



Annex N: Environmental & Social Panel of Experts, Dam Safety Review Panel & International Advisory Group

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Environmental & Social Panel of Experts

Introduction

The three-member Environmental and Social Panel of Experts (POE) was established by GOL with the approval and guidance of the World Bank. It is mandated to provide GOL with an independent assessment and review of environmental and social issues associated with the Project. The POE is required to act independently of both GOL and NTPC and in accordance with relevant World Bank guidelines.

To date, the POE has accomplished seven missions, conducted in January and July 1997, January 1998, 1999, 2001, 2003 and February 2004. Findings of the POE are reported and have been released publicly.

The POE will continue to play a decisive role through Project implementation and during the initial portion of the Operating Phase. A brief summary of the POE's key findings to date is presented below in this Annex. Individual reports noted above should be referred to for further information.

Composition

The POE included three members who are experts of international standing: Lee M. Talbot, PhD (George Mason University, Virginia, USA), Thayer Scudder, PhD (California Institute of Technology, USA) and T.C. Whitmore (deceased), PhD (Cambridge University, UK). The Concession Agreement requires that one member shall be an environmental generalist with expertise in environment/development trade-offs, one other member shall be a social scientist with expertise in resettlement and indigenous peoples of Southeast Asia and the other member shall have expertise in tropical forest and biodiversity conservation, utilisation and management. Alternatively, one member may be as recommended unanimously by the two other members as being an expert in a field related to any of those specified requirements and who is considered by them as a person who will enhance the role and function of the Panel of Experts. All candidate members must also be acceptable to the World Bank. Any vacancy in the membership of the Panel of Experts may be filled by GOL provided that the criteria above are satisfied and subject to a veto privilege by NTPC of one of the candidates proposed by GOL. Additionally, GOL may terminate the appointment of any member provided that the provisions set out in the paragraphs above apply to any substitute appointee.

Independence

The independence of the Panel of Experts is achieved by:

- The explicit requirement in the Concession Agreement that the POE must act independently of GOL and NTPC and in a manner which, in the Panel's own opinion, is in accordance with the World Bank Guidelines, which the Project is committed to follow and best protects both the environment and the interests of those affected by the Project;
- NTPC's guaranteed funding commitment for the POE up to an annual ceiling while the Panel of Experts is kept as a standing body;
- The Panel of Experts is to be a standing body until the third anniversary of the COD. Thereafter, at the discretion of GOL, it will serve until the sixth anniversary of the COD. Throughout the remainder of the Concession Period, it may be reconstituted as an *ad hoc* body from time to time at the request of GOL;
- The provisions that the qualifications, experience and independence of the individual members of the Panel of Experts cannot be challenged by NTPC;
- The provisions that the individual members of the Panel of Experts cannot be sued by NTPC in respect of any comment or recommendation made by them, whether made in accordance with the provisions of the Concession Agreement or not, even if made negligently and even if NTPC or another person suffers loss as a result of NTPC complying with that comment or recommendation;
- Limiting the rights of NTPC to appeal a comment or recommendation of the Panel of Experts, requiring that there be three Experts to hear the appeal; and
- Subject to compliance with requirements outlined in the Concession Agreement, the Panel of Experts would have the ability to amend or overturn its previous comments or recommendations. An exception would be comments or recommendations made relative to matters referred to them as provided in Schedule 4 of the Concession Agreement (Environmental and Social Objectives).

Notwithstanding these provisions, the members of the POE have no powers under the Concession Agreement except as expressly given by the Concession Agreement.

Function

The Panel of Experts has:

- A broad or general function for providing an independent review and guidance on the treatment of environmental and social issues associated with the Project;
- Specific rights set out in the Concession Agreement with respect to social and environmental issues relating to the Project; and

- Power itself, or if requested by GOL, to provide written reports:
 - Stating whether, in their opinion the parties have complied with their respective Environmental and Social Objectives and whether the World Bank guidelines have been complied with in the amelioration or remediation of unanticipated project impacts pursuant to the requirements of Clause 30.9;
 - Recommending remedial action in the case of considered non-compliance; and
 - Containing other comments as they may deem appropriate.

Key Recommendations & Findings

Key recommendations and findings of the POE include:

- Recommendation that a management strategy for the NNT NBCA be established and enforced, and hunting or other biodiversity exploitation be curtailed in core areas;
- Steps should be taken after the inundation of the Nakai reservoir to remove small diameter trees from the reservoir area;
- The substantially reduced flow in the Nam Theun is likely to affect riverbed vegetation but their loss from the 12 km section between the Nakai Dam and Nam Phao seems to be an acceptable trade off for the Project's positive gains; and
- A monitoring programme of fish migration and fishing activities on the Xe Bang Fai should be started.

A summary of POE comments and their integration into Project design is presented in Table N.1.

NTPC Obligation to Comply with Panel of Experts' Recommendations

Comments and recommendations of the POE as outlined in the Concession Agreement shall be binding on NTPC. NTPC shall promptly and at its own cost comply with and implement any comments and recommendations from the Panel of Experts, if GOL so directs NTPC, as long as those comments and recommendations have been made in respect of matters that are subject to the POE comments and recommendations, and in respect of a matter for which NTPC is responsible under the Concession Agreement.

Compliance with comments and recommendations is required if the Panel of Experts has:

- Acted within the powers given under the Concession Agreement, including a requirement that it is relevant to the World Bank Guidelines and has applied the provisions of the Concession Agreement relating to Environmental and Social Objectives and Unanticipated Project Impacts that are applicable, has applied standards which would be considered Good Operating Practices for the purposes of the Concession Agreement, and has acted in good faith; and
- Has followed the procedures set forth in the Concession Agreement, including a requirement that it meet with NTPC prior to publishing any comment or recommendation critical of NTPC.

Duration & Associated Costs

The costs of the Panel of Experts, which GOL is required to maintain as a standing body until the third anniversary of the Commercial Operation Date and which it may, at its election, maintain thereafter as a standing body until the sixth anniversary of the Commercial Operation Date, are to be met by NTPC up to certain specified amounts until that date.

Disputes Regarding Panel of Experts' Recommendations

NTPC may dispute the recommendations made by the Panel of Experts in only several specific circumstances, as outlined in the Concession Agreement.

Dam Safety Review Panel

Introduction

GOL instituted a Dam Safety Review Panel (DSRP) for review of all safety related issues. A total of three reports have been issued by the DSRP:

- February 2000 – Report on Visit to Lao PDR;
- June 2000 – Report on Meetings, Chambéry, France; and

Table N.1: Summary of POE comments

Issues Raised	Integration into Project Design
Infrastructure alternatives in the NBCA.	Infrastructure alternatives have been investigated in a number of reports (SEMPOP 2003) and it has been proposed that a combination of tracks and improved river access provides transportation links without endangering the biodiversity of the area.
World Heritage status of the NBCA and extension should be pursued.	NTPC will support GOL if it decides to apply for World Heritage status.
More socio-economic surveys and pioneering planning for the middle and lower Xe Bang Fai.	The Concession Agreement outlines plans to conduct baseline and subsequent socio-economic and health surveys of villages located along the Xe Bang Fai. Surveys will be undertaken after the Commercial Operations Date (two years after COD and four years after COD). NTPC has negotiated with EGAT to cease generation in advance of imminent flooding so that releases do not exacerbate natural floods. Surveys and plans have been made to address the implications of stream channel and bank changes and river levels in relation to riverside gardens and cross-river access.
Planning and Management of the Hmong Population in the NW and along the Nam Theun.	Proposals for improving livelihood options for Hmong villages to the NW of the NBCA are included in SEMPOP 2003.
RAP can be used as an incentive for population movement out of the NBCA.	NTPC recognizes the potential for the Nakai Plateau resettlement experience to act as an incentive for NBCA communities to relocate there. However this will only be encouraged once the Plateau Resettlers are established and the RAP has proved successful.
An International Panel of Experts (Dam Safety Panel) be appointed before Appraisal.	A Panel of Experts to address Dam Safety Issues was selected by GOL and approved by the World Bank in June 1999.
Monitoring program of current fish migrations and fishing activities be initiated by the 1999-2000 dry season.	A Xe Bang Fai Fisheries Baseline Study and ongoing monitoring was initiated.

- May 2002 – Report on Meetings, Chambéry, France.

Composition

The Dam Safety Review Panel comprises two members i) Paul Back, PhD (Consulting Engineer); and ii) Arthur Stukeley (Consulting Engineer Geologist), who are international experts in the fields of engineering, with emphasis on gravity dams, hydrology, spillways, and engineering geology. All candidate members must also be acceptable to the World Bank. Any vacancy in the membership of the Dam Safety Review Panel may be filled by GOL provided that the criteria above are satisfied and subject to NTPC having the right of veto of one out of any three qualified candidates recommended by GOL. GOL may terminate the appointment of any member provided that the provisions set out above apply to any substitute appointee.

Function

Generally, the Dam Safety Review Panel has the following function:

- A broad or general function of determining the safety of the dam and other civil structures, the downstream areas of the Nam Theun and Xe Bang Fai and the Catchment Area according to the requirements of the World Bank Dam Safety Policy (as in force on the date the Concession Agreement is executed);
- The specific rights set out in the Concession Agreement to inspect and review the design, construction, commissioning, and operation and maintenance of the Project; and
- Power itself, or if requested to do so by GOL, to provide written reports:
 - i) Stating whether, in their opinion, the design, construction, commissioning and/or operation and maintenance of the dam and other civil structures, the downstream areas of the Nam Theun or the Catchment Area comply with the World Bank's Dam Safety Policy;
 - ii) Recommending remedial action in the case of considered non-compliance; and
 - iii) Containing such other comments as they may deem appropriate.

Scope

The detailed scope of the Dam Safety Review Panel includes all aspects of dam safety and can be summarised as follows:

- **Flood Hydrology:** extent and sufficiency of data, methodology for derivation of extreme and design floods, procedures for routing floods throughout the reservoir and impact of floods downstream of the power plant;
- **Seismology:** identification of sources of seismic activity, assignment of earthquake magnitudes to each source, and methodology for derivation of vibration parameters at the site for maximum credible and design basis earthquakes;
- **Engineering Geology:** quality and sufficiency of the geological investigations and the interpretation thereof; correctness of the geological and hydrological models of the region, reservoir area and dam site; engineering implications with respect to foundation design, stability of natural and excavated slopes; and support of surface and underground excavations;
- **Rock Mechanics/Underground Excavations:** design of surface and underground excavations, including selection of stable slopes; appropriate shapes and orientations for underground excavations; and design of temporary and permanent support systems and linings;
- **Sedimentology:** estimates of sediment load that will enter the reservoir; method of operation of the reservoir to provide sediment storage in the short term and systematic scouring of the

downstream channel over the long term, and likelihood of achieving desired effects;

- **Dam Design:** adequacy of field and laboratory investigations in relation to materials for construction of the dam and cofferdams, appropriateness of materials selected, proportioning and composition of the various zones, static and dynamic analyses of the dam section; selection of foundation levels, proposed measures of forming cutoffs in and drainage of the foundations and abutments; construction procedures specified in relation to the dam and its foundations, instrumentation of the dam and proposed monitoring programme;
- **Hydraulic Design:** hydraulic design and specifications of the spillway and energy dissipation facilities, diversion, power conduit and drawdown facilities, regulating pond and tailrace facilities;
- **Planning and Design of Dams and Hydropower Facilities:** overall layout of the Project; design criteria; specifications; design of hydraulic structures; diversion scheme and sizing of its various components; capacity of the spillway and drawdown and tailrace facilities; procedures for routine inspection of the dam and checking safety of structures, including the organisation and staffing of the inspection agency;
- **Construction of Dams and Hydropower Facilities:** Construction planning studies, temporary facilities, access to the site, master schedule for implementation, conditions of contract; contractors proposals in relation to construction procedures, schedule, river diversion; organisation, staffing and procedures for managing the construction of the Project, methodology and organisation for quality control of the construction;
- **Concrete Technology:** Adequacy of testing of concrete materials, and their suitability for use in the works, specifications for concrete, mix design and quality control procedures; and
- **Specifications and manufacturers' proposals:** for turbines, generators and mechanical and electrical equipment in the Power Station and switchyard, with particular emphasis on design provisions for turbines operating in sediment laden water, and state of the art design of generators, switchgear and control systems.

Key findings to Date

Key findings of the DSRP to date include:

- **Nakai Dam:** The selection of the Roller Compacted Concrete (RCC) alternative for Nakai Dam is endorsed by the Panel as being the most appropriate for the site. Reviews have been undertaken of dam foundation and its protection, repair and maintenance.
- **Spillway:** A design review of splitter walls have been undertaken that will reduce scour downstream of the dam during asymmetric discharges through the spillway and minimise the potential problem of cavitation.
- **Diversion Works:** The Panel agreed that diversion works capacity is limited to the dry season ten year flood flows and the construction programme should be managed efficiently to avoid any unacceptable disruption to the limited time thus available for the construction of the dam.
- **Drawdown Facility:** On the Panel's recommendation, the drawdown facility will allow for water levels below El 526.85 m to be drawn down further by means of the power intake and also by the very limited discharge capability of the riparian release facility at El 522.0 m.
- **Intakes:** The Panel has received confirmation from the Head Construction Contractor that the designs will ensure that under transient surge conditions (sudden load rejection etc.) the screens would not be damaged by reverse flows through them.

- **Headrace:** The Panel has endorsed the decision of the headrace channel route.
- **Pressure Shafts:** The Panel has made recommendations about the stability of the shaft in light of the base rock conditions and potential water inflow problems.
- **Penstock:** The location for the upstream limit of steel lining within the penstock tunnel is under investigation and is under review by the Panel.
- **Power Station:** The Panel has recommended setting up a debris trap to be provided immediately downstream of the turbine draft tubes to prevent sealing of the gates.
- **Regulating Dam:** The key safety aspect here is the efficient functioning of the control gates at the regulating dam. These will govern the downstream flows, the Nam Kathang flow and the flow to the irrigation facility. The Panel has noted that it is important to ensure that gate operations at the dam do not lead to erosion or cavitation damage to the waterways.
- **Downstream Channel:** The most appropriate configuration for the downstream channel has been adopted to satisfy the environmental and technical performance criteria and to anticipate the behaviour of the channel in operation. The Panel has recommended that the construction contract should have the requirement for an ongoing maintenance commitment during the early months of operation of the channel.

In addition, the Panel has also reviewed the contractual arrangements for project quality control, design reviews and risk.

Independence

The Dam Safety Review Panel's independence is achieved by several means, including:

- The explicit requirement in the Concession Agreement that the Dam Safety Review Panel must act independently of GOL and NTPC and in a manner which, in the Panel's own opinion is in accordance with the World Bank's Dam Safety Policy;
- Actions of the Panel must be in the best interest of all who may be adversely affected by the dam and other civil works, the downstream areas of the Nam Theun and the Xe Bang Fai and the Catchment Area;
- NTPC's guaranteed funding commitment for the Dam Safety Review Panel up to an annual ceiling;
- The requirement that the Dam Safety Review Panel be a standing body until the sixth anniversary of the Commercial Operation Date and thereafter, be an ad hoc body which may be reconstituted from time to time at the discretion of GOL;
- The provisions that the qualifications, experience and independence of the individual members of the Dam Safety Review Panel cannot be challenged by NTPC;
- The provisions that the individual members of the Dam Safety Review Panel cannot be sued by NTPC in respect of any comment or recommendation made by them, whether made in accordance with the provisions of the Concession Agreement or not, even if made negligently and even if NTPC or another person suffers loss as a result of NTPC complying with that comment or recommendation;
- NTPC has limited rights to appeal a comment or recommendation of the Dam Safety Review Panel. If there is an appeal, three of the experts are required to hear the appeal;
- Subject to compliance with the requirements described below, the DSRP may amend or overturn previous comments or recommendations; and
- However, the members of the Dam Safety Review Panel are not party to the Concession Agreement and have no power to enforce themselves.

NTPC Obligation to Comply with Dam Safety Review Panel Recommendations

NTPC shall immediately and at its own cost comply with and implement any comments and recommendations of the Dam Safety Review Panel if GOL so directs NTPC; and if the Dam Safety Review Panel has:

- Acted within the powers given to it under the Concession Agreement, including a requirement that it has had regard to the World Bank's Dam Safety Policy, has applied the engineering standards applicable under the Concession Agreement and has acted in good faith and reasonably; and
- Followed the procedures set forth in the Concession Agreement, including a requirement that it meet with NTPC prior to publishing any comment or recommendation critical of NTPC.

Duration & Associated Costs

The costs of the DSRP, which GOL is required to maintain as a standing body until the sixth anniversary of the Commercial Operations Date and which it may, at its election, reconstitute when it wishes to do so, are to be met by NTPC up to a certain specified amount until that date.

International Advisory Group

Introduction

The World Bank established the International Advisory Group (IAG) in order to obtain guidance on ways in which the World Bank may improve its handling of environmental and social issues in the hydropower projects it supports worldwide, beginning with the Nam Theun 2 Project.

To date, the IAG has completed three missions and have published the following reports:

- 1997 IAG August International Advisory Group Report #1;
- 1998 IAG December International Advisory Group Report #2; and
- 2001 IAG April International Advisory Group Report #3.

A brief summary of the IAG's key findings to date is presented in this Annex. Individual reports noted above should be referred to for further information.

Scope of Work

The IAG was initially requested to provide independent assessment and recommendations to the World Bank on its handling of environmental and social issues related to the proposed Project. This scope of work included:

- An assessment of risks to the Bank posed by involvement in the Project, and advice on what measures the Bank should take to address these risks;
- Providing advice to the Bank on the Project's compliance with the Bank's environmental and social Operational Directives in both letter and spirit;
- Incorporating the concerns and expectations of key Bank stakeholders and providing advice to the Bank on steps to be taken to build international consensus on the proposed Project; and
- Potentially providing advice to the World Bank Environment Department on ways in which to improve hydropower development in an environmentally and socially sustainable manner for Bank-supported projects worldwide, while drawing upon the lessons learned from the ongoing experience with the Project and to the extent possible, Bank experiences with other hydropower developments.

Composition of the International Advisory Group

The IAG consists of five eminent persons in the field of environmental and social development; one of the Advisors is appointed as convener of the IAG and assumes responsibility for providing the IAG's secretariat. Members of the IAG are Mr. Dick de Zeeuw (Deputy Chairman of Netherlands Commission for Environmental Impact Assessment - Convener), Mr. David McDowell (Director General of IUCN - The World Conservation Union), Mr. Emil Salim (Former Minister of Environment for Indonesia), Mr. Kazuo Takahashi (Director of the International Development Research Institute, Japan), Ms. Meg Taylor (Former Ambassador of Papua New Guinea to the United States.).

Key Recommendations & Findings

The key recommendations and findings of the IAG include the following:

- The IAG concluded that in terms of the handling of environmental issues, early recognition of environmental consequences had been achieved and mitigation proposals, especially for protecting the watershed, are a breakthrough compared to past practices;
- The IAG concluded that compliance with the natural habitat Operation Directive is adequate if it is accepted that conversion of part of the Nakai Plateau into a reservoir is offset by conservation of the NNT NBCA and other areas of biodiversity significance;
- The IAG recommended that environment management should be an ongoing aspect of the Project;
- The IAG recommends measures to be taken to counter illegal hunting and trading activities in the watershed;

- It was recommended that further research be carried out on fish resources in all affected areas, including endemic fish;
- The IAG recommended that there should be no introduction of exotic fish species into the reservoir and an education campaign should be undertaken to guard against accidental or unplanned introduction; and
- The IAG recommended that the greenhouse gases impacts be updated.

Reporting Arrangements

The IAG provides its findings and recommendations to the Vice-President of the East Asia & Pacific Region of the World Bank with a copy to the Chair of the Bank-wide Steering Committee on Nam Theun 2 (Director of EA1) regarding work related to this Project.

Process, Outputs & Funding

Each mission of the IAG includes a field visit, where a deeper understanding of the proposed Project, and in particular, of the environmental and social impacts can be developed. Following a site visit, and further discussion with GOL and other stakeholders, the IAG prepares a summary note to the Bank on i) its evaluation of how the Bank has handled the environmental and social issues posed by the proposed Project; and ii) its recommendations on what further measures the Bank should undertake to improve its handling of the environmental and social issues of the Project. These notes, accompanied with a written Bank response are to be made available to the public. The members of the IAG are supported, in full, by the World Bank. Neither NTPC nor GOL assists in funding the IAG.

