ISH0306 - Consultancy for the Development of Guidelines for Hydropower Environmental Impact Mitigation and Risk Management in the Lower Mekong Mainstream and Tributaries

Common Standards & Guidelines

Simon Krohn & Christopher Grant

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The need for common design & operating standards

A centrally directed approach is needed for establishing:

- Design standards (flood hydrology, seismicity, etc);
- Flood management;
- Emergency Contingency Planning;
- Dam Safety;
- Hydro-safety;
- Operation & Maintenance; &
- Works at handover.

A consistent approach is needed, particularly on cascades. These decisions cannot be delegated to the private sector.
The need for defined environmental requirements

A centrally directed approach is needed to define requirements for:

- Minimum environmental flows;
- Retaining seasonal patterns and flood releases;
- Limits on discharge ramp rates;
- Water quality targets;
- Requirements sediment management operations;
- Protection of biodiversity hotspots; and
- Requirements for fish passage

These issues cannot be assessed by the private sector on a project by project basis. They need to be imposed as design requirements by national or regional authorities based on River Basin Planning.
The need to consider the future

Participation of the private sector is the only realistic route to power sector development, but:

- Hydropower projects are long term assets that permanently change the landscape;
- The period of private ownership is relatively short in the overall project lifetime.

<table>
<thead>
<tr>
<th>CA Period</th>
<th>Residual commercial life time</th>
<th>Future use</th>
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<tbody>
<tr>
<td>25 years</td>
<td>75 years</td>
<td>??? years</td>
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The project must be designed for national requirements long after the developer has departed. Should projects be designed for safe decommissioning? It is a requirement in other industries.
Current approach

National standards (example):

*Lao Electric Power Technical Standards*
- Compliance is a legal requirement in Lao PDR
- Scope covers:
  - General requirements for organisation
  - Hydropower & civil engineering facilities
  - Electrical facilities
  - Safety rules for operation & maintenance
- Currently being updated by MEM

Similar national standards apply in the region.

In addition:
- National legislation on design, environment, etc
- National Grid Codes
- GMS Performance Standards (under development by GMS power utilities)
Current approach

Regional standards (example):

*MRC Preliminary Design Guidance for Proposed Mainstream Dams*

- Currently covers only mainstream dams
- Provides high level guidance
- To be updated to provide more specific requirements.

International Standards:

- Typically required by lenders and insurers
- Regularly updated by industry experts
- Generally accepted as current best practice
- May not fully capture local conditions and requirements.
The need to be specific & consistent

International flood standards adopt widely different approaches to risk. It is necessary to specify what is required for the Mekong and to be consistent.

The same specific and consistent approach is needed to other design parameters such as seismicity, dam stability and environmental provisions.
Current approach

Design and operational standards should be defined in the Concession Agreement by the Government.

Attempts to subsequently introduce design changes and operational restrictions will need to be the basis of commercial negotiation. Project design and operational requirements should be defined before the project proceeds.

- A classic non-recourse finance model will require full project definition;
- A balance sheet financed project may not.

Private sector hydro requires a web of agreements that are not easily changed.
Compliance

If design, construction and operational standards are defined in the Concession Agreement then compliance should be monitored.

Typical provisions include:

• **Appointment of a Government Monitoring Engineer to:**
  - Review the project design for compliance;
  - Inspect construction activities for quality; and
  - Monitor first few years of operation for safety.

• **Appointment of a Lenders Engineer to:**
  - Monitor cost and risk during construction;
  - Assess compliance with specific loan agreement obligations (E&S); and
  - Review early operation period for revenue and debt service.

• **Appointment of a Dam Safety Review Panel to:**
  - Review project design and construction against current international practice;
  - Approve specific project safety documents such as the Emergency Preparedness Plan and Flood Instructions.
Contact details

Christopher Grant
Multiconsult UK Ltd
International House
Dover Place
Ashford, Kent
United Kingdom

Tel  +44 7880 406216
chris.grant@multiconsultgroup.com
www.multiconsultgroup.com