

**ANNEX 1**

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## Mandate of the Neutral Expert

**The World Bank**  
Washington, D.C. 20433  
U.S.A.

Roberto Dañino  
Senior Vice President and General Counsel

By Courier  
(advance copy of letter by fax)

May 12, 2005

Professor Raymond Lafitte  
Ecole Polytechnique Fédérale de Lausanne  
ENAC - LCH Laboratoire de constructions hydrauliques  
CH - 1015 Lausanne  
Switzerland

Dear Professor Lafitte,

*Re: Neutral Expert under the Provisions of the Indus Waters Treaty*

I am pleased to hear that you have agreed to serve as a Neutral Expert under the provisions of the Indus Waters Treaty concerning the construction of the Baglihar project.

Please find enclosed a copy of the Government of Pakistan's request of January 15, 2005 with its attachments, and of all the correspondence that the World Bank has so far exchanged with the Governments of India and Pakistan in relation to this matter, together with a copy of the Indus Waters Treaty of 1960.

I also understand that you have requested the logistical support of the Secretariat of the International Centre for Settlement of Investment Disputes (ICSID) to assist you in this assignment. I have therefore designated Ms. Eloïse Obadia to be the channel of communications between you and the parties. Ms. Obadia can be reached by telephone at 202-458-4109, by fax at 202-522-2615 and by e-mail at [eobadia@worldbank.org](mailto:eobadia@worldbank.org).

With best regards,

Sincerely yours,



Enclosures

## CVs of the Neutral Expert, of his Legal Adviser and of his Assistant

### Raymond LAFITTE

#### Curriculum Vitae

**Positions:** Expert

Professor at the Swiss Federal Institute of Technology of Lausanne (EPFL).  
Powerplants and Water resources development.

**Profession:** Civil Engineer

**Date of birth:** 13 January 1935

**Nationality:** Swiss

#### Professional Societies:

- Member of the Swiss Society of Engineers and Architects
- Honorary Member of the Swiss Committee on Dams and former President
- Chairman of the Committee on the Governance of Dam Projects of the International Commission on Large Dams (ICOLD)
- Former Vice president of ICOLD
- Former President of the International Hydropower Association (IHA)
- Former Member of the Board of Governors of the World Water Council (WWC).

**Education:** Graduate Civil Engineer of the Swiss Federal Institute of Technology in Zurich (1958).

#### Employment record:

**1999** Expert.

**1993-1998** **Stucky Consulting Engineers. Ltd**, Renens, Switzerland,  
General Manager, Member of the Board.

**1962-1993** **Bonnard & Gardel Consulting Engineers Ltd**, Lausanne, Switzerland,  
Engineer, Chief Engineer, Vice Manager, General Manager and Member of the Board.

**1959-1960** **Compagnie d'Etudes de Travaux Publics**, Lausanne, Switzerland,  
Engineer.

#### Participation in, or management of designs:

**Dams:** Switzerland: Stafel, Hydro-Rhône.

Algeria: Koudiat Acerdoune, Fergoug, Zardézas, Deurdeur, Cheffia, Harreza,  
Boukourdane, Bou-Hallou, Arris.

Iran: Jiroft, Shahid Rajaei.

Morocco: Boukhalef, Kadoussa, Jbel Lakhel, Bouanane, Martil, Dkhila, Lalla Aïcha,  
Sidi Saïd, El Ghrass, Sebou, Ansegmir.

Ecuador: Toachi Pilaton.

Ivory Coast: San Pedro.

Turkey: Deriner.

#### Expert Reports on dams:

Keban (Turkey), Lar (Iran), Al Wahda (Morocco), Sidi Abdelli\*, Taksebt\* (Algeria),  
Lessoc\*, Fah\*, Arnon\*, Gebidem\*, Ferpècle\*, Cleuson\* (Switzerland), Ziga\* (Burkina  
Faso), Karabura\*, Kirov\*, Orto Tokoi\*, Papan\* (Kyrgyz Republic), Karun IV\* (Iran),  
Kebir\*, Moula\* (Tunisia), Midlands (Mauritius)

(\* Chairman of the Panel of Experts)

**Hydro powerplants:**

Switzerland: preliminary design of pumped-storage plants, Hydro-Rhône, Chippis, Cleuson-Dixence, Pont de la Tine, Aubonne.

Morocco: Martil, Ait Messaoud, Afourer.

Iran: Jiroft, Shahid Rajaei.

Turkey: Deriner.

**Tunnels:** Switzerland: Rangiers, Arzilier, Chauderon, Flon, Mont Terri, Gomergrat, Moosbach, Lôtschberg.

**Various studies:** In the field of nuclear engineering, structures and foundations.

**Languages:** French, English, German

**PUBLICATIONS:** 35 publications in the field of dams and hydroelectric power-plants.

9 publications in the field of civil works of nuclear power plants.

**ADDRESS:** EPFL ENAC ICARE LCH  
Laboratoire de constructions hydrauliques  
GC A3 504 (Bâtiment GC)  
Station 18  
CH- 1015 Lausanne  
E-mail: raymond.lafitte@epfl.ch

**Laurence BOISSON DE CHAZOURNES**

Curriculum Vitae

**AREAS OF SPECIALIZATION**

International Law, International Water Law, Management of Natural Resources and Environmental Protection, Conflict prevention and dispute settlement

**EDUCATION**

*Visiting Scholar*, University of Michigan Law School (1990 – 1991) and Georgetown University Law Center (1994).

*Habilitation* (post-doctoral exam and certification to teach graduate studies), Université Panthéon-Assas (Paris II), Paris, France (1991).

*Ph.D. in International Law, summa cum laude*, Graduate Institute of International Studies, Geneva, Switzerland (1991).

*Certificate of Advanced Studies, magna cum laude*, Graduate Institute of International Studies, Geneva, Switzerland (1987).

*Bar Exam*, Lyon, France (October 1980).

*Maîtrise in Private Law, magna cum laude*, University of Lyon III, France (June 1980).

*Licence in Sociology*, University of Lyon II, France (June 1980).

*Diploma in Political Science, magna cum laude*, University of Lyon II, France (June 1979).

**LANGUAGES** French, English and Spanish

**PROFESSIONAL EXPERIENCE**

**1999 - Present**

*Director and Professor, Department of Public International Law and International Organization, Faculty of Law, University of Geneva* (Switzerland); *Visiting Professor, Graduate Institute of International Studies* (Geneva, Switzerland) and the *University of Aix-Marseille* (France).

*Consultant and Expert* with various governmental agencies, international organizations and private law firms.

*Permanent Court of Arbitration*, appointed by Secretary General to Panel of Arbitrators pursuant to Article 8(3) of the PCA Optional Rules for Arbitration of Disputes Relating to Natural Resources and the Environment (December 2002).

*Director of research*, Projects funded by the *Swiss Fund for research* and *French agencies*;

*Member of Steering Committee, The Project on Courts and Tribunals*, University of London/New York University

**1995-1999**

*Senior Counsel, Environment and International Law Unit, Legal Department, The World Bank*, United States

*Laurence Boisson de Chazournes*

*Curriculum Vitae*

**1990-1995**

**Associate Professor**, *The Graduate Institute of International Studies* (Geneva, Switzerland) and the *Faculty of Law of the University of Geneva* (Switzerland).

**Consultant**, with international organizations and the Swiss government. Reports prepared for the *International Labour Organization* (ILO), *The UN Intergovernmental Negotiating Committee for a Framework Convention on Climate Change* (UNFCCC), *The UN Center for Human Rights*, *The Federal Office for the Environment, Forests and Landscape* (Bern, Switzerland).

**PUBLICATIONS**

Laurence Boisson de Chazournes is also the author and co-author of fourteen books and over one hundred articles and reports (list available on request).

**ADDRESS** University of Geneva,  
Faculty of law,  
40, boulevard du Pont-d'Arve,  
1211 Geneva 4 (Switzerland)  
E-mail: [laurence.boissondechazournes@droit.unige.ch](mailto:laurence.boissondechazournes@droit.unige.ch)

**Laurent Mouvet**

Curriculum vitae

**Actual positions:** STUCKY Ltd, Renens, Switzerland  
Member of the Board of Directors  
Head of Dams Department

Swiss Federal Institute of Technology, Lausanne, Switzerland  
Faculty of Architecture, Civil Engineering and Environment  
Senior Lecturer, Construction Law

Swiss Committee on Dams  
Secretary-General and Treasurer

Swiss Dam Safety  
Expert agreed by the Swiss Government for  
Permanent Safety Assessment of two High Arch Dams

**Date of Birth:** March 26, 1961

**Nationality:** Swiss

**Education:** Graduate Civil Engineer of the Swiss Federal Institute of Technology, MSc,  
Lausanne, 1984

**Language:** French, Spanish, English, German

**Employment record:**

|            |  |
|------------|--|
| since 2002 | STUCKY Ltd, Renens, Switzerland<br>Consulting Company in the fields of Dams, Hydropower, Water Transfer,<br>Energy and Water Management<br>Head of Dams Department (since 2007),<br>Member of the Board of Directors (since 2005)<br>Project Manager |
| 1994-2002  | Swiss Federal Institute of Technology, Laboratory of Hydraulic Constructions,<br>Lausanne, Switzerland<br>Head of Section "Dams and Hydropower"<br>Senior Lecturer   |
| 1987-1994  | Marcel Bourquin Consulting Engineers, Neuchâtel, Switzerland<br>Consulting Company in the fields of Tunnel Construction and Project<br>Management<br>Branch Manager  |
| 1984-1987  | STUCKY Consulting Engineers Ltd, Lausanne, Switzerland<br>Civil Engineer, Dams Department  |

**Countries of activity:** Switzerland, France, Spain, Greece, Turkey, IR Iran, DR Congo, Libya, Brazil.

**Publications:** 15 publications in the field of Dams and Hydropower Schemes  
5 publications in the field of Project Management

Laurent Mouvet

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**Main Activities in Professional Organisations:**

Swiss Society of Engineers and Architects : Member  
Swiss Committee on Dams :  
    Secretary-General and Treasurer  
    Member of the Working Group on Dam Concrete  
International Commission on Large Dams:  
    Member of the Technical Committee on Dam Surveillance  
    Member of the Technical Committee on Floods  
    Official Representative of Switzerland to the Executive Meeting  
Swiss Association of Road Specialists: Member of the Working Group on Costing

**Address:** c/o STUCKY Ltd  
33 rue du Lac  
P.O. Box  
1020 RENENS / Switzerland  
e-mail: lmouvet@stucky.ch



## **Protocol of Meeting No. 1, June 9-10, 2005, Paris**

### **INDUS WATERS TREATY**

**Government of India – Government of Pakistan**

### **BAGLIHAR Hydroelectric Plant Expert Determination on Points of Difference Referred by the Government of Pakistan under the Provisions of the Indus Waters Treaty**

**Meeting No. 1 of the Neutral Expert with the Parties  
9 and 10 June 2005, in Paris – World Bank Offices**

### **PROTOCOL**

#### **1. Introduction**

1.1 Mr. Dañino, General Counsel and Senior Vice President of the World Bank, accompanied by Mr. David Freestone, Deputy General Counsel, and Ms. Eloïse Obadia, Counsel, ICSID, welcomed the Delegation of India (DOI) and the Delegation of Pakistan (DOP) attending this Meeting No. 1 with the Neutral Expert. He introduced the Neutral Expert, Professor Raymond Lafitte (NE), appointed by the World Bank after consultation with the Parties under the provisions of the Indus Waters Treaty (Treaty). He also introduced Mr. Laurent Mouvet who is assisting the NE.

With this appointment the role of the World Bank (WB), as appointing authority, is now complete. Having presented the NE, Mr. Dañino and Mr. Freestone left the meeting and handed over the chairmanship of the meeting to the NE.

1.2 Professor Lafitte welcomed the authorities of India and of Pakistan, and in particular H.E. Aneesuddin Ahmed. The List of the participants is attached to this Protocol, as Annex 1.

As proposed by the NE, this meeting has the aim to help him to ensure the fair and equitable treatment of the Parties and an orderly administration of the process in carrying out his task.

1.3 The Agenda proposed on 4 June 2005 by the NE was approved by DOI and DOP (Parties).

1.4 In its letter of 6 June 2005, the DOP requested that given the sensitivity of the issue a complete audio and written transcript of the meeting be made and provided to the Parties. The point of view of the NE was to have only a Protocol containing the decisions made at the meeting which would be approved by the Parties.

DOI supported the DOP's proposal and therefore the NE decided that an audio recording and written transcript would be made of the meeting. However, being at this early stage of his mission, the NE specified that he would not be bound by his statements on the technical issues made during the meeting. The NE also proposed to have a written Protocol of the Decisions to be submitted to the Parties for their approval at the end of the meeting. The Parties agreed.

1.5 The NE proposed the following programme of the meeting: 9 June 2005 devoted to discussions according to the approved Agenda until 6 p.m. and 10 June 2005 at 11 a.m. devoted to the discussion of the Protocol for its approval by the Parties. On 9 June 2005, the World Bank invites the Parties, the NE and his assistant for a dinner at 8 p.m.

## 2. Organization of the Neutral Expert's Role

### 2.1 Principal of the NE

Under the provisions of the Treaty, the principal is the Government of India and the Government of Pakistan.

### 2.2 Coordination by the International Centre for Settlement of Investment Disputes (ICSID)

At the request of the NE, ICSID is providing its logistical support. Ms. Eloïse Obadia is in charge of this task as coordinator.

### 2.3 Means of Communication

- a. The coordinator is the channel of communications among the Parties and the NE.
- b. All the correspondence between the Parties and the NE shall be addressed to the coordinator.
- c. All the written instruments shall be filed in 5 copies (2 for the non-filing party, 2 for the NE and 1 for the coordinator). Each party shall also send electronic versions of its statements, excluding documents, to the coordinator at the following e-mail address: [eobadia@worldbank.org](mailto:eobadia@worldbank.org), which will be immediately forwarded by her to the NE and the other party. The date of receipt of an official instrument shall be the date of receipt of a hard copy by the coordinator.
- d. It was agreed that the Parties should produce complete copies of the documents submitted. Originals of documents shall be submitted only at the request of the NE and the parties.

### 2.4 Mission of the NE

The Mission of the NE is defined by the Treaty. When carrying out his tasks, the NE may express his tentative views from time to time, but this will not be binding on him for the purposes of making a determination in the final report. The NE will most likely require the Parties to provide further information and to organize a site visit. He will provide the Parties

with a draft of his final report for their comments. These comments will be carefully examined and be taken or not into account.

#### 2.5 Contract of the NE

The terms of reference of the NE will be in accordance with the Treaty. A letter from the World Bank addressed to the NE will be deemed to be his contract. Referring to the Treaty, this letter will indicate the fees of the NE and his assistant(s). A copy of this letter will be sent to the Parties for their information. The remuneration and expenses of the NE and his assistant will be supervised by the World Bank. The NE left open the possibility to have recourse to specialized assistant(s), in accordance with the Treaty.

### 3. Statements of the Parties

#### 3.1 Statement of Pakistan

The statement of points of difference given by Pakistan has been expressed in its letter of 15 January 2005. The annex to this letter, listing these points, is attached to the Protocol as Annex 2. The DOP developed briefly its arguments on these points without prejudice to its further statements.

#### 3.2 Statement of India

India stated that the design of Baglihar hydroelectric plant is in full compliance with the provisions of the Treaty and this will be justified and drawn to the attention of the other party and the NE.

Without prejudice to its further statements, DOI gave a brief technical description of its position.

### 4. Technical Aspects of BAGLIHAR Hydroelectric Plant

Each party, DOP followed by DOI, developed in a more detailed manner the technical aspects of its statement, without prejudice to its further statements. In this context, DOI submitted to the NE and the other party a document containing figures and key features of the Baglihar project. This document shows the project as it has evolved in comparison to the elements briefly presented by DOP.

### 5. Neutral Expert's Work Programme

#### 5.1 The Sequence and Production of Written Instruments Shall be as follows:

I – Documents sent to Pakistan according to Appendix II to Annexure D, paragraph 9, to the Treaty as well as additional and updated documents to be filed by India on or before 15 July 2005.

II – Memorial to be filed by Pakistan on or before 19 August 2005.

III – Counter-Memorial to be filed by India on or before 23 September 2005.

IV – Reply to be filed by Pakistan on or before 28 November 2005.

V – Rejoinder to be filed by India on or before 3 January 2006.

The Parties may include with their Reply and Rejoinder only submissions, documents and evidence responding or rebutting to matters raised by the other party in their respective Memorial or Counter-Memorial, without prejudice for the Parties to present their arguments on the questions or new issues raised by the NE with a right of reply to the other party.

Each of the above written presentations shall be filed with the coordinator by the dates specified. For the convenience of the parties, each party shall also simultaneously provide an extra complete copy to the diplomatic mission in its country of the other party.

## 5.2 Site Visit

It was agreed that the site visit would take place after the receipt of the counter-memorial by the NE. The date is fixed at 1 October – 7 October, 2005. The hydraulic model in the vicinity of Roorkee will also be visited. DOP states that this model does not correspond to the Treaty and does not demonstrate the variations arising out of the points of difference.

The program will be proposed by the NE at a later stage. On this basis, the number and qualification of the attendees will be announced by the Parties. At the request of the DOP, a visit to the site and the model will take place for their engineers before 31 July 2005. The test reports for the model will be provided to the NE and Pakistan at the time of this visit. The NE supports these requests.

## 6. Next Meetings

The subsequent meetings 2 and 3 will be held in Geneva on the following dates and with the following aims:

- Meeting 2, after the site visit, on 20-21 October 2005, devoted to the additional questions of the NE. As far as possible, the questions will be supplied to the Parties in advance of the meeting;
- Meeting 3, after the Rejoinder, on 16-20 January 2006, devoted to the oral presentations by the Parties.

A fourth meeting, on a date not yet fixed, will be devoted to the presentation of the draft final report of the NE.

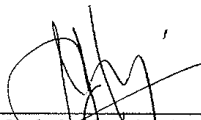
7. Conclusion

The NE wishes to thank the Parties for their cooperation and open spirit which prevailed during the course of this meeting. He also wishes to thank Ms. Obadia, Counsel, ICSID, for her very valuable support. Finally, he also thanks the persons in charge of the transcript and the sound recording.

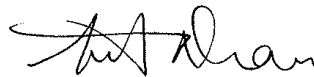
Each party subsequently expressed its thanks to the NE, his assistant, Ms. Obadia, the members of the delegation of the other party and the technicians.

The NE proposes and it is agreed that the meeting was confidential. If necessary, it will be possible to disclose to the media that a meeting took place in Paris with the aim of defining of the expert's mission, and of agreeing on the arrangements for the exchange of documents, future site visit and dates for further meetings.

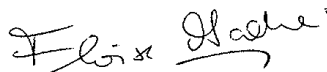
This Protocol is approved by both Delegations on 10 June 2005 in Paris.



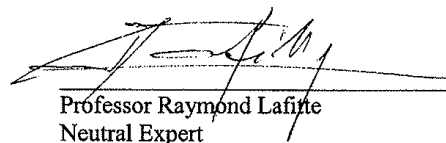
On behalf of the Government of India  
Shri J. Hari Narayan, Secretary,  
Ministry of Water Resources



On behalf of the Government of Pakistan  
Mr. Makhdoom Ali Khan,  
Attorney General for Pakistan



Éloïse M. Obadia  
Coordinator



Professor Raymond Lafite  
Neutral Expert

Annex 1

**INDUS WATERS TREATY**

**Government of India – Government of Pakistan**

**BAGLIHAR Hydroelectric Plant  
Expert Determination on Points of Difference Referred by the Government  
of Pakistan under the Provisions of the Indus Waters Treaty**

**Meeting No. 1 with the Parties and the Neutral Expert  
9 and 10 June 2005, in Paris – World Bank Offices**

**List of Participants**

**Delegation from India**

Shri J. Hari Narayan, Secretary, Ministry of Water Resources  
Shri R. Jeyaseelan, Chairman, Central Water Commission  
Shri R. K. P. Shankardass, Senior Advocate of Supreme Court of India  
Shri Narinder Singh, Joint Secretary (L&T), Ministry of External Affairs  
Shri D. K. Mehta, Commissioner (Indus), Ministry of Water Resources  
Mr. Natarajan, Second Secretary, Embassy of India in France

**Delegation from Pakistan**

Mr. Makhdoom Ali Khan, Attorney General for Pakistan  
Mr. Ashfaq Mahmood, Secretary, Ministry of Water & Power  
Mr. Jalil Abbas Jillani, Director General (SA), Ministry of Foreign Affairs  
Mr. Syed Jamait Ali Shah, Pakistan Commissioner for Indus Waters  
Mr. Syed Muhammad Faisal Hussain Naqvi, Legal Advisor, Ministry of Water and Power  
Mr. Bashir Ahmed Qureshi, Vice President, NESPAK  
H.E. Aneesuddin Ahmed, Ambassador of Pakistan in France

**Expert**

Professor Raymond Lafitte, Neutral Expert  
Mr. Laurent Mouvet, Assistant

**World Bank Staff**

Mr. Roberto Dañino, Senior Vice President and General Counsel  
Mr. David Freestone, Deputy General Counsel, Advisory Services  
Ms. Eloïse Obadia, Counsel, ICSID

Annex 2

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Enclosure to D.O. Letter No. W/127/21/PCIW  
Dated 15<sup>th</sup> January, 2005

### STATEMENT OF POINTS OF DIFFERENCE

Based on the information furnished by India relating to the design of the Baglihar Hydroelectric Plant on Chenab Main, the following points of difference have arisen:-

- (i) Pakistan is of the considered view that the design of the Baglihar Hydroelectric Plant on Chenab Main does not conform to criteria (e) and (a) specified in Paragraph 8 of Annexure D to the Indus Waters Treaty 1960 and that the Plant Design is not based on correct, rational and realistic estimates of maximum flood discharge at the site. The Indian side does not agree to Pakistan's position.
- (ii) Pakistan is of the considered view that the pondage of 37,722 MCM exceeds twice the pondage required for Firm Power in contravention of Paragraph 8(c) of Annexure D to the Treaty. The Indian side does not agree to Pakistan's position.
- (iii) Pakistan is of the considered view that the intake for the turbine for the plant is not located at the highest level consistent with satisfactory and economical construction and operation of the plant as a Run-of-River Plant and is in contravention of Paragraph 8(f) of Annexure D to the Treaty. The Indian side does not agree to Pakistan's position.

  
(SHERAZ JAMIL MEMON)  
Pakistan Commissioner for Indus Water

## **Minutes of Site Visit, October 2-3, 2005, Baglihar Site**

### **INDUS WATERS TREATY 1960**

**Government of India – Government of Pakistan**

### **BAGLIHAR Hydroelectric Plant Expert Determination on Points of Difference Referred by the Government of Pakistan under the Provisions of the Indus Waters Treaty**

**Visit of the Baglihar Site by the Neutral Expert and  
the Delegations of India and Pakistan  
October 2-3, 2005**

#### **MINUTES**

##### **1. Introduction**

1.1 As agreed at the Meeting No.1 on June 9-10, 2005 in Paris, the visit of project under construction ("Site") was carried out on October 2 and 3, 2005. This visit took place after the exchange of written instruments as decided:

- Documents previously sent to Pakistan as well as additional and updated documents filed by India on July 15, 2005;
- Memorial filed by Pakistan on August 18, 2005; and
- Counter-Memorial filed by India on September 23, 2005.

1.2 Further written instruments to be exchanged:

- Reply to be filed by Pakistan on or before November 28, 2005; and
- Rejoinder to be filed by India on or before January 3, 2006.

1.3 The Site visit was necessary for the Neutral Expert, accompanied by both Parties, to acquire a good understanding of the project under construction. It gave an opportunity for the Neutral Expert to collect further information and documents which are to be shared with the Delegation of Pakistan also. Furthermore, the Neutral Expert and both Parties exchanged some of their views.

1.4 The Neutral Expert was accompanied by his assistant, Mr. Mouvet. Mrs. Obadia, Counsel, at the World Bank and Coordinator for this Expert Determination, was also present. The lists of participants are attached as Annexes 1 and 2. The Delegation of India was led by Mr. R. Jeyaseelan, Chairman, Central Water Commission, and ex-officio Secretary to the Government of India. The Delegation of Pakistan was led by Mr. Ashfaq Mahmood, Secretary (Water and Power).



1.5 The schedule of the visit was as follows:

- October 1, 2005, arrival at Patnitop in the evening;
- October 2, 2005, in the morning, presentation of the project by India; in the afternoon, Site visit;
- October 3, 2005, in the morning, continuation of the Site visit; in the afternoon, discussion and consultation of documents; and
- October 4, 2005, return to Delhi.

## 2. Site Visit

2.1 The presentation on the project was given by Mr. R.C. Gupta, Vice-President, JP Ventures, and Mr. M.J. Ahmed, Senior Geologist, JP Associates. The following themes were described: general presentation of the project – geology and geotechnical features – design considerations – present status of the work.

2.2 The visit of the Site started with the right bank. The Delegations looked at the dam from the approach road on the right side and from the road at the crest elevation. The following could be seen: the dam blocks completed up to almost 50% of the concrete; the two diversion tunnels on the right bank, now obstructed by landslides; the river flowing on top of the three central blocks with a discharge of about 500 cumec. The Head Race Tunnel was then visited starting from its upper part at the intake down to the surge chamber. This was followed by a visit of the underground powerhouse, in which it could be noted that civil works were almost completed; one turbine/generator of 150 MW already erected, and the installation of the two other units under progress.

2.3 On October 3, 2005 in the morning, the left bank of the river was visited. It was then possible to have an overall view of the geological and topographical conditions of the opposite bank.

2.4 Due to the obstruction incident of the diversion tunnels, remedial measures will be carried out in the near future with the excavation of a new diversion outlet and the rehabilitation of the existing tunnels. Thereafter, the concreting of the central blocks could resume.

## 3. Discussions

3.1 At the request of the Neutral Expert, the following issues were discussed:

- the pondage; and
- the concept of the sluice spillway in relation to sediment control.

3.2 Design documents established by the Contractor for the construction drawings were made available. The Neutral Expert expressed his wish to receive copies of some of these documents; i.e.,

- a) seismic analysis;
- b) stability analysis of the dam; and
- c) hydraulic analysis of spillway.

In addition, the Neutral Expert expressed his wish to get copies of the following planning documents concerning:

- d) hydrology;
- e) sedimentation: sedimentation of the reservoir and sediment management;
- f) geology and geomechanics;
- g) flow duration curves and power system load curve;
- h) series of daily inflow for about thirty years;
- i) a set of updated drawings of the dam;
- j) dam monitoring concept;
- k) brief construction schedule; and
- l) cost of the main components of works (dam concreting and gates, civil works of the power plant, electro-mechanical components and power tunnel).

#### 4. Acknowledgement

The Neutral Expert wishes to thank the Indian Government for its hospitality, and in particular Mr. D.K. Mehta, Commissioner, and Mr. Vikrant Sharma, Assistant Director (Jammu), for their excellent organization of the visit. The Neutral Expert is grateful to the Government of India for its efficient and courteous security measures. The Neutral Expert also thanks warmly JP Ventures for its welcoming on the Site, and particularly, Mr. R.C. Gupta.

Finally, the Neutral Expert wishes to thank both Delegations of India and Pakistan for the spirit of good will which prevailed during all the discussions and exchanges of information.



Eloïse M. Obadia  
Coordinator  
October 7, 2005



Professor Raymond Lafitte  
Neutral Expert  
October 7, 2005

Annex 1  
Site Visit –Oct. 2, 2005

**INDUS WATERS TREATY 1960**

**Government of India – Government of Pakistan**

**BAGLIHAR Hydroelectric Plant  
Expert Determination on Points of Difference Referred by the Government  
of Pakistan under the Provisions of the Indus Waters Treaty**

**Visit of the Baglihar Site by the Neutral Expert and  
the Delegations of India and Pakistan  
October 2, 2005**

**List of Participants**

**Expert**

Professor Raymond Lafitte, Neutral Expert  
Mr. Laurent Mouvet, Assistant

**World Bank Group**

Ms. Eloïse Obadia, Coordinator

**Delegation of India**

Mr. R. Jeyaseelan, Chairman, Central Water Commission, ex-officio Secretary to the G.O.I  
Mr. D. K. Mehta, Commissioner (Indus), Ministry of Water Resources  
Dr. D.V. Thareja, Chief Engineer, Central Water Commission  
Mr. Naresh Kumar, Director, Central Water Commission  
Mr. C.K.L. Das, Deputy Commissioner (Indus), Ministry of Water Resources  
Mr. M.A. Nazim, Chief Engineer, JKPDC  
Mr. B.L. Garoo, Chief Engineer, JKPDC  
Mr. S.M. Hussain, Chief Engineer (Baglihar), JKPDC  
Mr. B. Lazaric, Chief Resident Engineer, Lahmeyer International  
Dr. W. Schwarz, Chief Civil Engineer, Lahmeyer International  
Mr. G.C. Parihar, Executive Engineer, JKPDC  
Mr. M.S. Srivastava, Director in Charge, JP Associates  
Mr. R.C. Gupta, Vice-President, JP Ventures  
Mr. S.C. Sharma, DGM, JP Associates  
Mr. M.J. Ahmed, Senior Geologist, JP Associates  
Mr. J.L. Bamzai, Senior Geologist, JKPDC

**Delegation of Pakistan**

Mr. Ashfaq Mahmood, Secretary, Ministry of Water & Power  
Mr. Syed Jamait Ali Shah, Pakistan Commissioner for Indus Waters  
Mr. Bashir Ahmad Quraishi, Vice President, NESPAK  
Mr. Asif Baig, Chief Engineer, NESPAK  
Mr. Peter J. Rae, Consultant, NESPAK  
Mr. Feisal Hussain Naqvi, Lawyer, Assisting PCIW on Baglihar Project

Annex 2  
Site Visit – Oct. 3, 2005

**INDUS WATERS TREATY 1960**

**Government of India – Government of Pakistan**

**BAGLIHAR Hydroelectric Plant**

**Expert Determination on Points of Difference Referred by the Government of  
Pakistan under the Provisions of the Indus Waters Treaty**

**Visit of the Baglihar Site by the Neutral Expert and  
the Delegations of India and Pakistan - October 3, 2005**

**List of Participants**

**Expert**

Professor Raymond Lafitte, Neutral Expert  
Mr. Laurent Mouvet, Assistant

**World Bank Group**

Ms. Eloise Obadia, Coordinator

**Delegation of India**

Mr. R. Jeyaseelan, Chairman, Central Water Commission, ex-officio Secretary to the G.O.I  
Mr. D. K. Mehta, Commissioner (Indus), Ministry of Water Resources  
Dr. D.V. Thareja, Chief Engineer, Central Water Commission  
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Mr. G.C. Parihar, Executive Engineer, JKPDC  
Mr. M.S. Srivastava, Director in Charge, JP Associates  
Mr. H.K. Garg, Consultant, JP Ventures  
Mr. R.C. Gupta, Vice-President, JP Ventures  
Mr. K.B. Madankrishanan, General Manager, JP Associates  
Mr. S.C. Sharma, DGM, JP Associates  
Mr. M.J. Ahmed, Senior Geologist, JP Associates  
Mr. R.K. Raina, JKPDC  
Mr. J.L. Bamzai, Senior Geologist, JKPDC

**Delegation of Pakistan**

Mr. Ashfaq Mahmood, Secretary, Ministry of Water & Power  
Mr. Syed Jamait Ali Shah, Pakistan Commissioner for Indus Waters  
Mr. Bashir Ahmad Quraishi, Vice President, NESPAK  
Mr. Asif Baig, Chief Engineer, NESPAK  
Mr. Peter J. Rae, Consultant, NESPAK  
Mr. Feisal Hussain Naqvi, Lawyer, Assisting PCIW on Baglihar Project

## **Minutes of Model Visit, October 5-6, 2005, Roorkee**

### **INDUS WATERS TREATY 1960**

**Government of India – Government of Pakistan**

### **BAGLIHAR Hydroelectric Plant Expert Determination on Points of Difference Referred by the Government of Pakistan under the Provisions of the Indus Waters Treaty**

**Visit of the Baglihar Model by the Neutral Expert and  
the Delegations of India and Pakistan  
Roorkee - October 5-6, 2005**

#### **MINUTES**

##### **1. Introduction**

1.1 As agreed at the Meeting No.1 on June 9-10, 2005 in Paris, the visit of the Comprehensive Model of Baglihar H E Plant ("Model") was carried out on October 5 and 6, 2005.

1.2 The visit of the Model took place after the visit of the Baglihar project under construction ("Site") on October 2-3, 2005. The objective of the visit for the Neutral Expert, accompanied by both Parties, was twofold: firstly, to be informed of the functioning of the hydraulic Model in its operation of sediment control; in particular, to assess the concept and efficiency of the sluice gates. Secondly, the aim was to comprehend the operation of the spillway, and more specifically when discharging the 10,000 year design flood.

This was also an opportunity for both Parties to exchange some views on the condition of the tests, their running and their results.

1.3 The Neutral Expert was accompanied by his assistant, Mr. Mouvet. Mrs. Obadia, Counsel, at the World Bank and Coordinator for this Expert Determination, was also present. The list of participants is attached as Annex 3. The Delegation of India was led by Mr. R. Jeyaseelan, Chairman, Central Water Commission, ex-officio Secretary to the Government of India. The Delegation of Pakistan was led by Mr. Ashfaq Mahmood, Secretary (Water and Power).

1.4 The Model tests were carried out by the Irrigation Research Institute (IRI). The Neutral Expert and the Delegations were hosted by the Mr. K.D. Sharma, Director of National Institute of Hydrology (NIH), Mr. Shiva Datta, Chief Engineer and Director (IRI), and Mr. M.S. Verma, Superintending Engineer (IRI).

1.5 The schedule of the visit was as follows:

- October 5, 2005, arrival at Roorkee in the morning; in the afternoon, presentation by the IRI, observation of stabilized reservoir bed and one test;
- October 6, 2005, in the morning, discussions and two tests; in the afternoon, continuation of one test and additional test; in the evening, return to Delhi.

## 2. Model Visit

2.1 Mr. Shiva Datta gave a brief introduction on the city of Roorkee and IRI. This was followed by a presentation given by Mr. S. Verma on the Hydraulic Research Station and the studies for the Baglihar Model, including the experiments conducted during the visit of the Pakistan Delegation on July 29, 2005. Electronic and hard copies of the presentation were provided to the Neutral Expert and the Delegation of Pakistan.

2.2 Both Delegations and the Neutral Expert observed the stabilized reservoir bed achieved after 45 hours of Model run under the following conditions more fully described in the Model test report T.M.No.76 RR (H<sub>2</sub>-7):

- Initial bed at elevation 821 at intake, then 2 degrees toward upstream;
- Discharge of 1964 cumec;
- Sediment Concentration of inflow – 1740 ppm;
- Intake for Stage I in operation;
- Gate 5 of sluice spillway fully open; and
- Reservoir level – 835 m;
- Model was run intermittently 6 hours per day.

2.3 Then the inflow was raised up to 16,500 cumec, corresponding to design discharge of spillway system. After stabilization of flow, the Model was run with the following conditions:

- Intake out of operation;
- Reservoir level – 840 m (FPL); and
- All sluice, surface and auxiliary spillways in operation.

Energy dissipation in the plunge pool, as well as the scour pattern at impact of gated spillway could also be observed.

2.4 On October 6, 2005 in the morning, a Model test was run in order to demonstrate the sluicing capacity of the system, according to the following procedure:

- a) Preparation of Model
  - Movable bed prepared with following characteristics:
  - Initial bed elevation at 808 m. at dam, bed slope at 5 degrees towards upstream up to the end of intake structure, then 2 degrees;
  - Movable bed is protected with a plastic sheet during Model filling phase in order to avoid as much erosion as possible.

b) Phase I

- Discharge of 3000 cumec;
- Sediment Concentration of inflow – 2800 ppm;
- Gates 4 and 5 partially opened;
- Intake for Stage I in operation; and
- Reservoir level – 835 m.

After 1 hour of operation, samples were taken in downstream of gates and power intake I to measure the sediment load.

c) Phase II

- Discharge and Sediment Concentration of inflow same as above;
- Gates 3, 4 and 5 partially opened;
- Intake for Stage I in operation; and
- Reservoir level – 835 m.

Again, after 1 hour of operation, samples were taken in downstream of gates and power intake I to measure the sediment load.

d) Phase III

- Discharge and Sediment Concentration same as above;
- All 5 gates of sluice spillway partially opened;
- Intake for Stage I in operation; and
- Reservoir level – 835 m.

Again, after 1 hour of operation, samples were taken in downstream of gates and power intake I to measure the sediment load.

Then the reservoir was emptied carefully and the sediment bed surveyed.

2.5 During the waiting time, the Delegations and the Neutral Expert could visit the flume models of the sluice and the chute spillways, at scale 1:40. Test conditions were the following:

- Reservoir level – 840 m (FPL);
- Discharge corresponding to design conditions of each spillway;
- No sediment load.

On the sluice spillway model, the flow along the chute, the effect of the splitters and the ledge, as well as the energy dissipation conditions in the plunge pool could be observed.

On the chute spillway model, the flow along the chute, the functioning of the aeration device and the trajectory of the jet could be observed.

2.6 On October 6, 2005 in the afternoon, the following test was carried out, in order to observe the swirls at intake:

- Design discharge of 430 cumec as well as 150% of design discharge passing through intakes Stage I;
- All spillway gates in closed position; and
- Reservoir level – 835 m.

### 3. Discussions

3.1 Discussions were held on October 5, 2005 in the afternoon on the representative value of the tests in connection with the sluicing of sediments. The Parties discussed what tests would be appropriate to determine the most adequate solution. No clear conclusions were drawn from these discussions. Later, on the morning of October 6, 2005, the Neutral Expert expressed his wish to receive the list of all the tests made in past years with the test conditions and the inferences in a few words for each test.

3.2 The morning of October 6, 2005 was devoted to the description of the various tests and their respective objectives. The Delegation of India specified that comprehensive sets of tests were made during the past years which led to the current concept of the sluice, chute and auxiliary spillways. As mentioned in paragraph 3.1, the Neutral Expert expressed his wish to receive the list of all the tests made and the Indian Party agreed.

3.3 On October 6, 2005, an informal meeting also took place with Mr. K.D. Sharma on the deterministic approach of the flood calculations. In the Neutral Expert's opinion, it would be very advantageous to obtain an estimate of the PMF for Baglihar.

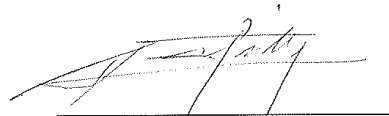
### 4. Acknowledgement

The Neutral Expert and the Delegation of Pakistan were touched by the kind hospitality of the members of the IRI and by their greetings. On behalf of the Pakistan Delegation, Mr. Ashfaq Mahmood warmly thanked his hosts. The Neutral Expert was grateful to Mr K.D. Sharma for his kindness and welcome. He gave his utmost compliments and congratulations to IRI for its dedication and the quality of its achievements.

Finally, the Neutral Expert wishes to thank both Delegations of India and Pakistan for their cooperation.



Eloïse M. Obadia  
Coordinator  
October 7, 2005



Professor Raymond Lafitte  
Neutral Expert  
October 7, 2005



Annex 3  
Model Visit – Oct. 5-6, 2005

**INDUS WATERS TREATY 1960**

**Government of India – Government of Pakistan**

**BAGLIHAR Hydroelectric Plant  
Expert Determination on Points of Difference Referred by the Government  
of Pakistan under the Provisions of the Indus Waters Treaty**

**Visit of the Baglihar Model by the Neutral Expert and  
the Delegations of India and Pakistan  
October 5-6, 2005**

**List of Participants**

**Expert**

Professor Raymond Lafitte, Neutral Expert  
Mr. Laurent Mouvet, Assistant

**World Bank Group**

Ms. Eloïse Obadia, Coordinator

**Delegation of India**

Mr. R. Jeyaseelan, Chairman, Central Water Commission, ex-officio Secretary to the G.O.I  
Mr. D. K. Mehta, Commissioner (Indus), Ministry of Water Resources  
Dr. D.V. Thareja, Chief Engineer, Central Water Commission  
Mr. Naresh Kumar, Director, Central Water Commission  
Mr. C.K.L. Das, Deputy Commissioner (Indus), Ministry of Water Resources  
Mr. M.A. Nazim, Chief Engineer, JKPDC  
Dr. W. Schwarz, Chief Civil Engineer, Lahmeyer International  
Mr. R.C. Gupta, Vice-President, JP Ventures  
Mr. S.S. Tiagi, Hydraulic Consultant, JP Ventures  
Mr. Shiva Datta, Chief Engineer and Director, IRI  
Mr. S. Verma, Superintending Engineer, IRI

**Delegation of Pakistan**

Mr. Ashfaq Mahmood, Secretary, Ministry of Water & Power  
Mr. Syed Jamait Ali Shah, Pakistan Commissioner for Indus Waters  
Mr. Bashir Ahmad Quraishi, Vice President, NESPAK  
Mr. Asif Baig, Chief Engineer, NESPAK  
Mr. Peter J. Rae, Consultant, NESPAK  
Mr. Feisal Hussain Naqvi, Lawyer, Assisting PCIW on Baglihar Project

## **Minutes of Wrap up Meeting, October 7, 2005, New Delhi**

### **INDUS WATERS TREATY 1960**

**Government of India – Government of Pakistan**

### **BAGLIHAR Hydroelectric Plant Expert Determination on Points of Difference Referred by the Government of Pakistan under the Provisions of the Indus Waters Treaty**

**Wrap up Meeting of the Site and Model Visits with the Neutral Expert and  
the Delegations of India and Pakistan  
October 7, 2005 – World Bank Offices – New Delhi**

#### **MINUTES**

##### **1. Introduction**

As announced by the Neutral Expert in his letter of September 5, 2005, the Delegations of India and Pakistan met with the Neutral Expert (NE) for a wrap up meeting following the visits to the project under construction (“Site”) and the Comprehensive Model of Baglihar H E Plant (“Model”).

A tentative agenda was submitted by the NE and accepted by the Parties.

The list of Participants is attached as Annex 4.

##### **2. Minutes of the Visits of the Site and of the Model**

The minutes prepared by the NE were submitted to the Parties, who gave their comments. The minutes were accordingly corrected and approved by the Parties.

##### **3. Remarks by the Parties**

As a preliminary statement, the NE gave his personal view on the Baglihar Project. The statement is attached to these minutes as Annex 1.

The NE proposed that the Parties give their comments, remarks and statements regarding the visits and the discussions held during the week.

The Pakistani Delegation made a statement which is attached to the minutes as Annex 2.

The Indian Delegation also made a statement which is attached to the minutes as Annex 3.

#### 4. Documents Requested by the NE

As mentioned in the minutes of the Site visit and of the Model visit, the Indian Delegation will submit the following documents:

Documents made available at the Site:

- a) seismic analysis;
- b) stability analysis of the dam; and
- c) hydraulic analysis of spillway.

Planning documents:

- d) hydrology;
- e) sedimentation: sedimentation of the reservoir and sediment management;
- f) geology and geomechanics;
- g) flow duration curves and power system load curve;
- h) series of daily inflow for about thirty years;
- i) a set of updated drawings of the dam;
- j) dam monitoring concept;
- k) brief construction schedule; and
- l) cost of the main components of works (dam concreting and gates, civil work of the power plant, electro-mechanical components and power tunnel).

Model test document:

- m) list of the all the tests made in past years with the test conditions and the inferences in a few words for each test.

Dates of submission of documents:

- Documents a) to c) shall be sent by India to the NE and to Pakistan on Monday October 10, 2005.
- Updated and refined documents d) to m) shall be sent by India to the NE and to Pakistan on November 30, 2005 at the latest. Existing documents d) to m), not already provided, shall be sent to NE and to Pakistan by October 28, 2005. An index of the documents d) to m) already submitted shall be provided by India on October 19, 2005 at Meeting No.2.

#### 5. Documents Requested by Pakistan

In a letter dated September 29, 2005, the Pakistan Commissioner requested the Indian Commissioner for certain information and data, including information on sediment issues, i.e.,:

- “ 1) Sediment rating curve of Chenab River at Baglihar Dam site [...]
- 4) Actual Sediment gradation curve of the suspended sediment alongwith percentages of sand, silt and clay in it with their size ranges. [...].”

The requested documents of points 1 and 4 of the September 29, 2005 letter will be provided to the Pakistan Delegation before its departure from Delhi in the afternoon of October 8, 2005.

Moreover these documents will also be provided as part of the documents e) as mentioned under point 4, Planning Documents.

#### 6. Program of Meeting No. 2 in Geneva

6.1 As agreed at the Meeting No. 1 in Paris, this meeting should be devoted to the additional questions of the NE. However, due to the progress of the knowledge and understanding of the NE, he proposed that this meeting be also devoted to answers to these questions, to the extent possible, by both Parties.

6.2 The questions concern two key points:

- Pondage and
- Sluice gates.

The NE will send at the beginning of the week following this meeting, the list of questions.

6.3 The NE wishes that the Delegation of India make a presentation in response to these questions if possible at Meeting No. 2; it was agreed that the need for an additional meeting for this purpose would be considered and decided upon at Meeting No. 2.

The Pakistan Delegation is invited to give a presentation on the practical way it believes that the sediment management question can be solved if possible at Meeting No. 2.

The NE takes note of the short period of time available for both Delegations, who will use their best efforts to fulfill his wish.

6.4 The time schedule will be as follows:

- Beginning of Meeting No.2 on Wednesday, October 19, 2005 at 3 p.m. at the World Meteorological Organization (WMO);
- Thursday, October, 20, continuation of the Meeting and conclusion;
- Friday, October 21, morning reserved for conclusion if needed or visit of a hydro plant, and afternoon visit of the Hydraulic Laboratory of the Institute of Technology of Lausanne.

#### 7. Press Release

A draft of the press release was submitted to the Parties for their suggestions and approval. A final draft was approved. It will be signed by the NE, his Assistant and the Coordinator.

8. Acknowledgement

The Neutral Expert reiterates his warm thanks to the Indian Government for its hospitality.

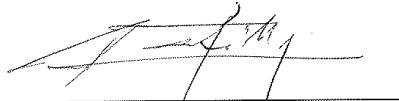
The Neutral Expert also reiterated his gratitude to both Delegations of India and Pakistan for their spirit of good will during all the visits and discussions.

These minutes are approved by both Parties.



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Eloise M. Obadia  
Coordinator  
October 7, 2005



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Professor Raymond Lafitte  
Neutral Expert  
October 7, 2005

Annex 1

**Statement of the Neutral Expert  
October 7, 2005**

I am generally supporting dams and power plants, which are a necessity for the development of a Country. They have to be designed, built and operated in accordance with the Laws and Rules prevailing in the Country where they are built, as well as in accordance with International Agreements and the State of the Art, that is to say:

- Technology and engineering,
- Economy and finance,
- Social matters,
- Environmental matters,

And I repeat in accordance with the Indus Waters Treaty 1960.

If all these requirements are met in the Baglihar H E P Plant, I will consider it as a great achievement.

Annex 2

**Aide Memoire dated October 7, 2005 regarding visit to the site of the Baglihar hydro-electric Project (BHEP) and the model of the BHEP.**

The Pakistan delegation thanks the Honourable Neutral Expert and the delegation of India for the very useful and informative visit to the BHEP and the BHEP Model and looks forward to receiving the documents requested by him from the Indian delegation.

In addition to the minutes of the visit to the BHEP and the BHEP Model prepared by the Honourable Neutral expert, the Pakistan delegation would also like to note the following with reference to the observations and discussions during the visit.

1. Analytical studies regarding sediment sluicing function based on relevant data were not made available.
2. Sedimentation data was not made available till the end of the visits. However, the delegation of India has agreed to make such data available.
3. No analytical/comparative study was presented proving that the sediment sluicing arrangement was in accordance with the minimum size requirement of the Treaty
4. The Tender drawings prepared in 1999 by India were different from the drawings and information provided to Pakistan by then.
5. The design of the BHEP was not fully documented.
6. The studies and analysis showing compliance of the design of the BHEP with the Treaty were not made available.
7. The BHEP Model and test procedures had several significant shortcomings.

Annex 3

**Remarks of the Indian Delegation accompanying the Neutral Expert  
on his site visit to the Baglihar HEP and the model at Roorkee.**

The Indian delegation takes this opportunity to thank the Neutral Expert and his team for visiting the Baglihar HEP (site) and the IRI at Roorkee for obtaining first hand information and on site discussions.

We are grateful to the Delegation of Pakistan also for the interaction and fruitful discussions on various issues under consideration.

In the evolution of design of the BHEP, various options were considered keeping in view the provisions of the Indus Waters Treaty. After arriving at a Treaty compliant design on sound technical and economic considerations, the design was further optimized.

- The basis of the designs was discussed in detail during the site and model visits and are also comprehensively covered in the Counter Memorial.
- All queries raised by the Neutral Expert and the Pakistan delegation were responded to and clarified.
- Site conditions, topography, geology that dictated the adoption of the present design were explained to the Neutral Expert and the Pakistan delegation during the site visit.
- Various Model studies for the conditions suggested by the Neutral Expert were carried out. The studies amply demonstrated the necessity and adequacy of the various provisions made in the design.
- The complete data as specified in the Treaty and also additional data/information as sought by Pakistan from time to time have been supplied in 1992, 2002, 2004 and 2005.



Annex 4  
Wrap up – Oct. 7, 2005

**INDUS WATERS TREATY 1960**

**Government of India – Government of Pakistan**

**BAGLIHAR Hydroelectric Plant  
Expert Determination on Points of Difference Referred by the Government  
of Pakistan under the Provisions of the Indus Waters Treaty**

**Wrap up Meeting of the Site and Model Visits with the Neutral Expert and  
the Delegations of India and Pakistan  
October 7, 2005 – World Bank Offices – New Delhi**

**List of Participants**

**Expert**

Professor Raymond Lafitte, Neutral Expert  
Mr. Laurent Mouvet, Assistant

**World Bank Group**

Ms. Eloïse Obadia, Coordinator

**Delegation of India**

Mr. J. Hari Narayan, Secretary, Ministry of Water Resources  
Mr. Fali S. Nariman, Legal Counsel  
Mr. R. K. P. Shankardass, Senior Advocate of Supreme Court of India  
Mr. R. Jeyaseelan, Chairman, Central Water Commission  
Dr. Wolfgang Schwarz, Chief Civil Engineer, Lahmeyer International  
Mr. V.V.R.K. Rao, Ex-Chairman, Central Electricity Authority  
Mr. Dilip Sinha, Joint Secretary (PAI), Ministry of External Affairs  
Mr. Narinder Singh, Joint Secretary (Legal & Treaty), Ministry of External Affairs  
Mr. D. K. Mehta, Commissioner (Indus), Ministry of Water Resources  
Dr. D.V. Thareja, Chief Engineer, Central Water Commission  
Mr. M.A. Nazim, Chief Engineer, J&K Power Development Corporation  
Mr. R.C. Gupta, Vice-President, JP Ventures  
Mr. Naresh Kumar, Director, Central Water Commission  
Mr. T.K. Sadhu, Director (Hydrology), Central Water Commission  
Mr. C.K.L. Das, Deputy Commissioner (Indus), Ministry of Water Resources

**Delegation of Pakistan**

Mr. Ashfaq Mahmood, Secretary, Ministry of Water & Power  
Mr. Syed Jamait Ali Shah, Pakistan Commissioner for Indus Waters  
Mr. Bashir Ahmad Quraishi, Vice President, NESPAK  
Mr. Asif Baig, Chief Engineer, NESPAK  
Dr. Izhar Ul Haq, General Manager, WAPDA  
Mr. Peter J. Rae, Consultant, NESPAK  
Mr. Moazzam A. Khan, Counsellor, High Commission for Pakistan, New Delhi  
Mr. Feisal Hussain Naqvi, Lawyer, Assisting PCIW on Baglihar Project

## Minutes of Meeting No. 2, October 19-21, 2005, Geneva

### INDUS WATERS TREATY 1960

Government of India – Government of Pakistan

### BAGLIHAR Hydroelectric Plant Expert Determination on Points of Difference Referred by the Government of Pakistan under the Provisions of the Indus Waters Treaty

Meeting No. 2 with the Neutral Expert and  
the Delegations of India and Pakistan  
October 19-21, 2005 – World Meteorological Organization – Geneva

#### MINUTES

*October 19, 2005*

1. Introduction

As agreed at Meeting No. 1 in Paris and confirmed in Delhi on October 7, 2005, the Neutral Expert (NE) and the Delegation of India (DOI) and the Delegation of Pakistan (DOP) met in Geneva to discuss additional questions posed by the NE on October 11, 2005 and to listen to the Parties' answers. The list of the questions is attached to these Minutes as Annex 2.

Professor Lafitte welcomed the authorities of India and of Pakistan and restated his condolences to both countries for the victims of the earthquake. He also reiterated his thanks to the Indian Government for its hospitality. Each Delegation presented the new participants. The list of participants is attached to these Minutes as Annex 1.

The Agenda, dated October 15, 2005, proposed by the NE was approved by the Parties. Also with the agreement of both Parties, a complete audio recording and written transcript of the meeting were made of this Meeting. Copies of the recording and transcript will be sent to the Parties on October 28, 2005.

As a preliminary remark, the NE reiterated the contents of his statement, attached to the Minutes of the Wrap-up Meeting as Annex 1.

2. Questions Asked by the NE and Answers by the Parties on Sedimentation and Spillway

- 2.1 DOI's presentation on sedimentation and spillway made by Dr. Thareja.
- 2.2 Answers given by the DOI to the questions asked by the NE on sedimentation and spillway. The answers to the questions Qs1, Qsw1, Qsw2 and Qsw3 will be provided on November 30, 2005. However, the DOI provided provisional answers in writing to Qs1, Qsw2 and Qsw3 on October 20, 2005 in the evening.

*October 20, 2005*

- 2.3 DOP's presentation on sedimentation made by Prof. Annandale.
- 2.4 DOP's presentation on spillway, power intake arrangement, the October model test visit and Qs7 were made by Mr. Rae.
- 2.5 DOP's comments on the DOI's presentation made by Mr. Mahmood.
- 2.6 Answers given by the DOP to the questions asked by the NE on sedimentation and spillway.
- 2.7 DOI's comments on the DOP's presentations and request for the production of case studies, if any, on the concepts developed by DOP concerning the arrangement in front of the intakes and the sluicing appurtenant works.

3. Questions Asked by the NE and Answers by the Parties on Pondage

The NE clarified the wording of Qp6 stating that the agreement on flexibility is evidently made in compliance with the Indus Waters Treaty 1960.

- 3.1 DOI's presentation on pondage made by Mr. Rao.
- 3.2 DOI's responses to NE's questions on Qp5 and Qp6 will be provided on November 30, 2005. The answer to Qp2 will be documented on November 30, 2005. However, the DOI provided provisional answers in writing to Qp2 on October 20, 2005 in the evening.
- 3.3 DOP's general statement on pondage made by Mr. Mahmood, followed by DOP's presentation on Qp1 and Qp4 made by Mr. Quraishi.

4. Questions Asked by the NE on a Bottom Outlet

The DOI will answer to Qbo1 on November 30, 2005. This topic triggered the question of the scope of the NE's mandate. On this occasion, the NE made a statement described in point 8.2 below.

5. Copies of Presentations

Both Delegations submitted electronic versions of their respective presentations.

6. Documents Requested by the NE

As agreed at the Wrap-up meeting on October 7, 2005, the documents made available at the Site by DOI were received:

- a) seismic analysis;
- b) stability analysis of the dam; and
- c) hydraulic analysis of spillway.

The Planning and Model test documents will be provided by DOI on November 30, 2005:

- d) hydrology;
- e) sedimentation: sedimentation of the reservoir and sediment management;
- f) geology and geomechanics;
- g) flow duration curves and power system load curve;
- h) series of daily inflow for about thirty years;
- i) a set of updated drawings of the dam;
- j) dam monitoring concept;
- k) brief construction schedule; and
- l) cost of the main components of works (dam concreting and gates, civil work of the power plant, electro-mechanical components and power tunnel).
- m) list of the all the tests made in past years with the test conditions and the inferences in a few words for each test.

Updated and refined documents d) to m) shall be sent by India to the NE and to Pakistan on November 30, 2005 at the latest. Existing documents d) to m), not already provided, shall be sent to NE and to Pakistan by October 28, 2005. Finally, the deadline for the submission of the index of the documents d) to m) already submitted was postponed to November 30, 2005.

7. Filings of the Last Written Instruments and Next Meeting

In consideration of the November 30, 2005 deadline given to India to file additional documents, it was agreed that for an efficient administration of the process the schedule agreed on at Meeting No. 1 should be revisited as follows with a shift of about one month:

- Reply to be filed by Pakistan on or before December 30, 2005;
- Rejoinder to be filed by India on or before February 3, 2006; and
- Meeting No. 3, on February 20-24, 2006, on the oral presentations by the Parties.

The date of Meeting No. 4, devoted to the presentation of the draft final report of the NE, will be decided at Meeting No. 3.

8. Other Matters

- 8.1 The results of the sample tests sediment concentration (in ppm) made at the hydraulic model on October 6, 2005 will be provided by DOI by October 31, 2005. The sediment grading curve for the bed material and suspended load of the Chenab river which is representative of what will come in the future reservoir will be given by DOI on November 30, 2005.
- 8.2 The NE stated that he might propose to the Parties to have recourse to a legal adviser to ensure that his determination strictly remains within the scope of the Treaty and the

points of difference raised by Pakistan. Both Parties agreed to the principle of this proposal. Should the NE proceed with this option, he would submit the name and curriculum vitae of the concerned person.

- 8.3 The NE undertakes to answer exclusively on the points of difference. Further considerations, if any, which may arise will be addressed by the NE in a separate document provided to the Parties.
- 8.4 Regarding the procedure of this expert determination, the NE specified that he will rely exclusively on the written statements of the Parties as well as on the statements made orally in the presence of both Parties.
- 8.5 The NE asked the Parties whether they had any comments on the way the procedure had been handled so far. Both Parties declared that they agreed on the way the procedure had been handled.

9. Communication to the Media

If necessary, it will be possible to disclose to the media the following points:

- Meeting No. 2 took place in Geneva on October 19-21, 2005 with the aim of answering technical questions raised by the NE.
- Both Parties made good and useful presentations.
- Meeting No. 3 will take place on February 20-24, 2005 at a place to be determined.

10. Technical Excursion

The NE and Mr. Mouvet organized for October 21, 2005 a technical visit: hydropower plant of Cleuson-Dixence (1200 MW); Emosson Arch Dam; visit of the Swiss Federal Institute of Technology, Lausanne, and in particular the hydraulic laboratory.

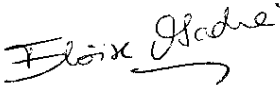
11. Acknowledgement

The NE is grateful to the Parties for their efforts to prepare in a short period of time good presentations and provide answers to most of the questions he has raised. He also thanks the Parties for their spirit of good will and of cooperation.

The NE thanks the WMO for its hospitality, the court reporter and sound technician for their work.

Both Parties express their gratitude and appreciation to the NE, Ms. Obadia and Mr. Mouvet for conducting Meeting No. 2, and for their warm hospitality, as well as for arranging the visits of a power plant, a dam and the hydraulic laboratory of EPFL.

These Minutes are approved by both Parties.



Eloise M. Obadia  
Coordinator  
October 21, 2005



Professor Raymond Lafitte  
Neutral Expert  
October 21, 2005

Annex 1  
Meeting No. 2 -- Oct. 19-21, 2005

**INDUS WATERS TREATY 1960**

**Government of India – Government of Pakistan**

**BAGLIHAR Hydroelectric Plant  
Expert Determination on Points of Difference Referred by the Government  
of Pakistan under the Provisions of the Indus Waters Treaty**

**Meeting No. 2 with the Neutral Expert and  
the Delegations of India and Pakistan  
October 19-21, 2005 – World Meteorological Organization – Geneva**

**List of Participants**

**Expert**

Professor Raymond Lafitte, Neutral Expert  
Mr. Laurent Mouvet, Assistant

**World Bank Group**

Ms. Eloïse Obadia, Coordinator

**Delegation of India**

Mr. J. Hari Narayan, Secretary, Ministry of Water Resources  
Mr. R. K. P. Shankardass, Senior Advocate of Supreme Court of India  
Mr. R. Jeyaseelan, Chairman, Central Water Commission  
Dr. Wolfgang Schwarz, Chief Civil Engineer, Lahmeyer International  
Mr. V.V.R.K. Rao, Ex-Chairman, Central Electricity Authority  
Mr. Narinder Singh, Joint Secretary (Legal & Treaties Division), Ministry of External Affairs  
Mr. D. K. Mehta, Commissioner (Indus), Ministry of Water Resources  
Dr. D.V. Thareja, Chief Engineer, Central Water Commission  
Mr. M.A. Nazim, Chief Engineer, J&K Power Development Corporation  
Mr. R.C. Gupta, Vice-President, JP Ventures  
Mr. Naresh Kumar, Director, Central Water Commission  
Mr. T.K. Sadhu, Director (Hydrology), Central Water Commission  
Mr. C.K.L. Das, Deputy Commissioner (Indus), Ministry of Water Resources  
Mr. K. Ilango, Consul General, Embassy of India (on October 19, 2005)

**Delegation of Pakistan**

Mr. Ashfaq Mahmood, Secretary, Ministry of Water & Power  
Mr. Syed Jamaat Ali Shah, Pakistan Commissioner for Indus Waters  
Mr. Bashir Ahmad Quraishi, Vice President, NESPAK  
Mr. Mirza Asif Baig, Chief Engineer, NESPAK  
Mr. Peter J. Rae, Consultant, NESPAK  
Mr. Feisal Hussain Naqvi, Lawyer, Assisting PCIW on Baglihar Project  
Mr. Syed Ibne Abbas, Director General, Foreign Office  
Dr. George Annandale, Engineering and Hydrosystems  
Ms. Tehmina Janjua, Acting Permanent Representative of Pakistan, Mission to U.N., Geneva  
(on October 19, 2005)

Annex 2  
Meeting No. 2 – Oct. 19-21, 2005

**INDUS WATERS TREATY 1960  
Government of India – Government of Pakistan**

BAGLIHAR Hydroelectric Plant  
Expert Determination on Points of Difference Referred by the Government of Pakistan under the  
Provisions of the Indus Waters Treaty

**Questions proposed by the Neutral Expert to the Parties  
in preparation for Meeting N°2,  
in Geneva on October 19-21, 2005**

**INTRODUCTION**

During Meeting N°1 in Paris it was decided that Meeting N°2 would be devoted to the additional questions of the Neutral Expert (NE), and that the questions would be supplied to the Parties in advance of the meeting.

During the wrap-up meeting in New Delhi on 7 October, the NE announced that questions would focus on two key points during Meeting N°2 in Geneva: pondage and sluice gates. The list of questions is given below, specifying, between brackets, the Party to whom each question is specifically addressed: Indian Party (IP) and Pakistan Party (PP).

The NE recalls that he requested various documents from the Indian Party (see Minutes of the wrap-up meeting of 7 October) which, will mostly be provided on 30 November. These documents will certainly contain answers to some of the questions presented here, and this should be taken into account. Moreover, insofar as the Parties will not be able, due to lack of time, to respond totally to all the questions listed here, it will be possible for them to complete their answer later, before the November 30. This matter will be discussed in Geneva.

**Qs. SEDIMENTATION**

The problem of the design of the spillway should be treated independently from that of sediment control.

According to current knowledge, the way to avoid a complete silting of the reservoir, including the live storage (that is to say the "pondage"), is to perform sluicing and/or flushing operations during the flood period, with the reservoir level lowered to its minimum. For this purpose, sluice gates are necessary, so the precise questions are the following:

Qs1: Could the calculation of the annual inflow of sediment be presented? (IP)

Qs2: What is the minimum value of the sluicing discharge? (IP; PP)



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Qs3: What is the minimum elevation of the sluice gates necessary to perform the sluicing operation efficiently, with the aim of protecting the water intake throughout the whole life of the power plant? **(IP; PP)**

Qs4: What is the minimum size of the sluice gates? **(IP; PP)**

Qs6: What is the minimum number of sluice gates and their best distribution along the upstream face of the dam? **(IP; PP)**

Qs7: What are the most appropriate tools and procedures to be used in order to support the answer to questions Qs2 to Qs6? **(IP; PP)**

The answers to the questions Qs2 to Qs6 should be given for various pondage volumes, for example: 6, 12, 24, 48 MCM.

Qs8: What are the experiences in Pakistan concerning reservoir sedimentation and the design or rehabilitation measures? **(PP)**

#### **Qsw. SPILLWAY**

The answer to the question Qs2 being given, it is evident that part of the flood volume entering the reservoir will be evacuated by the sluice gates (creating a sluicing effect). So the questions concerning the spillway design are the following:

Qsw1: What is the maximum reservoir level, above elevation 840 m., admissible for the spillway discharge condition? **(IP)**

Qsw2: What is the hydrograph of the 10,000 year return period (yrp) flood? **(IP)**

Qsw3: What are the maximum discharge and the hydrograph of the PMF for the Baglihar dam? **(IP)**

Qsw4: Is it possible to design an ungated spillway for the balance of the 10,000 yrp flood discharge in addition to the discharge of the sluice gates? **(IP; PP)**

#### **Qp. PONDAGE**

Concerning the calculation of the pondage, the interpretation of the Treaty by the two Parties is different, and the Neutral Expert will have to make a judgement on that matter. To enable him to give consideration to this, the following questions are put forward:

Qp1: without prejudice to the application of the Treaty, what are the definitions in this case, according to the state-of-the-art of:

Annex 2  
Meeting No. 2 – Oct. 19-21, 2005

- firm power?
- firm energy?
- pondage?

and what is generally the objective of the pondage? **(IP; PP)**

Qp2: May we obtain the flow duration curve at the Baglihar site calculated on the basis of around 30 years? **(IP)**

Qp3: May we obtain the load curves for the days of a characteristic week? **(IP)**

Qp4: May we request a presentation of graphs showing the calculation of the pondage, with time on the horizontal axis (seven day period, starting Saturday morning 8 am) and the cumulative volume of inflow/outflow on the vertical axis (MCM)?

Calculations should be made for some specific weeks, having mean seven days discharge of, for example, 100, 150, 200 and 300 m<sup>3</sup>/s. The Parties shall select the weeks (Saturday to Friday) which they feel to be most appropriate to demonstrate their case. The daily values could be taken from the records of daily inflow values at dam site provided previously by India to Pakistan.

**(IP, possibly PP)**

Qp5: What would be the influence of various pondage volumes on the energy production of the plant over some decades? **(IP)**

Qp6: During the meetings it was stated by the Indian Party that a large pondage would allow more flexibility for the operation of the plant, and we agree, but is it possible to quantify this flexibility for various pondage volumes, for example from 6 to 48 MCM? **(IP)**

#### **Qbo. BOTTOM OUTLET**

The Baglihar dam has no bottom outlet. Generally such an organ is considered as necessary for the safety of the dam, during its life, and also, at the beginning, to control its first filling.

Qbo1: What is the process envisaged to impound the reservoir (for example, during season? How to plug of the diversion tunnels?)? **(IP)**

Professor Raymond Lafitte  
Neutral Expert

Lausanne, 11 October 2005

## Minutes of Meeting No. 3, May 25-29, 2006, London

### INDUS WATERS TREATY 1960

Government of India – Government of Pakistan

### BAGLIHAR Hydroelectric Plant Expert Determination on Points of Difference Referred by the Government of Pakistan under the Provisions of the Indus Waters Treaty 1960

Meeting No. 3 with the Neutral Expert and  
the Delegations of India and Pakistan  
May 25-29, 2006 – International Dispute Resolution Centre Ltd. London

#### MINUTES

*May 25, 2006*

#### 1. Introduction

The Neutral Expert (NE) and the Delegation of India (DOI) and the Delegation of Pakistan (DOP) met in London to give the Parties the opportunity to make their oral presentations and to answer the NE's questions of April 12, 2006. The questions are attached to these Minutes as Annex 2.

Professor Lafitte welcomed the leaders and members of both delegations. He congratulated the delegations of India and of Pakistan for the quality of the work so far achieved. He also welcomed Ms. Eloïse Obadia, Coordinator and presented his team consisting of Professor Laurence Boisson de Chazournes, Legal Adviser, who is assisting the NE with respect to the scope of both the Treaty and the points of difference raised by Pakistan; and Mr. Laurent Mouvet, assisting the NE for technical issues. Each delegation presented its participants. The list of participants is attached to these Minutes as Annex 1.

The Agenda, dated May 15, 2006, proposed by the NE was approved by the Parties. Also with the agreement of both Parties, complete audio-recording and written transcripts of the Meeting were made. The transcripts were delivered by e-mail to the Parties and live notes were provided for the first four days of the Meeting. It was agreed that copies of the recording would be sent to the Parties before June 2, 2006.

The NE specified that there would not be post-meeting briefs and that the presentation of the Parties' arguments would be closed at the end of the Meeting. He also specified that he did not contemplate asking further questions. This was accepted by the Parties.

Regarding the Agenda, it was agreed that the Parties would address items 2.1, 2.2 and 3.1 during the course of the day and that with respect to item 2.2, India would give its presentation first. It was also agreed that the Parties would exchange and give to the NE soft

copies of their respective presentations. Finally, it was agreed that each Party could allocate its time as it sees fits provided that there was an overall parity of time between them.

2. Questions Asked by the Neutral Expert (NE) and Answers by the Parties

The NE specified that the preamble to his questions of April 12, 2006 was meant to explain the reasons why he was asking these questions as opposed to being a discussion on the interpretation of the Treaty. Therefore, the Parties were invited not to discuss the definitions given in the preamble.

Items in the Agenda were thereafter dealt with as follows.

A – Evolution of science and technology regarding reservoir sedimentation (item 2.1 of the Agenda)

- 2.1 DOP's presentation on Qrs 1 made by Dr. George Annandale. Presentation on Qrs 2 made by Mr. Peter Rae.
- 2.2 DOI's presentation on Qrs 1 made by Dr. K.G. Ranga Raju. Presentation on Qrs 2 made by Mr. D.K. Mehta.

B – Suspended sediments (item 2.2 of the Agenda)

- 2.3 DOI's presentation on Qssm 1-4 made by Mr. R. Jeyaseelan. Baglihar Reservoir Sedimentation Study made by Mr. Henrik Garsdal.
- 2.4 DOP's presentation on Qssm 1-4 made by Dr. George Annandale.
- 2.5 Questions posed by Pakistan and India's answers followed by India's questions and Pakistan's answers. NE's questions to both Parties.

3. Oral Presentations by India and Pakistan of their Arguments

A – Introductory submissions (item 3.1 of the Agenda)

- 3.1 DOP's presentation made by Professor James Crawford.
- 3.2 DOI's presentation respectively made by Mr. J. Hari Narayan, Mr. F.S. Nariman and Mr. R.K.P Shankardass.

These presentations were followed by one comment of Mr. Ashfaq Mahmood. The NE thanked the Parties.

*May 26, 2006*

4. The Parties agreed that they would deal with items 3.2 and 3.3 during the course of the day.

B – Maximum Design Flood Discharge (item 3.2 of the Agenda)

- 4.1 DOP's presentation made by Mr. Asif Baig.
- 4.2 DOI's presentation made by Mr. T.K. Sadhu.
- 4.3 Questions posed by Pakistan and India's answers followed by India's questions and Pakistan's answers. NE's questions to both Parties.

C – Spillway Design Issues (item 3.3 of the Agenda)

- 5.1 DOP's presentation respectively made by Mr. Ashfaq Mahmood, Dr. George Annandale and Mr. Peter Rae.
- 5.2 DOI's presentation respectively made by Dr. D.V. Thareja, Mr. Henrik Garsdal, Dr. Wolfgang Schwarz and Dr. K.G. Ranga Raju.
- 5.3 Questions posed by Pakistan and India's answers followed by India's questions and Pakistan's answers. It was agreed that India would provide before the end of June 2006, a description of the experience of boulders at Salal reservoir bed particularly near to the intake. NE's questions to both Parties. Both Parties were asked to provide the calculations on the concentration and size of suspended sediment at the level of the power intake for various discharges entering in the reservoir in the designs for their respective proposals.

*May 27, 2006*

D – Artificial Raising of Water Level (item 3.4 of the Agenda)

- 6.1 DOP's presentation respectively made by Mr. Ashfaq Mahmood and Mr. Peter Rae.
- 6.2 DOP's presentation made by Mr. R. Jeyaseelan.
- 6.3 Questions posed by Pakistan and India's answers followed by India's questions and Pakistan's answers. NE's questions to both Parties. Both Parties were asked to provide the calculation for the rising of the water level in the case of maximum flood with one gate closed.

E – Pondage (item 3.5 of the Agenda)

- 7.1 DOP's presentation respectively made by Prof. James Crawford and Mr. Ashfaq Mahmood.

7.2 DOI's presentation respectively made by Mr. J. Hari Narayan and Mr. F.S. Nariman.

7.3 NE's question to the Parties.

F – Power Intake (item 3.6 of the Agenda)

8.1 DOP's presentation respectively made by Mr. Ashfaq Mahmood and Mr. Peter Rae.

8.2 DOI's presentation respectively made by Mr. Naresh Kumar and Dr. Wolfgang Schwarz.

8.3 Questions posed by Pakistan and India's answers followed by India's questions and Pakistan's answers. NE's question to both Parties.

G – NE's Work Programme; Meetings n°4 and n°5 (item 4 of the Agenda)

9. The NE proposed to present his final draft determination to the Parties during Meeting No. 4. It was agreed that this meeting would be held in Paris on October 2–4, 2006. The Parties would also have an opportunity to provide their immediate reactions, if any. It was agreed that the document would be confidential.

10. It was also agreed that there would be a Meeting No. 5 in Washington, DC, on November 6–8, 2006 for the Parties to fully present their comments on the final draft determination.

11. The NE mentioned that he intends to render his decision before the end of the year 2006.

*May 28, 2006*

H – Closing Statements – Relief (item 3.7 of the Agenda)

12.1 DOP's presentation respectively made by Prof. James Crawford, Dr. George Annandale, Mr. Peter Rae, Mr. Asif Baig and Mr. Ashfaq Mahmood.

12.2 DOI's presentation respectively made by Mr. J. Hari Narayan, Dr. K.G. Ranga Raju, Dr. D.V. Thareja, Dr. Wolfgang Schwarz, Mr. F.S. Nariman, and Mr. R.K.P. Shankardass.

I – Other Matters (item 5 of the Agenda)

13. Regarding the transcripts made of the Meeting, the NE proposed that the Parties suggest corrections (grammatical or spelling errors) within two weeks of the receipt of the hard copies of the transcripts and audio-recording of the Meeting. The suggestions accepted

by both Parties would be incorporated in a master document for each day which would constitute the final version of the transcripts.

14. The NE asked the Parties whether they had any comments on the way the procedure had been handled so far. Both Parties declared that they were satisfied with the way the procedure had been handled.

J – Conclusion (item 6 of the Agenda)

15. The NE was pleased to note that during the course of the Meeting the Parties' presentations were governed by two essential points of the Code of Ethics of Dam Engineers, i.e., Competence and Honesty.

*May 29, 2006*

K – Other Matters (second part of item 5 of the Agenda)

16. India presented its proposed construction program of balance works of Baglihar Hydroelectric Project as on May 13, 2006.

17. India filed the documents requested in relation to the questions posed during the Meeting. India will produce within two weeks detailed calculations with respect to Qssm3.

18. It was agreed that the following statement could be disclosed to the media:

- Meeting No. 3 took place in London on May 25-29, 2006.
- Both Parties made their presentations and answered the Neutral Expert's questions.
- The NE proposed to present his final draft determination to the Parties during Meeting No. 4. It was agreed that this meeting would be held in Paris on October 2-4, 2006. The Parties would also have an opportunity to provide their immediate reactions, if any. It was agreed that the document would be confidential.
- It was also agreed that there would be a Meeting No. 5 in Washington, DC, on November 6-8, 2006 for the Parties to fully present their comments on the final draft determination.
- The NE mentioned that he intends to render his decision before the end of the year 2006.

19. Acknowledgement

The NE is grateful to the Parties for their efforts to prepare such good presentations and to provide answers to the questions he raised. He also thanks the Parties for their spirit of good will and of cooperation.

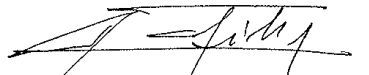
The NE thanks the court reporters for their work.

Both Parties express their gratitude and appreciation to the NE, Ms. Obadia, Prof. Boisson de Chazournes and Mr. Mouvet for conducting Meeting No. 3.

These Minutes are approved by both Parties.



Eloïse M. Obadia  
Coordinator  
May 29, 2006



Professor Raymond Lafitte  
Neutral Expert  
May 29, 2006



Meeting No. 3 – May 25-29, 2006  
Annex 1

**INDUS WATERS TREATY 1960**

**Government of India – Government of Pakistan**

**BAGLIHAR Hydroelectric Plant  
Expert Determination on Points of Difference Referred by the Government  
of Pakistan under the Provisions of the Indus Waters Treaty**

**Meeting No. 3 with the Neutral Expert and  
the Delegations of India and Pakistan  
May 25-29, 2006 – International Dispute Resolution Centre Ltd. London**

**List of Participants**

**Expert**

Professor Raymond Lafitte, Neutral Expert  
Mr. Laurent Mouvet, Assistant  
Professor Laurence Boisson de Chazournes, Legal Adviser

**World Bank Group**

Ms. Eloïse Obadia, Coordinator

**Delegation of India**

Shri J. Hari Narayan, Secretary, Ministry of Water Resources, Leader of the delegation  
Shri F.S. Nariman, Senior Advocate of Supreme Court of India  
Shri R. K. P. Shankardass, Senior Advocate of Supreme Court of India  
Shri R. Jeyaseelan, Chairman, Central Water Commission  
Dr. C.D. Thatte, Former Secretary (WR)  
Shri V.V.R.K. Rao, Ex-Chairman, Central Electricity Authority  
Shri Narinder Singh, Joint Secretary (Legal & Treaties Division), Ministry of External Affairs  
Dr. K.G. Ranga Raju, Former Professor, I.I.T. Roorkee  
Shri D. K. Mehta, Commissioner (Indus), Ministry of Water Resources  
Dr. D.V. Thareja, Chief Engineer, Central Water Commission  
Dr. Wolfgang Schwarz, Hydraulic Expert, Lahmeyer International, Germany  
Shri T.K. Sadhu, Former Director, Central Water Commission  
Shri M.A. Nazim, Chief Engineer, J&K Power Development Corporation  
Shri Naresh Kumar, Director, Central Water Commission  
Shri Tanmoy Das, Director, Central Electricity Authority  
Mr. Henrik Garsdal, Sr. Hydraulic Engineer, Danish Hydraulic Institute, Denmark  
Shri C.K.L. Das, Deputy Commissioner (Indus), Ministry of Water Resources  
Shri R.C. Gupta, Vice-President (Civil), JP Associates  
Shri Subhash C. Sharma, Advocate

Meeting No. 3 – May 25-29, 2006  
Annex 1

**Delegation of Pakistan**

Mr. Ashfaq Mahmood, Secretary, Ministry of Water & Power, Leader of the delegation  
Dr. Maleeha Lodhi, Pakistan High Commissioner at London  
Mr. Abdul Basit, Deputy High Commissioner at London  
Mr. Syed Jamait Ali Shah, Pakistan Commissioner for Indus Waters  
Professor James Crawford, SC (Legal Consultant)  
Mr. Samuel Wordsworth (Legal Consultant)  
Mr. Peter J. Rae (Technical Expert)  
Dr. George Annandale (Technical Expert)  
Mr. Bashir Ahmad Quraishi, Vice President, NESPAK  
Mr. Mirza Asif Baig, General Manager, NESPAK  
Mr. Syed Mehar Ali Shah, Sediment Expert, NESPAK  
Mr. Syed Ibne Abbas, Director General (South Asia), Ministry of Foreign Affairs  
Mr. Syed Feisal Hussain Naqvi (Lawyer/Consultant)

Annex 2

**INDUS WATERS TREATY 1960**  
**Government of India – Government of Pakistan**

BAGLIHAR Hydroelectric Plant  
Expert Determination on Points of Difference Referred by the Government of Pakistan under the  
Provisions of the Indus Waters Treaty

**Additional Questions Proposed by the Neutral Expert to the Parties**  
**in Preparation of Meeting N°3**  
**24-28 May 2006**

**1. INTRODUCTION**

Meeting N°3 will be devoted to the oral presentations by India and Pakistan of their arguments. On this occasion, the Neutral Expert (NE) would also like to receive from each Party answers to the following questions related to the sedimentation management of the Baglihar scheme.

**2. EVOLUTION OF SCIENCE AND TECHNOLOGY REGARDING RESERVOIR SEDIMENTATION**

The Indus Waters Treaty 1960 is a remarkable achievement for its drafters. High level engineers and lawyers had the foresight to set out rules, with great clarity, concerning the principles and some details of the design of hydraulic works concerning the utilisation of the waters of the Indus system of rivers, which have served for the longer term.

In my opinion, these rules can be divided into four categories. Firstly, "strict principles"<sup>1</sup>, include, for example, (ARTICLE III) (1): "*Pakistan shall receive for unrestricted use all those waters of the Western Rivers which India is under obligation to let flow under provision of Paragraph (2)*", etc; or (4): "*Except as provided in Annexures D and E, India shall not store any water of, or construct any storage works on, Western Rivers*". In short, this means that the power plants on these rivers should be run-of-river plants.

Secondly, "details of design" are also strict, such as in (ANNEXURE D) (15): "*[...] the volume of water received in the river upstream of the Plant, during any period of seven consecutive days, shall be delivered into the river below the Plant during the same seven-day period [...]*" or, (15) (ii): "*[...] the volume of water delivered into the river below the Plant in any one period of 24 hours shall not be less than 50%, and not more than 130%, of the volume received above the Plant during the same 24-hour period [...]*".

Thirdly, the Treaty sets out "practical rules" concerning the design of hydraulics works, such as the concept of the spillway or the intakes for the turbines. These "practical rules" remain general; the Treaty is a synthesis document of 22 pages, and 122 pages of annexures; this is not a Handbook of Applied Hydraulics.

Lastly, conscious of the considerable technology involved in the implementation of water resources schemes, and keeping in mind its potential evolution throughout the next century, the authors of the Treaty foresaw that these "practical rules" should also respond to some "basic conditions" which, in principle, are also quite strict, such as the "*satisfactory utilisation of water*",

<sup>1</sup> The terminology: "strict principles", "details of design", "practical rules", "basic conditions" is a proposal of the NE to be able to characterize the rigidity or, to the contrary, the flexibility of the rules of the Treaty.

Annex 2

"*sound and economical design*" and "*satisfactory operation of the works*". It is not surprising that the Parties agreed with these "basic conditions"; we can assume that one Party would not be satisfied, from a human perspective, if the other were to develop a scheme on a river of the Indus basin which could be a technical, economic, social or environmental catastrophe.

These "basic conditions" are not simple nuances and, as is the case in the Parties' Written Instruments, we should pay a great deal of attention to them.

The most important examples of these "practical rules" and "basic conditions" from the Treaty are quoted below (underlining by the NE):

**Preamble**

*The Government of India and the Government of Pakistan, being equally desirous of attaining the most complete and satisfactory utilisation of the waters of the Indus system of rivers and recognising the need, therefore, of fixing and delimiting, in a spirit of goodwill and friendship, the rights and obligations of each in relation to the other concerning the use of these waters and [...].*

**ARTICLE VII**

**Future Co-operation**

*(1) The two Parties recognize that they have a common interest in the optimum development of the Rivers, and, to that end, they declare their intention to co-operate, by mutual agreement, to the fullest possible extent [...]*

**ANNEXURE D**

**(ARTICLE III (2) (d))**

**Part 3—New Run-of-River Plants**

[...]

*(d) There shall be no outlets below the Dead Storage Level, unless necessary for sediment control or any other technical purpose; any such outlet shall be of the minimum size, and located at the highest level, consistent with sound and economical design and with satisfactory operation of the works.*

*(e) If the conditions at the site of a Plant make a gated spillway necessary, the bottom level of the gates in normal closed position shall be located at the highest level consistent with sound and economical design and satisfactory construction and operation of the works.*

*(f) The intakes for the turbines shall be located at the highest level consistent with satisfactory and economical construction and operation of the Plant as a Run-of-River Plant and with customary and accepted practice of design for the designated range of the Plant's operation.*

[...]

Evidently, these "basic conditions" which, in principle, should be strictly applied, are—in light of the "practical rules"—open to interpretation and are consequently a matter for discussion between the Parties.

The NE believes that an important element in considering the range of flexibility in the application of the "practical rules" could be found in an analysis of the evolution of engineering since 1960; this is particularly so in the case of science and technology regarding reservoir sedimentation. Pakistan in its Reply and India in its Rejoinder both briefly dealt with this subject.

The NE would very much like to know the Parties' point of view in this regard, including that of the Commissioners of the Permanent Indus Commission, who are members of the Parties' delegations. This body, created at the time of the signature of the Treaty, came together regularly

Annex 2

over 46 years and the Commissioners—heirs of the Treaty negotiators—would have a good understanding of this evolution. Moreover, the Parties have called upon eminent National and International Experts of undisputable integrity, who can give extremely valuable opinions.

Finally, the NE wishes to stress to the Parties that his present requests in no way seek to question the Treaty which with its "strict principles", "details of design", "practical rules" and "basic conditions", has been effective for 46 years. His questions aim to enable him to make an important assessment of the flexibility of "practical rules" as regards the science and technology of sedimentation management.

QUESTIONS (Qrs), to India and Pakistan, and to their Experts are as follows:

During the 1950s (in particular as demonstrated in the Transactions of the Fourth Congress on Large Dams -- New Delhi, 1951), the theoretical basis of sediment transport mechanisms were known (bed load, suspended load and density currents). The design of ungated or gated spillways, bottom outlets, water intakes on rivers and in reservoirs, and sand traps had been developed. However, reservoir sedimentation was generally considered unavoidable.

**Qrs1: Since when could we consider that a general understanding has existed concerning methods of reservoir sedimentation management, and the science and technology of the design of related hydraulic works; for example, passing and removal of sediments through reservoirs (sluicing, venting of density currents, flushing, dredging) or bypassing the reservoirs?**

**Qrs2: Since when have large-scale high pressure spillway gates been built?**

These questions do not relate to knowledge of scientific theories or solutions for some particular cases, but refer rather to the existence of a well-developed science and technology generally accepted by designers, contractors and owners concerned by sedimentation problems (in other words, that which is taught in institutes of technology).

### 3. SUSPENDED SEDIMENTS

The sedimentation management of the reservoir involves three major problems (apart from sediment yields in the watershed and degradation of the river downstream of the dam):

- a) Reservoir sedimentation with possible loss of live storage;
- b) Water intake sedimentation with possible transport of coarse sediment into the power tunnel;  
and
- c) Erosion damage to the turbines due to suspended sediment.

a) and b) were largely developed by the Parties in relation to the design of the spillway and water intakes.

As for point c), India's design assumes that the reservoir should play the role of a sand trap, even in its ultimate stage when the dead storage is full of sediment. Moreover, it is foreseen that operation of the power plant will be interrupted when the sediment concentration exceeds the threshold level at which erosion begins to affect the turbines. Pakistan has also adopted this concept as one of the design bases for its proposal of works for sediment control.

Annex 2

More information is necessary, in the opinion of the NE, concerning the management of these suspended sediments during the ultimate stage of operation of the reservoir; this is the objective of the following QUESTIONS (**Qssm**), addressed to the two Parties:

**Qssm1:** With the reservoir operating as a sand trap, how and when will the sediment deposits be removed from the reservoir?

**Qssm2:** What is the maximum acceptable threshold for the concentration and size of suspended sediments passing through the turbines?

**Qssm3:** What are the concentration and size of suspended sediment at the level of the power intake for various discharges entering in the reservoir in the designs proposed by both India and Pakistan?

**Qssm4:** At what stages, and for how many hours per year on average, will operation of the power plant be interrupted (when it could have been running at full capacity) to protect the turbines against erosion?

Professor Raymond Lafitte  
Neutral Expert



Lausanne, 12 April 2006

## Minutes of Meeting No. 4, October 2-4, 2006, Paris

### INDUS WATERS TREATY 1960

Government of India – Government of Pakistan

### **BAGLIHAR Hydroelectric Plant Expert Determination on Points of Difference Referred by the Government of Pakistan under the Provisions of the Indus Waters Treaty 1960**

Meeting No. 4 with the Neutral Expert and  
the Delegations of India and Pakistan  
October 2 - 4, 2006 – World Bank Office, Paris

#### MINUTES

*October 2, 2006*

1. Introduction

1.1 The Neutral Expert (NE) and the Delegation of India (DOI) and the Delegation of Pakistan (DOP) met in Paris on October 2, 2006 at 9 a.m. for the presentation of the NE's final draft Expert Determination.

1.2 The NE welcomed his Excellency the Ambassador of Pakistan and the leaders of the delegations of Pakistan and India and the members of these delegations.

1.3 He also welcomed Ms. Martina Polasek, who replaced Ms. Eloise Obadia since August 24, 2006 as the Coordinator. The list of participants is attached to these Minutes as Annex 1.

1.4 The Agenda, dated August 25, 2006, proposed by the NE was approved by the Parties. It was proposed and agreed that item No. 3 of the Agenda: "preliminary remarks by the parties," would be moved to the end as item 6. The Agenda is attached to these Minutes as Annex 2.

1.5 The NE specified that he would not respond to any comments made by the Parties, with the exception of any clarification that he may need; these comments should not lead to any discussion. It was agreed that the preliminary comments by the Parties would be subject to any later development of the remarks and additional comments to be made in writing.

1.6 With the agreement of both Parties, complete audio-recording and written transcripts of the Meeting were made. The transcripts were delivered by e-mail to the Parties at the end of each Meeting day.

1.7 The NE stated that the Parties are invited to submit, by October 26, 2006, their written comments on the final draft Expert Determination and, in particular, on the soundness of the determinations made by the NE in the context of the Indus Waters Treaty. These

comments are to be submitted to the Coordinator and will not be exchanged between or transmitted to the Parties. The Parties will be given the opportunity to present and explain their comments orally to the NE at Meeting No. 5 to be held in Washington, D.C. The NE specified in this respect that the presentations should not lead to any discussion, but that he may ask for clarifications on certain specific points. The parties agreed to this procedure.

## 2. Oral Presentation

2.1. Copies of the final draft Expert Determination were distributed to each member of the delegation. The NE indicated that Chapters 6 -Expert Determination – and 7 – Apportionment between the Parties of costs of remuneration and expenses of the Neutral Expert- would be distributed to the Parties after the presentation of the general considerations.

2.2. The NE began by presenting the table of contents of the final draft Expert Determination. He indicated that his final decision expected before the end of the year would also contain an Executive Summary. The presentation of the final draft Expert Determination was made as follows:

- Chapter 5.1 Object and Purpose of the Treaty and its Interpretation – L. Boisson de Chazournes;
- Chapter 5.2 Spillway – L. Mouvet ;
- Chapter 5.3 Evolution of Technology Concerning Reservoir Sedimentation – NE;
- Chapter 5.4 Provisions of the Treaty Dealing with Sedimentation – NE;
- Chapter 5.5 Modeling of Reservoir Sedimentation – NE;
- Chapter 5.6 Maximum Flood Discharge – NE;
- Chapter 5.7 Artificial Raising of the Water Level – L. Mouvet;
- Chapter 5.8 Pondage – NE;
- Chapter 5.9 Level of the Power Intake – L. Mouvet.

*October 3, 2006*

2.3. The NE made the presentation of Chapter 6 - Expert Determination – and 7 – Apportionment between the Parties of costs of remuneration and expenses of the Neutral Expert. Copies of these Chapters were earlier distributed to the Parties.

2.4. The presentation of Chapter 6 of the final draft Expert Determination was made by the NE in the following order:

- 6.1 Maximum Design Flood;
- 6.2 Spillway;
- 6.3 Artificial Raising of the Water Level;
- 6.4 Pondage;
- 6.5 Level of the Power Intake.



2.5 At the end of his presentation, the NE invited the Parties' comments on the soundness of his final draft Expert Determination, taking due consideration of the Indus Waters Treaty. He emphasized that the aim of this procedure was to allow the NE to give a sound and non-contestable determination in application of the Treaty. The NE stressed that his determination represented his sincere belief and conviction.

### 3. Organization of Meeting No. 5

3.1. The NE raised the item dealing with the organizing of Meeting No. 5 scheduled to be held in Washington, D.C. on November 6-8, 2006. Upon India's suggestion, it was agreed that the Meeting would be held in the period November 7-9, 2006.

3.2. The NE proposed a tentative agenda commencing with Pakistan's presentation of its comments followed by India's presentation and, finally, by possible questions of the NE. The Parties were unable to estimate at this time how much time they would need for their respective presentations.

### 4. Other Matters

#### *Information to the Media*

4.1. As regards information provided to the media in regard to Meeting No. 4, the Parties agreed on a text for a press release, which is attached to these Minutes as Annex. 3. It was further agreed, as provided in the Minutes of Meeting No. 3, that the final draft Expert Determination would remain confidential until the final decision has been issued.

4.2. The Parties had no further matters to discuss. It was agreed that the meeting would reconvene at 9.00 a.m. on October 4, 2006.

*October 4, 2006*

### 5. Preliminary Remarks by the Parties

5.1. The NE opened the session at 9.00 a.m. and invited both delegations to make their initial comments on the final draft Expert Determination.

5.2. The Pakistan delegation represented by Messrs. Ashfaq Mahmood, George Annandale and Prof. James Crawford made preliminary comments.

5.3. The Indian delegation represented by Mr. J. Hari Narayan made preliminary comments.

6. Conclusion

6.1. The NE proposed that each party submit comments on the transcript of Meeting No. 4 within two weeks of receipt of the audio recording of the meeting. He also indicated that he himself, the Legal Adviser and the Assistant would within the same period propose corrections to the transcript, which would be transmitted to the Parties.

6.2. The NE asked the Parties whether they had any comments on the way the procedure had been handled so far. Both Parties declared that they were satisfied with the way the procedure had been handled.

7. Acknowledgment

The NE is grateful to the Parties for their patience for hearing his presentation.

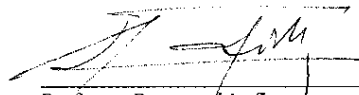
The NE thanks the court reporters for their work.

Both Parties expressed their gratitude and appreciation to the NE, Ms. Polasek, Prof. Boisson de Chazourmes and Mr. Mouvet for conducting the Meeting No. 4.

These Minutes were approved by both Parties.



Martina Polasek  
Coordinator  
October 4, 2006



Professor Raymond Lafitte  
Neutral Expert  
October 4, 2006

Attachments:

- Annex 1: List of Participants
- Annex 2: Agenda
- Annex 3: Press Release

Meeting No. 4 – October 2-4, 2006

**Annex I**

**INDUS WATERS TREATY 1960**

**Government of India – Government of Pakistan**

**BAGLIHAR Hydroelectric Plant  
Expert Determination on Points of Difference Referred by the Government of  
Pakistan under the Provisions of the Indus Waters Treaty**

**Meeting No. 4 with the Neutral Expert and  
the Delegations of India and Pakistan  
October 2-4, 2006**

**The World Bank Office, 66 Avenue d'Iéna, Paris, France**

**List of Participants**

**Expert**

Professor Raymond Lafitte, Neutral Expert  
Mr. Laurent Mouvet, Assistant  
Professor Laurence Boisson de Chazournes, Legal Adviser

**World Bank Group**

Mrs. Martina Polasek, Coordinator

**Delegation of India**

Mr. J. Hari Narayan, Chief Secretary, Government of Andhra Pradesh, Leader of the delegation  
Mr. R. Jeyaseelan, Chairman, Central Water Commission  
Mr. F.S. Nariman, Senior Advocate, Supreme Court of India  
Mr. R. K. P. Shankardass, Senior Advocate, Supreme Court of India  
Mr. V.V.R.K. Rao, Former Chairman, Central Electricity Authority  
Dr. K.G. Ranga Raju, Former Professor, I.I.T. Roorkee  
Mr. Dilip Sinha, Joint Secretary (L&T), Ministry of External Affairs  
Mr. Narinder Singh, Joint Secretary (L&T), Ministry of External Affairs  
Mr. D.K. Mehta, Commissioner (Indus), Ministry of Water Resources  
Dr. D.V. Thareja, Chief Engineer, Central Water Commission  
Mr. R.C. Gupta, Vice-President (Civil), JP Ventures Limited  
Mr. Naresh Kumar, Director, Central Water Commission  
Mr. C.K.L. Das, Director, Central Water Commission  
Dr. Wolfgang Schwarz, Hydraulic Expert, Lahmeyer International, Germany  
Mr. Henrik Garsdal, Sr. Hydraulic Engineer, Danish Hydraulic Institute, Denmark  
Mr. Subhash C. Sharma, Junior of Mr. F.S. Nariman

Meeting No. 4 – October 2-4, 2006

**Annex 1**

**Delegation of Pakistan**

Mr. Ashfaq Mahmood, Secretary, Ministry of Water & Power  
H.E. Mr. Anees-du-Din Ahmed, Ambassador of Pakistan to France  
Mr. Jalil Abbas Jilani, Director General (South Asia), Ministry of Foreign Affairs  
Professor James Crawford, SC  
Mr. Samuel Wordsworth  
Mr. Syed Feisal Hussain Naqvi  
Mr. Peter J. Rae  
Dr. George Annandale  
Mr. Bashir Ahmed Quraishi  
Mr. Mirza Asif Baig  
Mr. Syed Mehar Ali Shah  
Mr. Syed Jamait Ali Shah

Annex 2

**INDUS WATERS TREATY 1960**  
**Government of India – Government of Pakistan**  
**BAGLIHAR Hydroelectric Plant**  
**Expert Determination on Points of Difference Referred by the Government**  
**of Pakistan under the Provisions of the Indus Waters Treaty**  
**Meeting No. 4 with the Neutral Expert and**  
**the Delegations of India and Pakistan**  
**October 2-4, 2006, in Paris -- World Bank Offices**

AGENDA

1. Introduction  
(Welcome, attendance, programme of the meeting, approval of the agenda, minutes)
  2. Oral presentation by the NE of his final draft determination:
    - 2.1 Introduction
    - 2.2 General considerations
    - 2.3 Expert Determination
  3. Any preliminary remarks by the Parties on the final draft determination
  4. NE's Work Programme; Meeting n° 5 in Washington, D.C .
  5. Other Matters (information to the media, if any)
  6. Conclusion
- Post Meeting: Approval of the Minutes

Prof. Raymond Lafitte  
August 25, 2006



COMMENTS

The meeting will start on October 2 at 9:00 a.m..  
The NE will need a maximum of 2 days for his presentation.  
The Parties will have a minimum of half a day for any preliminary remarks they may have.

**Annex 3**

**PRESS RELEASE**

The Neutral Expert shared his final draft Expert Determination with the representatives of Pakistan and India. The two Governments will submit their written comments on the final draft Expert Determination to the Neutral Expert by 26 October 2006. The Neutral Expert will convene a meeting in Washington, D.C. on 7 – 9 November 2006 to receive oral comments by the parties. He intends to render his decision before the end of this year.

4 October 2006 - Paris

**Minutes of Meeting No. 5, November 7-9, 2006, Washington D.C.**

**INDUS WATERS TREATY 1960**

**Government of India – Government of Pakistan**

**BAGLIHAR Hydroelectric Plant  
Expert Determination on Points of Difference Referred by the Government  
of Pakistan under the Provisions of the Indus Waters Treaty 1960**

**Meeting No. 5 with the Neutral Expert and  
the Delegations of India and Pakistan  
November 7-9, 2006 – The World Bank Office, Washington, D.C.**

**MINUTES**

*November 7, 2006*

1. Introduction

1.1 The Neutral Expert (NE) and the Delegation of India (DOI) and the Delegation of Pakistan (DOP) met in Washington, D.C. to give the Parties the opportunity to make oral presentations of their comments on the NE's Final Draft Determination.

1.2 Ms. Ana Palacio, Senior Vice President and Group General Counsel of the World Bank, accompanied by Mr. David Freestone, Deputy General Counsel, and Mr. Salman Salman, Lead Counsel, welcomed the NE and his team as well as the leaders and members of both delegations.

1.3 Professor Lafitte thanked Ms. Palacio. Thereafter, Ms. Palacio and her colleagues withdrew. Professor Lafitte welcomed the leaders and members of the delegations of India and of Pakistan. He also welcomed Ms. Eloïse Obadia and Ms. Martina Polasek, Coordinators. The list of participants is attached to these Minutes as Annex 1.

1.4 The Agenda, dated October 12, 2006, proposed by the NE was approved by the Parties. The Agenda is attached to these Minutes as Annex 2. Also with the agreement of both Parties, complete audio-recording and written transcripts of the Meeting were made. The transcripts were delivered by e-mail to the Parties at the end of each Meeting day.

1.5 Regarding the Agenda, it was agreed that the Parties would have an equal amount of time of five hours to make their presentations.

2. Oral Comments by the Parties on the Final Draft Determination of the NE

2.1 Remarks by Pakistan

2.1.1. Mr. Ashfaq Mahmood, Prof. James Crawford, Dr. George Annandale and Mr. Peter Rae made presentations.

*November 8, 2006*

2.1.2 Prof. James Crawford and Mr. Ashfaq Mahmood made further presentations.

2.2 Remarks by India

Mr. J. Hari Narayan, Mr. Naresh Kumar, Mr. V.V.R.K. Rao, Prof. K.G. Ranga Raju, Mr. Henrik Garsdal, Dr. D.V. Thareja, Mr. R.K.P. Shankardass and Mr. F.S. Nariman made presentations.

3. Questions by the NE to the Parties

The NE had no questions to the Parties on their oral presentations.

4. NE's Work Program in View of the Issuance of his Decision

It was agreed that the Neutral Expert would hand deliver to each Party two duly signed hard copies of the decision as well as a soft copy on February 12, 2007 in Geneva. Additional seventy five copies of the decision will be sent simultaneously to the two Commissioners of the Indus Waters Commission by courier by the Coordinator by February 16, 2007.

5. Other Matters

5.1 Exchange of Documents

5.1.1 At the end of Meeting No. 5, each Party has received two hard copies of the written comments made by the other Party on the Final Draft Determination. It was agreed that the electronic copy of these comments would be provided by the Coordinator in the afternoon of November 9, 2006. In addition, electronic copies of the Parties' oral presentations will also be provided on November 9, 2006.

5.1.2 It was decided that on the basis of the documents submitted by both Parties as well as their oral presentations, Pakistan will provide comments on the 2D computer simulation presented by India by November 24, 2006. India will provide comments on Mr. Rooseboom's letter by November 24, 2006. Furthermore, at the request of the NE, India will provide information on salient features of Salal Dam (power intake, spillway and sediment problems). All these above-mentioned documents shall be introduced in the proceeding as was agreed at Meeting No. 1 (six sets of the



documents filed with the Coordinator and an extra complete copy provided to the diplomatic mission in its country of the other Party). There shall be no further submission of documents.

5.2 Regarding the transcripts made of the Meeting No. 5, the NE proposed that the Parties suggest corrections (grammatical or spelling errors) within two weeks of the receipt of the hard copies of the transcripts and audio-recording of the Meeting. The suggestions accepted by both Parties would be incorporated in a master document for each day which would constitute the final version of the transcripts.

5.3 It was decided that once the decision is rendered, each Party will apply its own rules as to the dissemination of the decision. It was also agreed that the NE and the Coordinator would be allowed to disseminate the executive summary of the decision after February 16, 2007. This will be done without comments.

5.4 The NE asked the Parties whether they had any comments on the way the procedure had been handled so far. India declared that it was satisfied with the way the procedure had been handled, stressing in particular the transparency and fairness of the process. Pakistan made reservations which are annexed to these Minutes as Annex 3. India made a reply statement which is annexed to these Minutes as Annex 4 (as set out in the corresponding portion of the transcript of the Meeting for Day 3, page 14, lines 1-20). Furthermore, the NE also made a statement which is annexed to these Minutes as Annex 5.

6. Acknowledgement

The NE is grateful to the Parties for their efforts and good spirit during the overall process.

The NE thanks the court reporters for their work.

Both Parties express their gratitude and appreciation to the NE, Ms. Obadia, Ms. Polasek, Prof. Boisson de Chazournes and Mr. Mouvet for conducting Meeting No. 5.

These Minutes are approved by both Parties.



Eloïse M. Obadia  
Coordinator  
November 9, 2006



Professor Raymond Lafitte  
Neutral Expert  
November 9, 2006

Meeting No. 5 – November 7-9, 2006  
Annex 1

**INDUS WATERS TREATY 1960**

**Government of India – Government of Pakistan**

**BAGLIHAR Hydroelectric Plant  
Expert Determination on Points of Difference Referred by the Government of  
Pakistan under the Provisions of the Indus Waters Treaty**

**Meeting No. 5 with the Neutral Expert and  
the Delegations of India and Pakistan  
November 7-9, 2006**

**The World Bank Office, 1818 H Street N.W. Washington DC 20433**

**List of Participants**

**Expert**

Professor Raymond Lafitte, Neutral Expert  
Mr. Laurent Mouvet, Assistant  
Professor Laurence Boisson de Chazournes, Legal Adviser

**World Bank Group**

Mrs. Eloïse Obadia, Coordinator  
Mrs. Martina Polasek, Coordinator

**Delegation of India**

1. Mr. J. Hari Narayan, Chief Secretary, Government of Andhra Pradesh, Leader of the delegation
2. Mr. F.S. Nariman, Senior Advocate, Supreme Court of India
3. Mr. R. K. P. Shankardass, Senior Advocate, Supreme Court of India
4. Mr. R. Jeyaseelan, Chairman, Central Water Commission
5. Mr. V.V.R.K. Rao, Former Chairman, Central Electricity Authority
6. Dr. K.G. Ranga Raju, Former Professor, I.I.T. Roorkee
7. Mr. Narinder Singh, Joint Secretary (L&T), Ministry of Foreign Affairs
8. Mr. D.K. Mehta, Commissioner (Indus), Ministry of Water Resources
9. Dr. D.V. Thareja, Chief Engineer, Central Water Commission
10. Mr. Henrik Garsdal, Senior Hydraulic Engineer, Danish Hydraulic Institute, Denmark
11. Mr. Naresh Kumar, Director, Central Water Commission
12. Mr. G. Aranganathan, Senior Joint Commissioner (Indus), Ministry of Water Resources
13. Mr. Subhash C. Sharma, Junior of Mr. F.S. Nariman
14. Mr. Bharat Maurya, Liaison & Protocol Officer, Ministry of Water Resources
15. Mr. Anoop Mishra, Minister (Economic), Embassy of India to the USA
16. Mr. Manoj Joshi, Counselor (Economic), Embassy of India to the USA

Meeting No. 5 – November 7-9, 2006  
Annex 1

**Delegation of Pakistan**

1. Mr. Ashfaq Mahmood, Secretary, Ministry of Water & Power. Leader of the Delegation
2. Mr. Abdul Wajid Rana, Minister (Economic), Embassy of Pakistan
3. Mr. Jalil Abbas Jilani, Director General (South Asia), Ministry of Foreign Affairs
4. Mr. Syed Jamait Ali Shah, Pakistan Commissioner for Indus Waters
5. Mr. Syed Feisal Hussain Naqvi, Legal Consultant
6. Mr. Bashir Ahmad Qureshi, Vice President (Dams Expert), NESPAK
7. Mr. Mirza Asif Baig, General Manager, Hydrology Expert, NESPAK
8. Mr. Syed Muhammad Mehar Ali, Senior Engineer (Sedimentation & Numerical Modeling Expert), NESPAK
9. Professor James Crawford, SC, Expert in International Water Laws
10. Mr. Samuel Wordsworth, Associate of Professor Crawford
11. Dr. George Annandale, Technical Expert
12. Mr. Peter J. Rae, Technical Expert
13. Mr. Muhammad Syrus Sajjad Qazi, Counsellor, Embassy of Pakistan.

Annex 2

**INDUS WATERS TREATY 1960**  
**Government of India – Government of Pakistan**  
**BAGLIHAR Hydroelectric Plant**  
**Expert Determination on Points of Difference Referred by the Government**  
**of Pakistan under the Provisions of the Indus Waters Treaty**  
**Meeting No. 5 with the Neutral Expert and**  
**the Delegations of India and Pakistan**  
**November 7-9, 2006, in Washington, D.C. – World Bank Offices, 1818 H Street, N.W.,**  
**Conference Room MC2-800**

**AGENDA**

1. Introduction  
(Welcome, attendance, programme of the meeting, approval of the agenda, minutes)
2. Oral comments by the Parties on the final draft determination of the NE:
  - 2.1 Remarks by Pakistan
  - 2.2 Remarks by India
3. Possible questions by the NE to each Party for clarification.
4. NE's Work Programme in view of the issuance of his Decision.
5. Other Matters (information to the media, if any)
6. Conclusion  
Post Meeting: Approval of the Minutes

Prof. Raymond Lafitte  
*October 12, 2006*



COMMENTS (as amended pursuant to changes in the schedule)

The meeting will start on November 7, 2006 at 2 p.m.  
The Parties will have one and half days to present their respective remarks.  
The NE will have approximately half a day for his possible questions to each Party.

With the agreement of the Parties, a joint dinner has been organized on November 8, 2006 at 8 p.m.

Annex 3

**Statement of Pakistan made on November 9, 2006 (by Professor James Crawford)**

Mr NE, I ask your permission to make a statement:

- You have asked each party whether it was content with the procedure followed at the meeting. We are unable to give a positive response. This is for two reasons.
- First reason: there has been no interchange between you and ourselves. We have made very clear that we wanted to engage with you, to understand your thinking, so that we could attempt to persuade you of your error. You have refused to be so engaged. We accept that it is for you to ask questions, or to give us keys to your thinking, as you see fit; but, as you have not done so, and as your draft determination left us very unsure of how you got to your decision, we do not feel that we have had a satisfactory opportunity to put our case forward.
- Second reason: India has submitted new evidence on which we have been given no opportunity to comment. We appreciate that this part of the procedure was not intended to be adversarial, but we did not agree to a procedure in which a wholly new, unsolicited and untested model would be put forward by India in circumstances where our expert (Dr Annandale) would have no right to point out what he considers to be some very obvious flaws.
  - This is a very unsatisfactory element of the procedure. To address this, we request permission for Dr Annandale to present a brief written statement on the new material presented by India. He would do this by Friday 24 November.
- We must also express our extreme concern as to the presentation made by Mr Shankardass yesterday. India's position has never previously been explained as it was yesterday by Mr Shankardass, and India's design has never been justified on the basis that the reservoir will be drawn down, or that this is permitted by the Treaty. India does not actually make this argument now.
- We would like our reservations to this effect to be recorded in the minutes.

**Annex 4**

**Statement of India made on November 9, 2006 (as transcribed in the verbatim transcript of Meeting No. 5, Day 3)**

“MR. NARAYAN:

We would like to point out in response [to Pakistan’s statement] two or three things.

Firstly, we do not -- that in the presentation of Pakistan which preceded our presentation, new material in the form of Rooseboom and other such references had, indeed, been introduced by Pakistan.

The second point we would like to urge is that, yes, the two-dimensional study was introduced by India yesterday for the first time, but that was in response to the specific point made in the determination suggesting that more research would be needed on that specific question of how 300 meters became 200 meters and whether there was a looping effect on the calculation, which is why that study was taken up.

Having said that, we would also like to state that we have no objection, and affording time to Professor Annandale or, indeed, anybody else to respond to the study. We would only request that in such event we may be given a copy of the comments and given a chance to rebut those comments.

And, similarly, we should also be given an opportunity to comment on Rooseboom's report and likewise.”

**Annex 5**

**Statement of the NE made on November 9, 2006**

Mr. Ashfaq Mahmood, Mr. Hari Narayan, distinguished delegates, I wish to make the following statement, and I wish that it will be included in the minutes.

I recall that it had been agreed that Meeting No. 5 would only be devoted to the oral presentation of the written comments made by the parties on the final draft determination on October 26.

I consider that both parties had full opportunity to present their case and to comment on my final draft determination.

I also consider that no new arguments have been submitted during the oral presentations, and therefore I will take into consideration all comments and documents received from the Parties on my final draft determination, including those to be produced on November 24, 2006.

Lastly, I consider that this procedure of submitting comments on the final draft determination has achieved its goal.

## **Documents consulted by the Neutral Expert**

### Written Instruments submitted by the Parties:

|                        |            |   |
|------------------------|------------|---|
| Government of Pakistan | 14.08.2005 | Memorial of the Government of Pakistan  |
| Government of India    | 23.09.2005 | Counter-Memorial of the Government of India   |
| Government of Pakistan | 25.01.2006 | Reply of Government of Pakistan to the Counter Memorial by Government of India – Parts I and II |
| Government of India    | 20.03.2006 | Rejoinder of the Government of India – Volumes I and II   |

### Design documents provided by India on the request of the NE:

|            |   |
|------------|---|
| 15.07.2005 | <u>Volume I</u> – Information furnished to Pakistan on 30 May 1992 - Information sent by India on 7 May 1993 - Particulars of change communicated on 24 May 2002  |
| 15.07.2005 | <u>Volume II</u> – Data/Information/Studies sent by India on 15 December 2004, as per Annexure 'A' of Pakistan's Note Verbale dated 10 August 2004 - Record containing additional Information/Documents/Views exchanged between India and Pakistan at the Secretary-level Meeting held from 3 to 7 January 2005 |
| 15.07.2005 | <u>Volume III</u> – Updated Information   |
| 28.07.2005 | <u>Volume IV</u> – Model Studies for: Flow Conditions at the Power Intake - Discharging Capacity of Spillways - Pattern of Sediment Deposition in the Vicinity of Intake  |
| 30.11.2005 | <u>Volume V(i)</u> – Planning and Model Test Documents - Hydrology, Flow Duration Curves - Series of Daily Inflow for 30 Years  |
| 26.12.2005 | <u>Volume V(ii)</u> – Planning and Model Test Documents - Sedimentation of the Reservoir and Sediment Management  |
| 30.11.2005 | <u>Volume V(iii)</u> – Planning and Model Test Documents - Geology and Geomechanics   |
| 30.11.2005 | <u>Volume V(iv)</u> – Planning and Model Test Documents - Dam Monitoring Concept - Brief Construction Schedule - Costs of Main Components - List of All Tests Made in Past Years  |
| 30.11.2005 | <u>Volume V(v)</u> – Replies to Questions Posed by the Neutral Expert   |
| 26.12.2005 | <u>Addendum to Volume V(v)</u> – Replies to Questions Posed by the Neutral Expert   |

### Other Official Documents submitted by the Parties:

|                        |             |   |
|------------------------|-------------|---|
| Government of India    | 19.06..2006 | Answers to Questions Posed by the Neutral Expert during Meeting No. 3                     |
| Government of Pakistan | 24.10.2006  | Comments of Government of Pakistan on the Final Draft Determination by the Neutral Expert |



|                        |            |   |
|------------------------|------------|---|
| Government of India    | 26.10.2006 | Written Comments on the Final Draft Expert Determination                        |
| Government of India    | 24.11.2006 | Salient Features of Salal Dam and Comments on Prof. Albert Rooseboom's Report   |
| Government of Pakistan | 24.11.2006 | Comments of Government of Pakistan on 2D Computer simulation Presented by India |

Minutes of meetings (attached as annexes 1.3.1 to 1.3.8) :

Protocol of Meeting No. 1, June 9-10, 2005, Paris  
Minutes of Site Visit, October 2-3, 2005, Baglihar Site  
Minutes of Model Visit, October 5-6, 2005, Roorkee  
Minutes of Wrap up Meeting, October 7, 2005, New Delhi  
Minutes of Meeting No. 2, October 19-21, 2005, Geneva  
Minutes of Meeting No. 3, May 25-29, 2006, London  
Minutes of Meeting No. 4, October 2-4, 2006, Paris  
Minutes of Meeting No. 5, November 7-9, 2006, Washington D.C.

Transcripts of meetings:

Meeting No. 1, June 9-10, 2005, Paris  
Meeting No. 2, October 19-21, 2005, Geneva  
Meeting No. 3, May 25-29, 2006, London  
Meeting No. 4, October 2-4, 2006, Paris  
Meeting No. 5, November 7-9, 2006, Washington D.C.

Other Documents submitted by India on Request of the Neutral Expert:

| Author              | Document reference | Date       | Title  |
|---------------------|--------------------|------------|--|
| Jaiprakash Ass. Ltd |                    | 28.10.2005 | Item "k" of para 3.2 of MOM dated 07.01.05 - Proposed Construction Schedule for Remaining Works                    |
| -                   |                    | 28.10.2005 | Item "l" of para 3.2 of MOM dated 07.01.05 - Estimated Cost of Baglihar Plant                                      |
| IRI, Roorkee        | 76-RR (H2-7)       | Sept. 05   | Report on Model Studies for Baglihar Dam Works   |
| IRI, Roorkee        | 76-RR (H2-8)       | Oct. 05    | Report on Model Studies for Baglihar Dam Works - Conducted during the Visit of Neutral Expert on 5-6 October, 2005 |

| Author              | Document reference  | Date       | Title  |
|---------------------|---------------------|------------|--|
| IRI, Roorkee        |                     | 05.10.2005 | Presentations made on Oct. 5, 2005 by IRI, Roorkee before Neutral Expert                               |
| Jaiprakash Ass. Ltd | 1600-0009-011-Ann.2 | Sept. 2000 | Earthquake Parameters for Analysis and Design of Dam and Appurtenant Structures of Baglihar HE Project |
| Hydroprojekt IG     |                     | Jan 02     | Baglihar HEP - Dam Stability Analyses  |
| Jaiprakash Ass. Ltd | 1600-0209-004-Rev.1 | May 01     | 2-D Stability and Stress Analysis for Main Dam   |
| Jaiprakash Ass. Ltd | 1600.0209-02 rev.1  | Dec. 2000  | Layout and Hydraulic Design of Spillways   |
| Jaypee Ventures Ltd | -                   | 25.07.2005 | 450 MW Baglihar H.E. Project - Welcome (set of slides)   |

Set of drawings submitted by India on Request of the Neutral Expert:

| Author              | Document reference | Date       | Title   |
|---------------------|--------------------|------------|---|
| Jaypee Ventures Ltd | 1600-0101.001      | -          | Construction Drawing - Layout of Dam Works & Diversion Tunnel on Right Bank |
| Jaypee Ventures Ltd | 1600-0205-060      | Oct 03     | Structures at Top of Main Dam - Elevation                                   |
| Jaypee Ventures Ltd | 1600-0201-021      | Oct 03     | Chute Spillway - Profile, Aeration and Energy Dissipation Arrangement       |
| Jaypee Ventures Ltd | 1600-0201-022      | Oct 04     | Chute Spillway - Profile, Aeration and Energy Dissipation Arrangement       |
| Jaypee Ventures Ltd | 1600-0201-031      | Nov 04     | Chute Spillway - Profile, Aeration and Energy Dissipation Arrangement       |
| Jaypee Ventures Ltd | 1600-0205-005      | Feb 04     | Details of concrete in Dam Block 14 (Auxiliary Spillway)                    |
| Jaypee Ventures Ltd | 1600-0205-016      | 29.09.2004 | Details of concrete in Dam Block 2 (N.O.F)                                  |
| Jaypee Ventures Ltd | 1600-0205-007      | Jun 04     | Details of concrete on Dam Block 13 (Sluice Spillway)                       |
| Jaypee Ventures Ltd | 1600-0301-018      | Aug 04     | General arrangement & Concrete Outlines - L sections through Power Intake   |