 ensuring that the operating pool is kept relatively  
 14 small.  
 15 (Slide 48) So, pulling the threads together, on  
 16 Pakistan's formulation, we see that paragraph 8(c)  
 17 essentially requires a three-step process.  
 18 First, calculate the MMD for the HEP site using  
 19 paragraph 2(i) of Annexure D and the historical daily  
 20 data that India is required to provide under Appendix II  
 21 to Annexure D.  
 22 Second, determine the pondage "required for Firm  
 23 Power", being the pondage required to allow 24 hours of  
 24 sub-MMD flow to be passed through the turbines at the  
 25 MMD rate, irrespective of how far below the MMD the flow

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12:34 1 pools of its HEPs.  
 2 Second, it achieves this Treaty compliance while  
 3 still providing India with a meaningful amount of firm  
 4 power for each 24-hour period, which amount is then  
 5 doubled to allow India to give its HEPs additional  
 6 operational flexibility, within the framework of  
 7 paragraph 15.  
 8 And third, it complies with each of the sufficiency  
 9 criteria that I took you to earlier.  
 10 Just to make that point good, those are also on the  
 11 slide. We can now see there that Pakistan's approach to  
 12 paragraph 8(c) results in a clear and unique volume of  
 13 maximum pondage for each Annexure D.3 HEP, derived  
 14 solely from the MMD of the HEP in question.  
 15 It can be easily deployed using tools that would  
 16 have been available to the drafters of the Treaty in  
 17 1960, so manual or graphical means with minimal use of  
 18 calculation, avoiding disagreements as to the correct  
 19 methodology.  
 20 It results in a figure that does not require  
 21 constant correction and cannot be rendered unfit for  
 22 purpose by future developments.  
 23 And it generates a result that, because of the  
 24 averaging process of MMD calculation, is not overly  
 25 sensitive to individual values in the input data.

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12:36 1 Because those values are averaged over many years,  
 2 errors or outliers in any one year will not affect the  
 3 result significantly, forestalling further disagreement.  
 4 It doesn't require -- yes, Professor Buytaert.  
 5 PROFESSOR BUYTAERT: Sorry. I just want to pick up on the  
 6 point 3 you mention here, where you say it "Does not  
 7 require constant correction".  
 8 Could you perhaps elaborate on what reasons you  
 9 could see for the need for correction?  
 10 DR MILES: I'll give you the answer now, and you'll see it  
 11 more when it comes on to India's case.  
 12 If, for example, you were to premise pondage  
 13 calculation on the basis of a load curve at a particular  
 14 point in time, and the load curve then changes, suddenly  
 15 this thing is not going to be fit for purpose and it's  
 16 going to require some correction. So that's more what  
 17 I had in mind. So that's obviously not a problem on  
 18 Pakistan's methodology, because we're based on  
 19 hydrology, but it is a problem for India's. And I'll  
 20 come on to that in due course.  
 21 PROFESSOR BUYTAERT: But then an engineer might argue that  
 22 accounting for future changes in the load curve is  
 23 standard practice; indeed, it's something you would do  
 24 when you would design a hydroelectric plant outside of  
 25 the Treaty. So it kind of assumes that an engineer

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12:37 1 would not be able to deal or make a forecast of future  
 2 changes in the load curve.  
 3 DR MILES: It depends on which load curve, and I'll come on  
 4 to that in due course. There's a difference --  
 5 I'll give you the answer now. There's a difference  
 6 between a load curve provided for a particular month in  
 7 a particular year and a 25-year forecast, for example,  
 8 of what the power system is likely to do over time.  
 9 PROFESSOR BUYTAERT: But again, one would argue that given  
 10 the lifespan of a hydropower plant and the fact that  
 11 they are incorporated in an electric grid, that's  
 12 exactly part of the design of a hydroelectric plant:  
 13 making a forecast of changes in demand, and designing  
 14 a plant such that it remains relevant and optimal during  
 15 its entire lifetime.  
 16 DR MILES: I understand that. But again, the question is:  
 17 which load curve? If you were fixing a load curve on  
 18 the basis of a particular month in a particular year,  
 19 that's going to require correction. If what you're  
 20 doing is you're forecasting on the basis of a wider,  
 21 more foreseeing sort of "25 years in advance, what's the  
 22 position going to be?" kind of situation, that would be  
 23 different.  
 24 PROFESSOR BUYTAERT: Well, eventually I would think that  
 25 the latter is what one would do if one is to design

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12:38 1 a hydroelectric plant.  
 2 DR MILES: Yes, but it's not what India does, is the point.  
 3 PROFESSOR BUYTAERT: Okay. That's, I guess, a different  
 4 thing. I just wanted you to clarify this point.  
 5 DR MILES: Sorry, I'm not meaning to say that -- obviously  
 6 if there was a methodology for the calculation of  
 7 pondage that did what would ordinarily happen, which is,  
 8 "Okay, where are we going to be in 25 years' time, over  
 9 the lifetime of the plant?", that's not something that  
 10 would require constant correction, right? But  
 11 ultimately also this is only one of six efficiency  
 12 criteria, so you've also got the other five to deal  
 13 with. But I take your point entirely.  
 14 PROFESSOR BUYTAERT: Absolutely. I wanted to make sure  
 15 I was clear on this one. Thank you.  
 16 DR MILES: You were exceptionally clear.  
 17 SIR DANIEL: Mr Chairman, perhaps I might just intercede for  
 18 a moment. It's obviously not on the issues of substance  
 19 that Dr Miles is dealing with. I'm just a little bit  
 20 concerned that we're going to become exceptionally  
 21 stressed for time.  
 22 We very much welcome the questions from the Court,  
 23 both because it's testing our hypothesis and because it  
 24 will give us the gruel that we need to address in the  
 25 second round. If Dr Miles does not finish by 1 o'clock,

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12:39 1 we are going to have problems. So I wonder whether --  
 2 and maybe this is a direction to Dr Miles -- he should  
 3 take the questions that we welcome, but then defer them  
 4 to a second round, because otherwise we will not get  
 5 through our agenda.  
 6 THE CHAIRMAN: Thank you, Sir Daniel.  
 7 I do think the questions are important. I suppose  
 8 I would also note that the members of the Court have  
 9 read the Memorial very carefully and all of us are  
 10 familiar with the various figures within it, such that  
 11 to the extent Dr Miles is able to go more quickly  
 12 through some of his discussion, I think he should feel  
 13 free to do that. I do realise you're now moving on to  
 14 aspects that weren't necessarily in the Memorial, so  
 15 therefore it may not be possible to move more quickly.  
 16 But I think we need to continue as we are, bearing  
 17 in mind the concern we may have with time. But I do  
 18 want the members to feel free to engage in their  
 19 questions, because I do think we have several.  
 20 So, Dr Miles, why don't you proceed.  
 21 DR MILES: (Slide 50) I'm now moving on to India's approach  
 22 to this. So that closes, for now, the book on  
 23 Pakistan's approach, and now we're going to have a look  
 24 at what India is actually doing.  
 25 So India has maintained a consistent approach to

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12:41 1 the question of the calculation of pondage under  
 2 Annexure D -- one hesitates to say "under  
 3 paragraph 8(c)" -- and has argued that the approach  
 4 taken by the Neutral Expert in Baglihar was correct.  
 5 (Slide 51) So we've got an example from the  
 6 correspondence between the Commissioners, which might be  
 7 thought to be the high-water mark of India's attitude,  
 8 and the correspondence is from 21 August 2015 (P-16).  
 9 You can see there the principle of the calculation of  
 10 pondage was raised and addressed by the Neutral Expert  
 11 in Baglihar.  
 12 So India's approach is that Baglihar is correct  
 13 and -- as may be seen perhaps from the statement that  
 14 we see in the letter here -- binding on the parties more  
 15 generally. And you've already been addressed by  
 16 Mr Fietta on why that proposition is wrong.  
 17 But nevertheless, India's position is that the  
 18 Baglihar position, even if not binding, on the  
 19 calculation of pondage under Annexure D is correct, and:  
 20 "... serv[es] as a template to achieve quicker and  
 21 amicable resolution in the Commission itself in  
 22 an expeditious manner."  
 23 Now, in Pakistan's submission, India's reliance on  
 24 the Baglihar approach as being in any way authoritative  
 25 is misguided. If I can be blunt, the Neutral Expert in

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12:42 1 that proceeding was completely wrong as to his  
 2 determination of pondage for that HEP. And in making  
 3 the finding that he did, he has blown the parties'  
 4 interactions on this issue off course for nearly  
 5 20 years.  
 6 The Court in this respect will have in mind the  
 7 words of Professor Briscoe of Harvard, an avowedly  
 8 disinterested observer, who in 2010 observed that the  
 9 Neutral Expert's determination "gutted the [Treaty] of  
 10 its essential balance". That's at P-0326.  
 11 While it is too late for Professor Lafitte's mistake  
 12 to be reversed, Pakistan asks this Court to -- as its  
 13 predecessor did -- find that his conclusions on the  
 14 calculation of pondage are wrong, and to make a further  
 15 finding as to the correct approach to this that will be  
 16 binding in the future.  
 17 With that introduction, I turn now to demonstrate  
 18 why, given the clear provisions of the Treaty, the  
 19 Baglihar approach to the determination of maximum  
 20 pondage cannot be correct, and indeed produces dangerous  
 21 results that, if widely accepted, would endanger the  
 22 fabric of the Treaty.  
 23 (Slide 52) In Baglihar, we see on the slide, it's  
 24 discussed in two places: 5.9 and 6.5. And in 5.9, he  
 25 sets out some general considerations as to the

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12:43 1 foundation of his approach to pondage. And in 6.5, he  
 2 takes those general considerations and applies them to  
 3 the specific case of the Baglihar HEP.  
 4 (Slide 53) So let's start with what Professor  
 5 Lafitte did, which is a discussion of the reason for  
 6 pondage as a general matter. Broadly speaking,  
 7 I suppose that this could be considered correct. And  
 8 while this discussion is very interesting as a legal  
 9 matter, it's relevant only as a point of distinction  
 10 with the approach under the Treaty that it has put in  
 11 place. So the Treaty has a special understanding of the  
 12 way in which pondage is calculated.  
 13 (Slide 54) On the slide, we see the commencement of  
 14 Professor Lafitte's examination of the Treaty provisions  
 15 themselves. And he starts with the provisions of  
 16 Annexure D, specifically the definition of "Pondage" in  
 17 paragraph 2(c) and the design criteria that govern its  
 18 calculations in paragraph 8(c).  
 19 Now, an initial point of difficulty here: this is  
 20 not, in Pakistan's submission, the correct starting  
 21 point. The correct starting point is Article III, which  
 22 establishes Pakistan's exclusive right to the waters of  
 23 the Western Rivers, and casts everything in Annexure D  
 24 as a closely limited exception. And this is not an idle  
 25 point because without the context, the provisions of

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1 Annexure D -- and perhaps especially these ones --  
 2 cannot be properly understood.  
 3 In the following paragraphs, we see where the  
 4 trouble begins (PLA-2, paragraph 5.9.2):  
 5 "With these two provisions the Treaty specifies that  
 6 the pondage volume should be calculated to satisfy daily  
 7 or weekly load variations of the plant and consequently  
 8 the variations in the turbine discharge necessary to  
 9 produce this variable demand of power."  
 10 With the greatest of respect, it does not. The  
 11 Treaty specifies (Annexure D, paragraph 8(c)) that:  
 12 "The maximum Pondage in the Operating Pool shall not  
 13 exceed twice the Pondage required for Firm Power."  
 14 Firm power, as we know, is the power produced by the  
 15 HEP when the river flows at the MMD level. It's not the  
 16 power produced to meet daily and weekly load variations,  
 17 which could be up to and including the HEP's installed  
 18 capacity.  
 19 So what Professor Lafitte seems to have done is to  
 20 elevate paragraph 2(c) to the criterion of design, and  
 21 read paragraph 8(c) effectively out of Annexure D. And  
 22 the same goes for paragraph 2(i), which provides the  
 23 definition of "Firm Power" and pegs it to the MMD.  
 24 He seems also to have misread paragraph 2(c). As  
 25 we know, that provides that the pondage shall be:

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12:46 1 "... of only sufficient magnitude to meet  
 2 [variations] in [turbine] discharge ..."  
 3 Properly interpreted, it is not an enabling  
 4 provision: it is another limitation. And the role of  
 5 that limitation is plain when it's tied together with  
 6 paragraphs 8(c) and 2(i).  
 7 The basic rule, per paragraphs 8(c) and 2(i), is  
 8 that maximum pondage is twice that required for firm  
 9 power. This sets a basic and objective parameter for  
 10 the size of the operating pool. But within that  
 11 parameter, 2(c) seems to be providing an additional  
 12 limitation, which is that India is entitled to pondage  
 13 of only sufficient magnitude to meet variations in  
 14 turbine discharge. If this quantity is less than that  
 15 required for firm power, India must reduce its pondage  
 16 again to meet that further limitation.  
 17 Again, this is wholly unsurprising when the wider  
 18 Treaty is considered. Pakistan is entitled to exclusive  
 19 use of the waters of the Western Rivers.  
 20 So one can see why this would be a relatively useful  
 21 limitation in the case where we have a HEP with  
 22 a relatively small installed capacity, in an area with  
 23 a relatively high MMD. So the pondage required for firm  
 24 power in such a case could be relatively large: more  
 25 than would ordinarily be needed given the HEP's

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12:47 1 installed capacity and the load placed upon it by India.  
 2 And so it would make sense, in light of the overall  
 3 mission of Article III, to limit India further by  
 4 reference to what was only sufficient to meet turbine  
 5 variations.  
 6 (Slide 55) Insofar as showing why India's approach  
 7 is wrong, I could stop there. This initial error by  
 8 Professor Lafitte renders the rest of the analysis  
 9 incorrect. I'm afraid, though, further errors were  
 10 made, and we can see these on the slide.  
 11 Starting off (PLA-2, paragraph 5.9.2):  
 12 "An important matter to be stressed is that the  
 13 Treaty does not say that 'Pondage' means Live Storage of  
 14 only sufficient magnitude to meet the fluctuations of  
 15 the daily and weekly inflow of Chenab river."  
 16 Again, with the greatest respect, yes, it does.  
 17 Paragraphs 8(c) and 2(i) provide that the pondage  
 18 required for firm power is the live storage required to  
 19 supplement the river to the MMD level. Pondage is  
 20 required, therefore, to even out a variable -- that is  
 21 to say fluctuating -- sub-MMD inflow.  
 22 Professor Lafitte continues:  
 23 "This is confirmed by the Treaty which fixes the  
 24 limitation of India's use of water from the Western  
 25 Rivers. According to Annexure D ... Paragraph 15 ..."

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12:48 1 And then we see the provisions of paragraph 15.  
 2 He says:  
 3 "This means that the plant could turbine, during one  
 4 day, a discharge which is different from the river  
 5 inflow, but not lower than 50% and not higher than 130%;  
 6 consequently the power of the plant could vary."  
 7 Now, this is true and accurate. But what  
 8 Professor Lafitte does not do is explain why that's  
 9 relevant to the calculation of pondage. Paragraph 15 is  
 10 an operational criterion, not a design criterion, and  
 11 appears nowhere in paragraph (c).  
 12 But we can see why Professor Lafitte felt the need  
 13 to reach for this. If he is right that pondage is to be  
 14 calculated to meet fluctuations in turbine discharge,  
 15 then the operational criterion of paragraph 15 is the  
 16 only conceivable limitation on pondage because India is  
 17 the one that's setting the turbine discharge. So as  
 18 a consequence, paragraph 15 must be shoehorned into the  
 19 design phase to prevent India from having the ability to  
 20 set unilaterally the live storage of its HEPs, contrary  
 21 to Pakistan's interests.  
 22 Again, this makes no sense as a matter of Treaty  
 23 interpretation, and could be avoided if paragraph 8(c)  
 24 is properly interpreted.  
 25 And moreover, it misunderstands the relationship

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12:49 1 between paragraph 15 and paragraph 8(c). Paragraph 15  
 2 is not a limitation on 8(c). Rather, paragraph 8(c) is  
 3 a design guarantee that provides that if India violates  
 4 the operational limitations of paragraph 15, the  
 5 operating pools of the HEPs in respect of which  
 6 paragraph 15 is violated are kept small from the outset,  
 7 so as to limit the volume of water stored and, thereby,  
 8 the damage caused.  
 9 (Slide 56) Professor Lafitte did refer eventually to  
 10 the definition of "Firm Power", but he didn't do so in  
 11 the section titled "Determination of pondage". And  
 12 again, we have the relevant passage on the slide (PLA-2,  
 13 paragraph 5.9.3).  
 14 The starting point here is again problematic, with  
 15 Professor Lafitte referring not to the definition of  
 16 "Firm Power" in paragraph 2(i), which establishes  
 17 a special meaning for the term in accordance with  
 18 Article 31(4); rather, he refers to a completely  
 19 irrelevant definition from the American Society of Civil  
 20 Engineers.  
 21 He then highlights, after that, that firm power can  
 22 be base or peak power under this definition. Again,  
 23 that's irrelevant: it's a rate of power production.  
 24 And then he turns to the definition of "Firm Power"  
 25 in the Treaty itself, and goes on to calculate correctly

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12:50 1 for Baglihar at 131 MW, based on an MMD of  
 2 125.68 [cubic] metres a second. But what he doesn't do,  
 3 though, is explain how this figure factors into his  
 4 theory of pondage calculation, you know: 131 MW,  
 5 125 cubic metres a second.  
 6 (Slide 57) But on the following page, the answer  
 7 becomes clear when he describes India's submissions:  
 8 "For its part, India, in its Counter-Memorial  
 9 determined the Pondage based on a constant daily inflow  
 10 of 125.68 m3/s ..."  
 11 That is, the MMD:  
 12 "... and with variations in turbine discharge  
 13 corresponding to electricity consumption and especially  
 14 to the peak load hours. Respecting the mean value  
 15 inflow during the week of 125 m3/s, the plant would only  
 16 operate for 49.11 hours per week at its design discharge  
 17 ... and its installed capacity ..."  
 18 To put it another way, India's theory of pondage is  
 19 as follows: they want to assume that the inflow of the  
 20 plant throughout the week is constantly at the MMD.  
 21 That's an unreasonable assumption that's not reflected  
 22 in the real world. It wants to assume that India is  
 23 entitled to use that inflow to peak the Baglihar HEP not  
 24 at the full firm power level; so it's not producing firm  
 25 power, but it wants to produce to its installed

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12:53 1 approach as his own, which we see in his final  
 2 conclusion in this section (PLA-2, section 5.9.5).  
 3 What this does effectively is that Professor Lafitte  
 4 ends up with a calculation methodology that is  
 5 completely untethered from the Treaty, in Pakistan's  
 6 submissions; and in particular, the requirement in  
 7 paragraph 8(c) that pondage be fixed in accordance with  
 8 what is required for firm power.  
 9 What he has ended up with is the pondage required  
 10 for peaking the Baglihar HEP above firm power,  
 11 potentially all the way to that HEP's installed  
 12 capacity. Put another way, he has calculated on the  
 13 basis of pondage for secondary power, which, per  
 14 paragraph 2(j), is the "power, other than Firm Power,  
 15 available ... during certain periods of the year".  
 16 (Slide 59) And more significantly again, by  
 17 permitting India to generate for a specified number of  
 18 hours over a week, he has conflated power with energy.  
 19 And you'll recall India's case, which is there on the  
 20 slide.  
 21 (Slide 60) We can see what happened when  
 22 Professor Lafitte came to determine the maximum pondage  
 23 for the Baglihar HEP. Again, the paragraphs of this  
 24 part of the Baglihar determination are quite dense, and  
 25 we have the summary points for you on the slide.

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1 capacity. Thus, he is assuming a pondage pool based on  
 2 installed capacity, and not the Treaty-defined  
 3 "Firm Power".  
 4 At this point, a load curve corresponding to  
 5 electricity consumption within India, together with the  
 6 restrictions of paragraph 15, are used to determine how  
 7 much pondage is required using a series of mass curves.  
 8 It's a rather computationally dense process, certainly  
 9 more dense than the one that Pakistan has set out. And  
 10 then, although he doesn't say it here, the resulting  
 11 pondage volume is then doubled per paragraph 8(c).  
 12 As to this, the Neutral Expert observes:  
 13 "As regards India's [calculation], the time of peak  
 14 load hours on Tuesday, Wednesday and Thursday does not  
 15 exactly correspond to the power demand of the Northern  
 16 Region in winter ... It appears that this pattern of  
 17 peak load hours is favourable to the increase of the  
 18 operating pool, which reaches 18.75 Mm3, and finally to  
 19 the pondage which is double: 37.5 Mm3."  
 20 So what Professor Lafitte has determined here is  
 21 that India has tried to maximise its pondage by failing  
 22 to set the storage and discharge schedule of the  
 23 Baglihar HEP in accordance with the load curve on which  
 24 it's purporting to rely.  
 25 (Slide 58) But he eventually adopts India's general

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12:54 1 So you assume all inflow into the HEP reservoir for  
 2 the entire week is at the MMD. You assume that the HEP  
 3 will operate continually through the week, with  
 4 a discharge through the turbines above or below the MMD.  
 5 You set a schedule in accordance with paragraph 15 of  
 6 Annexure D, assuming there will always be increased  
 7 storage during the week and increased discharge during  
 8 the week. You use a series of mass curves to determine  
 9 the total live storage required for such an operation to  
 10 take place week by week. And then you double the live  
 11 storage, so calculated, pursuant to paragraph 8(c).  
 12 Nowhere in this analysis does Professor Lafitte tell  
 13 us how this pondage is "required for Firm Power".  
 14 Indeed, by his assumption that the discharge through the  
 15 turbines will either be above or below the MMD, he seems  
 16 to be suggesting that, on his model, the plant will  
 17 never be operating at firm power.  
 18 (Slide 61) But Professor Lafitte hadn't finished his  
 19 analysis there. He then had to tweak it slightly in  
 20 order to give India additional storage. The steps are  
 21 set out on this slide here.  
 22 He notes that one of the objectives of pondage is to  
 23 enable operation during peak hours. Interesting, but  
 24 not relevant under 8(c).  
 25 Second, he makes the following statement, which, in

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12:56 1 Pakistan's submission, betrays [a lack of] understanding  
 2 of the scheme of the Treaty and the relationship between  
 3 Article III and Annexure D:  
 4 "Moreover, the NE cannot ignore the fact that one of  
 5 the object(s) and purpose(s) of the Preamble is for the  
 6 two parties to attain '(...) the most complete and  
 7 satisfactory utilisation of the waters of the Indus  
 8 system of rivers (...)'. In this context, the pondage  
 9 should be as large as possible, with the conditions,  
 10 naturally, that the provisions of the Treaty are  
 11 respected. In particular, the rule mentioned in  
 12 [paragraph 15 of Annexure D] is fundamental."  
 13 Now, pausing there. In Pakistan's submission,  
 14 that's a remarkable statement. Boiled down to its  
 15 essentials, Professor Lafitte seems to be saying that  
 16 India is entitled to the greatest amount of live storage  
 17 it can manage within the confines of the Treaty's  
 18 operational limitations. Put another way, despite the  
 19 plain words of Article III, he is duty-bound to give  
 20 India the greatest amount of pondage the words of the  
 21 Treaty can bear.  
 22 Now, the Court is aware of what the Treaty says, and  
 23 therefore why this is wrong. Article III gives  
 24 Pakistan, as a headline and inalienable right, the  
 25 exclusive use of the waters of the Western Rivers. It

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12:58 1 calculation, purportedly in order to meet the  
 2 requirements of paragraph 15. This is, once more,  
 3 computationally dense, and results in a series of mass  
 4 curves that appear at Annex 6.5.7.  
 5 This then results in a pondage of 16.28 million  
 6 cubic metres, which is then doubled to produce  
 7 an operating pool of 32.56 million cubic metres.  
 8 Now, that is, under Pakistan's understanding of the  
 9 Treaty, a colossal amount of pondage, equivalent to  
 10 72 hours of firm power or 21 hours' continuous  
 11 production at the plant's installed capacity; values  
 12 which lie far outside of industry norms for storage  
 13 volumes for power peaking. It is also far closer to  
 14 India's requested pondage in that case of 37.5 million  
 15 cubic metres than Pakistan's requested pondage of  
 16 6.22 million cubic metres.  
 17 Again, it bears repeating that in the design that  
 18 Professor Lafitte considered, the Baglihar HEP had  
 19 an installed capacity of 450 MW, and the 969 MW  
 20 Neelum-Jhelum plant makes do with an operating pool of  
 21 3.8 million. Put another way, in terms of volume, you  
 22 could fit 8.5 NJHEP operating pools into the Baglihar  
 23 HEP operating pool. And the NJHEP has more than double  
 24 the installed capacity of the Baglihar HEP. So  
 25 something is just not adding up.

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12:57 1 does not give Pakistan the exclusive use of those waters  
 2 only once India has extracted every drop of power it  
 3 possibly can from them. To claim otherwise, as  
 4 Professor Lafitte seems to do, is to fundamentally  
 5 misunderstand and, by extension, misapply the Treaty.  
 6 Now, returning to his calculations, he then  
 7 effectively introduces the concept of peak hours for  
 8 increased generation. He accepts that this should be  
 9 based "on a forecast of power demand [for the next]  
 10 15 or 20 years in the Northern Region of India".  
 11 However, that's not what India has given him. So he  
 12 instead adopts a load curve for the same region in  
 13 December 2004. So he fixes the pondage for a plant that  
 14 could function for up to a century on the basis of  
 15 a single month in a single year.  
 16 And then he admits that:  
 17 "We are aware of ... the uncertainties of this  
 18 approach, but it is the best available to us at this  
 19 time."  
 20 In short, he confesses that the pondage that this  
 21 result produces may well not be a useful amount of  
 22 storage for very long, as the requirements of the power  
 23 system are going to be subject to change.  
 24 Then fourth, having defined the number of peak  
 25 hours, he then introduces additional peak hours into the

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13:00 1 Another alarming figure that arises out of  
 2 Professor Lafitte's calculation: given that the Baglihar  
 3 HEP site MMD is 125.68 cubic metres per second, and  
 4 further given its operating pool of 32.56 million  
 5 cubic metres a second, then if the Chenab is flowing at  
 6 the MMD level, it will take 72 hours, or 3 full days,  
 7 for India to fill the Baglihar HEP operating pool from  
 8 the dead storage level, allowing for zero downstream  
 9 releases; that is, assuming India doesn't comply with  
 10 paragraph 15.  
 11 So what this means is that through the Baglihar HEP,  
 12 India can turn off the taps on the Chenab above Baglihar  
 13 for 3 days in the dry season. This alone is bad enough.  
 14 But if similar generosity is extended to India with  
 15 respect to all its other HEPs on the Chenab, constructed  
 16 and planned, then the situation becomes orders of  
 17 magnitude more grim.  
 18 Now, that cannot be what the drafters of the Treaty  
 19 intended. And yet, as India has told Pakistan again and  
 20 again in the Commission, it is how it thinks the Treaty  
 21 works.  
 22 THE CHAIRMAN: Professor Buytaert.  
 23 PROFESSOR BUYTAERT: Dr Miles, just a quick question.  
 24 You obviously emphasised the amount of volume and  
 25 the length of time. But putting this into the

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13:01 1 perspective of, again, [Annexure] E, where India has  
 2 an allowance, if you call it like that, for storage  
 3 plants, which the calculation I think is around  
 4 2,000 million cubic metres, this amount would seem  
 5 relatively small compared to that allowance for storage  
 6 plants.  
 7 One could even take that further and do a thought  
 8 exercise: what if India would have said that Baglihar is  
 9 a storage plant, falling, therefore, under the  
 10 conditions of Annexure E? Would that have made the  
 11 design compliant with the criteria of a storage plant?  
 12 DR MILES: My initial reaction to that question would be:  
 13 Annexure E, as you know -- I mean, the amount of storage  
 14 that India gets under Annexure E is banked in, right?  
 15 It's a fixed amount and it's geographically limited.  
 16 When you're dealing with run-of-river HEPs under  
 17 Annexure D, there's no limit on the number of these  
 18 plants that India can build. It's not just about one  
 19 plant; it's about what happens when you just keep  
 20 building them and keep building them and keep building  
 21 them, and give them more and more and more storage over  
 22 the time. Eventually you end up with a situation in  
 23 which the live storage starts to get really quite  
 24 considerable indeed, and starts eating into the  
 25 exclusive right to the waters of the Western Rivers.

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13:03 1 Professor Buytaert, the load curve that they're using is  
 2 going to very quickly be rendered out of date: it's  
 3 therefore unfit for purpose. It's sensitive to errors  
 4 or omissions in the input data, because obviously that  
 5 data is entirely provided by India. It's not rooted in  
 6 data that India must provide under Appendix II of  
 7 Annexure D. I think we've discussed with Mr Shah, who  
 8 has confirmed that India does not provide a load curve.  
 9 And because India is the one who is setting the load  
 10 curve -- or, even if they weren't using a load curve,  
 11 setting the paragraph 15 storage and discharge schedule  
 12 on the basis of which this computation depends -- it's  
 13 going to allow India to unilaterally manipulate the  
 14 result.  
 15 So in our submission, this fails to meet all of the  
 16 six criteria that we have in mind.  
 17 (Slide 64) Finally, we've got part VI on answering  
 18 the Court's question on pondage. I have to take this  
 19 very quickly. It's only one slide.  
 20 (Slide 65) If you recall, we've got the question on  
 21 the slide.  
 22 (Slide 66) And then following that, we've got the  
 23 relevant and irrelevant factors for pondage calculation.  
 24 Now, the first one is obvious based on what  
 25 I've said, which is that in Pakistan's submission, the

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13:02 1 So that would be my initial approach to your  
 2 question, but I think that there's going to be a pretty  
 3 substantial presentation on Annexure E in the next  
 4 round.  
 5 PROFESSOR BUYTAERT: Okay. Perhaps we should keep it for  
 6 then. Thank you.  
 7 DR MILES: Mr Chair, if you give me five more minutes,  
 8 I'll be done.  
 9 THE CHAIRMAN: Okay, let's do that.  
 10 DR MILES: (Slide 63) Alright. So very quickly, the summary  
 11 of the approach detriments. We can see them on the  
 12 slide.  
 13 India's approach, in our submission, does not comply  
 14 with the Treaty. It neglects and distorts  
 15 paragraphs 8(c) and 2(i) of Annexure D, in preference to  
 16 paragraph 2(c) and paragraph 15.  
 17 It gives more pondage than required for firm power.  
 18 It is deliberately and expressly premised on giving  
 19 India the capacity to produce secondary power. It does  
 20 not meet the sufficiency criteria; in fact, in  
 21 Pakistan's submission, it fails all of them. It doesn't  
 22 derive its pondage from the MMD. Its computation using  
 23 1960s tools is not straightforward; or in any event, not  
 24 as straightforward as Pakistan's approach.  
 25 Based on the matter that we were discussing earlier,

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13:04 1 touchstone of paragraph 8(c) is the phrase "Pondage  
 2 required for Firm Power". As paragraph 2(i) tells us,  
 3 "Firm Power" is the power an annexure D.3 HEP can  
 4 produce instantaneously when the river in question flows  
 5 at the MMD level.  
 6 Now, I won't take you back to it, but this is again  
 7 the raison d'être of the live storage under Annexure D,  
 8 as found by the Kishenganga Court in its partial award:  
 9 "... one of the primary objectives of the Treaty is  
 10 to limit the storage of water by India on the  
 11 Western Rivers ..."  
 12 The second relevant consideration is the  
 13 relationship between firm power and the MMD.  
 14 Third criterion: the need, in order to provide firm  
 15 power, to pass all flow received in 24 hours through the  
 16 turbines at the MMD rate within the same 24 hours, and  
 17 then we double the resulting amount.  
 18 Then finally, on the right, we have the irrelevant  
 19 factors. I mean, to a certain extent, it's anything  
 20 I haven't already mentioned. But it's paragraphs 2(c)  
 21 and 15 of Annexure D; it's information not required to  
 22 be provided India under Appendix II of Annexure D; it's  
 23 any other extra-Treaty material; it's any calculation  
 24 techniques not available in 1960 or not able to be done  
 25 with a very straightforward approach in 1960; and it's

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13:06 1 any other matters.  
 2 Members of the Court, you've been very patient with  
 3 me as I have taken you through some very technical but  
 4 very important material. Rather than test your patience  
 5 further with some wrap-up comments, I will conclude  
 6 here. Unless you have any further questions, those are  
 7 my submissions for this first round.  
 8 THE CHAIRMAN: Professor Buytaert.  
 9 (1.06 pm)  
 10 Questions from THE COURT  
 11 PROFESSOR BUYTAERT: I'm really sorry to eat into your lunch  
 12 break, but I would be very keen to go back -- could we  
 13 bring up the slides again? I think if you go back to  
 14 the second-last slide, or three slides. (Pause) This  
 15 one (slide 63).  
 16 DR MILES: Yes.  
 17 PROFESSOR BUYTAERT: So a quick comment on point 3.  
 18 From an engineering perspective, I think there's  
 19 a difference between a load curve that might change over  
 20 25 years and what you said: a load curve that might very  
 21 quickly become obsolete. It's not because things change  
 22 over 25 years that they very quickly become incorrect.  
 23 That's just an engineering comment.  
 24 DR MILES: No, I think we actually agree on that point,  
 25 Professor.

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13:08 1 discharge schedule and all the rest of it, and we'll get  
 2 there, but you're not going to be told what's behind the  
 3 storage and discharge schedule.  
 4 PROFESSOR BUYTAERT: Well, I had a quick look at P-586,  
 5 which I think Sir Daniel drew our attention to yesterday  
 6 in his closing remarks, and I actually had a quick look  
 7 through it. And it seems to me that -- that's a letter  
 8 from the Pakistan Commissioner in 1992, and according to  
 9 that letter, it seems to suggest that at least in that  
 10 particular occasion of Baglihar, they provided the load  
 11 curves. I think that the Pakistan Commissioner was not  
 12 very happy about the load curves, but that's perhaps  
 13 a different thing. But at least there it would seem  
 14 that they did provide the load curves as part of the  
 15 exchange.  
 16 DR MILES: I'll check that. But certainly it's not recent  
 17 practice.  
 18 PROFESSOR BUYTAERT: Yes, it might not be. But at least  
 19 thank you for confirming that.  
 20 I guess you agree that under point 5, at least  
 21 according to the Treaty, they would have to provide  
 22 those data as part of the calculation; is that right?  
 23 DR MILES: No, I don't think I would necessarily concede  
 24 that. But, you know, it's not for me to do that. I can  
 25 simply go away and I can check the position.

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13:07 1 PROFESSOR BUYTAERT: But more important, I think, is your  
 2 point 5. So you say:  
 3 "Is not rooted in data that India must provide ..."  
 4 But then I think you softened your point. Because  
 5 indeed, if I look at this Appendix II to Annexure D,  
 6 I think it does say -- let me just pull it up, the point  
 7 on the calculations of the ... "Particulars of Design".  
 8 (Pause)  
 9 At 3(b), it says:  
 10 "Full Pondage Level, Dead Storage Level and  
 11 Operating Pool together with the calculations for the  
 12 Operating Pool."  
 13 And you mentioned -- that's why I asked earlier the  
 14 question about operating pool and pondage; you answered  
 15 that those are the same. So that clearly includes also  
 16 the calculations for pondage.  
 17 If India includes the load curves into that  
 18 calculation, clearly the load curves are part of the  
 19 calculations that, under this point, India would have to  
 20 provide to Pakistan as part of this appendix.  
 21 DR MILES: Except that they don't provide us with a load  
 22 curve. So they provide us with the -- and I'll go back  
 23 and I'll check in due course, of course. But my  
 24 understanding is that what will happen is you'll get  
 25 a series of calculations, you'll get a storage and

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13:09 1 I suppose this also depends on what is the proper  
 2 methodology. Because depending on what you feel the  
 3 proper methodology is, that's going to change what the  
 4 calculations are for the computation of the load curve.  
 5 PROFESSOR BUYTAERT: Absolutely. But under the assumption  
 6 that the load curve would be part of the calculation,  
 7 I would expect that it's provided as part of the  
 8 calculations.  
 9 Thank you.  
 10 THE CHAIRMAN: Very good. I think that exchange highlights  
 11 why we are, in part, interested in as much material  
 12 about the exchanges that have taken place over the  
 13 decades relating to the plants, to see exactly what kind  
 14 of information is flowing back and forth, which may or  
 15 may not be driven by the Treaty requirements.  
 16 So, Sir Daniel, I think we are certainly at our  
 17 lunch break. I would propose that we come back at the  
 18 normal time of 2 o'clock, since I understand you've got  
 19 plenty to keep us busy during the afternoon.  
 20 Is it your expectation that if we do that, we will,  
 21 in all likelihood, finish up on time?  
 22 SIR DANIEL: Thank you, Mr Chairman. Yes, indeed. And  
 23 I'm grateful for the allowance of eating a little bit  
 24 into the lunch break; no pun intended.  
 25 Mr Chairman, let me just clarify that when

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13:11 1 I interjected a moment ago, it was not in any shape or  
 2 form intended to dampen down on the questions, because  
 3 I must say that the Pakistan team is finding these  
 4 questions actually very important because it's, in the  
 5 absence of the Respondent, the only way that we can  
 6 focus our argument. So we welcome the questions.  
 7 We will, I think, on the current schedule, finish  
 8 comfortably within the time that we have, but we won't  
 9 have any wriggle room.  
 10 This brings me to a question. Dr Miles is going to  
 11 be back on his feet immediately after lunch to address  
 12 a number of the Court's written questions. You may wish  
 13 to take advantage of his presence there just to put to  
 14 him any questions arising from this. But I am going to,  
 15 as it were, give him a direction that he's got to keep  
 16 to the time that's been allocated to him, which is about  
 17 45 minutes or so after lunch.  
 18 But otherwise I would very much request,  
 19 Mr Chairman, through you, that the Court does provide us  
 20 with all the questions that are pressing upon you in  
 21 your written questions tomorrow, because we don't want  
 22 to leave anything unaddressed.  
 23 THE CHAIRMAN: That's fine. Clearly Dr Miles is under the  
 24 control not just of the engineers, but also of  
 25 Sir Daniel!

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13:12 1 We certainly are going to continue to ask questions  
 2 during the course of the day. Eliciting some amount of  
 3 response helps us in formulating our further questions.  
 4 But you can expect that we will provide you with written  
 5 questions by no later than noon tomorrow, as was  
 6 previously anticipated.  
 7 So let's leave it at that. Thank you, Dr Miles,  
 8 very much for your presentation this morning. It's been  
 9 a long haul for you. But you're not quite done yet for  
 10 the day, so --  
 11 DR MILES: It's okay, Mr Chair, I can do this all day!  
 12 THE CHAIRMAN: We look forward you seeing you at 2 o'clock.  
 13 (1.13 pm)  
 14 (Adjourned until 2.00 pm)  
 15 (2.00 pm)  
 16 (Evacuation due to fire alarm)  
 17 (2.17 pm)  
 18 THE CHAIRMAN: Okay. I think that fire alarm was perhaps  
 19 a combination example of an operation of Murphy's law  
 20 and hydro, in that we were sent out into the rain a bit.  
 21 We did lose a little bit of time; we'll see how we do  
 22 over the afternoon of picking that back up. We can  
 23 adjust accordingly.  
 24 So, Dr Miles, I think we're back to you.  
 25 DR MILES: Thank you very much. I hope not to take the full

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14:18 1 45 minutes -- subject, of course, to the Court's  
 2 questions -- so we may be able to make up a little bit  
 3 of extra time.  
 4 Response to the Court's pre-hearing questions 1(a) and (b)  
 5 and 2(b)  
 6 DR MILES: (Slide 1) Mr Chairman, members of the Court,  
 7 we come now to the final leg of my submissions before  
 8 you for this round. I am, as always, extremely grateful  
 9 for your patience and attention.  
 10 (Slide 3) This presentation, as foreshadowed by  
 11 Sir Daniel, addresses three questions asked by the Court  
 12 in its direction of 20 June 2024: that's questions 1(a),  
 13 1(b) and 2(b). And as is tradition, I have them for you  
 14 on the slide.  
 15 As the Court makes clear in the chapeau to  
 16 question 1, these questions have evidently been  
 17 motivated by your desire to understand how Pakistan and  
 18 India's duelling interpretations of the technical  
 19 criteria of paragraph 8 of Annexure D would operate in  
 20 practice.  
 21 Question 1 deals with Pakistan's interpretation of  
 22 these criteria. To that end, question 1(a) asks how  
 23 Pakistan's interpretation of paragraph 8, if applied to  
 24 the Baglihar HEP, would have affected that HEP's design;  
 25 and question 1(b) asks how that same interpretation of

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1 paragraph 8 would have affected the design of our old  
 2 friend the Neelum-Jhelum hydroelectric plant, assuming  
 3 in arguendo that the NJHEP were subject to paragraph 8.  
 4 Now, question 2 of course deals with India's  
 5 interpretation. And to that end, question 2(b) asks how  
 6 India's interpretation of paragraph 8 would have  
 7 affected the design of Neelum-Jhelum, assuming again  
 8 that the NJHEP is subject to the criteria set out in  
 9 that provision.  
 10 (Slide 4) Now, as between these two approaches,  
 11 there are four broad areas that need to be addressed, on  
 12 my estimation.  
 13 First, we have this morning's subject, which is the  
 14 question of maximum pondage under paragraph 8(c).  
 15 That's important, as it sets the size of the operating  
 16 pool and therefore fixes our dead storage level.  
 17 Second, there is the question of the placement of  
 18 power intakes under paragraph 8(f). On Pakistan's  
 19 interpretation, intakes located entirely below dead  
 20 storage level are also considered outlets for the  
 21 purposes of Annexure D, and so this also engages,  
 22 potentially, paragraph 8(d).  
 23 Third, there is a question of spillway design and  
 24 placement under paragraph 8(e). Again, spillways  
 25 located entirely below the dead storage level are

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14:20 1 considered outlets, so this also will engage  
 2 paragraph 8(d).  
 3 And finally, we've got the question of freeboard  
 4 under paragraph 8(a).  
 5 (Slide 5) So to this end, with your permission,  
 6 I propose to proceed expeditiously as follows.  
 7 First, I'm going to answer question 1 in two parts:  
 8 first, I'll provide a brief summary of Pakistan's  
 9 approach to paragraph 8, pulling the threads together  
 10 from the submissions this week; and second, I will apply  
 11 that approach to the Baglihar HEP and Neelum-Jhelum,  
 12 answering questions 1(a) and (b) in the process.  
 13 Second, I will also answer question 2(b), also in  
 14 two parts: first, I will provide a brief description of  
 15 India's approach to paragraph 8; and second, I will  
 16 answer question 2(a) by applying that approach to the  
 17 Neelum-Jhelum plant.  
 18 (Slide 7) So turning now to question 1, and let's  
 19 turn first to Pakistan's approach. You've been  
 20 addressed on this over the past day and a half. You are  
 21 familiar with the parameters of the argument, and  
 22 therefore I'll just run through them in whistle-stop  
 23 fashion.  
 24 So on pondage, very familiar to you by now.  
 25 Pakistan derives the pondage from the hydrology and

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14:23 1 they have to prove a need for it. And a gated spillway  
 2 will be possible in some cases: usually a crest-gated  
 3 spillway, not an orifice gated spillway. But no matter  
 4 what the nature of the beast is, it cannot be used to  
 5 deplete dead storage.  
 6 Freeboard. Very quick. Free overflow feature at  
 7 the full pondage level; minimum safe freeboard based on  
 8 international standards.  
 9 So that's Pakistan's position in a nutshell. Let's  
 10 turn to look at how it would apply to modify the design  
 11 of Neelum-Jhelum. I realise that this is question 1(b),  
 12 coming after question 1(a) sequentially. But given how  
 13 familiar the Court is with Neelum-Jhelum, it's perhaps  
 14 a better starting point than Baglihar.  
 15 (Slide 8) So a very familiar image, as you see on  
 16 the slide. This is the Neelum-Jhelum plant as built,  
 17 without the constraints of the Indus Waters Treaty.  
 18 So on the slide, we have here the full pondage  
 19 level. This is at 1,015 metres above sea level. And  
 20 then there's the dead storage level: that's coming in at  
 21 1,008 metres above sea level. And between those two,  
 22 we've got our existing operating pool of  
 23 3.8 million cubic metres.  
 24 Now, if we are going to apply Pakistan's  
 25 understanding of paragraph 8 to this design, we're going

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14:21 1 emphasises the need for firm power production only, in  
 2 accordance with paragraph 8(c) and paragraph 2(i) of  
 3 Annexure D. And on Pakistan's estimation, the answer  
 4 for every HEP, a unique and fixed value for every HEP,  
 5 is going to be 50% of the minimum mean discharge,  
 6 12 hours of storage, multiplied by 2.  
 7 On power intakes, Professor Webb has addressed you  
 8 on these.  
 9 So Pakistan considers that the principal reference  
 10 point for determining the height of the intakes is the  
 11 dead storage level.  
 12 When dealing with a surface-level intake partly  
 13 above the dead storage level, which is Pakistan's  
 14 preferred design, paragraph 8(f) provides that the  
 15 intakes must be located at the highest level, consistent  
 16 with satisfactory and economical construction and  
 17 operation of the HEP as a run-of-river HEP.  
 18 And then when we're dealing with the deep intake,  
 19 which is wholly below the dead storage level, we're  
 20 going to be dealing with paragraph 8(d) there as well.  
 21 If they are required -- and in Pakistan's estimation  
 22 they are rarely required -- they must be as small and  
 23 high as possible.  
 24 Spillways and outlets: India is entitled ipso facto  
 25 to an ungated spillway. If they want something else,

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14:24 1 to see some immediate areas of difficulty. I think  
 2 I have the laser pointer here. It's not quite as  
 3 responsive as one would like, but let's try it anyway.  
 4 First of all, we've got the operating pool.  
 5 Pakistan has calculated the MMD at the Neelum-Jhelum  
 6 site as equalling 57.42 metres cubed per second. So on  
 7 this basis, the NJHEP operating pool has a slightly  
 8 bigger volume than would be permitted under  
 9 paragraph 8(c), so it's going to have to shrink. And  
 10 when it shrinks, the dead storage level is going to have  
 11 to rise in the reservoir.  
 12 I've marked the new dead storage level of  
 13 1,011 metres above sea level on the slide. That's going  
 14 to reflect an operating pool of 2.48 million  
 15 cubic metres, so about 1.3 million less than the  
 16 original design.  
 17 Now, with the dead storage level higher in the  
 18 reservoir, our intakes -- which are currently located  
 19 here (indicating), more or less; that's the headrace  
 20 tunnel, moving out through the collecting canal --  
 21 they're going to have to rise as well. Their depth is  
 22 presently fixed by the need to maintain a water seal  
 23 when the operating pool is at the minimum level,  
 24 minimising vortices that would pull floating trash into  
 25 the desanders. And the intake level can now be raised

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1 a corresponding amount with the dead storage level,  
 2 without breaching that water seal.  
 3 As to the freeboard, the auxiliary spillway of the  
 4 NJHEP -- which, if you recall, is around here  
 5 (indicating) -- is a surface-gated spillway with the top  
 6 of the gates at the full pondage level. So that  
 7 provides the free overflow feature that prevents  
 8 deliberate overfilling of the operating pool, pursuant  
 9 to paragraph 8(a). So we have  
 10 a paragraph 8(a)-compliant design.  
 11 As to the height of the freeboard itself, at the  
 12 moment the NJHEP has a normal freeboard of 4 metres.  
 13 3 metres of that is surcharge storage, and so the  
 14 minimum freeboard is only 1 metre.  
 15 Now, given that NJHEP includes an embankment element  
 16 in addition to its concrete dam -- and you'll remember  
 17 the embankment element well over here -- this is likely  
 18 already in the minimum safe freeboard, and so  
 19 paragraph 8(a) is not going to require us to lower it.  
 20 We now come to the really problematic part of the  
 21 design, which is of course the deep orifice spillway.  
 22 Paragraphs 8(d) and (e), in Pakistan's appreciation,  
 23 are extremely suspicious of this. From Pakistan's view,  
 24 if this spillway were included in an Indian HEP, it  
 25 would have a blinking red light next to it. It's really

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14:27 1 low, it's right down the bottom, it's almost at the  
 2 floor of the reservoir itself.  
 3 More to the point -- and as you know from speaking  
 4 to Mr Miana and his team -- this thing is built to flush  
 5 the Neelum-Jhelum reservoir deep below dead storage  
 6 level. It's intended to empty it entirely. And it's  
 7 been used for this function twice in the plant's  
 8 lifetime.  
 9 The Kishenganga commandment applies here: thou shalt  
 10 not deplete dead storage.  
 11 The only reason that the Neelum-Jhelum HEP would be  
 12 permitted such a spillway is if it were necessary to  
 13 pass the design flow to a PMF. Now, in Pakistan's view,  
 14 this is not necessary, and so up it must go. It must be  
 15 replaced with either an ungated surface spillway or --  
 16 more likely, given that the site is quite narrow --  
 17 a gated surface spillway, maybe combined with some kind  
 18 of ungated spillway capacity.  
 19 Now, this leads on to the question of sediment  
 20 management.  
 21 With its gated surface spillway, the Neelum-Jhelum  
 22 operator should be able to undertake sluicing, keeping  
 23 the live storage free of sediment. The discharge  
 24 capacity required for sluicing would be quite high: in  
 25 the order of a 1-in-50-year return period of flood

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14:28 1 discharge.  
 2 But if it transpires that, despite all of this,  
 3 Neelum-Jhelum is no longer sustainable from a sediment  
 4 management perspective, then paragraph 8 does not permit  
 5 the introduction of an orifice spillway or any other  
 6 low-level outlet into the design to allow for flushing.  
 7 On this point, the Kishenganga Court's  
 8 interpretation decision is extremely clear: in such  
 9 a case, the solution is not to construct the HEP so as  
 10 to breach the prohibition on drawdown flushing; it's to  
 11 build the HEP at a more suitable site, or investigate  
 12 other sediment management techniques: for example,  
 13 dredging.  
 14 Now, when all that's said and done, what's the  
 15 Treaty-compliant design going to look like?  
 16 (Slide 9) Now, we don't propose to give you a fully  
 17 developed alternative design, presented in AutoCAD or  
 18 some other kind of software; we didn't really have the  
 19 time to do that. But we do have a rough approximation  
 20 that we've knocked up for you. And it is here on the  
 21 slide.  
 22 You'll see the features that we've just discussed.  
 23 We've got a smaller operating pool, resulting in  
 24 a higher dead storage level. The intakes have been  
 25 raised to reflect that higher dead storage level, and

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1 they've been expressly made surface-level intakes.  
 2 We've got our unchanged freeboard relative to the full  
 3 pondage level. And the biggest change: a gated surface  
 4 spillway, with the bottom level of the gates below the  
 5 dead storage level, to pass the design flood and PMF and  
 6 allow for sluicing.  
 7 Now, I hasten to add: this is just one alternative  
 8 design for the NJHEP that is paragraph 8-compliant, but  
 9 nevertheless results in an efficient and functioning  
 10 HEP. But it's not the only alternative; there are  
 11 likely others.  
 12 And as has been stressed by Pakistan throughout this  
 13 hearing, engineers are ingenious people who are skilled  
 14 in adapting to regulatory limits on design like those  
 15 imposed by Treaty. I'm sure that with time and  
 16 application of effort, there are many other designs that  
 17 could be developed, some of which may be better from  
 18 the HEP operator's perspective than this one.  
 19 But one thing is very clear: the NJHEP, in its  
 20 current configuration, would not be  
 21 paragraph 8-compliant. Were it subject to Annexure D,  
 22 it would need to be redesigned.  
 23 So that's question 1(b) answered. Let's now have  
 24 a look at the same approach to the Baglihar HEP to  
 25 answer question 1(a).

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14:30 1 (Slide 11) Here is Baglihar, on the slide. We  
 2 needed to deposit the document that we did this morning  
 3 into the record because it contains an upstream  
 4 elevation of the dam as built. So this is India telling  
 5 us: Baglihar has been constructed, and here is what it  
 6 looks like.  
 7 Once more, we have the current dead storage level.  
 8 I've marked that at -- sorry, that's the full pondage  
 9 level, which is at 840 MASL, metres above sea level.  
 10 And here's our dead storage level. You remember that  
 11 we've got an enormous reservoir for Baglihar: it's  
 12 a mile wide and an inch deep. And so that gigantic  
 13 operating pool is basically housed within that  
 14 relatively small amount of vertical space. You'll  
 15 recall that the dam is 144.5 metres tall.  
 16 Now, we see that there are, from Pakistan's point of  
 17 view, several problematic features with this design,  
 18 which was wrongly blessed, says Pakistan, by  
 19 Professor Lafitte.  
 20 Again, the pondage level allowed is far too high,  
 21 and therefore the dead storage level has been placed  
 22 relatively deep in the reservoir to develop that volume.  
 23 The intakes -- sorry. Well, they're fixed  
 24 relatively deep down. There they are. The intakes are  
 25 fixed at 821 metres above sea level: that's a full

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14:32 1 15 metres below India's already-too-low dead storage  
 2 level. That's still an improvement on India's original  
 3 design, rejected by Professor Lafitte, which called for  
 4 intakes at 818 metres above sea level, so deeper again.  
 5 The freeboard is broadly acceptable but, adopting  
 6 Pakistan's position in Baglihar, it could afford to be  
 7 lower. The dam is a concrete gravity dam with a large  
 8 reservoir. It looks fairly safe to us and is not going  
 9 to be susceptible to overtopping.  
 10 And then, of course, we have the problematic orifice  
 11 spillway, with gates sitting 35 metres below the dead  
 12 storage level; that's at 801 metres above sea level.  
 13 That's not as bad, from a paragraph 8 perspective, as  
 14 the NJHEP's spillway. If it was at the very, very  
 15 bottom of the reservoir, it would be extremely  
 16 problematic. But this still, given the elevation that  
 17 it's sitting at, gives the operator of the HEP command  
 18 over considerable amounts of the reservoir volume.  
 19 You'll recall that this was fixed at this level in  
 20 the reservoir to allow it to be completed to a level  
 21 17 metres below dead storage level by flushing. And  
 22 you'll further recall that exactly this operation was  
 23 ruled impermissible in the Kishenganga partial award.  
 24 So we're going to need to make some changes.  
 25 First, we're going to have to recalculate pondage.

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14:33 1 This stretch of the Chenab has an MMD of 125.68 cubic  
 2 metres per second, and so on Pakistan's approach to  
 3 pondage, that leads to an operating pool of 5.43 million  
 4 cubic metres. On this basis, we're going to be raising  
 5 the dead storage level -- that's the green line -- to  
 6 839.3 metres above sea level, which is just below the  
 7 full pondage level. Again, an inch deep is quite a lot  
 8 when you multiply it out over a mile.  
 9 So second, the intakes. At the moment, as you can  
 10 see from the slide, India has a relatively deep intake  
 11 in its design, and that's going to need to be raised to  
 12 match the new dead storage level while maintaining the  
 13 existing water seal to minimise vortexing. And we'd  
 14 also like to turn that into a surface-level intake, with  
 15 a sill upstream from the deep part of the intake to  
 16 minimise the amount of sediment that could enter; the  
 17 "skimming wall" that Professor Webb and Dr Morris talked  
 18 about.  
 19 Now, third, freeboard. As I've described, Pakistan  
 20 is of the view that Professor Lafitte was unduly  
 21 conservative in his analysis of freeboard height. This  
 22 could be reduced to 1.1 metres, the minimum height for  
 23 concrete dams under the Bureau of Reclamation's  
 24 memorandum on Freeboard Criteria.  
 25 Then lastly, of course, but by no means least, we

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14:35 1 have another deep orifice spillway with a blinking red  
 2 light next to it.  
 3 As with the NJHEP, the Kishenganga partial award  
 4 makes it clear that flushing of the reservoir is  
 5 prohibited. And given that the purpose of the spillway  
 6 is to enable just this kind of flushing, the design must  
 7 be changed to a crest-gated spillway, with the gate sill  
 8 below the dead storage level to allow for sediment  
 9 management via sluicing. And that will be sufficient to  
 10 pass the design flood and the PMF.  
 11 We could also examine the question of whether some  
 12 undersluices may be needed to be added to the design  
 13 below the intakes to better control sediment. But if  
 14 those are added, they're going to be paragraph 8(d)  
 15 outlets and they're going to have to be as small and  
 16 high as possible within the reservoir. But it may be  
 17 that raising the intakes combined with the use of coated  
 18 runners will be sufficient for sediment management  
 19 purposes, such that those additional outlets are not  
 20 necessary, and therefore prohibited.  
 21 So what's this going to look like? It's going to  
 22 look like this. Again, Dr Morris has worked up  
 23 an approximation, which we have for you on the slide.  
 24 There may be other designs that are Treaty-compliant;  
 25 this is merely one. And what we see here, once again,

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14:36 1 is a workable and efficient HEP.  
 2 It has a smaller operating pool, resulting in  
 3 a higher dead storage level. Now, again, as I said,  
 4 it doesn't look like much; but given the sheer size of  
 5 the reservoir, this thing is roughly half as big again  
 6 as the NJHEP's existing operating pool.  
 7 The intakes have been raised to reflect that higher  
 8 dead storage level and to reduce sediment ingress. The  
 9 freeboard height has been reduced relative to the  
 10 unchanged full pondage level. And of course, our  
 11 biggest change: a gated surface spillway with the bottom  
 12 level of the gates below the dead storage level to allow  
 13 for sluicing, as well passage of the design flood and  
 14 PMF.  
 15 Seasonal operation would require that the operating  
 16 pool is held to the dead storage level every year to  
 17 allow for seasonal sluicing to take place. As Dr Morris  
 18 said, that's best practice in any event.  
 19 Now, this design may create problems for India.  
 20 As Dr Morris has pointed out, its choice to situate  
 21 the dam in such a way that we have a small operating  
 22 pool on top of a large amount of dead storage is going  
 23 to create problems from a sediment management  
 24 perspective. Sediment sluicing will be required with  
 25 the reservoir at the dead storage level, and the purpose

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14:38 1 And in view of the discussions we had over the last few  
 2 days, I wonder whether this site is a site that requires  
 3 deep orifice spillways; or if not, and it's rather just  
 4 desirable, what might have been the specific reasons  
 5 that the engineers decided to go for this design?  
 6 I know you're (inaudible), so it's perhaps more  
 7 a question to Dr Morris. But I thought I'd flag it as  
 8 something that would be really useful, I think, to have  
 9 a feel of what kind of sacrifices India would make, in  
 10 a particular case, not to include deep orifice  
 11 spillways.  
 12 DR MILES: I will hold over a little bit for Dr Morris if  
 13 required. But the immediate reaction is: as we heard  
 14 from Mr Miana, this thing was put where it was so that  
 15 they could flush the reservoir. And obviously, per  
 16 Kishenganga, per the clear provisions of Annexure D,  
 17 that right was forgone by India when it entered into the  
 18 Treaty on the terms it did.  
 19 The only reason, in that circumstance, in which you  
 20 would be allowed to have an orifice spillway that deep  
 21 is if it was absolutely necessary to pass the design  
 22 flood or the PMF. And the analysis that we've done  
 23 indicates that you can get the same result with  
 24 a crest-gated spillway, and so up it goes.  
 25 PROFESSOR BUYTAERT: Thank you.

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14:37 1 of that procedure will be to limit the accumulation of  
 2 sediment in the pondage.  
 3 To the extent that there may be some accumulation of  
 4 sediment during extreme floods, when surcharge above the  
 5 dead storage level might occur, India will need to find  
 6 another way around the sediment problem: for example, by  
 7 dredging.  
 8 And again, if it concludes that the only way to  
 9 manage sediment is through depleting dead storage  
 10 through flushing, then the site is ex facie unsuitable  
 11 for a HEP of this type. It will need to change its  
 12 design -- that's to say India will -- possibly to  
 13 a small dam with a tunnel; or it's going to need, if  
 14 it's wedded to this kind of tall dam, short tunnel  
 15 design, it's going to have to find somewhere else to  
 16 build the project.  
 17 So that concludes Pakistan's answer on question 1.  
 18 (Slide 12) Question 2, concerning redesign of the  
 19 NJHEP in --  
 20 THE CHAIRMAN: Professor Buytaert.  
 21 DR MILES: Yes, Professor Buytaert.  
 22 PROFESSOR BUYTAERT: Dr Miles, coming back on the  
 23 Neelum-Jhelum plant. (Pause)  
 24 So the Neelum-Jhelum plant, you mentioned that that  
 25 is a plant with very deep orifice spillways, isn't it?

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14:40 1 DR MILES: (Slide 13) So, as with question 1, on to  
 2 question 2. We'll start with a summary of India's  
 3 approach.  
 4 On pondage, very familiar by now. India derives  
 5 pondage from load, a load that it chooses to place on  
 6 the plant, and it then says that the pondage derived  
 7 from that load is limited by the parameters of  
 8 paragraph 15 of Annexure D. And then once it has  
 9 figured out the pondage that it needs to meet the load,  
 10 it then doubles the amount of pondage required.  
 11 Now, in terms of power intakes, India prefers a deep  
 12 intake, below the dead storage level, and says it's  
 13 required to prevent vortices from forming. Of course,  
 14 this is going to create some sediment management  
 15 problems if it's not carefully watched.  
 16 Insofar as spillways and outlets are concerned,  
 17 India's predilection for drawdown flushing means that it  
 18 prefers a deep orifice spillway, which it's going to use  
 19 for flood control and sediment management.  
 20 As for freeboard, India's view appears to be that  
 21 paragraph 8(a) doesn't regulate the freeboard. So as  
 22 long as they've got their free overflow feature at the  
 23 full pondage level, they're fine. They then use the  
 24 Indian standards to fix the safe freeboard, and they  
 25 allow design convenience for structures placed atop the

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14:41 1 dam to influence the height of the freeboard.  
 2 (Slide 14) So here is Neelum-Jhelum back on the  
 3 slide, with the dead storage level and the full pondage  
 4 level -- obviously the other way round -- marked at  
 5 1,008 and 1,015 metres above sea level respectively.  
 6 And we've got our 3.8 million cubic metre operating  
 7 pool.  
 8 So the first thing we're going to have to do is  
 9 apply India's pondage approach to the operating pool.  
 10 Now, just impressionistically, this is going to result  
 11 in an increased amount of pondage.  
 12 The difficulty that we have is that we don't know  
 13 the load that India is going to put on this plant,  
 14 because it's not an Indian plant and therefore they've  
 15 not provided us with a prospective paragraph 15  
 16 schedule. And so far, therefore, we can't calculate the  
 17 maximum pondage.  
 18 So from a certain point of view, the Court has asked  
 19 a slightly impossible question. But we do want to be  
 20 helpful, and so what we've done is we've taken the  
 21 storage and discharge schedule that was approved by  
 22 Professor Lafitte in Baglihar and applied it to the  
 23 minimum mean discharge for the Neelum-Jhelum HEP, which  
 24 is 57.42 cubic metres [per second]. And this is going  
 25 to result in an operating pool of 21.75 million

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14:42 1 cubic metres, which is roughly what we would expect from  
 2 India's methodology for a 969 MW plant.  
 3 Just by way of a yardstick, Baglihar, at the time of  
 4 its construction, was only 450 MW, but it had a pondage  
 5 pool of 32.56 million cubic metres.  
 6 Just one problem though: the total impoundment of  
 7 the entire NJHEP reservoir is only 10 million  
 8 cubic metres. Put another way, and rounding up, India's  
 9 approach has produced an operating pool 2.2 times the  
 10 size of the NJHEP reservoir.  
 11 So how are we going to deal with this? One option  
 12 is going to be to move the project. The topography does  
 13 not permit a reservoir this size with a dam the size of  
 14 the NJHEP.  
 15 But as Mr Farooq reminded us on the site visit,  
 16 there are two ways to increase the size of an operating  
 17 pool: we can go down, decreasing the dead storage level;  
 18 or we can go up, increasing the full pondage level by  
 19 increasing the height of the dam. And so that's what  
 20 we've done: we've increased the height of the dam wall  
 21 to take account of the enlarged operating pool.  
 22 But of course the operating pool is only live  
 23 storage. We've also got to take account of dead  
 24 storage. The live storage/dead storage split in the  
 25 Baglihar reservoir is 10% to 90%. And impounding

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14:44 1 a 217.5 million cubic metre reservoir -- a little under  
 2 22 times the size of the current reservoir -- at the  
 3 NJHEP site would be difficult, to say the least. And so  
 4 we've adopted the live storage/dead storage split from  
 5 the KHEP, which is a more modest 41:59.  
 6 So when we pull all this together, we're going to  
 7 have a dam with a crest at 1,069.4 metres above sea  
 8 level, a full pondage level at 1,064.4 metres above sea  
 9 level and a dead storage level at 1,047.5 metres above  
 10 sea level. Now, the current crest of the dam is at  
 11 1,019 metres above sea level. So to fit in India's new  
 12 operating pool, we're going to have to raise the dam by  
 13 about 40 metres, just about doubling its height. But  
 14 India will be able to get its 21.75 million cubic metres  
 15 of pondage.  
 16 Now, of course a dam of this size is going to run  
 17 into some complications, especially at Neelum-Jhelum.  
 18 You will recall that we've got the main boundary thrust  
 19 running right down the axis between the embankment dam  
 20 and the concrete dam, and a geological survey could  
 21 reveal that an enlarged Neelum-Jhelum HEP just couldn't  
 22 be built at the present site, and therefore you're going  
 23 to have to move the project.  
 24 So on to intakes. They're still here. India  
 25 prefers a deep intake, as we know. But given how high

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14:46 1 our dam now is, these will need to come up somewhat to  
 2 give the intake protection against sediment. But they  
 3 will still be -- rest assured -- well below the new dead  
 4 storage level, which is India's preference.  
 5 Freeboard. Well, India does not consider this to be  
 6 regulated under the Treaty, so it's India's to set,  
 7 provided they've got their free overflow feature at the  
 8 full pondage level. So that stays where it is.  
 9 And finally, of course, the spillway. Now, India,  
 10 as I have said, favours a deep orifice spillway to allow  
 11 it to flush the reservoir whilst, in the same structure,  
 12 managing the design flood. And it's going to combine  
 13 that with a surface-level spillway, gated or ungated, at  
 14 the full pondage level, to prevent the operating pool  
 15 from being overfilled, contrary to paragraph 8(a).  
 16 Now, the NJHEP has an orifice spillway already,  
 17 right at the bottom of the reservoir. But India, in all  
 18 fairness, acknowledges that flushing and passage of the  
 19 design flood do not require it in terms to always be at  
 20 the bottom of the dead storage reservoir, and so they're  
 21 going to allow it to be raised. But it's still going to  
 22 be well below the dead storage level.  
 23 And as you know, the NJHEP already has a crest-gated  
 24 auxiliary spillway, so that will remain right where it  
 25 is, so the design remains paragraph 8(a)-compliant.

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14:47 1 (Slide 15) So what's this going to look like?  
 2 Again, Dr Morris has worked up an approximation which  
 3 we have for you on the slide, and the following features  
 4 stand out.  
 5 We've got a massively increased operating pool,  
 6 requiring a correspondingly large increase in the height  
 7 of the dam; intakes that have been raised in relevant  
 8 terms to meet the dead storage level imposed by that  
 9 increased dam; an unchanged freeboard owing to the  
 10 presence of a free overflow feature at the full pondage  
 11 level; and a deep orifice spillway intended for flood  
 12 control and sediment management. I see Dr Morris has  
 13 chosen to retain the existing outlets, presumably for  
 14 sediment management reasons.  
 15 Pausing there, this shows, in Pakistan's submission,  
 16 just how dangerous and subversive India's standard  
 17 design for its Western Rivers HEPs is.  
 18 By insisting on a large operating pool, India has  
 19 now forced itself to build a larger dam with much  
 20 greater storage. That will cause the intakes to be  
 21 lower in the reservoir, where they are more affected by  
 22 sediments. And by insisting on a deep orifice spillway,  
 23 India is going to give itself greater capacity to  
 24 control that greater storage.  
 25 And the result of all of this kind of design is

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14:48 1 going to be an increase in India's capacity to turn the  
 2 waters of the Western Rivers against Pakistan, contrary  
 3 to the logic of the Treaty itself and Pakistan's intent  
 4 in entering into the same.  
 5 So, Mr Chairman and members of the Court, I think  
 6 we're just about caught up. Unless you have any  
 7 lingering questions, that ends my submissions.  
 8 (2.49 pm)  
 9 Questions from THE COURT  
 10 THE CHAIRMAN: I just have one question for you, Dr Miles.  
 11 The maximum pondage level isn't compelled by the  
 12 Treaty in your designs for how India would do something  
 13 like Neelum-Jhelum. I take it you're assuming that they  
 14 will build to the level of the maximum pondage to which  
 15 they would be entitled. First, you could confirm that;  
 16 and perhaps further confirm that they aren't compelled  
 17 to do that.  
 18 But I suppose what I'm mostly interested in is:  
 19 is there a reason for us to think that India will  
 20 invariably build to the maximum pondage level that they  
 21 believe they're entitled to under the Treaty?  
 22 DR MILES: First of all, you're quite right: paragraph 8(c)  
 23 says "The maximum Pondage in the Operating Pool". So if  
 24 India desired, it could do a reduced pondage level.  
 25 But as far as I'm aware, whenever India puts forward

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14:50 1 a design, they say, "Well, no, this is what the load  
 2 requirements are, this is the load we're going to put on  
 3 the plant, and this is therefore the pondage that we're  
 4 entitled to". So when they're not obviously required to  
 5 under the Treaty, that's certainly the case. Certainly  
 6 whenever they put it forward, we get given the formula.  
 7 I suppose in some plants -- I think Salal is a good  
 8 example. So despite the fact that they're obviously  
 9 entitled to pondage at Salal, they've put in no  
 10 operating pool at Salal, despite the fact they're  
 11 entitled to do so under the Treaty.  
 12 So it could well be that they won't always do this.  
 13 But certainly the recent practice -- Baglihar,  
 14 Kishenganga, Ratle -- is that Pakistan gets given the  
 15 formula, and that's the operating pool.  
 16 THE CHAIRMAN: Professor Buytaert.  
 17 PROFESSOR BUYTAERT: At the same time, there are many other  
 18 dams built since the Treaty was put in place that seem  
 19 to have a much lower storage or pondage, some even  
 20 without any pondage, isn't it?  
 21 DR MILES: That's true, sir. There's a number of small  
 22 plants. I think the biggest one that they've built  
 23 without pondage has been Salal, which is 690 MW.  
 24 And certainly you're quite right. I mean, if you  
 25 look at I think it's Annexure C, not every plant they're

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14:51 1 building is with live storage. But when we've had  
 2 a plant -- perhaps a better way for me to put it is that  
 3 whenever there's been a plant with a dispute over the  
 4 live storage, it's been of the kind that I have  
 5 described.  
 6 PROFESSOR BUYTAERT: Presumably if the pondage is much  
 7 lower, it's less likely to lead to a dispute?  
 8 DR MILES: Well, quite.  
 9 THE CHAIRMAN: Okay, very good. I think I just need to  
 10 thank you, Dr Miles, for your presentation. And if  
 11 I understand correctly, it's now Professor Tanzi's  
 12 opportunity, who has been waiting even more patiently  
 13 than Dr Miles.  
 14 So, Professor Tanzi, you're welcome to approach the  
 15 podium, and when you're ready, please proceed. (Pause)  
 16 (2.53 pm)  
 17 Submissions on the Permissibility and Utility  
 18 of a Narrative Dispositif  
 19 PROFESSOR TANZI: Thank you, Mr Chairman, members of the  
 20 Court. Allow me to say, first of all, that I am pleased  
 21 and honoured to be appearing before you, and to do so on  
 22 behalf of the Islamic Republic of Pakistan.  
 23 Before elaborating upon the request in Pakistan's  
 24 Memorial for a "narrative dispositif" approach, I will  
 25 briefly address two questions put by the Chairman to

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<p>14:53 1 Mr Fietta on Wednesday. In the interest of time, 2 response in appropriate detail will be developed in our 3 second round of submissions. 4 First, concerning what constitutes an award for 5 purposes of determining the scope of the res judicata 6 effect applicable to it -- Day 3, page 143 -- the 7 international adjudicative practice -- from Polish 8 Postal Service to Bosnian Genocide, Arbitral Award of 9 3 October 1899 (Guyana v Venezuela) -- adopts a wide 10 margin for the determination of which parts of the 11 reasoning are to be considered as "entailed in the 12 decision", following very much a case-specific approach. 13 And as Mr Fietta explained with reference to the ICJ 14 holding in the latest Nicaragua v Colombia case, 15 PLA-0108, it can be necessary in any event to determine 16 the meaning of a res judicata dispositif by reference to 17 the reasoning set out in the judgment in question. 18 In our context, this would provide ground for 19 Pakistan's argument attaching res judicata effects to 20 the specific passages quoted by Mr Fietta from the 21 motifs in the Kishenganga awards in the light of 22 paragraph 23 of Annexure G. However, the flexibility 23 and little predictability which emerge from the 24 international adjudicative practice on the point at 25 issue is precisely one of the many factors for</p> <p style="text-align: center;">Page 169</p>	<p>14:56 1 legal analysis may also be found in relation to legal 2 reasoning precisely in relation to treaty 3 interpretation. And this was the case in the 2012 4 Judgment on Land and Maritime Boundary case between 5 Cameroon and Nigeria. 6 Mr Chairman, we will submit the details, as 7 I anticipated, before the end of these oral proceeding. 8 But on a more general level, let me say that Pakistan 9 regards this formula -- one of incorporation by 10 reference, if you wish -- as a modulation of the 11 approach that Pakistan is asking you to take. 12 In the next 30 minutes, I will be addressing 13 an aspect of the request for declaratory relief which 14 touches upon its form, but is closely related to its 15 substance. I will address the former, and Sir Daniel, 16 in his closing, will address the latter. 17 Reduced to a single statement, Pakistan is asking 18 the Court to include an operative part in its award that 19 is as expanded and as detailed as possible. The reasons 20 for this request in relation to the present proceeding 21 may be quickly summarised. 22 The disputes before you emerge from the backdrop of 23 a broader controversy over similar issues which has been 24 running for a long time; as recalled by Sir Daniel on 25 Monday, since "the earliest days following</p> <p style="text-align: center;">Page 171</p>
<p>1 Pakistan's request from your Court of a narrative 2 dispositif. 3 As to cases of dispositifs cross-referencing parts 4 of the motifs, there are examples, indeed. We shall 5 submit, Mr Chairman, detailed references to your Court 6 in the second round. But allow me to stress that this 7 adjudicative practice stretches from references to 8 coordinates and demarcation lines to interpretative 9 reasoning. 10 Indeed, resort to this technique can be found in 11 large supply in relation to territorial and maritime 12 spaces to be delimited, be it for delimitation of 13 boundaries or maritime zones for purposes of the 14 determination of the sovereign rights. 15 Suffice to recall the Jan Mayen Delimitation 16 judgment, the 2001 judgment on Maritime and Territorial 17 Delimitation between Qatar and Bahrain, PLA-0098, or the 18 two Land and Maritime Delimitation judgments between 19 Costa Rica and Nicaragua. In such cases, the dispositif 20 usually refers to delimitation or demarcation lines. 21 Similarly, resort in dispositifs to referencing 22 statements, determinations and findings reached in the 23 preceding legal analysis can be found in the Temple of 24 Preah Vihear 2013 judgment. 25 But cross-referencing to reasoning in the preceding</p> <p style="text-align: center;">Page 170</p>	<p>14:57 1 independence". Despite repeated recourse to third-party 2 dispute settlement mechanisms by the parties, contested 3 issues continue to arise as a source of dispute, and 4 they may continue to do so. 5 First, the history of the broader controversy shows 6 the possibility for different mechanisms under the 7 Treaty to reach solutions which may be, or may be 8 interpreted as, mutually conflicting. The disagreements 9 surrounding the determination by the Neutral Expert on 10 the Baglihar project bear testament to the difficulties 11 which may stem from such actual or potential 12 contradictions. And this may occur despite, as shown by 13 Mr Fietta, that it should be clear which outcome of 14 different dispute settlement mechanisms should prevail 15 in case of contradictory findings on matters of law. 16 Even so, and even where the import of a particular 17 decision is clear -- and this takes me to the second 18 reason for the anticipated concern -- it cannot be 19 excluded that doubts may be raised as to what the 20 decision covers and what it does not. This has been the 21 case in the Kishenganga partial award, which, as we 22 know, was subject to a request for clarification and 23 interpretation by India. 24 This is no denying that the disputing parties are 25 well entitled, under the Treaty, to request the Court to</p> <p style="text-align: center;">Page 172</p>



14:59 1 interpret the award. However, the Treaty's  
 2 preoccupation with the finality of awards is clearly  
 3 reflected in the extraordinary nature of that procedure,  
 4 which is subject to strict time limits, and which  
 5 determines, after its completion, the dissolution of the  
 6 Court.  
 7 And yet, such procedure may lend itself to abuse.  
 8 India's request for interpretation of the Kishenganga  
 9 partial award was in fact not so much an invitation to  
 10 the Court to spell out a complex legal point, but  
 11 a clear attempt to narrow the scope of the decision.  
 12 And as explained by Mr Fietta, even if the Kishenganga  
 13 Court firmly rejected this attempt, controversy as to  
 14 the true meaning of that award continued, and does  
 15 continue to this day.  
 16 Mr Chairman, members of the Court, Pakistan  
 17 commenced these proceedings after much hesitation.  
 18 Eventually, as Mr Aslam said before you during the first  
 19 set of hearings (Hearing on Competence, Day 3, page 84,  
 20 lines 13-25), this decision was made:  
 21 "... in the hope that ... [an] equitable and fair  
 22 decision ... would restore balance to the Treaty and  
 23 allow it to remain, as it has for over 60 years,  
 24 a reliable cornerstone for peaceful relations between  
 25 India and Pakistan."

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15:00 1 The history of the relations between the two parties  
 2 provides ample evidence of the need for a ruling of the  
 3 kind requested by Pakistan. At the same time, it shows  
 4 how difficult it is for one such ruling to withstand the  
 5 test of the constant challenges by the other party.  
 6 These challenges may well pay lip-service to the award,  
 7 only to suggest that they do so because it has not fully  
 8 disposed of the questions submitted to the Court.  
 9 As it has already been discussed, disagreements on  
 10 questions of res judicata typically bear on its material  
 11 scope in each specific case. And as acknowledge by  
 12 Mr Fietta, it may hinge on the relationship between  
 13 dispositif and motifs. This is a point to which we will  
 14 likely return next week in relation to your  
 15 question (a), Mr Chairman.  
 16 It is therefore understandable that Pakistan would  
 17 be concerned that the finality of your award or awards  
 18 be protected, Mr Chairman, so as to minimise their  
 19 vulnerability or its vulnerability to frivolous  
 20 objections and vexatious claims in the future,  
 21 particularly when the defendant has regrettably chosen  
 22 not to appear.  
 23 Mr Chairman, members of the Court, it is with this  
 24 in mind that Pakistan asks you to deliver as detailed  
 25 a dispositif as possible, so as to clarify with the

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15:02 1 maximum possible clarity the legal obligations stemming  
 2 from the award concerning the systematic interpretation  
 3 of the Treaty. As indicated in the Memorial, Pakistan  
 4 considers that this would be essential for the purposes  
 5 of providing full certainty as to what constitutes the  
 6 unquestionably binding part of the Court's award.  
 7 Mr Chairman, members of the Court, within the time  
 8 that remains -- and I will try to be fast -- my  
 9 submission will come in five parts.  
 10 First, I will contextualise the request for  
 11 a narrative dispositif within the framework of  
 12 a declaratory award and its rationale.  
 13 Second, I will express Pakistan's concerns in  
 14 relation to the vulnerability of an unqualified  
 15 declaratory relief, which I have anticipated a while  
 16 ago.  
 17 Third, I will illustrate how Pakistan's request does  
 18 not, and is not intended to, trespass the boundaries of  
 19 judicial propriety.  
 20 Fourth, I will demonstrate that the Court is fully  
 21 entitled to follow a narrative dispositif approach, and  
 22 that doing so would be appropriate and useful, if not  
 23 required, for purposes of the proper administration of  
 24 justice.  
 25 Finally, I will close with a few concluding remarks.

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15:03 1 Mr Chairman, members of the Court, in its written  
 2 submissions, Pakistan asked you to deliver a combination  
 3 of injunctive and declaratory relief. I shall deal  
 4 exclusively with the latter, for the narrative  
 5 dispositif Pakistan is requesting is but a form of  
 6 declaratory relief.  
 7 The availability of declaratory relief as a form of  
 8 reparation in international adjudication is beyond  
 9 dispute. Whilst the Treaty does not provide specific  
 10 rules concerning its availability, it provides no  
 11 exceptions to the general rule either, just as well as  
 12 under Article 36 of the ICJ Statute.  
 13 Paragraph 2(b) of Annexure G of the Treaty requires  
 14 that the Request for Arbitration include a statement  
 15 setting forth, inter alia, "the nature of the relief  
 16 sought". Moreover, paragraph 23 provides that:  
 17 "The Court shall render its Award, in writing, on  
 18 the issues in dispute and on such relief, including  
 19 financial compensation, as may [be] claimed."  
 20 That the Treaty should expressly mention financial  
 21 compensation within a wider range of potential forms of  
 22 relief corroborates the view that no constraints apply  
 23 to the remedial competence of the Court, let alone to  
 24 the extent requiring the Court to depart from the  
 25 adjudicative principle ne infra petita.

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15:05 1 The widespread use of declaratory relief responds to  
 2 two intertwined exigencies for purposes of the  
 3 settlement of a dispute on a case-specific basis. The  
 4 first one concerns the special nature of most  
 5 international disputes, where restitution or  
 6 compensation may not be fully conducive to the  
 7 resolution of the controversy.  
 8 The second one pertains to the need for flexibility,  
 9 including as a matter of form, where a comprehensive and  
 10 serviceable blueprint is required for the resolution of  
 11 the dispute to have a full and lasting effect. As put  
 12 in straightforward terms by Judge Leonardo Nemer  
 13 Caldeira Brant in his recent entry on "Finality of  
 14 Judgments":  
 15 "... a declaratory judgment [or award] puts  
 16 a definitive end to the controversy and is equally  
 17 binding on the parties [as a constitutive one]."  
 18 This was well illustrated by the Permanent Court of  
 19 International Justice in the interpretation proceedings  
 20 in the Chorzów Factory case. The court referred to  
 21 Judgment No. 7 as one being:  
 22 "... in the nature of a declaratory judgment, the  
 23 intention of which is to ensure recognition of  
 24 a situation at law, once and for all and with binding  
 25 force as between the Parties; so that the legal position

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15:07 1 thus established cannot again be called in question in  
 2 so far as the legal effects ensuing therefrom are  
 3 concerned."  
 4 In Northern Cameroons, the court stressed that:  
 5 "... if in a declaratory judgment [an adjudicator]  
 6 expounds a rule of customary law or interprets a treaty  
 7 which remains in force, its judgment has a continuing  
 8 applicability ..."  
 9 Mr Chairman, members of the Court, this being said,  
 10 a declaratory award, like any other adjudicative  
 11 decision, is not free from vulnerabilities, particularly  
 12 if, after it has been handed down, the parties go on to  
 13 disagree. I will confine myself to three specific  
 14 concerns.  
 15 The first one pertains to the question, already  
 16 discussed, of the material scope of the decision, with  
 17 special regard to the balance between motifs and  
 18 dispositif. And if the balance is skewed in favour of  
 19 the motifs, controversy may arise as to why something  
 20 has not been included in the dispositif.  
 21 Second, there may be matters that the award disposes  
 22 of, either cursorily or even implicitly, which under the  
 23 good faith principle would entirely reasonably provide  
 24 strong ground for legal guidance to the parties. But  
 25 again, controversy may arise as to the contours of the

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15:08 1 legally binding scope of the decision.  
 2 Already mentioned practice before the International  
 3 Court of Justice points to the difficulties that may  
 4 arise when one party is either genuinely perplexed about  
 5 the scope of the obligations stemming from the decision,  
 6 or about its actual meaning, or is rather determined to  
 7 narrow down, ex post, its material scope.  
 8 The third concern, Mr Chairman, pertains to the fact  
 9 that, as already mentioned, the interpretation procedure  
 10 remains an extraordinary remedy, subject to strict time  
 11 limits, and destined to extinguish the Court with its  
 12 use.  
 13 In light of such concerns, a narrative dispositif in  
 14 your award could accomplish several vital objectives  
 15 that would materially enhance an effective and durable  
 16 solution of the present disputes.  
 17 First and foremost, it would provide much needed  
 18 clarity on the central legal issues of the disputes  
 19 before you and the conclusions that you will reach. By  
 20 setting forth the key determinations in the operative  
 21 part of the award, rather than leaving them to be pieced  
 22 together from the statement of reasons, the space for  
 23 divergent interpretations by the parties further down  
 24 the line would be significantly reduced.  
 25 And by delineating the parties' respective rights

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15:09 1 and obligations in an articulated and readily accessible  
 2 form, whose legally binding force would be beyond doubt,  
 3 your Court would engender a more secure and stable legal  
 4 framework for the relations between them under the  
 5 Treaty going forward.  
 6 Mr Chairman, members of the Court, Pakistan is  
 7 asking nothing of this Court which would be in any way  
 8 inconsistent with judicial propriety.  
 9 First, Pakistan is not asking for an advisory  
 10 opinion, which the Treaty does not make provision for.  
 11 On the contrary, the present phase of the proceedings in  
 12 which we are engaged are the subject of express  
 13 direction by the Court. And the absence of the  
 14 Respondent cannot turn an adversarial proceeding into  
 15 a hypothetical one.  
 16 It is accepted that a decision of a declaratory  
 17 nature may have a broad scope. And so long as it is  
 18 functional to the resolution of a live dispute, this  
 19 does not turn a decision in a contentious case into  
 20 an advisory opinion. As the International Court of  
 21 Justice put it in Fisheries Jurisdiction:  
 22 "... there is no incompatibility with its judicial  
 23 function in making a pronouncement on the rights and  
 24 duties of the Parties under existing international law  
 25 which would clearly be capable of having a forward

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15:11 1 reach."  
 2 Second, Pakistan is not asking this Court to preempt  
 3 any future claims by India concerning Pakistan's  
 4 responsibility under the Treaty in other potential  
 5 disputes based on different sets of facts and claims,  
 6 thus abusively stretching the res judicata principle.  
 7 The ICJ was recently faced with the point at issue  
 8 in the jurisdictional phase of the Genocide case between  
 9 Ukraine and Russia. And while the circumstances of the  
 10 case are radically different, the court's view of the  
 11 matter is material to the present proceedings.  
 12 In essence, Russia argued that a declaratory  
 13 judgment, as requested by the applicant, recognising  
 14 Ukraine's compliance with its own obligations, would not  
 15 fall within the bounds of judicial propriety. Russia  
 16 grounded its claim, inter alia, on the assumption that  
 17 the requested declaratory judgment could preempt claims  
 18 against Ukraine under new evidence based on the  
 19 operation of the res judicata attaching to the judgment.  
 20 The ICJ was not persuaded. In rejecting the  
 21 respondent's arguments, it acknowledged that whenever  
 22 a dispute is settled by way of a judgment, there is  
 23 always a possibility that a future claim may be covered  
 24 by res judicata. But this possibility alone, said the  
 25 court, does not provide a basis for finding that

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15:12 1 a request for declaratory relief is inconsistent with  
 2 judicial propriety.  
 3 Pakistan is not seeking, as Ukraine did,  
 4 a declaration recognising its compliance with its  
 5 obligations under the Treaty, let alone to the effect of  
 6 preempting future claims arising from different sets of  
 7 circumstances. Rather, Pakistan is seeking, in this  
 8 phase of the case, an award that addresses  
 9 a long-standing dispute between the parties on questions  
 10 of systemic interpretation of the Treaty. And this  
 11 falls squarely within the scope of Article IX(1) of the  
 12 Treaty.  
 13 It is therefore clear that entertaining Pakistan's  
 14 request would be a legitimate exercise of this Court's  
 15 jurisdiction, and would not contradict the principles of  
 16 judicial propriety. Using the words of the Permanent  
 17 Court in the Chorzów interpretation judgment, Pakistan's  
 18 request is aimed at obtaining:  
 19 "... recognition of a situation at law, once and for  
 20 all and with binding force as between the Parties; so  
 21 that the legal position thus established cannot again be  
 22 called into question in so far as the legal effects  
 23 ensuing therefrom are concerned."  
 24 The mere possibility that a future claim by India  
 25 may be covered by the res judicata effect of the

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15:14 1 declaratory award or awards does not render Pakistan's  
 2 request inapposite.  
 3 Mr Chairman, members of the Court, having outlined  
 4 the features of a narrative dispositif and the reasons  
 5 for requesting it, I will now address, first, the power  
 6 of the Court to render such dispositif; and second, the  
 7 appropriateness, usefulness and need for it to exercise  
 8 such power in the present proceedings.  
 9 As to the first point, under the combined provisions  
 10 of paragraph 23 of Annexure G and Article 26(6) of the  
 11 Court's Supplemental Rules of Procedure on the "forms  
 12 requirements" of an award of the Court, no constraints  
 13 emerge as to the Court's power to render such  
 14 a dispositif.  
 15 And no constraints of the sort may be inferred from  
 16 the general adjudicative practice. Once the  
 17 jurisdictional mandate over a given dispute is assessed,  
 18 the remedial competence of the adjudicator must follow,  
 19 which is constrained only in substance by the general  
 20 principles ne ultra and ne infra petita and the canons  
 21 of judicial propriety, as the case may be.  
 22 As observed by Ian Brownlie in addressing  
 23 declaratory judgments in general:  
 24 "There are no problems of forms and ... the category  
 25 of declaratory judgments is very diverse in contents".

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15:16 1 As to the second point, namely of the  
 2 appropriateness, usefulness and need for the Court to  
 3 render a declaratory award in the form of a narrative  
 4 judgment, the ICJ in Northern Cameroons, amongst others,  
 5 provides valuable guidance.  
 6 The first factor that emerges from the court's  
 7 reasoning is the need for "forward reach" of the  
 8 adjudicative decision. As already mentioned, the court  
 9 stressed that:  
 10 "... if in a declaratory judgment it expounds a rule  
 11 of customary law or interprets a treaty which remains in  
 12 force, its judgment has a continuing applicability."  
 13 In other words, declaratory adjudication of the kind  
 14 requested by Pakistan is appropriate when the award can  
 15 be applied to the parties' future conduct and ensure  
 16 compliance with obligations in force under international  
 17 law.  
 18 In fact, in Northern Cameroons, the court declined  
 19 to exercise its jurisdiction because the treaty at issue  
 20 had been terminated. Differently in the present case,  
 21 the Treaty whose interpretation is in dispute is  
 22 perfectly in force, and this mechanism is aimed at  
 23 enhancing its validity and integrity. And the  
 24 declaratory award providing for an objective,  
 25 articulated and binding interpretation of the disputed

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15:17 1 provisions would have the necessary "forward reach" to  
 2 effectively resolve the dispute between the parties.  
 3 Mr Chairman, members of the Court, the importance of  
 4 the "forward reach" factor underscores the need for  
 5 a decision that can be operationalised and applied in  
 6 practice. This is precisely why Pakistan requests  
 7 a clear and comprehensive statement by your Court of the  
 8 parties' rights and obligations under the Treaty in the  
 9 form it has requested.  
 10 Another distinguishing factor determining the  
 11 appropriateness of rendering a declaratory judgment may  
 12 be drawn from the ICJ jurisprudence on the circumstances  
 13 dictating the need for articulation and precision of the  
 14 declaratory relief. In the Jan Mayen case, the court  
 15 observed that:  
 16 "To give only a broad indication of the manner in  
 17 which the definition of the delimitation line should be  
 18 fixed, and to leave the matter for the further agreement  
 19 of the Parties, as urged by Norway, would in the Court's  
 20 view not be a complete discharge of its duty to  
 21 determine the dispute."  
 22 While the ICJ decision was taken in the face of the  
 23 contrary position of the claimant, Norway potentially  
 24 raising ne ultra petita concerns, no such concerns could  
 25 arise in the instant proceedings, for it is the

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15:18 1 applicant that urges an articulated and precise  
 2 declaratory award.  
 3 A third factor determining the appropriateness of  
 4 rendering a detailed declaratory relief pertains to the  
 5 question of judicial economy; or, actually, to the need  
 6 of avoiding the risk of exercising false judicial  
 7 economy under the specific circumstances of the case.  
 8 As Pakistan submitted in its Memorial (paragraph 13.10),  
 9 in the context of the present dispute, "an economy of  
 10 reasoning will not serve the parties well".  
 11 It is not disputed that Court has the freedom to  
 12 select the ground upon which it will base its judgment  
 13 and is not obliged to examine all the considerations  
 14 advanced by the parties. However, as noted by  
 15 Judge Lauterpacht in his separate opinion in  
 16 Norwegian Loans:  
 17 "... a Party to proceedings before the Court is  
 18 entitled to expect that its Judgment shall give as  
 19 accurate a picture as possible of the basic aspects of  
 20 the legal position adopted by that Party."  
 21 As he put it, it is a sound procedural principle  
 22 that an adjudicative decision "should attach to the  
 23 submissions of the Parties a purpose, though not  
 24 necessarily an effect, which the parties attached to  
 25 them", unless the possibility is barred by statutory

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15:20 1 limits or reasons of judicial propriety, which we have  
 2 seen would not apply in the present case. And as  
 3 Hersch Lauterpacht stressed in the particular  
 4 circumstances of that case:  
 5 "... although there may be an attraction in  
 6 selecting the most simple, concise, and expeditious  
 7 solution, such considerations are not the only  
 8 legitimate factor for the Court."  
 9 Along the same lines, Judge Gaja, in his declaration  
 10 in Obligations Concerning Negotiations Relating to  
 11 Cessation of the Nuclear Arms Race, observed that,  
 12 whilst one can see a minimalist decision as  
 13 an application of judicial economy, "judicial economy  
 14 may also require the Court to take a decision on certain  
 15 issues that were raised", and could be the object of new  
 16 proceedings between the same parties "when these  
 17 proceedings are a distinct possibility".  
 18 In the absence of a fulsome dispositif, future  
 19 litigation becomes more than a distinct possibility.  
 20 Suffice to recall India's aggressive HEP programme and  
 21 the history of disagreements under the Treaty to date.  
 22 I'm turning now to my conclusions, Mr Chairman.  
 23 In the practice of international adjudicatory  
 24 bodies, the contents of the dispositif are constrained  
 25 by the requests of the parties. Accordingly, the Court

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15:22 1 may be precluded from adjudicating points not arising  
 2 out of issues in dispute. Conversely, if the applicant  
 3 presents a certain narrative dispositif as a necessary  
 4 element in the award for it to settle the disputes  
 5 before the Court, and the latter agrees, there are no  
 6 impediments for the Court to adopt that approach; on the  
 7 contrary, there is solid ground for it to do so.  
 8 Pakistan, in asking for this approach, is certainly  
 9 not asking the Court to push extravagantly the envelope  
 10 of procedural canons. As former President of the  
 11 International Court of Justice Rosalyn Higgins observed  
 12 before the Sixth Committee of the General Assembly  
 13 almost 20 years ago:  
 14 "For many years, it was usual for the Court to be  
 15 asked by one party simply for a declaration of a breach  
 16 of an obligation by the other party ... A short and  
 17 uncomplicated dispositif could suffice. But since my  
 18 arrival at the Court in 1995, I have noted that very  
 19 detailed findings on diverse points of law are required  
 20 and, moreover, the declaration of the substantive  
 21 violation is less frequently found to be a sufficient  
 22 remedy."  
 23 As your Court observed in Procedural Order 6  
 24 (paragraph 30), the overarching duty of international  
 25 dispute resolution bodies is to exercise their

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15:23 1 authority:  
 2 "... in such a manner as to facilitate the actual  
 3 resolution of the Parties' dispute and to avoid the  
 4 risks of duplicative proceedings or conflicting  
 5 decisions."  
 6 Pakistan believes that it is only through a robustly  
 7 reasoned and precisely targeted dispositif that your  
 8 award may fulfil that function. An abstract and  
 9 succinct formulation in the operative part of the  
 10 Court's interpretation of the provisions in dispute  
 11 would not serve the parties or the integrity of the  
 12 Treaty, including consistency between its mechanisms of  
 13 dispute settlement. Accordingly, Pakistan respectfully  
 14 requests the inclusion of a carefully framed narrative  
 15 dispositif in the award as the most effective means to  
 16 impart clarity, predictability and finality to the  
 17 resolution of the disputes before you.  
 18 Mr Chairman, members of the Court, this concludes my  
 19 speech and I thank you for your attention, and I may  
 20 kindly ask you to call Sir Daniel to the podium for the  
 21 closing submissions; unless you have questions, of  
 22 course.  
 23 THE CHAIRMAN: Thank you, Professor Tanzi. Let me see if  
 24 I have questions from any of my colleagues here.  
 25 I have just a couple of my own then. So I will

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15:26 1 language that somehow draws into it prior discussion.  
 2 I'm not asking you to respond to those possibilities  
 3 at this time; I'm just signalling that's the way I am  
 4 thinking about the possibilities.  
 5 And to the extent that you do have examples of  
 6 number 2 and number 3, that would be helpful. That is,  
 7 if you have an example of a narrative dispositif in  
 8 another proceeding that provides a sense of what it is  
 9 Pakistan might be looking for, I think it would be  
 10 helpful for the Court to see that. If there are  
 11 examples of the cross-reference-style dispositif, that  
 12 would be helpful as well.  
 13 So that's, I suppose, more just an opening point  
 14 that I would make.  
 15 My second thought is how we might be thinking about  
 16 decisions that have been reached by other tribunals in  
 17 the sense of phased decision-making, because I do think  
 18 that's what we're talking about here. We're talking  
 19 about -- as I think you well phrased it, there's  
 20 a concrete dispute about two particular plants that is  
 21 currently before this Court, and what I think we've  
 22 decided is we need to address some systemic issues  
 23 before we can get to those disputes.  
 24 That strikes me as somewhat similar to what we have  
 25 seen in other courts and tribunals. The Iran-US Claims

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15:24 1 detain you at the podium for just a few more moments.  
 2 (3.25 pm)  
 3 Questions from THE COURT  
 4 THE CHAIRMAN: It seems to me that there are at least three  
 5 types of dispositif that one might be contemplating  
 6 here.  
 7 So the first would be what you might call the  
 8 "normal" dispositif: relatively brief in nature, perhaps  
 9 akin to what we had in the decision on the competence of  
 10 the Court; a well-reasoned series of paragraphs  
 11 preceding it that help us understand what that  
 12 dispositif means. I understand that's not what Pakistan  
 13 is asking for in this instance.  
 14 That leads to a second possibility, which I think  
 15 you've called a more "narrative dispositif", that would  
 16 contain within that dispositif a much more robust  
 17 discussion of the issues and findings that might have  
 18 value in terms of providing not just guidance to the  
 19 parties, but an appreciation of the binding quality and  
 20 significance of it.  
 21 And then the third possibility I think I signalled  
 22 a little earlier in the week of an approach that you  
 23 might call a "cross-reference dispositif", where the  
 24 dispositif perhaps is not quite as long as your  
 25 narrative dispositif, but would explicitly contain

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15:28 1 Tribunal has done a series of interpretative decisions  
 2 that then provide guidance for how cases before it might  
 3 unfold. The Ethiopia-Eritrea Claims Commission took  
 4 decisions that provided guidance as to how claims would  
 5 unfold before it. Even the International Court of  
 6 Justice, as I think you've been indicating, when you  
 7 look at a phased case, even if you want to approach it  
 8 as merits/reparations, typically it's a very extensive  
 9 amount of guidance to the parties as to the contours of  
 10 the dispute and what's proper and improper under  
 11 a particular treaty that provides the guidance  
 12 thereafter.  
 13 So I'd be interested in reflections you have on  
 14 those types of examples as well. So the first set of  
 15 examples is: what does a dispositif look like? The  
 16 second set of examples is: how might we be thinking  
 17 about these phased processes, which clearly are not  
 18 advisory opinions and are not viewed that way by anyone,  
 19 and whether it provides guidance to this Court?  
 20 And then the last of my reflections is to think  
 21 a little bit more about the text of the Treaty, which  
 22 you didn't really spend much time on in your  
 23 presentation, and perhaps that will come with  
 24 Sir Daniel. But I was looking at Article IX of the  
 25 Treaty while you were speaking, and reflecting a little

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15:29 1 bit on the way in which it opens up:  
 2 "Any question [arising] between the Parties  
 3 [regarding] ... interpretation or application of this  
 4 Treaty".  
 5 It then does have a process for a Neutral Expert  
 6 that clearly is a much more focused, plant-specific  
 7 process, but also a process before a Court of  
 8 Arbitration. It seems like, within that text, it opens  
 9 up the opportunity for the kind of phased process that  
 10 we are currently engaged upon, and that perhaps some  
 11 aspects of that text could be brought to bear as we  
 12 think through this process that we're undertaking, and  
 13 the propriety of it, as you've been discussing before  
 14 us.  
 15 So you're welcome to respond to any of that now, but  
 16 you're also welcome to just take that on board for  
 17 reflections over the weekend.  
 18 PROFESSOR TANZI: Thank you very much, Mr Chairman. There  
 19 will be certainly room for reflection over the weekend.  
 20 But a quick reaction as to the last point: the point  
 21 will be addressed certainly by Sir Daniel, or at least  
 22 by way of anticipation with respect to what may come up  
 23 next week. But as I anticipated in my speech, I am  
 24 going to address basically the form of the relief we are  
 25 asking you for in declaratory terms. Sir Daniel will

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15:31 1 get on with substance.  
 2 As far as the first two questions are concerned,  
 3 which I see very much as intertwined, I anticipated that  
 4 we regard your question about cross-referencing by the  
 5 dispositif vis-à-vis the previous reasoning very much as  
 6 a modulation; as I said, a form of incorporation in the  
 7 dispositif by reference to the motif, which could be  
 8 a possibility in order to meet the concerns that I have  
 9 just expressed.  
 10 There have been cases, which will be submitted to  
 11 you, in which the award or judgment does indeed address  
 12 interpretation either of existing treaties or previous  
 13 judgments, and there is where I see very much  
 14 an expanded dispositif.  
 15 And I would like to draw your attention to a case  
 16 that I haven't mentioned, but it may be relevant and of  
 17 assistance to you, which is Croatia v Republic of  
 18 Slovenia -- actually, not versus, because they came to  
 19 the arbitration tribunal by compromis.  
 20 It is quite an elaborate dispositif, consisting of  
 21 six parties. And there is ample language aimed at  
 22 providing guidance to the parties concerning  
 23 interpretation of the applicable law, including the  
 24 permanence and, let's say, the duration of the legal  
 25 effects stemming from the award, which is a point linked

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15:33 1 to the forward reach of what we expect of the award.  
 2 And let me say that, like any international  
 3 obligation arising out of a written source, be it  
 4 primary or secondary, it is open for lasting. And  
 5 interestingly, in part V, the arbitral tribunal stressed  
 6 that the rights and obligations of Croatia and Slovenia  
 7 established by this award shall subsist unless and until  
 8 they are modified by agreements between the two states.  
 9 Thank you.  
 10 THE CHAIRMAN: Very good. Thank you very much.  
 11 So I think we have up next Sir Daniel. I'm looking  
 12 at the clock and noting that we might normally be taking  
 13 a coffee break at this time. Do you have a preference  
 14 as to how we proceed?  
 15 SIR DANIEL: Thank you, Mr Chairman. I think it probably  
 16 would be sensible, if you're happy to do so, to take the  
 17 break now, and then I'll have a clear run. And I will  
 18 simply cut my cloth to suit the time that's available.  
 19 THE CHAIRMAN: Very good. Then I propose we come back at  
 20 4 o'clock and resume.  
 21 (3.34 pm)  
 22 (A short break)  
 23 (3.59 pm)  
 24 THE CHAIRMAN: Okay. So I do think we're in the end  
 25 stretch, at least for today. We have Sir Daniel at the

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15:59 1 podium. So when you're ready, please proceed.  
 2 SIR DANIEL: Thank you, Mr Chairman, members of the Court.  
 3 Observations on the Court's questions to Professor Tanzi  
 4 SIR DANIEL: I think before I get to my observations, simply  
 5 because it's going to be fresh in everybody's minds,  
 6 I thought I might just pick up, Mr Chairman, your last  
 7 questions to Professor Tanzi and just make one or two  
 8 observations about them. And then I'll come back to my  
 9 more prepared remarks; more prepared but, given  
 10 overnight, not so scripted.  
 11 Mr Chairman, you identified three possible types of  
 12 dispositifs that came to your mind: the normal one, very  
 13 brief, staccato, sentence by sentence; not what we are  
 14 asking for -- and you're absolutely right -- not what  
 15 we're asking for in this case. Second, the narrative  
 16 dispositif, which includes the reasoning within the  
 17 dispositif. And then the third, the cross-reference to  
 18 the analysis. Just to tick them off.  
 19 As I say, we are not asking for the normal  
 20 short-form dispositif because we think that that's  
 21 likely to get us -- not likely to get us into  
 22 difficulties, but it may raise difficulties. Now, there  
 23 may be a number of different ways that you could deal  
 24 with it.  
 25 As you'll recall -- and I think from memory it was

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16:00 1 paragraph 13.14 of our Memorial where we addressed this,  
 2 and then you picked up on this, Mr Chairman, in your  
 3 questions to Mr Fietta -- the language of paragraph 23  
 4 of Annexure G provides a little bit of uncertainty,  
 5 because it doesn't talk about an award, but "Award" and  
 6 then it's "accompanied by ... reasons". So one of the  
 7 reasons why we were asking for the narrative dispositif  
 8 was precisely to anticipate and avoid any uncertainty  
 9 there.  
 10 But there may be many different ways of doing it  
 11 without turning the whole of your award effectively into  
 12 a dispositif.  
 13 We are attracted, at one level, by the possibility  
 14 of a normal, reasonably short-form dispositif which  
 15 cross-refers. And I'll come in just a moment to  
 16 a number of examples of which I'm aware because there  
 17 are a number of cases in which I have been involved.  
 18 But I will just telegraph a potential difficulty which  
 19 you might want to bear in mind as you think about this.  
 20 Normally one would get a dispositif and if there is  
 21 an argument about res judicata, what are the binding  
 22 parts of the award, then there would be the argument on  
 23 the basis of the traditional jurisprudence that in fact  
 24 the reasoning is incorporated into the dispositif. And  
 25 most of the jurisprudence of which we are aware reads

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16:03 1 around the interpretation of paragraph 23.  
 2 I should say that Professor Tanzi took you to some  
 3 of the ICJ decisions, and we hope to be able to provide  
 4 you next week with a table which elaborates on this in  
 5 a little bit more detail. I, from my own practice and  
 6 experience, am aware, for example, of a whole host of  
 7 cases from the Iran-US Claims Tribunal which adopt this  
 8 kind of approach. Mr Chairman, you will be familiar  
 9 with many of those. What immediately comes to mind are  
 10 cases like B61, probably B1, although I don't have that  
 11 as closely in mind. My recollection is A15, probably  
 12 A15(II.A); there are a whole series of decisions there.  
 13 And the way in which the Iran-US Claims Tribunal has  
 14 worked, for those who are perhaps not so familiar with  
 15 it, this was a tribunal that was established in  
 16 1982/1983, following the Iranian Revolution and the  
 17 rupture between the United States and Iran, but it's  
 18 only been coming to final awards, in some cases, in  
 19 relatively recent years. And the tribunal of course has  
 20 changed over time, so you've had a changing composition.  
 21 And that tribunal, in the course of a single case,  
 22 cases usually proceed -- inter-state cases usual proceed  
 23 by reference to names, so A-something or B-something --  
 24 those cases usually proceed by way of a series of  
 25 decisions, and they may be substantive decisions, not

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16:02 1 the res judicata effect as broader than just the final  
 2 paragraphs, as you've heard.  
 3 If, however, you include a short-form dispositif  
 4 which then cross-refers to particular parts of the  
 5 award, you may very well find that it generates  
 6 a dispute as to why this paragraph was excluded rather  
 7 than included.  
 8 So if you think of that approach, it may be -- and  
 9 this is a little bit, I think, what we were anticipating  
 10 in the format of our final submissions -- if you think  
 11 of this approach, it may be, for example, that you say  
 12 something like, in the short-form part of the  
 13 dispositif, that, "The interpretation of paragraph 8(d)  
 14 will be as follows, as set out in section 5 of the  
 15 award". So that it's not something which adopts  
 16 an approach which says, "as set out in paragraphs 321  
 17 and 323", and then the question that arises is: well,  
 18 why haven't you referred to paragraph 322?  
 19 The whole raison d'être of the narrative dispositif  
 20 was to make sure that what the parties received from you  
 21 was all-embracing, and that we wouldn't then be drawn  
 22 into disputes about whether the short form actually  
 23 incorporated the reasons. But we asked for it to avoid  
 24 uncertainty and as a belt and braces, out of  
 25 an abundance of caution, to avoid any difficulties

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16:05 1 just case management decisions; and then you have  
 2 a series of preliminary awards or interim awards or  
 3 partial awards and final awards, each one building on  
 4 the other. And some of them are avowedly addressing  
 5 issues of law before the tribunal comes to the final  
 6 determination on the facts.  
 7 There are other examples that come to mind as well:  
 8 North Sea Continental Shelf, two joined judgments of the  
 9 International Court of Justice in 1969. This was  
 10 a little bit more of a hybrid, because the court went  
 11 into a little bit more of an elaboration of reasons, but  
 12 the questions in dispute were rather narrower. So what  
 13 you have in the dispositif is a paragraph rather than  
 14 a sentence, but it just shows a little bit more of  
 15 an elaboration.  
 16 And then from our knowledge and research so far,  
 17 it looks as if there is probably going to be a useful  
 18 mine to explore, particularly when it comes to claims  
 19 commissions. Mr Chairman, you mentioned the  
 20 Ethiopia-Eritrea Claims Commission. And we're aware  
 21 that, for example, they sometimes have partial awards,  
 22 sometimes awards, sometimes decisions. Some of those  
 23 decisions contain guidance which are much more  
 24 elaborated as part of those decisions.  
 25 So the short answer to all of this is that we are

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16:07 1 aware that there are lots of hybrid formats that could  
 2 be adopted. And I think the principal purpose of  
 3 addressing this in our Memorial, and then through  
 4 Professor Tanzi's submissions, was really to say to you,  
 5 members of the Court, that there is a lurking issue in  
 6 the shadows here, and we think that you can take comfort  
 7 that you are not somehow bound by the straitjacket of  
 8 the short form of award where you simply have to have,  
 9 seriatim, a whole series of short propositions: that you  
 10 do have scope to elaborate a little bit further.  
 11 I make two other very brief observations: one to  
 12 pick it up and, I hope, sweep it aside.  
 13 The procedure that we are involved in is quite  
 14 clearly not an advisory opinion. And I think that was  
 15 the tenor, Mr Chairman, of your remarks.  
 16 I only make the point to avoid any suggestion in the  
 17 future that what you are faced with -- because we do not  
 18 have a respondent on the other side, and you are dealing  
 19 with systemic issues -- that what you are faced with is  
 20 somehow hypothetical. It is not hypothetical. There is  
 21 an actual dispute. And this is the way in which the  
 22 Court, in its wisdom -- which we have welcomed -- has  
 23 decided to organise the proceedings.  
 24 And we don't think that there is either any  
 25 irregularity or indeed that it's unusual when you look

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16:10 1 follow up on the last point you had.  
 2 My reason in pointing to Article IX of the Treaty  
 3 was not particularly well-developed thinking. But what  
 4 I had in mind was that as we're thinking through the  
 5 fact that we've got a Neutral Expert as  
 6 a decision-maker, a Court of Arbitration as  
 7 a decision-maker, and we're thinking about res judicata  
 8 effects of those two dispute-settlers, their respective  
 9 competences obviously are different in scope. And it  
 10 just seemed to me that it might be the case that you  
 11 would view the competence of the Court of Arbitration as  
 12 extending beyond the plant-specific issues to broader  
 13 interpretive issues that may be necessary in order to  
 14 resolve the plant-specific issues.  
 15 If that's the case -- and I think that's how we've  
 16 been generally proceeding in this -- then it must be  
 17 true that it envisages a threshold set of decisions that  
 18 could be issued about how best to interpret the Treaty,  
 19 so that you can then get to the plant-specific issues  
 20 that would be within the competence of either the  
 21 Neutral Expert or a Court of Arbitration.  
 22 So again, not particularly well-developed thinking,  
 23 but it struck me that maybe aspects of that Article IX  
 24 help us in understanding why this is not an advisory  
 25 proceeding, but is instead part and parcel of what the

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16:08 1 across the spectrum. As I said, the Iran-US Claims  
 2 Tribunal will do this kind of thing very frequently.  
 3 Then the last point, Mr Chairman, was you referenced  
 4 Article IX of the Treaty. It wasn't a point that I was  
 5 going to come to, and we can think about whether we need  
 6 to address it or make anything more of it in the course  
 7 of the weekend.  
 8 Instinctively, that doesn't seem to me to fall quite  
 9 within this kind of framework, because essentially what  
 10 that is setting up are a number of gateways.  
 11 Article IX(1) talks about "Any question ... [of]  
 12 interpretation or application", but then there are  
 13 a number of gateways. And I don't think that we are  
 14 here quite talking about gateways to decision-making,  
 15 but rather about how you capture your decision in a way  
 16 which is binding and authoritative, and least amenable  
 17 to dispute and disagreement.  
 18 But those are issues that we can come back to. And,  
 19 Mr Chairman, if you've got any responses or reactions or  
 20 further questions, obviously I'd be very happy to take  
 21 them down, or you can include them in your questions to  
 22 us of tomorrow.  
 23 (4.10 pm)  
 24 Questions from THE COURT  
 25 THE CHAIRMAN: Thank you, Sir Daniel. Maybe I'll just

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16:11 1 Treaty expected the dispute-settlers to do.  
 2 SIR DANIEL: Thank you for that, for your thought, and  
 3 we will give it additional consideration.  
 4 Of course ...  
 5 (Fire alarm sounds)  
 6 THE CHAIRMAN: Unfortunately we will pause the proceeding to  
 7 see if our Registrar can resolve the alarm situation.  
 8 Perhaps we can stay here until we are told we need to  
 9 leave. (Pause)  
 10 It looks like our Registrar did resolve the  
 11 situation. So, Sir Daniel, that was the only  
 12 observation I had. Please feel free to proceed.  
 13 SIR DANIEL: And just before the alarm went off, I was just  
 14 going to say: thank you, Mr Chairman, for that. It's  
 15 a helpful further thought to provoke our thinking.  
 16 While you have found in your Competence Award, in  
 17 PO6, that having two mechanisms seized of a dispute --  
 18 or aspects of a dispute -- in parallel is compatible  
 19 with the Treaty, it's not evident that this was the best  
 20 way to proceed. And it may be that the unusual  
 21 circumstance of a Court handing off to a Neutral Expert,  
 22 handing back to a court, is something that is  
 23 contemplated or workable under Article IX, but we'll  
 24 have to give some thought as to whether it fits within  
 25 this framework.

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16:14 1 It also takes us back to the question that you  
 2 raised, Mr Chairman, about a paragraph 13 challenge:  
 3 would it have to go back to another Court, or could it  
 4 conceivably come to this Court?  
 5 So we will take it away and give that some further  
 6 thought.  
 7 THE CHAIRMAN: Just to be clear, I was not contemplating  
 8 a passing-back to a Neutral Expert. I was really just  
 9 contemplating that you have a circle in which the  
 10 Neutral Expert can operate; you have then a broader  
 11 circle within which a Court of Arbitration can operate.  
 12 It seems to me it would be a natural thing for  
 13 a Court of Arbitration to receive questions that fall  
 14 both inside and outside the scope of what a Neutral  
 15 Expert could do, to first be deciding the broader  
 16 questions that are necessary before you can get to those  
 17 more plant-specific questions, and then decide the  
 18 plant-specific questions.  
 19 In other words, the way that Article IX is  
 20 structured seems to me to contemplate this possibility  
 21 of threshold broader questions, to be followed by  
 22 plant-specific questions; and that it could all stay  
 23 within the scope of that one Court of Arbitration, but  
 24 it could also be sequenced in terms of an initial award  
 25 and then a follow-on award.

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16:15 1 That was all I was trying to think through.  
 2 SIR DANIEL: Thank you, Mr Chairman. And that must  
 3 obviously be correct, because there are many examples,  
 4 including in the Great Hall of Justice across the way,  
 5 in which the ICJ has decided to sequence something: to  
 6 the parties, a direction, "Could you please address  
 7 this, and then we'll come and address the next thing  
 8 later".  
 9 And I do recall that one of the submissions that we  
 10 have made to you about competence, when we were still in  
 11 the halcyon days of thinking about coordination, I think  
 12 I recall standing here and handing up that A3  
 13 coordination document to you in the very first meeting,  
 14 and characterising it in terms of: let's deal with the  
 15 interpretation first, and let's deal with the  
 16 application second. So that may be a way of dealing  
 17 with it.  
 18 But we'll come back and give that some further  
 19 thought.  
 20 (4.16 pm)  
 21 Concluding observations and request for relief  
 22 SIR DANIEL: So, Mr Chairman, members of the Court, that  
 23 takes me to my hastily scribbled but nonetheless  
 24 typed-up remarks for closing. And as I say, I will cut  
 25 my cloth to fit the time, so I will conclude by 5.30,

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16:17 1 subject to the winds of questions blowing me off-course.  
 2 So my closing submissions are divided into four  
 3 parts.  
 4 First of all, I would like to make some brief  
 5 observations on issues of substance.  
 6 Second, I will turn to some framing considerations  
 7 for your task in this first phase on the merits. And in  
 8 particular, I'd like to make reference to the Competence  
 9 Award and PO6.  
 10 Third, I'd like to address what is to be addressed,  
 11 in what form and when. And that will pick up a little  
 12 bit on Professor Tanzi's submissions.  
 13 Then finally, what I'd like to do, very briefly, is  
 14 just to walk through our final submissions, and I will  
 15 ask my colleagues to put those on screen -- and that's  
 16 at Memorial paragraphs 13.29 and 13.30 -- just to make  
 17 a number of more focused observations and to draw these  
 18 to your attention. But our final submissions will be  
 19 made more formally on Tuesday afternoon, when we close  
 20 our case.  
 21 Beyond that, Mr Chairman, there will be some  
 22 housekeeping issues to be addressed which are relevant  
 23 to the second round. But I'll come to those, if you  
 24 don't already have those in mind, as I imagine you do.  
 25 Before I embark on these four stages, let me just

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16:18 1 make two preliminary observations. The first one is to  
 2 draw attention to chapter 13 of our Memorial and to  
 3 commend it for your very close attention.  
 4 Now, we, on our side of the podium, have been  
 5 sitting with rapt attention and enthusiasm as you've  
 6 taken us to the footnotes and the annexes and the  
 7 appendices, so we imagine that you've actually gone  
 8 through chapter 13 in close detail. But in case not,  
 9 we do commend it to your attention. And I will be  
 10 picking up themes from that chapter, and there will be  
 11 a detailed elaboration of the final submissions in due  
 12 course.  
 13 The second preliminary observation is really to pick  
 14 up on a theme that I think has been developing during  
 15 the course of the week, but I think most evident,  
 16 perhaps, in the context of the exchanges between the  
 17 Court and Dr Miles on the issue of pondage. And that is  
 18 that the interpretation of the Treaty is, of course,  
 19 going to be informed, and heavily informed, and properly  
 20 heavily informed, by engineering appreciations, but this  
 21 is ultimately a legal text that's going to have to be  
 22 interpreted for what it is, because this is the only  
 23 thing that is certain between the parties.  
 24 Dr Morris, when he donned his hat as a lawyer at the  
 25 close of his submissions, was talking about how, when he

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16:20 1 read the travaux préparatoires some years ago, no doubt  
 2 in the context of the Kishenganga case, his impression,  
 3 as an engineer reading the travaux, was that there was  
 4 not a great deal of meeting of the minds on really  
 5 detailed issues at the time of the negotiations, and  
 6 that the party were cajoled, pressured, influenced by  
 7 the World Bank to reach agreement.  
 8 And the text of the Treaty that we have is the only  
 9 agreement that we have by the parties: that's the text  
 10 to which they all put their signatures, even if that is  
 11 masked by disagreement. So the text is what we are left  
 12 with: this text of this, as it were, constitutional  
 13 instrument between the two states. So we've got a very  
 14 interesting and important interplay between the  
 15 engineering appreciations and the legal appreciations  
 16 which are going to be necessary here.  
 17 To some extent -- and I have to say, we are not  
 18 terribly clear on this ourselves -- but to some extent,  
 19 this may have been the approach that was intended in the  
 20 differentiation of the mechanisms between the Neutral  
 21 Expert process and the Court process: the Neutral Expert  
 22 process, which is a process which is just left to  
 23 engineering interpretation, but a much narrower process;  
 24 and the Court process, which is a process of legal  
 25 systemic interpretation, which is informed by

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16:21 1 engineering appreciations.  
 2 Of course, that's one of the reasons why, in  
 3 Annexure G, it is provided that at least one of the  
 4 members of the Court should be an engineer, so that the  
 5 engineering and the legal appreciations could come  
 6 together; and there will be at least -- or we assume --  
 7 at least one of the members of the Court who would be  
 8 a lawyer. It might have been that the appointing  
 9 authority from Imperial College might have appointed  
 10 a lawyer and the appointing authority from the US  
 11 Supreme Court might have appointed an engineer, but that  
 12 would have been a slightly unusual outcome.  
 13 So it's just to say that we are going to have to  
 14 find a way to bring the engineering appreciations and  
 15 legal appreciations together.  
 16 With that, I turn to my first substantive topic,  
 17 which is some brief observations on points of substance.  
 18 And I don't, in this context, propose to review and  
 19 repackage the argument of substance that we've heard  
 20 over the course of the last week. I've tried to do so  
 21 a little bit as we've gone along, and if I try and do so  
 22 now, I'm both going to run out of time and get them all  
 23 confused. But we will try and pick up some of the  
 24 themes again next week.  
 25 But there are, nonetheless, some closing threads

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16:22 1 that I think would be useful to draw together as we  
 2 conclude.  
 3 The first one is the framing issue of Article III  
 4 and Annexure D.  
 5 As I have listened both to our submissions and to  
 6 the Court's enquiry over the course of the last week,  
 7 I have to say I've been wondering whether we have  
 8 been -- through perhaps dint of circumstance, because  
 9 we are so buried deep in these issues -- that perhaps  
 10 we've been shining a light on issues less clearly or too  
 11 sharply on some issues. So I'm going to try just to  
 12 draw back a little bit and shine a spotlight on  
 13 particular rocks in the navigation channel which may  
 14 want steering around.  
 15 The first one is this framework of Article III and  
 16 then of Annexure D.  
 17 I think the starting point is that Pakistan has  
 18 a right of unrestricted use to the waters of the Western  
 19 Rivers. The starting point is not let flow. Let flow  
 20 is the obligation which is the corollary of the right.  
 21 The starting point is the right of unrestricted use. We  
 22 then have the corollary, which is India's obligation to  
 23 let flow, not to interfere, and no storage.  
 24 I think we've perhaps all been a little bit  
 25 bedazzled or confused or seduced by the concept of

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16:24 1 let flow because it is such an unusual concept, to think  
 2 of this in terms of a let-flow obligation. It's  
 3 a let-flow obligation, but it's an obligation that  
 4 arises under Pakistan's right of unrestricted use.  
 5 So we have the right of unrestricted use. We then  
 6 have India's corollary obligations: let flow, no  
 7 interference and no storage. And then we have,  
 8 underneath that, India's entitlement by way of exception  
 9 to generate hydroelectric power. So right, obligation,  
 10 entitlement by way of exception to generate  
 11 hydroelectric power.  
 12 And then we have the exercise of the exception,  
 13 which is not unrestricted; it is subject to tight  
 14 constraint. That's in Annexure D. And there is,  
 15 I think, a critically important point, which I also have  
 16 a sense perhaps in the cut-and-thrust of looking at some  
 17 of the entrails of the questions that we may be losing  
 18 sight of, and that is that India is not free to generate  
 19 hydropower however it wishes.  
 20 That's what the Treaty provides. It doesn't say,  
 21 Article III(2)(d), that India is entitled to generate  
 22 hydropower. It says, Article III(2)(d), that India is  
 23 entitled to generate hydropower in accordance with  
 24 Annexure D, and Annexure D is a tight constraint on how  
 25 they are able to do so. So it's not a self-standing

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16:25 1 free entitlement to exercise an exceptional right.  
 2 In this context, I suspect as well -- because we  
 3 have been so focused, at least on our side, and we may  
 4 therefore have lost sight of the wood for the trees --  
 5 we have perhaps lost a little bit of sight of what is  
 6 an absolutely critical and fundamental concept when  
 7 we come to dealing with unrestricted use, and that is  
 8 the principle of non-interference.  
 9 Because the principle of non-interference, and how  
 10 it is precisely defined in Article I, paragraph (15), is  
 11 a very important indicator of the balance that was  
 12 struck in the Treaty. We've had a lot of submissions to  
 13 you, but also a lot of questions from you to us, about  
 14 precisely what this balance is.  
 15 In a sense, the balance is to be found, in some  
 16 shape or form, in this term "interference with the  
 17 waters of", and the prohibition of interference, subject  
 18 to exception in Article III, paragraph (2). And if  
 19 I can just recall briefly -- and this does not need to  
 20 come up on the screen and you don't need to have a look  
 21 at it because we've looked at it already. But I(15)  
 22 says:  
 23 "The term 'interference with the waters' means:  
 24 (a) Any act of withdrawal therefrom; or ..."  
 25 And we're more concerned with paragraph (b):

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16:28 1 I'm not here talking about the grand bargains that I've  
 2 addressed you on, but I'll come back to those in just  
 3 a moment.  
 4 But it's useful, I think, and necessary for purposes  
 5 of your deliberations and the conclusion that you will  
 6 come to, to remember that this is not a one-sided  
 7 bargain. India got control and exclusivity over the  
 8 Eastern Rivers, subject to very, very, very tight  
 9 limitations for Pakistan. And it's important that the  
 10 Court does not lose sight of this. This is not simply  
 11 a bargain about how Pakistan has a right of unrestricted  
 12 use, and what is the extent of India's exceptional  
 13 entitlement to hydropower.  
 14 This is why we've been so concerned to talk to you  
 15 about the layering of the bargains. We've got the peace  
 16 bargain, which settled the peace. We've got the Treaty  
 17 bargain, which is the balance between the parties  
 18 between Article II and Article III. India got the use  
 19 of the Eastern Rivers; Pakistan got the use of the  
 20 Western Rivers. And it's only within Pakistan's side of  
 21 the bargain that this dispute is arising.  
 22 So what we have at the moment, in Pakistan's  
 23 submission, is a circumstance in which India, through  
 24 the stopping of the waters of the Eastern Rivers, wants  
 25 to bank its side of the bargain, and then have

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16:27 1 "Any man-made obstruction to their flow which causes  
 2 a change in the volume ... of the daily flow of the  
 3 waters ..."  
 4 Now, that's a pretty dramatic balancing scale.  
 5 Because what we have in Article III, paragraph 2 is  
 6 "thou shalt not interfere", subject to exception. And  
 7 the principle of non-interference says that  
 8 "interference" means: "Any man-made obstruction" --  
 9 a dam -- "which causes a change in the volume ... of the  
 10 daily flow of the waters". A dam is going to do that,  
 11 unless you just build the structure and let the water  
 12 flow through.  
 13 So it may be that when you come to think of this  
 14 balance, that it's going to be useful for you to think  
 15 about it with perhaps a little bit more granular focus  
 16 on the principle of non-interference, and in the way  
 17 that I've just described: unrestricted use; the  
 18 corollary obligations of let flow, no interference and  
 19 no storage; and then the entitlement by way of exception  
 20 to hydropower; but a tightly constrained exception.  
 21 I think at this point it's also perhaps useful for  
 22 me to remind us all -- and again, it's inevitable when  
 23 one gets drawn into the detail of the examination of the  
 24 small aspects of paragraph 8, what does this provision  
 25 mean that one loses sight of the bigger bargain. And

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16:30 1 an argument on Pakistan's side of the bargain about how  
 2 much it can get from us.  
 3 And you need to draw back and say, "This hydro  
 4 bargain does not operate in isolation: it operates  
 5 within the framework of the Treaty bargain, which is the  
 6 Article II, Article III; and the Treaty bargain operates  
 7 within the framework of the peace bargain". Because the  
 8 peace bargain is essential when it comes to determining  
 9 exactly where that balance should lie. And I suspect  
 10 a little bit that in the context of focusing on the  
 11 entrails of particular provisions, that there is a risk  
 12 that we may have lost a little bit of sight of that.  
 13 This brings me to the issue of weaponisation, about  
 14 which we've heard a lot: both to identify its importance  
 15 and the role that it has to play, but also to ensure  
 16 that it is not blown out of all proportion. Because as  
 17 Dr Morris and as Mr Akbar and as I and Ms Rees-Evans and  
 18 others have said, this is something which was driving  
 19 the negotiations that took place in the 1950s up to  
 20 1960. It's a returning concern on the part of Pakistan.  
 21 It is a speculative concern, but it is one that's  
 22 important. We need to understand it, and we need to  
 23 understand its role to play, and not to make it the  
 24 elephant in the room that is driving everything.  
 25 The threat of weaponisation of water was in the

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16:31 1 forefronts of the minds of the negotiators and it  
 2 remains a core concern. You heard the travaux  
 3 circumstances dimension from Ms Rees-Evans and you've  
 4 heard the real ongoing concerns that we've all  
 5 expressed. And this is relevant to an understanding of  
 6 the balance that was struck in 1960.  
 7 Ms Rees-Evans took you to an exhibit,  
 8 Exhibit P-0515, in which Mr Iliff, the World Bank's  
 9 chief negotiator, wrote at the time about Annexure D  
 10 that its provisions "certainly tie India up very  
 11 tightly". There was an understanding on the part of  
 12 everyone in the room, when the Treaty was signed in  
 13 1960, that the intent and the purpose and the effect of  
 14 Annexure D was to "tie India up very tightly".  
 15 It is not the task of dispute settlement, I would  
 16 say respectfully, it's not the task of dispute  
 17 settlement to prise open Annexure D and say, "We need to  
 18 give India a little bit more water than it was entitled  
 19 in 1960", or "We need to view the bargain a little bit  
 20 more narrowly". We need to view the Treaty for what the  
 21 Treaty is and was, which is a peace bargain, a treaty  
 22 bargain -- and Article II, Article III [bargain] -- and  
 23 then the hydro bargain, which proceeds on the basis of  
 24 a right, obligations which are corollaries of the right,  
 25 and then narrowly constrained exceptions.

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16:35 1 respective rights and duties as reflected in the Treaty  
 2 as a whole, the three bargains. And the balance is  
 3 between Pakistan's right under the primary rule and  
 4 India's entitlement under the exception.  
 5 India's approach, we say, would turn that enquiry on  
 6 its head, because it would be saying, "How much can we  
 7 get by way of the exception? And then let's see what  
 8 damage we do to the rule". You have to come to this  
 9 through the rule, and then come to the exception.  
 10 So relevant to the principle -- and you've heard  
 11 Professor Webb, you've heard me, you've heard others on  
 12 this ad nauseam, so I won't go into it in any detail at  
 13 all -- but relevant to the principle is that the  
 14 exception must be interpreted narrowly so as not to  
 15 diminish the headline rule.  
 16 Again, we say all three of the bargains -- the peace  
 17 bargain, the Treaty bargain and the hydro bargain -- are  
 18 all not only relevant to the interpretation but they are  
 19 absolutely necessary and mandated for you in your task.  
 20 Because this is the essence of the general rule of  
 21 treaty interpretation and the supplementary rules: that  
 22 you look not just at the words on the page, but you look  
 23 at their wider context, you look at good faith -- and  
 24 good faith brings this all in -- and you look at the  
 25 object and purpose of the Treaty, quite apart from the

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16:33 1 So, Mr Minear, to your question about how to balance  
 2 Pakistan's speculative concern about weaponisation with  
 3 India's entitlement to enough water for hydropower  
 4 generation -- and it may also be, Professor Buytaert,  
 5 that it's something that you asked about as well;  
 6 forgive me if my mind is a little bit unclear on the  
 7 provenance of the question.  
 8 But let me just say that I think Pakistan's response  
 9 is that we don't think that that is the balance that  
 10 needs to be accommodated, between Pakistan's speculative  
 11 concern about weaponisation and India's entitlement to  
 12 enough water to generate hydropower. The balance to be  
 13 struck is a much deeper, much more nuanced and much  
 14 wider-spread balance: it's the balance of the Treaty.  
 15 Because as I say, what we find at the moment is India  
 16 cutting off the waters of the Eastern Rivers, trying to  
 17 bank its side of the bargain, then coming to play in our  
 18 territory and saying, "We want more from you".  
 19 And we think that the task of the Court -- and it  
 20 comes back to paragraph 29 of Annexure G as well -- that  
 21 the task of the Court is to identify and determine and  
 22 specify what the balance was that was struck at the  
 23 time, not to enlarge it with a view only on the hydro  
 24 bargain, without the view of the Treaty bargain and the  
 25 peace bargain. So the balance is between the parties'

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16:36 1 circumstances of conclusion and the  
 2 travaux préparatoires.  
 3 Now, as a next point, I'd say that the terms of  
 4 Annexure D allow for, and warrant, consideration of  
 5 changing technologies, including for reasons of climate  
 6 change, to be taken into account.  
 7 You've heard a number of examples of how technology  
 8 may be relevant for India when it comes to addressing  
 9 its obligations under the Treaty. One such example  
 10 emerges because of advances in tunnelling technologies,  
 11 that Dr Morris spoke about. He also spoke about  
 12 innovations in the hydraulics when it comes to outlets,  
 13 and there's also the issue of the coating of turbines.  
 14 So there are lots of innovations in technology that we  
 15 say not just are permitted by the Treaty; we say they  
 16 are actually required by the Treaty.  
 17 India cannot come along to us and say, "We plan to  
 18 site a hydroelectric plant here. We are going to build  
 19 it with 1960s technology, and because of that, we are  
 20 required to flush, we are required to do all sorts of  
 21 other things". Our response is going to be: no, "sound  
 22 and economic design" requires sound and economic design  
 23 today. And if it's going to cost you a little bit more  
 24 to comply with your Treaty obligations because you site  
 25 your plant somewhere slightly different, so that you can

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16:38 1 build desanders, or that you spend an extra amount every  
 2 year or every five years or every ten years on coating  
 3 your turbines, or if you acquire the latest hydraulics  
 4 when it comes to outlets, that is what you have to do.  
 5 You are not building your plants on the Western Rivers  
 6 in the same way as you're building your plants in the  
 7 east of the country, where you have a much wider  
 8 entitlement.  
 9 This brings me to a point that I hope has come  
 10 through to you through all of our submissions.  
 11 India is designing its Western run-of-river plants  
 12 for the 5,000, not for the 201. And it's doing so on  
 13 the basis of generic countrywide standards that it  
 14 wishes to apply to the 5,000; and the 201 are  
 15 an irritant. Why does the CWC, the Central Water  
 16 Commission authority in India -- "Why", they may be  
 17 saying to themselves, "Why do we have to go and take our  
 18 well-developed, well-trying-and-tested standards off the  
 19 shelf, dust them down and see what changes we have to  
 20 make for the 201 plants that we are planning on the  
 21 Western Rivers?"  
 22 And our response is: India, you entered into  
 23 an arrangement with Pakistan in 1960 to resolve  
 24 differences and look to the future. You bound yourself.  
 25 In binding yourself, you had a reciprocal commitment

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16:40 1 from Pakistan, which also bound itself, to some benefit  
 2 to Pakistan but also to some detriment to Pakistan.  
 3 That bargain has to hold. And it is the responsibility  
 4 of the Treaty, and the dispute settlement mechanisms  
 5 under the Treaty, to hold India to that bargain, despite  
 6 the fact of its absence from the Court. India must  
 7 design its plants from the get-go, from the minute that  
 8 they come into the minds of the planners, with the  
 9 Treaty in mind.  
 10 Now India's case on the issues engaged by this phase  
 11 of proceedings can be found in its pleadings in the  
 12 Baglihar case, its pleadings in the Kishenganga case,  
 13 its engagements in the Permanent Indus Commission, its  
 14 public statements, in its correspondence. And Pakistan  
 15 has set out carefully its appreciation of India's case  
 16 throughout its submissions.  
 17 I come back to a point that I made in opening. And  
 18 it may have seemed like something that trips off the  
 19 tongue lightly, but it's not. India cannot strengthen  
 20 its weak case by the device of not coming here to  
 21 present it. And it raises a very significant issue  
 22 which I'll come back to in just a moment.  
 23 It is significant that India's run-of-river HEPs are  
 24 storing, in some instances, water by way of pondage as  
 25 if those run-of-river HEPs were designed as storage

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16:41 1 projects under Annexure E, instead of run-of-river HEPs  
 2 under Annexure D. And you've heard already, I think,  
 3 from Dr Morris and from others, that there is something  
 4 that is not congruent with the Treaty when one has this  
 5 appreciation. And this is a feature of the Baglihar  
 6 approach to the calculation of pondage.  
 7 India can build efficient HEPs on the Western  
 8 Rivers, sound of design and satisfactory and economical  
 9 in their workings, in compliance with the Treaty. There  
 10 are always workarounds. You've heard this from  
 11 Dr Morris. The design criteria of the Treaty do not  
 12 preclude sound and economical design of Western  
 13 run-of-river HEPs. And just to identify a number of key  
 14 considerations.  
 15 Compliance with the Treaty. When India comes to  
 16 plan its Western run-of-river HEPs, it must have in mind  
 17 the importance of complying with the Treaty. The  
 18 ability to comply with the Treaty is critical. It must  
 19 take compliance into account from the very conception of  
 20 the HEP. It cannot simply be shaped by compliance only  
 21 with Indian national standards, which may not be  
 22 Treaty-compliant.  
 23 Second, to return to a point that I made and that  
 24 others have addressed as well, site choice is crucial.  
 25 A small number of sites may be per se excluded because

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16:43 1 they would only work with drawdown flushing.  
 2 The example given by Professor Webb, the example  
 3 that I've just touched upon now, is if there are two  
 4 sites along the same stretch of river, one which may be  
 5 a little more accessible and a little bit cheaper, and  
 6 the other one which, notwithstanding that it's a little  
 7 bit more accessible, may allow desanders to be built,  
 8 then when India decides on the site, it's got to decide  
 9 on the basis of what will be Treaty-compliant. It may  
 10 be that there is marginally greater cost, but that  
 11 greater cost will come at the benefit of compliance with  
 12 the Treaty.  
 13 Now the issue of choice of site of course usually  
 14 happens before any engagement with Pakistan. And one of  
 15 the difficulties, the challenges for Pakistan, that  
 16 emerged, I think, most clearly from the Commissioner's  
 17 evidence to you and your examination of him, is that  
 18 India is not as forthcoming with the information that  
 19 it should be providing as the Treaty requires, and as  
 20 we would hope.  
 21 Professor Buytaert, I think you asked Dr Miles about  
 22 the provision of information relating to the load curve,  
 23 for example, and you took him back to the 1992 letter,  
 24 which was the beginning of the Baglihar dispute.  
 25 Now if I'm wrong in what I'm about to say, I will

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16:44 1 stand here and correct myself on Monday or Tuesday,  
 2 whenever it is. But I think one of the problems since  
 3 1992 is that as the disputes have progressed and as  
 4 these issues have remained unresolved, India is in fact  
 5 withholding information or not providing it in a timely  
 6 manner, and Pakistan is not able to engage in a fulsome  
 7 way.  
 8 Paragraph 9 of Annexure D requires that the full  
 9 design information has to be provided no less than  
 10 six months before, effectively, ground is broken. But  
 11 the Commissioner also took you to -- and I think so did  
 12 Professor Webb, and I've done so as well -- also took  
 13 you to Article VII, paragraph (2) of the Treaty, which  
 14 addresses future cooperation. Again, I don't invite you  
 15 to turn it up, but I want to just reads the words, so  
 16 that it's clear what they say. And VII(2) says:  
 17 "If either Party plans to construct any engineering  
 18 work which would cause interference with the waters ..."  
 19 Again, we come to "interference with the waters":  
 20 "If either Party plans to construct any engineering  
 21 work which would cause interference with the waters of  
 22 any of the Rivers ... which, in its opinion, would  
 23 affect the other Party materially ..."  
 24 And I should just interpolate here and say:  
 25 "which ... would affect the other Party materially [in

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16:47 1 other comments. I think you will see in the context of  
 2 both the Baglihar and certainly the Kishenganga dispute  
 3 that the initial concerns about Kishenganga in 1988 were  
 4 first picked up from press reports. And again, if I'm  
 5 misspeaking, I will correct myself on that, India is not  
 6 complying with its information-sharing obligations under  
 7 the Treaty, and that is a precursor to the compliance  
 8 with the design criteria in paragraph 8.  
 9 So I come back again to a point that I've touched  
 10 upon already, but just do so briefly.  
 11 Innovation in hydropower engineering, including as  
 12 regards sediment management, are permitted and are  
 13 required under the Treaty. And this includes the  
 14 availability of state-of-the-art tunnelling  
 15 technologies, turbine coatings, hydraulic improvements  
 16 of intake designs. These are entirely compatible with  
 17 the Treaty framework, and are called for by reference to  
 18 the language in 8(d), (e) and (f) of "sound and  
 19 economical design".  
 20 Every project has its own challenges. You've heard  
 21 this from Dr Morris; and I imagine that Dr Blackmore,  
 22 when it comes to your deliberations in private away from  
 23 us, will be able to inform you of all of his experiences  
 24 when it comes to dam design construction and operation.  
 25 Every project has its own challenges: geology,

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16:46 1 its opinion]", that obviously has to be a good faith  
 2 interpretation, because the siting of a HEP would  
 3 undoubtedly cause an interference with the waters. So  
 4 India cannot say to itself: well, Article VII(2) is not  
 5 engaged because this siting of a HEP doesn't materially  
 6 interfere with the waters. I mean, that would just be  
 7 nonsensical.  
 8 But in circumstances in which any engineering work  
 9 would cause an interference with the water, that party:  
 10 "... shall notify the other Party of its plans and  
 11 shall supply such data relating to the work as may be  
 12 available and as would enable the other Party to inform  
 13 itself of the nature, magnitude and effect of the work."  
 14 And we say -- and I think, Mr Minear, this was  
 15 perhaps in response to a question from you -- we say  
 16 that when India begins to contemplate the siting of  
 17 a HEP, it needs to come along to Pakistan in the  
 18 Commission -- that's the purpose of the Commission: it's  
 19 a standing body precisely for these purposes -- and say,  
 20 "We're thinking of siting the HEP over here. Let's have  
 21 a discussion about it".  
 22 Part of the difficulty -- and you will have picked  
 23 this up from what we've had to say already -- is that  
 24 Pakistan is, on occasion, having to identify where India  
 25 is planning to site its HEPs from press reports or from

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16:49 1 topography, hydrology, community and environment,  
 2 regulatory challenges. But there are always solutions,  
 3 if those challenges are addressed preemptively rather  
 4 than after the fact, but certainly not when the works  
 5 are sunk in concrete, as Pakistan is facing.  
 6 We initiated these proceedings on 19 August 2016,  
 7 when we had a concern about the Kishenganga dam. We  
 8 included in that original Request for Arbitration  
 9 a request for interim measures because we wanted to  
 10 forestall the works being sunk in concrete. The  
 11 World Bank sat on its hands for six years. Kishenganga  
 12 is sunk in concrete and operating.  
 13 Now in the Kishenganga proceedings, in the interim  
 14 award, there was some discussion about "own risk". And  
 15 "own risk" is all very well as a principle for lawyers  
 16 to talk about. It's going to be a very brave Court of  
 17 Arbitration indeed that's going to turn around to India  
 18 and say, "Tear down this dam".  
 19 So the design criteria are Pakistan's only  
 20 protection. They have to be got right from the outset,  
 21 because once it's sunk in concrete, facts on the ground  
 22 become very, very difficult to unwind.  
 23 I have three brief points of detail to recall about  
 24 pondage. You've heard a lot about pondage today, and we  
 25 have committed ourselves to coming back to a range of

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16:51 1 the questions that have been asked by members of the  
 2 Court next week. But just three points.  
 3 The definition of "Firm Power" under the Treaty,  
 4 which is the basis for the calculation of pondage, is  
 5 based on hydrology of the river, not on a plant's  
 6 installed capacity. And it must be so. It cannot be  
 7 that India could come along and say to Pakistan, "We  
 8 want to build a 2,000 MW plant, and because we want to  
 9 build a 2,000 MW plant on the Chenab River or on the  
 10 Neelum, you have to give us X amount of pondage". It  
 11 just does not comport with the *raison d'être* of the  
 12 Treaty to say that installed capacity is what drives  
 13 pondage. It's the hydrology of the river.  
 14 And it cannot be the place of the plant in India's  
 15 unilateral conception, in a dark room somewhere in  
 16 Delhi, about how much that particular plant is going to  
 17 be providing to the grid, the load of the plant, because  
 18 that could change from day to day to day to day, or  
 19 India could come to Pakistan and say, "This is the  
 20 amount that we consider that the plant in question will  
 21 provide to the grid", and give a massively overinflated  
 22 amount, just in order to get the pondage; and then to  
 23 use the pondage, have it sit around, or to have it  
 24 sitting there as a sword of Damocles over Pakistan's  
 25 head.

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16:52 1 So it's not the question of installed capacity, not  
 2 the plant's anticipated contribution to the grid.  
 3 And it's not the possibility either of secondary  
 4 power. 8(b) provides that in the design of the plant,  
 5 India must take into account the possibility of  
 6 secondary power. But secondary power is not to be  
 7 equated to pondage. That would be the flow of the  
 8 water, for example, during the monsoon period, when  
 9 water is plentiful. And you'll find the definition of  
 10 "Secondary Power" in paragraph 2(j) of the Treaty.  
 11 My second point about the calculation of pondage --  
 12 and I think, Mr Chairman, I think the Court certainly  
 13 has this, because it was an element of the exchange with  
 14 Dr Miles in which various members of the Court were  
 15 speculating about an even simpler approach than what we  
 16 thought was the most simple approach that we could come  
 17 up with.  
 18 But in essence, the calculation of the maximum  
 19 allowable pondage rests on two provisions of the Treaty,  
 20 and two provisions only: it rests on paragraph 8(c),  
 21 which is the formula for the calculation of pondage; and  
 22 that refers back to 2(i), to firm power. Other  
 23 provisions of the Treaty may be relevant in the margins,  
 24 or to test the analysis. But these two provisions of  
 25 the Treaty we think are the only two provisions that you

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16:54 1 need to take account of.  
 2 And I forget which members of the Court put their  
 3 finger on this, but it seemed to be very prescient  
 4 putting a finger on it, that the difference between  
 5 Pakistan's and India's approach is that Pakistan is  
 6 driven by hydrology, whereas India is driven by load.  
 7 There is a fundamental difference. There is just no  
 8 getting away from that fact. That's a fact that you're  
 9 going to have to grapple with. We think, obviously,  
 10 that our approach is driven by an authentic  
 11 interpretation of the Treaty.  
 12 If I could just read to you paragraph 8(c), but by  
 13 adjusting some of the words a little bit, just to remove  
 14 the language of pondage. It would say:  
 15 "The maximum [volume of usable water for operating  
 16 purposes] shall not exceed twice the [stored water]  
 17 required for Firm Power."  
 18 [If] we just take the confusion of this word  
 19 "Pondage" out of the picture, then we think it becomes  
 20 abundantly clear:  
 21 "The maximum [volume of usable water for operating  
 22 purposes] shall not exceed twice the [stored water]  
 23 required for Firm Power."  
 24 That will make it absolutely clear that what we're  
 25 talking about is hydrology; we're not talking about

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16:55 1 load.  
 2 Dr Miles put a slide on the screen which took you to  
 3 some of India's articulation of its position, and we  
 4 think that that's where the mangle started.  
 5 Then of course there is the definition of "Firm  
 6 Power" in [paragraph] 2(i). And I don't propose to go  
 7 into it; you've heard a lot about it already, and we may  
 8 come back to it next week. But the definition of "Firm  
 9 Power" in 2(i) is a definition that's based on  
 10 hydrology.  
 11 Now, we will come back, Mr Minear, to your question  
 12 in the last few days. One of the reasons why we've been  
 13 hesitating to do so, apart from the cadence of our  
 14 having to work up our submissions, is we want to go  
 15 back, I think, and have a look at those US cases I think  
 16 that you referred us to, if memory serves me: your  
 17 question about the extent to which, if you like, there  
 18 is a ghost of the normal meaning which somehow informs  
 19 the interpretation of a special meaning. But we will  
 20 come back to that next week.  
 21 Our view is that the calculation of pondage is based  
 22 solely on the hydrology of the river. And we don't see  
 23 how any other approach could work, because it would be  
 24 completely open to abuse by India, completely  
 25 unrealistic: my example of a 2,000 MW plant which bore

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16:57 1 no relationship to the flow of the river at all, and  
 2 then saying, "Well, we need to store this huge amount of  
 3 water by way of pondage because we are hinging it on  
 4 installed capacity, or we're hinging it on load, or  
 5 we're hinging it on some hypothetical backroom cook-up  
 6 of how much this particular plant is going to contribute  
 7 to the Indian electricity grid". It's not going to  
 8 play.  
 9 Once the calculation has been done on the hydrology  
 10 of the river, "Firm Power" under 2(i), this must  
 11 thereafter then be applied to the normal operation of  
 12 a run-of-river HEP. And it comes to the issue of the  
 13 operating cycle or some other time component: is it  
 14 daily, 24 hours, versus weekly?  
 15 I have to say quite candidly: this is an issue of  
 16 Treaty interpretation, because the Treaty does not say  
 17 it in terms. And we have struggled time and again. One  
 18 of the reasons why there's been a change in methodology  
 19 in Pakistan's calculation is that we've gone back to  
 20 Treaty to try and see what the best element is of the  
 21 time cycle. And you have seen this set out in our  
 22 Memorial, and Dr Miles has addressed it. And if needs  
 23 be, we'll come back to it again next week.  
 24 It seems to us, on the basis of a rigorous analysis  
 25 of the Treaty, that the only approach that recommends

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17:00 1 that there is a parallel process, which you've also  
 2 addressed in PO6. The exercise of competence, in the  
 3 circumstances, is also addressed in PO6, and this is  
 4 without prejudice to the coming phases.  
 5 So when you give your systemic interpretation in  
 6 your award in the first phase of the merits, you're  
 7 obviously going to have to have a very careful eye on  
 8 how this is going to play if the second phase on the  
 9 merits comes back to this Court and you then have to  
 10 address the Kishenganga plant and the Ratle plant. Or  
 11 how is it going to play if your systemic interpretation,  
 12 [in the] first phase on the merits, then goes to the  
 13 Neutral Expert, and the Neutral Expert is then going to  
 14 apply it to Kishenganga or Ratle. Or none of those, and  
 15 that we move on to a dispute in due course about some  
 16 other plant, and how is that going to be picked up in  
 17 practical terms. So it's going to have to be very  
 18 precisely and clearly calibrated, as I mentioned the  
 19 other day.  
 20 Now, it remains to be seen what happens with the  
 21 Neutral Expert process, insofar as what's on the public  
 22 record. I've already told you that there is going to be  
 23 a paragraph 7 competence hearing, which takes place in  
 24 September, again on the public record. Then there will  
 25 have to be a decision. We have reserved our position,

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16:58 1 itself is a 24-hour cycle, not only because that's the  
 2 approach that's written into the Treaty but because  
 3 that's the approach that seems to comport with -- or  
 4 does comport with -- the nature of these run-of-river  
 5 plants, in respect of HEPs in which there is a huge  
 6 seasonal variation of water. These are peaking plants  
 7 during the dry season.  
 8 So that's the time period. We think that this is  
 9 a question of Treaty interpretation, because it's not  
 10 written into the Treaty. Obviously it's informed by  
 11 engineering considerations. And one of the issues that  
 12 you will no doubt be discussing in your deliberations,  
 13 the lawyers and the engineers together, is whether, with  
 14 all the engineering learning on the Court, there is  
 15 anything other than a 24-hour cycle relating to the  
 16 operation of the plants that is relevant.  
 17 Now I know time is short. And I've spent more time  
 18 than I wanted on these opening provisions, but I thought  
 19 it was important to do so. But I'm going to go move on  
 20 quite quickly, if I may, to a number of framing  
 21 considerations for your task in the first phase of the  
 22 merits.  
 23 There are a number of documents and principles that  
 24 will frame your task. Your Competence Award says  
 25 competence without limitation. There is an appreciation

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17:01 1 in my submissions to you, about paragraph 13, if the  
 2 Neutral Expert goes beyond his competence. I hope that  
 3 doesn't arise.  
 4 So the first document that's going to frame your  
 5 deliberations is going to be your Competence Award.  
 6 Then there's going to be PO6, and I'll come back to  
 7 that in just a moment.  
 8 Then there is going to be Pakistan's Amended Request  
 9 for Arbitration, our Memorial, our hearing evidence and  
 10 submissions, and our final submissions. And that's  
 11 important for the reason that Professor Tanzi noted:  
 12 that obviously you are going to be, in some sense, bound  
 13 by our petita, the petita of our case. And that's one  
 14 of the reasons why, in our final submissions, it goes on  
 15 for two or three pages. We wanted to make sure that we  
 16 put into our request for relief everything that we could  
 17 think that we would need because we didn't want you to  
 18 be faced with a circumstance where we didn't ask for  
 19 something that you think you needed to address.  
 20 You're obviously going to be influenced by your  
 21 appreciation of India's case in the Baglihar and  
 22 Kishenganga pleadings, and other Indian documents and  
 23 materials, and Pakistan's characterisation of India's  
 24 case.  
 25 This brings me back to the point that I made earlier

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17:02 1 [that] India cannot strengthen its case by the device of  
 2 not being here.  
 3 There is a closely related and important  
 4 consideration to this, and that is that India cannot be  
 5 permitted, following your award, to challenge or dismiss  
 6 it on the ground that you based your award on a mistaken  
 7 appreciation of India's case, a case that might then be  
 8 hastily reconceived in the light of your award.  
 9 Mr Chairman, members of the Court, we do anticipate  
 10 that that is a very real risk, and a very real concern,  
 11 that you give your award on systemic interpretation and  
 12 then India, in some other place, at some other time,  
 13 says "This award cannot be relied upon" because India  
 14 was not here; it did not make its arguments; and, had it  
 15 made its arguments, the Court would have reached  
 16 an entirely different appreciation; so this is entirely  
 17 unsafe and unsound. In our view, that would be  
 18 consummate bad faith on the part of India, because it's  
 19 creating that circumstance by not appearing.  
 20 So when it comes to your consideration of the  
 21 res judicata aspects of your award, Mr Chairman, members  
 22 of the Court, we think that you need to grapple with  
 23 that with a firmness to ensure that your award doesn't  
 24 go off the rails if India doesn't like it -- of course,  
 25 you may find against us -- that it doesn't go off the

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17:05 1 Relevance of PO6.  
 2 PO6 is the origin of these proceedings; the  
 3 questions to which we were directed in paragraph 35.  
 4 But this proceeding, and your award in due course in  
 5 this systemic phase, is going to have to go beyond the  
 6 questions that are articulated in paragraph 35.  
 7 Also relevant are other elements of PO6, when it  
 8 comes to considering the scope of your award. Because  
 9 the dispute is not just a dispute about systemic  
 10 interpretation; it is also a dispute about the KHEP and  
 11 the RHEP. So you will have to have one eye on how your  
 12 award will or may be applied in other circumstances:  
 13 whether it's the KHEP or the RHEP, whether it's to other  
 14 of the 201 dams, hydroelectric plants, that India is  
 15 planning.  
 16 So I come back to the point that I made in opening:  
 17 this is not an advisory opinion, this is not  
 18 a hypothetical case. The award that you're going to  
 19 give is going to have to be real and concrete and able  
 20 to be applied.  
 21 The Court has reserved its position on the  
 22 competence of the Neutral Expert; that's PO6,  
 23 paragraphs 27 and 28. We are proceeding on the basis  
 24 that the Neutral Expert may be competent, but he hasn't  
 25 yet addressed his competence; that's a matter that

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17:04 1 rails by the mere device that India then throws up its  
 2 hands and says, "Didn't have our arguments, therefore  
 3 reached the wrong conclusion".  
 4 Now let me say, within the limits of what I am able  
 5 to say, what is in the public domain of the Neutral  
 6 Expert proceedings. Pakistan knows India's case, as we  
 7 have India's memorial in the Neutral Expert proceedings.  
 8 We cannot put it before you, at least not without the  
 9 permission of the Neutral Expert following a formal  
 10 application. We cannot make that application at this  
 11 point. But we know what India's case is.  
 12 Now I cannot say anything more about that. And in  
 13 due course, these issues may be relevant. I hope they  
 14 are not. But it is an issue that this Court needs to be  
 15 aware of, because this is a dispute that is going to  
 16 continue outside of this courtroom once you render your  
 17 award. So it is relevant in respect of the res judicata  
 18 aspect of your awards, or the awards that you will  
 19 issue.  
 20 Now beyond the issues addressed in the Competence  
 21 Award, in PO6, in all of the pleadings, our pleadings,  
 22 India's position, you will also need to consider  
 23 ancillary issues or other relevant questions that may be  
 24 required or warranted by your enquiry. And I'll come  
 25 back to this shortly.

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17:07 1 we will be coming to in due course. And as I have said  
 2 a number of times already, Pakistan has reserved its  
 3 position, particularly with regards to the paragraph 13  
 4 caveat.  
 5 What's also going to inform your award, we submit,  
 6 is your identification and articulation of "the general  
 7 duty of mutual respect and comity" in paragraphs 31 to  
 8 33 of Procedural Order No. 6. You set this out very  
 9 clearly, immensely clearly, but you only unpacked it  
 10 a little bit; and you only unpacked it a little bit in  
 11 the context of the organisation of the proceedings. You  
 12 didn't unpack it any further. It may be that when it  
 13 comes to your award, you will feel the need to unpack it  
 14 a little bit further so that everybody knows what this  
 15 general duty of mutual respect and comity actually  
 16 requires in the kind of circumstances with which we're  
 17 faced.  
 18 But this was the basis on which you organised your  
 19 proceedings. So it's going to be relevant to the way in  
 20 which you organise your award, and these  
 21 non-paragraph 35 elements will be relevant to what you  
 22 will need to address when it comes to the issues with  
 23 which you are seised.  
 24 So, in other words, you are not, we say, constrained  
 25 solely by the petita of our case. You are driven by the

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17:08 1 exercise of systemic interpretation in which you are  
 2 engaged. And there are ancillary questions of  
 3 interpretation relevant to Article III and paragraph 8,  
 4 and we have addressed some of these in our Memorial at  
 5 paragraph 13.19, and I will touch upon some of those in  
 6 just a moment.  
 7 So I turn to my next heading, which is, "What is to  
 8 be addressed, in what form and when?", and start off  
 9 with: what is to be addressed?  
 10 Obviously to be addressed are the paragraph 35  
 11 questions, and other specified questions, such as  
 12 question 35(a), which is the res judicata question.  
 13 There are also ancillary questions, because it is  
 14 unlikely that you will be able to just say in your  
 15 award, "This is the Court's answer to question 35(a),  
 16 (b), (c), (d) through to (g)". There are going to be  
 17 other things that you are going to have to address along  
 18 the way. And indeed, we have asked you in our petita to  
 19 address some other questions along the way. We've  
 20 identified some.  
 21 So, for example, in our Memorial at paragraph 13.18,  
 22 we have said:  
 23 "The Court's Award should also give the fullest  
 24 possible guidance to the Neutral Expert in the parallel  
 25 proceedings, and to any Neutral Expert who may be

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17:09 1 appointed in other cases in due course, to enable them  
 2 to determine differences of which they may be properly  
 3 seised without taking them beyond the bounds of their  
 4 competence as defined by Part 1 of Annexure F of the  
 5 Treaty."  
 6 Now as you come to address this within our petita  
 7 and as part of our Amended Request for Arbitration, you  
 8 may feel that you need to go beyond questions 35(a)  
 9 through to (g).  
 10 In Memorial paragraph 13.18, we have identified  
 11 that:  
 12 "... the Parties and any other dispute settlement  
 13 body that may come after this Court, should be as clear  
 14 as possible about the meaning of Paragraphs 8(a), (c),  
 15 (d), (e) and (f) ..."  
 16 Because these are going to be -- or may be --  
 17 relevant to other disputes.  
 18 And we anticipate -- and we've set this out in our  
 19 Memorial -- that there will be other relevant questions  
 20 that are engaged by the Court's enquiry. The unhappy  
 21 legacy of the Baglihar determination is not one that  
 22 you're going to be able to escape. We think that that  
 23 needs to be addressed, not for purposes of reopening  
 24 Baglihar but for purposes of actually setting the Treaty  
 25 and the interpretation mandate on the right track. It's

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17:11 1 going need to be addressed.  
 2 We have asked you expressly in our request for  
 3 relief to address the nature and character of the  
 4 Treaty, because we think that that is absolutely  
 5 essential to the proper exercise of interpretation. We  
 6 have asked you expressly, in the request for relief, to  
 7 address the relationship, for interpretative purposes,  
 8 between headline obligations and exceptions. We have  
 9 asked you expressly, in the request for relief, to  
 10 address best practices in the service of the Treaty, but  
 11 not in circumvention of it.  
 12 So we have, with apologies, but by intention, put  
 13 a very, very heavy load on your plate. We'll come back  
 14 to the issue of timing in just a moment.  
 15 But there are also some issues that are not on your  
 16 agenda in this phase, notably any dispute about the KHEP  
 17 or the RHEP. They're not on your agenda. They're not  
 18 before the Court. You don't have submissions and  
 19 evidence. You cannot possibly reach any conclusion  
 20 about the KHEP and the RHEP. And all of this is pending  
 21 clarification of the competence of the Neutral Expert.  
 22 I just say -- just so that I reference it, but we'll  
 23 come back to it in due course -- that Pakistan welcomes  
 24 the Chairman's summary of the five sequential steps for  
 25 applying sources of law practice that are at the heart

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17:12 1 of Pakistan's Memorial. This was at transcript Day 3,  
 2 pages 221 to 222, and we will come back to that. We  
 3 think that something along these lines is going to be  
 4 exactly what is required by the Court in order to give  
 5 us guidance.  
 6 So then I come to "in what form?" We have asked for  
 7 a narrative dispositif because we think that some form  
 8 of a dispositif which is more than merely a staccato  
 9 statement of short sentences is going to be necessary to  
 10 address the concerns that we have; that we have brought  
 11 to you in this dispute. Professor Tanzi has addressed  
 12 that. We think there is lots of scope for the Court to  
 13 write a dispositif as it thinks appropriate to address  
 14 the issues: a considered and reasoned award which --  
 15 through both its analysis and its conclusions, not just  
 16 its operative part -- is what is necessary to provide  
 17 guidance on interpretation and application.  
 18 The award will need to be, on these points, precise  
 19 and certain and in granular form. And to avoid  
 20 an unnecessary economy of reasoning, the operative part  
 21 is not constrained by the formulation of the questions  
 22 posed in paragraph 6.  
 23 So we then come to "when?"  
 24 Mr Chairman, you've already put on our agenda that  
 25 this is a big issue and it's going to take the Court

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17:13 1 more than six months. It's going to take the Court more  
 2 than six months plus six months, we expect. As I said  
 3 initially, and I'll say again, you will not have us  
 4 driving you or agitating for an award to be rendered  
 5 speedily. These are big issues: we want them to be  
 6 clearly considered. And we will look forward to getting  
 7 the award from you when we get the award.  
 8 As to the issue of the preliminary partial award,  
 9 Mr Chairman, as you raised, I'm going to come back to  
 10 that next week, rather than address it now, if I may.  
 11 So what I would like to do -- and I'm going to do  
 12 this very quickly, and we will certainly end by 5.30 --  
 13 is I'm going to ask my colleagues if they can put on the  
 14 screen our final submissions from our Memorial. That's  
 15 paragraphs 13.29 to 13.30. (Pause)  
 16 Perhaps you have them in front of you, in which case  
 17 we don't need the screen. While we're looking at that,  
 18 I'll just make one or two preliminary points.  
 19 So the final submissions -- with all the formality  
 20 of the signature of the Deputy Agent, and it will be  
 21 spoken probably by the Secretary of the Ministry of  
 22 Water Resources, who will be coming over the weekend, so  
 23 the most senior figure in the Ministry of Water will be  
 24 here, so you will have it from him, in a Pakistani  
 25 voice, not from counsel -- we will address next week.

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17:15 1 We will be, unsurprisingly, updating the final  
 2 submissions a little bit, but not in terms of substance  
 3 but just because, as you will see, there are passages in  
 4 the final submissions that refer to submissions advanced  
 5 and evidence adduced in the Memorial. And we are simply  
 6 going to be adding to that, and to the submissions  
 7 advanced and evidence adduced during the hearing, and to  
 8 any submissions that may be advanced and evidence  
 9 adduced in any post-hearing submissions that may be  
 10 directed by the Court.  
 11 So we will be updating the final submissions, but  
 12 only in terms of these admin points. We think that the  
 13 final submissions cover the ground sufficiently fully  
 14 that they stand up to scrutiny in the light of the  
 15 hearing, although we will of course review that when the  
 16 dust has settled on this week.  
 17 But I would just like to walk you through these  
 18 provisions just to make one or two passing points.  
 19 (Pause)  
 20 We're going to go down to paragraph 13.29 of the  
 21 Memorial. Obviously the reason for the detail of the  
 22 request is to ensure that everything that we thought we  
 23 might need are within the petita of the proceedings;  
 24 we didn't want to leave anything out.  
 25 So the chapeau of 13.29:

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17:17 1 "Having regard to the preceding, and the submissions  
 2 advanced in this Memorial ..."  
 3 To which we will add "this hearing":  
 4 "... Pakistan respectfully requests the Court:  
 5 A. To set out its findings on the issues engaged by  
 6 this Phase of the proceedings in a narrative dispositif  
 7 that elaborates in detail and in prescriptive terms the  
 8 overall interpretation and application of Article III  
 9 and Paragraph 8 of the Treaty, and in particular what is  
 10 required for purposes of compliance with the design  
 11 criteria of Paragraph 8 of Annexure D and [any] other  
 12 relevant ... provision[] of the Treaty ..."  
 13 I'm not going to read out the whole of the final  
 14 submissions, but just walk you through some of them. So  
 15 that's paragraph A, the narrative dispositif.  
 16 Then B:  
 17 "Having regards to the facts, evidence and law ...  
 18 to adjudge and declare:  
 19 (i) the nature and character of the Treaty, and the  
 20 bargains reflected in the Treaty in the terms addressed  
 21 in Chapter 7 [and our submissions] ..."  
 22 So here we are asking you to address the character  
 23 of the Treaty and the nature of the bargains: peace,  
 24 Treaty and hydro bargain. As we said in the Memorial,  
 25 we certainly do not intend to be prescriptive about the

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17:18 1 language that we use, the terms that we use. You will  
 2 come up with your own analysis. We are not looking for  
 3 you to rubber-stamp our analysis, but we are asking you  
 4 to address those issues.  
 5 Then:  
 6 "(ii) the binding or otherwise controlling effect of  
 7 the decisions of past dispute resolution bodies  
 8 addressed in Chapter 8 ... and elsewhere in [the]  
 9 Memorial, with respect to:  
 10 (a) the parties;  
 11 (b) the present proceedings before the Court;  
 12 (c) the present proceedings before the Neutral  
 13 Expert; and  
 14 (d) future proceedings before a court ... or  
 15 a neutral expert ..."  
 16 So, Mr Chairman, we had, in this aspect of our final  
 17 request for relief, perhaps precisely in mind not  
 18 necessarily the timing of it, but that your award will  
 19 deal with exactly the kinds of issues that you are  
 20 contemplating under 35(a). And we will address that in  
 21 due course next week.  
 22 Then:  
 23 "(iii) the relationship, for interpretative  
 24 purposes, between ... the headline obligations ... and  
 25 ... the exception[s] ..."

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17:19 1 We are asking you to address that.  
 2 "(iv) that engineering 'best practices' can and must  
 3 be used for purposes of complying with the design  
 4 criteria and operational constraints in Part 3 of  
 5 Annexure D of the Treaty, but that 'best practices'  
 6 cannot be relied upon to circumvent the requirements of  
 7 the Treaty ..."  
 8 We are asking you to address that. Because that  
 9 will make it clear to India that it can and should and  
 10 must use best practices in complying with its Treaty  
 11 obligations, but it cannot use best practices as  
 12 an excuse, as a device to get outside the scope of  
 13 the Treaty.  
 14 "(v) with respect to the interpretation and  
 15 application of Paragraph 8(d) ... what is to be taken  
 16 into account ... what is to be excluded ...", et cetera.  
 17 Then the subsequent paragraphs go through these  
 18 sequentially. So (v) is paragraph 8(d), (vi) is  
 19 paragraph 8(e), (vii) is paragraph 8(f), (viii) is  
 20 paragraph 8(c), (ix) is paragraph 8(a).  
 21 And then we've got two hold-alls, unsurprising, very  
 22 common in requests for relief:  
 23 "(x) any other findings as the Court may consider to  
 24 be necessary or warranted for purposes of providing  
 25 controlling guidance on the interpretation and

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17:22 1 elements that are set out there are requests for  
 2 post-award directions:  
 3 "To convene a case management conference of the  
 4 Parties for the purpose of considering:  
 5 (i) the status of ... parallel proceedings ...  
 6 (ii) what engagement, if any, the Court should  
 7 undertake with ... the Neutral Expert ...  
 8 (iii) the need for directions ..."  
 9 Now I should say, it's not just post-award  
 10 directions, because it may be -- and this is completely  
 11 compatible with your procedural orders and your  
 12 Supplemental Rules -- it may be that we feel the need to  
 13 come to you before your award on these issues to raise  
 14 some of these points. But the intention of these  
 15 further requests for relief was to set an anticipatory  
 16 agenda of how things would move forward.  
 17 So then we have B:  
 18 "To give such directions as may be necessary and  
 19 warranted for the scheduling and conduct of further  
 20 phases of the proceedings ..."  
 21 Because you will not become functus officio, you  
 22 will not go off into this good night once you render  
 23 your award. You will be here.  
 24 "To reserve any issue of costs in respect of the  
 25 present phase of the proceedings for decision by the

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17:20 1 application of, and relationship between: ..."  
 2 Article III, 8(a), 8(c) 8(d), 8(e), 8(f).  
 3 And then:  
 4 "(xi) such other findings as the Court may consider  
 5 to be necessary or warranted."  
 6 So we hope -- and certainly this was our purpose and  
 7 intention -- that we have encapsulated within these  
 8 requests for relief everything that we think is going to  
 9 be necessary from the Court's systemic interpretation  
 10 award in this first phase on the merits. It's a very  
 11 big task, we recognise that. This is a dispute that has  
 12 been brewing from 1992: we think it's time that it is  
 13 resolved.  
 14 The only way that Pakistan and India are going to be  
 15 able to move forward, when it comes to broader issues  
 16 about climate and broader issues about water, is if  
 17 there is certainty, clarity, an affirmative dispositive  
 18 statement about what was agreed in the past, what should  
 19 be applied in the present. The platform for the future  
 20 is certainty about the past and agreement about the  
 21 present. We need a platform that has got deep roots.  
 22 Then we can look to all the huge challenges of the  
 23 region.  
 24 And then we've got 13.30, which is Pakistan's  
 25 further requests to the Court. And really the four

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17:23 1 Court in due course ..."  
 2 And I note that one of the reasons why we are  
 3 reserving the position on costs is not necessarily to  
 4 anticipate that you will be issuing an award on costs  
 5 and there will be big questions about costs in  
 6 inter-state proceedings, but you will recall -- because  
 7 this is addressed expressly in Annexure G of the  
 8 Treaty -- that the parties are to share the costs. The  
 9 costs are only being paid by Pakistan at the moment.  
 10 And we may want to come back to you on this question  
 11 of costs. Because India should be on the other side of  
 12 the courtroom, it should be paying its fair share. It  
 13 is a Treaty partner. Pakistan is, in the Neutral Expert  
 14 proceedings, it is paying its costs, it is doing its  
 15 duty as a good Treaty partner. We expect India to be  
 16 here, not to be laying the groundwork for challenges in  
 17 due course. So we may very well wish to come back to  
 18 you on the issue of costs.  
 19 And then finally, and this is important, our request  
 20 that you "remain seised of the dispute".  
 21 You have determined in the competence phase that you  
 22 are competent in respect of the whole of the dispute.  
 23 When, Mr Chairman, your signature or all of your  
 24 signatures go on the bottom of that award in due course,  
 25 it is not your final award; it is your partial award on

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17:25 1 the first phase of merits on systemic interpretation.  
 2 It is not the final award. You will be required to  
 3 remain functus.  
 4 Mr Chairman, that's the end of my substantive  
 5 submissions. I note only that there are one or two  
 6 necessary housekeeping points that we need to address.  
 7 Because you have left to us, by your letter of 27 May,  
 8 to decide when we want to come back to you: whether it's  
 9 Monday or Tuesday, or both Monday and Tuesday. And of  
 10 course we are not yet in a position to make that  
 11 decision because we don't know how many thousands of  
 12 questions you're going to be putting to us.  
 13 THE CHAIRMAN: Thank you very much, Sir Daniel. I think  
 14 I can advertise already it will not be in the thousands  
 15 range --  
 16 SIR DANIEL: I'm so relieved by that!  
 17 THE CHAIRMAN: -- and I don't think in the hundreds range  
 18 either. I won't go further than that though.  
 19 Let me just turn to my colleagues to see if they  
 20 have questions for you, based on your presentation.  
 21 I have a few, which I don't expect you to answer now,  
 22 but it may just help to hear it orally as you work over  
 23 the weekend.  
 24 (5.26 pm)  
 25 Questions from THE COURT

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17:28 1 and said, "You have the world's expert on sedimentation,  
 2 Pakistan, we are trying to decide where to site our  
 3 plant: could we borrow him for purposes of working out  
 4 where the desander should be located?"  
 5 Now that may be at the conception stage. There may  
 6 be a Treaty interpretation [point] that I need to come  
 7 back and give to you. But that timing, I think, is  
 8 going to depend on whether the Treaty is an instrument  
 9 that is bringing adversaries, who are scratching at each  
 10 other, together or bringing friends who are cooperating  
 11 together. That may be the reality of it.  
 12 But there is VII(2), and we will see whether we can  
 13 give you a more granular legal response.  
 14 THE CHAIRMAN: Well, I certainly take from that response:  
 15 the earliest possible point in time.  
 16 SIR DANIEL: Yes.  
 17 THE CHAIRMAN: I think I was reacting a little bit to your  
 18 hope that we engage in relatively granular discussion of  
 19 these issues, and that granularity in part may turn on  
 20 a sense of -- at least in Pakistan's mind -- when is it  
 21 exactly that this type of obligation kicks in. Because  
 22 so far, the statements have been pretty general in  
 23 nature in that regard.  
 24 SIR DANIEL: I think as far as granularity goes, I wrote  
 25 down in quotes the Chairman's statement "earliest

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17:26 1 THE CHAIRMAN: So first, you did raise Article VII,  
 2 paragraph (2) in your remarks. And the basic question  
 3 there is: what does Pakistan think is somewhat more  
 4 precisely the moment at which India is obligated to  
 5 cooperate in the sense meant in Article VII,  
 6 paragraph (2)?  
 7 I'm reminded in part, I think it was the first site  
 8 expert's presentation about the differing stages of the  
 9 planning process: pre-feasibility studies, feasibility  
 10 studies and so on. But a little bit more granular  
 11 information from you as to when it is that obligation  
 12 would kick in in Article VII, paragraph (2), sentence 1;  
 13 recognising that it may not be the same as sentence 2,  
 14 when Pakistan itself can request information.  
 15 SIR DANIEL: Mr Chairman, should I give you a very quick  
 16 response now, which is not a legal response but it's  
 17 going to be relevant to the point?  
 18 That is that if, as we would hope, the parties are  
 19 good Treaty partners, that would happen immediately.  
 20 Because these are -- Dr Morris described this as -- the  
 21 Treaty divided the watersheds. But these are rivers  
 22 that the parties share. Pakistan has a huge amount of  
 23 expertise and obviously a very significant interest, as  
 24 the downstream riparian.  
 25 I mean, just imagine the Nirvana if India came along

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17:29 1 possible moment in time". That's good granularity.  
 2 THE CHAIRMAN: Okay. Well, you can ponder whether that's  
 3 a standard that reads well in an award.  
 4 Let me turn to my second question. It relates to  
 5 the pondage issue. Dr Miles took us through the basic  
 6 sequence by which Pakistan envisages that pondage should  
 7 be calculated. And the second step, as I understand it,  
 8 basically in that sequence is to look at an equation  
 9 that includes mean minimum discharge, but also things  
 10 relating to generating head and efficiency and water  
 11 density and gravity.  
 12 Ultimately though, it didn't seem to me that that  
 13 step in the process actually fed into the calculations.  
 14 It seemed to me that they were very much hydro-oriented;  
 15 and that once you determine the MMD, you can immediately  
 16 move to the step of looking at the pondage required for  
 17 firm power without doing any of those other calculations  
 18 that are more plant-specific.  
 19 So it wasn't clear to me why that was even part of  
 20 the calculus. And again, you can address it now if you  
 21 wish, but I'm happy to hear in due course.  
 22 SIR DANIEL: I'm happy to defer that to in due course.  
 23 THE CHAIRMAN: Okay.  
 24 The third question was: you spoke a bit in your  
 25 presentation about the issue of why daily rather than

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17:31 1 weekly is appropriate. That certainly is also something  
 2 Dr Miles spoke about. The presentations seemed very  
 3 oriented to the Treaty, which is entirely proper,  
 4 looking at the particular language and when it is that  
 5 "weekly" and "daily" appears.  
 6 It seemed less oriented toward looking at what might  
 7 have been in the minds of the drafters of the Treaty.  
 8 And to the extent that we're operating in a space where  
 9 I think we all recognise there's a little bit of  
 10 uncertainty about that time period -- you were quite  
 11 clear in your Memorial on that, and you have been here  
 12 too -- it strikes me that it's worth looking perhaps  
 13 also at the contemporary literature of the time, of the  
 14 type you've been presenting to us -- the Corps of  
 15 Engineers and others -- and perhaps assessing whether we  
 16 think it would have been common to do a weekly analysis  
 17 as opposed to a daily analysis.  
 18 That doesn't necessarily answer the question.  
 19 I realise we're in a Treaty-specific context here. But  
 20 to the extent that we're trying to surmise what was in  
 21 the minds of the drafters, it seems to me that perhaps  
 22 hearing a little bit more from you on that issue might  
 23 be helpful.  
 24 SIR DANIEL: And I can give you not a preliminary response  
 25 but a little bit of context for that, because I think

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17:33 1 and look at that again, and you can help me with that in  
 2 due course on Monday or Tuesday. But that's the type of  
 3 assessment that I think we need to at least address in  
 4 some fashion.  
 5 SIR DANIEL: And to be clear, we are not saying that there  
 6 are no references, for example, in the Treaty to  
 7 "weekly". There are. We find references to "weekly" in  
 8 paragraph 2(c), which is the definition of "Pondage".  
 9 But when you look across the whole of the Treaty,  
 10 the operating framework that seems to have informed the  
 11 drafting of the Treaty seems to be a 24-hour period.  
 12 And that's unsurprising, because these are intended as  
 13 peaking plants. And as Dr Miles has drawn to your  
 14 attention, the "twice the [amount of] Pondage required  
 15 for Firm Power" was intended, we understand, to be, as  
 16 it were, a backstop for India, overly generous. It's  
 17 not only what you require for firm power, but it's twice  
 18 what you require for firm power, on the basis that these  
 19 plants would operate probably in the morning, probably  
 20 in the evening, but as peaking plants.  
 21 But again, we'll come back to all of that.  
 22 THE CHAIRMAN: Yes, I think the Treaty analysis is quite  
 23 clear. What to me is less clear is the literature  
 24 surrounding the Treaty, where, even for peaking plants,  
 25 it doesn't seem that they're necessarily looking at

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17:32 1 that we will be able to address this comprehensively.  
 2 Some of our number have a whole library now of 1950s  
 3 civil engineering dam construction manuals. So we've  
 4 got them all, the Creager & Justin and all the rest of  
 5 them.  
 6 You will also recall from our Memorial that we took  
 7 the trouble to go to Stanford and have someone examine  
 8 the archives of Raymond Wheeler in case there was  
 9 anything in his private papers. I think we cite to them  
 10 once or twice, but we didn't find anything illuminating  
 11 in General Wheeler's papers.  
 12 But we have looked at exactly that, at the  
 13 contemporary issues. And I think that informed our  
 14 appreciation, because our appreciation was informed not  
 15 simply by the legal interpretation but by the further  
 16 testing of the approach that we've settled upon by  
 17 reference to the conception of what run-of-river HEPs  
 18 were intended to be when it came to the negotiation of  
 19 the Treaty in 1950 and the early 1960s. So without  
 20 doubt, we will be able to provide you with information  
 21 on that.  
 22 THE CHAIRMAN: That would be helpful.  
 23 You mentioned the Creager manual: my impression was  
 24 it used a weekly load curve as it assessed the normal  
 25 approach, as opposed to a daily. I may have to go back

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17:35 1 a daily load but at a weekly load. But again, you can  
 2 just take a look at that.  
 3 My fourth question was that I was a little bit  
 4 confused: it seemed that you said at the outset that the  
 5 Court was limited by your petita, but then towards the  
 6 end of your presentation you said we could go outside  
 7 the petita. Now maybe I misheard you, maybe you  
 8 misspoke. But could you just clarify on that point?  
 9 SIR DANIEL: Yes, indeed. You didn't mishear me, I didn't  
 10 misspeak, but perhaps I spoke incompletely.  
 11 You are confined by our petita insofar as that is  
 12 the case that we have presented to you: the Amended  
 13 Request for Arbitration and then our request for final  
 14 relief. But as you proceed in your analysis, you are  
 15 going to -- or you may very well -- come across issues  
 16 that you consider you have to address to make your  
 17 analysis work.  
 18 So the petita, I think, confine the relief that you  
 19 can give to us, but I don't think that the petita define  
 20 the boundaries of your analysis. And if, as part of  
 21 your analysis, you consider that you have to or that you  
 22 should address issues because they are ancillary,  
 23 because they are necessary, because otherwise the  
 24 foundation for your conclusions will not be arrived at,  
 25 then you can address that.

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17:37 1 And the clearest example is that we haven't said in  
 2 our request for final relief -- we haven't asked you in  
 3 terms to say that Raymond Lafitte got it wrong. You may  
 4 consider, as the Kishenganga Court considered, that you  
 5 may wish to say that, because that will be the clearest  
 6 way of saying that the Neutral Expert in the Baglihar  
 7 case got it wrong.  
 8 So you heard me correctly, but I just didn't  
 9 complete the rest of the sentence.  
 10 THE CHAIRMAN: That's very helpful, thanks.  
 11 The final question, before we talk about  
 12 housekeeping, was: in the course of the presentations,  
 13 including your own, it has struck me that this issue of  
 14 practices, best practices, has as a component: should we  
 15 be looking at global practices, should we be looking at  
 16 Indian practices? And my understanding from your  
 17 presentations is: it's not sufficient to look at just  
 18 Indian practice; we need to be looking at best practices  
 19 on a broader scale.  
 20 I'm wondering whether you can say more about that in  
 21 the context of dams being built in a particular area of  
 22 the world, the Himalayas, dams being built by  
 23 a particular country in that area of the world.  
 24 I fully understand that this is not an issue that's  
 25 of interest to a single country: it is a transboundary

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17:39 1 issue at a minimum. But I haven't seen yet any  
 2 discussion of why, in this particular context, just  
 3 Indian practices -- or just maybe Indian and Pakistani  
 4 practices -- alone are not sufficient to satisfy the  
 5 requirements of the Treaty, as opposed to looking at  
 6 more, say, regional or more important perhaps global  
 7 practices.  
 8 So if there's anything more you can do on that,  
 9 I would be interested in it.  
 10 SIR DANIEL: We will, certainly. And let me give you just  
 11 an initial observation.  
 12 First of all, you will recall that when I walked  
 13 through the provisions of Annexure D with you, I think  
 14 on Tuesday morning -- it seems like a long time ago now,  
 15 but on Tuesday morning -- I took you to paragraph 2.  
 16 And one of the points that I made about paragraph 2, the  
 17 definitional paragraph, was that it gives very precise  
 18 and bespoke and special meanings to certain terms. And  
 19 I think there are ten of them there, (a) through to (j).  
 20 I also identified that there were some terms that  
 21 arise in paragraph 8, for example, that were not the  
 22 subject of definition. So, for example, paragraph 2  
 23 does not provide a definition for "sound and economical  
 24 design" or "satisfactory operation of the works";  
 25 it just doesn't do that.

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17:40 1 Now I suspect -- and I will consult with our travaux  
 2 guru, Laura Rees-Evans, to see whether there is any sort  
 3 of learning on these issues -- but that will have fed  
 4 into Professor Webb's submissions. I suspect that there  
 5 is a very good reason why those were not subject to  
 6 definition, because those were intended to provide  
 7 a degree of flexibility over time to allow best  
 8 practices to come in. "Sound and economical design" is  
 9 not something that you can crystallise in time; reify in  
 10 time. So that's the first point.  
 11 The second point is [that] it's quite clear that it  
 12 cannot just be by reference to Indian standards.  
 13 Because if it was just by reference to Indian standards,  
 14 who knows what: we may find that there is a guideline or  
 15 a standard or a regulation or a law that we are simply  
 16 presented with which says, "This has just passed the  
 17 Parliament in Delhi, this is what the law is, this is  
 18 Indian law, this is the only thing that's controlling".  
 19 This is a Treaty. This is a Treaty of a very  
 20 special character. So that's why it cannot just be  
 21 Indian standards. And indeed, I think our view would  
 22 be -- and I'm sure that my Pakistani colleagues and  
 23 those who can and will instruct me would not say -- that  
 24 this can just be Indian and Pakistani standards, because  
 25 "best practices" means best practices.

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17:41 1 But the reason why this point is so important, and  
 2 why I've put before you the formulation that we have,  
 3 which is best practices in the services of the Treaty  
 4 and not in circumvention thereof, is that India has said  
 5 to us, or said in the Kishenganga proceedings, perhaps  
 6 in the Baglihar proceedings, that Pakistan is trying to  
 7 restrain India's use of best practices and it cannot be  
 8 permitted to do so.  
 9 We are taking India head-on on this. India is  
 10 required to use best practices when it chooses the site;  
 11 when it designs the dam; when it constructs the dam;  
 12 when it operates the dam. It cannot have a best  
 13 practice in terms of the design, and then use concrete  
 14 that is just going to collapse and cause a catastrophic  
 15 failure. India is required to use best practices when  
 16 it comes to sound design and the operation of the plant.  
 17 So we will return to it in more detail, but that's  
 18 a preliminary response to what ...  
 19 THE CHAIRMAN: Mr Minear.  
 20 MR MINEAR: Sir Daniel, I want to express my appreciation  
 21 for the tolerance your team has shown to my many  
 22 questions, including Dr Miles today. I know I tend to  
 23 interrupt progress. So if I can help you in a small  
 24 respect, I'd like to.  
 25 You mentioned my reference to two American cases on

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17:43 1 the second day that say something about the American  
 2 approach to the ordinary meaning of defined terms.  
 3 I think Professor Webb answered that question for me  
 4 adequately. But if you want to reflect on those cases  
 5 further, one is called Bond v United States, 572 US 844,  
 6 a 2014 decision; the other is Sackett v EPA, which is  
 7 598 US. It doesn't have a page number yet because it's  
 8 a 2023 decision. They both pop up on Google: they're  
 9 major American cases.  
 10 But like I say, I think they've been adequately  
 11 answered for my concerns.  
 12 SIR DANIEL: Thank you very much. That may mean that  
 13 Professor Webb doesn't have to work over the weekend  
 14 becoming an expert in US law! But thank you very much  
 15 for that. That's very helpful.  
 16 THE CHAIRMAN: I think then we are left with just a few  
 17 housekeeping issues.  
 18 So let me start this off by noting that we do  
 19 anticipate providing written questions to Pakistan, and  
 20 our intention is to meet the noon deadline tomorrow that  
 21 we had in mind for doing so. Some of those questions --  
 22 perhaps even most of those questions -- are ones that  
 23 we've already asked, but we wanted to be sure that they  
 24 would be on your radar screen. There may be some new  
 25 ones that we hadn't raised. And there may be ones that

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17:44 1 you would like to address that we don't put on our list,  
 2 and you're certainly free to do that. But we will try  
 3 to give you those questions to help you organise your  
 4 presentations.  
 5 At present, we do have Monday and Tuesday scheduled  
 6 as full days for the hearing. As you indicated,  
 7 Sir Daniel, we have left it to Pakistan to decide how  
 8 they want to approach it: do you want to begin at 9.30  
 9 on Monday, do you want to begin Monday afternoon  
 10 instead? The question would be then: when might you be  
 11 in a position to alert the Court as to your preference  
 12 in that regard? And so I invite you to speak to that  
 13 issue.  
 14 SIR DANIEL: Thank you, Mr Chairman.  
 15 The short answer is that at the moment we don't  
 16 know, because we'd like to wait and see your questions.  
 17 We will obviously reflect on what we have, questions  
 18 from the transcript, now. You will forgive us if there  
 19 is a brief moment of decompression before we get sucked  
 20 back into the mill.  
 21 I think what I can say for certain is that, all  
 22 other things being equal, we will certainly use Tuesday.  
 23 The question is whether we would want to use Monday as  
 24 well, and all of Monday or part of Monday.  
 25 If I may, perhaps we could come back, through

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17:46 1 Mr Schofield, maybe initially but perhaps finally on  
 2 Saturday evening with a sense of this. But perhaps no  
 3 later than, let's say, 11 o'clock on Sunday morning, so  
 4 that there is time to plan. But we will try and do that  
 5 as quickly as possible.  
 6 At the moment, I think our sense is that there are  
 7 lots of thing that we would like to say, because it's  
 8 difficult to respond to questions from the microphone.  
 9 But that, at the moment, probably we would be able to do  
 10 it in one day, so it's a question of whether we will  
 11 need two.  
 12 THE CHAIRMAN: That timing I think is certainly agreeable to  
 13 the Court.  
 14 Once you've determined the period of time when you  
 15 would like to be presenting, I think it would be  
 16 helpful, 30 minutes before that commencement, for the  
 17 Court to receive from you an indication of your expected  
 18 line-up of speakers and basic topics that they might be  
 19 addressing, if that's feasible. It doesn't have to be  
 20 particularly granular, to use a word we've been  
 21 invoking, but it would help give us a little bit of  
 22 a sense of the progression as we move into that period  
 23 of time.  
 24 SIR DANIEL: We'll certainly do so.  
 25 THE CHAIRMAN: That would be great.

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17:47 1 One thing we haven't touched upon is the possibility  
 2 of post-hearing submissions. So I just wanted to flag  
 3 that as something that you may want to be taking into  
 4 account as we move into this second part of the hearing.  
 5 We certainly do have the documents still coming in  
 6 on the schedule that was previously set. But the  
 7 further question would be whether, at the end of this  
 8 hearing, you see a need for some sort of post-hearing  
 9 submission. The Court will certainly be bearing this in  
 10 mind as well. If we feel that there's a particular  
 11 issue that we need something more from you on, we might  
 12 be in a position to alert you to that on Tuesday. But  
 13 we might not: it might be something that we have to  
 14 think about a bit and then come back to you in due  
 15 course.  
 16 SIR DANIEL: Well, as we have given it some thought, I can  
 17 give you some initial reactions.  
 18 First of all, I think we would find it useful,  
 19 because we think it would be helpful to the Court if the  
 20 additional documents that we produce by the intended  
 21 time of 30 September do come under cover of  
 22 a post-hearing submission -- or a transmittal document;  
 23 let's not call it a post-hearing submission -- because  
 24 I think we would like to be able to say to you, for your  
 25 own knowledge and comfort, the searches that we've

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17:49 1 undertaken, and if there have been any decisions that  
 2 we've had to take about relevance.  
 3 So I think regardless of any substantive  
 4 post-hearing submissions, I think it would be useful  
 5 that you do not just get a dump of documents but you get  
 6 an explanation that accompanies those documents.  
 7 On the question of whether there should be, as it  
 8 were, real post-hearing submissions, we will obviously  
 9 reflect on that, as to whether there is anything that we  
 10 feel we've elucidated less well. But we're also going  
 11 to be very much driven by the Court's sense.  
 12 For example, just to come back to the Baglihar  
 13 issue, if you wanted from us something that addressed  
 14 the detailed technical argument, and how the pondage  
 15 calculation was undertaken in Baglihar, then we would  
 16 need a little bit of time to work that up, and that  
 17 would come in post-hearing submissions.  
 18 In this context though, I also just add for the  
 19 Court's consideration, that you made it clear -- and we  
 20 made it clear in the applications that we made -- that  
 21 India should have an opportunity to comment on the new  
 22 documents that we put in. And your practice after the  
 23 competence hearing was that India was given  
 24 an opportunity to comment on the documents within  
 25 a particular period of time.

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17:51 1 course, if they receive 10 documents or 100 documents or  
 2 1,000 documents at the end of September, that they are  
 3 then given a period of time which is commensurate with  
 4 the documents that are then produced, bearing in mind  
 5 that all of those documents -- given the nature of the  
 6 category, all of those documents will be documents that  
 7 India has already.  
 8 So I suppose our proposal -- but I'm thinking on my  
 9 feet here -- our proposal would be for two tranches: one  
 10 in respect of the documents arising in this hearing, and  
 11 then one in respect of anything else that comes in due  
 12 course.  
 13 THE CHAIRMAN: Okay, that's very helpful.  
 14 Why don't we leave it at that. I think we've agreed  
 15 you'll be in contact with Mr Schofield over the weekend  
 16 as to your preferences for Monday/Tuesday; and that  
 17 whatever that decision ends up being, you'll be  
 18 providing to us, in advance of it, a general sense of  
 19 how you anticipate the presentations to progress.  
 20 So unless there's any other business we need to  
 21 attend to, then let me just thank you for your  
 22 presentation and thank your entire team for their  
 23 presentations throughout the week. I know it's very  
 24 difficult and very tiring to pull all of this together,  
 25 but you've been doing yeoman's work, and not just

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17:50 1 Our view beyond that is that India does not have  
 2 an entitlement to make a post-hearing submission as  
 3 a written pleading, because that would simply open up  
 4 the whole written phase again, because this would be the  
 5 first time that we would have had anything in writing  
 6 from India. So insofar as India has an entitlement to  
 7 comment on the documents, it's an entitlement to comment  
 8 on the document, and not to all of a sudden put in  
 9 a counter-memorial.  
 10 Then obviously there are issues around transcript  
 11 corrections and things like that, which we'll get to at  
 12 the end of the hearing.  
 13 THE CHAIRMAN: Do you have a view as to when it is India  
 14 would possibly be entitled to make that submission? I'm  
 15 thinking that the documents may not be completely in  
 16 until September 30.  
 17 SIR DANIEL: It may be, for convenience and good order, that  
 18 this should come in in two tranches. I don't recall  
 19 precisely your direction following PO3, the competence  
 20 hearing, but I think you gave India something like  
 21 two weeks to respond to the documents that were  
 22 disclosed in the competence hearing.  
 23 And maybe there should be something like that,  
 24 requiring India to concentrate its mind on the documents  
 25 that they will now be receiving. And then in due

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17:53 1 advancing the positions you have but reacting to our  
 2 questions, and we're very grateful to you for that.  
 3 So I hope you have a reasonably good rest of the  
 4 weekend, as much as that's possible, and we look forward  
 5 to seeing you next week.  
 6 SIR DANIEL: Thank you very much. And from us to the Court  
 7 and to the Secretariat, we wish you a good weekend as  
 8 well. We know there are some big events, for those who  
 9 may be sports fans, on Sunday evening; sadly not for us.  
 10 THE CHAIRMAN: Very good. Thank you so much.  
 11 (5.53 pm)  
 12 (The hearing adjourned sine die)

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ARBITRATION PURSUANT TO ARTICLE IX AND ANNEXURE G OF THE INDUS WATERS TREATY 1960

Day 5 -- Hearing on the Merits, First Phase

Friday, 12 July 2024

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ARBITRATION PURSUANT TO ARTICLE IX AND ANNEXURE G OF THE INDUS WATERS TREATY 1960

Day 5 -- Hearing on the Merits, First Phase

Friday, 12 July 2024

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