

Report to HSAF – 21st January 2010

**Trial Report on the
Draft Hydropower Sustainability Assessment
Protocol August 2009**

**Project: Teesta V, Sikkim, India
NHPC Ltd,
Dates: 1-7 December 2009**

**Report to the Hydropower Sustainability
Assessment Forum**

This Report is based on the Draft Hydropower Sustainability Assessment Protocol August 2009 (the "Draft Protocol"). It is intended to provide feedback to the Forum on practical experiences with the Draft Protocol. This feedback will be used, together with that from other participants in the trialling program, as input to the recommended edits to the Draft Protocol.

Assessment Team and Owner's Representative¹

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|-------------------------|---|
| Trial Auditor: | Dr Helen Locher, Coordinator, Hydropower Sustainability Assessment Forum |
| Owners Representatives: | Mr A K Chaudhary, Chief Engineer (Civil), Teesta-V Power Station, NHPC Ltd |
| | Dr Sujit Kumar Bajpayee, Assistant Manager (Environment), Corporate Planning Division, NHPC Ltd |

Trialling Report Part 1 – Introductory Information

Company²

NHPC Ltd., incorporated in 1975, is a Government of India Enterprise. NHPC's installed capacity is 13 operating power stations totaling 5175 MW, and it is presently constructing a further 11 power stations totaling 4622 MW. NHPC is planning to become a 10,000 MW company by end 2012. NHPC has been an IHA member since 2002, and an IHA Board member since 2003.

Project³

Teesta-V is the first project to be commissioned in a planned cascade of six hydropower projects on the Teesta River, located in Sikkim, India. It is a run-of-river scheme with a relatively small pondage. It works as a peaking power station and helps in stabilizing the eastern grid. Major project components are:

- A 45m (above ground level) high concrete gravity dam, length at top is 176.5 m with a central ogee shape spillway
- Three vertical intake structures of 6.5m, each with a capacity of 117 m³/s
- Three desilting chambers downstream of the intake structures, with silt flushing tunnels
- A 17.2 km long headrace tunnel to bring water from the intake structures to the Power House
- A 92.5m high by 30m diameter Surge Shaft at the end of the head race tunnel
- An underground power house with three Francis turbines, each 170 MW capacity
- Three tail race tunnels downstream of the power house discharging to the Teesta River
- Associated infrastructure including roads, bridges, construction village, resettlement village

¹ Name, function, organization & signature for each individual. This does not include interviewees.

² Basic information on the company, such as country of operation, public/private ownership, installed hydro capacity and annual generation. Membership in the IHA and other associations, and formal commitments to and reporting on sustainability etc. would also be of interest. For a Section I assessment, this would be replaced by who is undertaking the assessment.

³ Basic information on the project, such as location, physical lay-out, single-/ multiple-purpose, installed capacity, etc. Note for a Section I assessment where there is not a project of focus, this would describe the focus of the assessment.

Current Status of Project, and Protocol Section Applied

Construction started in March 2000 and the power station was commissioned in March 2008. Section IV of the Draft Protocol 2009 was utilized for this assessment.

Motivation for and Purpose of the Assessment

NHPC is committed to corporate social responsibility. As a Government of India Enterprise, NHPC is accountable to the people of India and a steward of India's natural resources. NHPC Ltd feels that this project is an example of good practices in the Indian context, and for some aspects is an example of best practice. It recognizes that there are areas where it could do better, and is interested in learning more about these, in order to apply these learnings to this project and to future projects.

Disclaimers and Confidentiality Agreements, if any⁴

During the trial, NHPC made every effort to provide appropriate evidence as well as access to those with relevant expertise and views, including government and members of the project-affected community. Travel times were a significant factor with the trial. The priority was put on getting through all Draft Protocol aspects to form a view on their utility, comprehension, scope etc, as well as to identify what types of evidence can be expected to be available to support scoring of each aspect. Some government and project-affected community members were able to be interviewed in this trial, but for a future assessment it is recommended that more non-industry interviews are conducted. Because of the limited interviews with government and community members, there was little evidence to support scoring of consultation and stakeholder support.

Schedule of the Assessment⁵

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|----------------|--|
| 1/12/09 | Flight from Delhi to Bagdogra, then drive to Teesta-V Power Station. Introductory overview of area maps, project diagrams, power station model |
| 2/12/09 | Site visit – catchment area treatment sites, dam, dam staff residential area, reservoir, power house, and a number of project benefits (e.g. schools, health centres, adopted village, butterfly park, road construction). Tour of power house. |
| 3/12/09 | Site visit to resettlement village, rehabilitation of spoil dump area, surge shaft. Overview presentation on Teesta-V project with emphasis on data relevant to Draft Protocol assessment. Interviews, review of documented evidence. |
| 4/12/09 | Tour of hospital, school, solid waste treatment area. Interviews, review of documented evidence. |
| 5/12/09 | Travel back to Delhi |
| 7/12/09 | Interviews with corporate office staff, review of documented evidence. |

⁴ Any qualifications the assessment team wishes to make regarding the information provided (e.g. limited number of stakeholders interviewed, depth of review of documents etc.); scope of confidentiality agreements, if any. Note these can also be made as relevant to particular aspects in the body of the report.

⁵ Dates with travel schedules, persons interviewed, site visits, presentations etc.

Trialling Report Part 2 –

Assessment Results from the Draft Protocol Trial – General

This part of the trial report is about general observations on the assessment results, while the following section provides aspect-by-aspect results and observations. The purpose of this part of the report is to provide feedback on the following issues. Where possible, examples for problems encountered should be given and improvements suggested.

Objectivity and replicability. *How robust do you feel the Protocol is in terms of assessment teams arriving at consistent and unbiased results?*

The Draft Protocol needs to be simpler, and with clearer scoring instructions before it can be considered objective and replicable. Fewer points of assessment would enable more time to be spent on each aspect within the audit process, and also more space for specific instruction and guidance for that scoring.

Understandability. *Which parts of the Protocol did the assessment team find hard to understand?*

Some of the effectiveness measures and how these should be scored were difficult – they will need better clarity and guidance. The scope of each aspect was sometimes hard to understand because of overlap with other aspects, and this also should be a focus of better guidance.

Scope and comprehensiveness. *Do you feel the Section includes the right aspects? Which issues did the assessment team encounter that are not covered in the Protocol, or that are duplicated unnecessarily?*

- Project Affected Communities overlaps with Social Management Plan and Indigenous Peoples.
- Benefit Sharing overlaps with Economic Viability and Additional Benefits.
- Occupational safety is awkwardly separated out from Asset and Community Safety and would benefit from being merged.
- Aquatic biota gets insufficient attention and should be its own aspect – there is a risk that it is subsumed by a focus on terrestrial biodiversity in the Biodiversity aspect.
- Resettlement gets insufficient attention and should be its own aspect – there will be a considerable period of time post project commissioning in which commitments specifically to the resettlers need close attention.
- Social Management Plan and Environment Management Plan could be merged to have one aspect focussed on the management systems for social and environmental management, since these are in most cases dealt with in a common business management system and also the considerations are often closely integrated.
- Consultation and Stakeholder Support are unnecessarily duplicated in every aspect, and it is very difficult to make assessments on these. One of the biggest problem areas is determining who is a stakeholder for each aspect, and this would take considerable time in the assessment process, not to mention having to go out and interview or get evidence on this. It is suggested to have one aspect called Consultation and Communication for the Operational Section of the Protocol, because the way the Draft Protocol is set up it does not promote a straightforward and direct discussion about community engagement approaches by the business. Particular aspects could still pick up on important components of this, e.g. grievance mechanisms under resettlement, indigenous peoples, and labour & working conditions; or community input into environmental flow objectives.

Ease of use. *How practicable do you feel the Protocol is as an assessment tool? Is any information required to apply the Protocol not available or available only with undue cost or effort?*

There are a number of measures for which information is not easily accessible, or within the timeframe of the assessment are difficult to assess. These are noted on an aspect-by-aspect basis in Part 3 of this report.

Impact and effectiveness. *To what extent did the assessment team find the application of the Protocol a useful exercise in terms of identifying weaknesses/opportunities, encouraging dialogue, and encouraging improvement of performance?*

The Draft Protocol is highly useful even in its present form with many opportunities for improvement. It provided a highly structured and systematic review approach across all facets of the project, and was a positive experience for all parties involved. With increasing experience by auditors, it will provide a vehicle to communicate and disseminate information on best practice approaches across the globe, with reference to individual projects exhibiting such practices – this can be of great interest and value to individual projects. Also in some cases the project has done all it can with respect to its responsibilities, but there are significant lapses because another agency has not met its responsibilities (e.g. fish hatchery at Teesta-V) – such a Protocol review can help put pressure on those other agencies to move faster to deliver their commitments.

Applicability to a range of scale and regions. *Did the assessment team identify any special problems in applying the Protocol in relation to project scale, region, developed versus developing economy, type of project, etc.? How did the assessment team make its scoping decisions with respect to aspect relevance, and considerations relevant to project context or scale?*

A point of much discussion was how expectations on best practice might vary depending on public versus private developer, and guidance should be given on this. For example in the Teesta-V context, public health, additional benefits, education, and catchment management were all exceptional but perhaps the actions of NHPC go beyond what one could reasonably expect of a private developer. Also Financial Viability has different considerations depending on a government business enterprise versus a private developer. Teesta-V is one of a cascade development with different owners and different timings for development – this was awkward to know how to deal with questions about efficiency of use of the hydrological resource, and could benefit from better guidance on this context. Expectations on safety in the developed world are likely to greatly exceed those in the developing world context, and some guidance would be of benefit on this.

Scoping decisions were made in discussions between the auditor and auditee as they arose with specific aspects, which seemed to work well.

Adequacy of implementation guidance. *How did you find the introductory section and the auditing guidance notes? Where would additional implementation guidance be helpful to the assessment teams?*

Introductory Section (20 pages)

The upfront guidance notes on how to score Quality of the Assessment Process and Quality of the Management process were often referred to assist scoring. A problem was with an aspect where there was one significant or critical gap in the assessment or management process – this seemed to fall between the instructions for a score of 2 and a score of 3.

Guidance Notes:

In some places the aspect specific guidance notes seemed educational but not clearly assisting scoring. It may help to separate educational text into a separate document, and keep the auditing document more directly focussed on instructions for auditors/auditees. For example for a particular aspect e.g. Resettlement, it would suffice to list what would be expected in the scope of an assessment or management plans, and leave it to the auditor to look for the level of comprehensiveness or critical gaps.

Presentation of Results. *How useful did you find the auditor worksheet and the suggestions for summary presentation of results provided in the Introduction?*

Did not use the auditor worksheet, but just took notes following the Protocol structure and points of assessment and later transferred them to the reporting template.

A histogram of scores is presented in Table 1. This tried to present the range from low to high scores for each aspect. It is not a very useful approach, because many attributes were not scored due to difficulties (see Table 2 with all the detailed scores) so are not reflected in the range of scores shown; for example, Financial Viability, or Markets, Innovation and Research had very few actual scores assigned. Also in some cases there were all very high scores and only one low score, which may have been for only one bullet point (sub-attribute), but paints a picture in the histogram of overall significantly poor performance (e.g. Economic Viability & Additional Benefits).

Trialling Report Part 3 –

Assessment Results from the Draft Protocol Trial – Aspect by Aspect

The intention of this part of the trial report is to provide an aspect-by-aspect summary of who was interviewed; what evidence was brought forward; and views of the assessment team on how well the Draft Protocol addresses that particular aspect.

A full report with scoring has been provided to NHPC. This report provides feedback to the Forum on the project relevant to future edits of the Draft Protocol. For each aspect, this report outlines the context for Teesta-V, evidence viewed, issues with the Draft Protocol text, and recommendations.

IV-1: RIVER BASIN & TRANSBOUNDARY ISSUES

Teesta-V context:

The Teesta River basin is the westernmost sub-basin of the Brahmaputra River. It rises in the Himalayan mountains at more than 5,000m elevation, and flows almost 300 km through Sikkim, West Bengal and Bangladesh where it meets with the Brahmaputra River. The area of the Teesta-V project is heavily forested with steep mountainous slopes, and with a very low population. Much of the land area is either forested or alpine areas, and 82% is the property of the Sikkim Department of Forests, Environment & Wildlife. Sikkim state is highly environmentally conscious – there is a ban on logging, considerable tracts of land are in terrestrial reserves, plastic bags are banned, the state plans to be fully organic in the future, and all road signage must have 20% of the space dedicated to environmental slogans. Because of the steep slopes and young geology, landslips especially during the monsoon season are common and land development opportunities are limited. Most villages are higher up the slopes and utilise side streams; there is little flat land near the river and it is difficult for public access. Land use is for agriculture and grazing, and there is an active army presence for border control.

At present Teesta-V is the largest operational hydropower project on the mainstem Teesta River. 30 hydropower schemes have been identified in the Ministry of Power's river basin development plan, and these have been prioritized for development. Many hydro developments are now in planning or under construction, by NHPC as well as other companies. Teesta-V is one of six in the planned Teesta cascade; there are three in a Teesta Low Dam cascade; and there are also existing and planned dams in several of the major tributaries to the Teesta River.

A condition of the Teesta-V project approval was that carrying capacity study of the Teesta River basin would be conducted. This very rigorous study took more than four years, resulting in a 166-page Executive Summary and Recommendations document supplemented by 9 or 10 volumes. It makes strong recommendations about limits to the basin's capacity to support hydropower development, and resulted in stopping of some of the most upstream projects.

For the Teesta-V project, transboundary issues are not relevant.

Evidence: Site tour, review of maps, review of engineering plans for power developments. Documentary evidence viewed – 4, 36, 45 (see Attachment 1 for numbered documents). Interviews - NHPC staff, and Chief Conservator of Forests, State Forest Department (see Attachment 2 for interviewee names and positions).

Aspect Difficulties or Issues: The expectation cannot be put on the developer that it would take a lead in developing basin plans. It is difficult to put the auditor in the position of judging likelihood of effective contribution to optimal utilisation of the water resources in the basin when for the vast majority of the world's basins such an understanding does not exist. Consultation and stakeholder support are difficult to determine how relevant to Teesta-V's ongoing operations, who is a relevant stakeholder, what evidence would be applicable, and how to score. The river basin issue was discussed during the public hearing for the Teesta-V project, and agreement for the project given by

the State government who would have a river basin perspective – the aspect guidance needs to provide more clarity as to how these would relate to the different scoring thresholds.

Recommendations for Aspect Improvements: More guidance on how to form views with respect to project sustainability in the absence of integrated basin plans or any process to develop these. Could consider deleting consultation, stakeholder support and compliance aspects; pick up consultation and stakeholder support in a dedicated aspect, and pick up compliance under Corporate Governance.

IV-2: HYDROLOGICAL RESOURCE AVAILABILITY & MANAGEMENT

Teesta-V context: The Teesta-V project drew on 20 years of flow data (1976-1996) and considerable meteorological data to create a hydrological model. The Central Water Commission (CWC) is responsible for most river monitoring. Glacial monitoring is more recent, only starting in 2008, so no such data was available. The planned project life is 35 years, and planning is based on 90% reliability of historical flows. The CWC continues to collect hydrological data, and Teesta-V now has its own gauging and water level stations as well (inflows to reservoir; reservoir level; outflows from power station). The emphasis at the project level is on the short-term data, as this is a run-of-river station. The NHPC corporate office hydrology team looks after long-term hydrological analyses, and every five years updates the hydrological series for each power station based on updated data – this is verified by relevant central government agencies.

Evidence: Personally viewed hydrological data and gauging stations. Documentary evidence viewed – 13, 40, 44, 58. Interviews - Teesta-V engineering and environmental staff, NHPC hydrologist.

Aspect Difficulties or Issues: Overlap with River Basin (IV-1) with respect to reliability and efficient utilisation of the water resource, and Reservoir Management (IV-19) with respect to operational rules; needs to be better distinguished. Cascade efficiencies are difficult to address in the absence of a single owner – not sure how this is best addressed in the Protocol scoring. Consultation and stakeholder support are difficult to determine how relevant to Teesta-V's ongoing operations, who is a relevant stakeholder, what evidence would be applicable, and how to score.

Recommendations for Aspect Improvements: Give clearly aspect scoping instructions at the outset. Give better guidance on the context for cascade projects with multiple owners and development timetables. Could consider deleting consultation, stakeholder support and compliance aspects; pick up consultation and stakeholder support in a dedicated aspect, and pick up compliance under Corporate Governance.

IV-3: ECONOMIC VIABILITY INCLUDING ADDITIONAL BENEFITS

Teesta-V context: Development of Teesta-V in the remote area of Sikkim has been instrumental in the overall development of the area and infrastructure development. Before the commencement of the project the infrastructure facilities between Singtam, Balutar, Dipudara and Dikchu (the Dam site) were bare minimum. Some of the project benefits:

- 12% of the electricity generated is provided to the State Government free of charge.
- Stabilisation of the eastern network grid is provided by the peaking operations of Teesta-V.
- Priority given to use of local workforce.
- Construction of a 22-bedded project hospital (see Public Health aspect IV-15).
- Adoption of two villages - Loom village in Dzongu Reserve area near to the project Dam site and village in Rakdong near Adit-IV & V for development. The Village Adoption Programme has involved construction of water tanks, water supply lines, foot bridges, footpaths and a Gumpa (Buddhist Temple) in Loom village.
- Upgrading of a 28 km stretch road from Singtam market up to Dikchu to a national-highway standard.

- Repair and renovation of three bridges between Singtam and Dikchu, and four bridges between Siliguri and Singtam.
- Constructed a government Secondary School Building at Dikchu and a Primary School building at Aamdara, and provided all the furniture and fixtures. Opened three free primary schools for the children of labourers in the project area during the construction period.
- Established a Kendriya Vidyalaya near Project Headquarters and one primary school for providing basic education to the children of poor families, free of cost. All expenses for running the Kendriya Vidyalaya and primary school are borne by NHPC.

Evidence: Site tour, viewed considerable evidence of recent development work including in local towns and villages, road construction, new bridges, new schools, and adopted village. Documentary evidence viewed – 1, 2, 18, 22, 35, 47, 48. Interviews – Teesta-V staff, hospital and school staff, Chief Conservator of Forests, State Forest Department.

Aspect Difficulties or Issues: Teesta-V additional benefits are a good news story. The scores are considerably lowered because of the absence of a cost-benefit analysis. CBAs are inherently difficult especially when factoring in externalities like social and environmental costs, and can be highly contentious when attempted.

Recommendations for Aspect Improvements: Rename to Project Benefits, remove reference to Economic Viability, merge with Benefit Sharing. Remove references to cost-benefit analysis. Could give better guidance on who is a stakeholder and evidence expected for stakeholder support.

IV-4: FINANCIAL VIABILITY

Teesta-V context: Project Cost: Rs. 26.19 billion. Provisional tariff fixed by the Central Electricity Regulatory Commission (CERC), Govt. of India is Rs. 1.62 per unit. 12% free power to Sikkim. Expenditure under Rehabilitation & Resettlement (31/03/2009) Rs. 38.71 million. Expenditure under Catchment Area Treatment : Rs. 366 million.

Evidence: Documentary evidence viewed – 2, 26, 37, 53. Interviews – Teesta-V financial staff.

Aspect Difficulties or Issues: Despite having interviews with Teesta-V financial staff, this aspect was difficult to score. There was insufficient time to go into the depth that the aspect required. Mostly we were discussing points of clarification about the Teesta-V / NHPC context, and considerations relevant to a national government enterprise. The aspect seems to be asking for a lot more than might be necessary. Consultation and stakeholder support are difficult to determine how relevant to Teesta-V's ongoing operations, who is a relevant stakeholder, what evidence would be applicable, and how to score.

Recommendations for Aspect Improvements: Hone in more directly on the considerations that are most critical e.g. have financial targets been set based on a rigorous process, are they being met and regularly reported on, and are publicly available annual reports being produced. Could benefit from better guidance on considerations relevant to public sector versus private projects. Could consider deleting consultation, stakeholder support and compliance aspects.

IV-5: CORPORATE GOVERNANCE

Teesta-V context: NHPC's vision and mission include sustainable development and a commitment to environmental management. There is a corporate social responsibility area on the external website, publicly available annual reporting, and a multiplicity of corporate policies. There is a Right To Information section of the website which addresses transparency. NHPC has an Integrity Pact with Transparency International. Posters and signage in key areas around project infrastructure emphasises NHPC's public commitments to a host of sustainability related considerations, including environment, social responsibility and safety. NHPC has a Vigilance section in the corporate office and a Vigilance officer at the Teesta-V power station to address unethical behaviours.

Evidence: Viewed signage related to ethical behaviour in areas around the power station. Documentary evidence viewed – 21, 26, 27, 28, 29, 30, 31, 32, 33, 34, 35, 51, 61. Interviews – Teesta-V and NHPC Corporate Vigilance staff.

Aspect Difficulties or Issues: This aspect asks for too many things, some of which are inherently difficult to assess. Seems to jump back and forth between project level and corporate level considerations without much guidance.

Recommendations for Aspect Improvements: Remove consultation, stakeholder support and conformance with plans – these are too detailed and too difficult to assess in any practical way. Address all compliance related considerations in a concise way – this should be the focal point for the business monitoring and reporting on compliance obligations. Remove assessment of the robustness of business systems and structures as an effectiveness measure – there is no practical way to score this.

IV-6: PROCUREMENT

Teesta-V context: Teesta-V has a detailed Procurement Procedure, Annual Procurement Plans, and staff with clear responsibilities in this area. NHPC corporate policy sets out requirements, including preferred use of local supplies, labour and workforce. NHPC and Teesta-V vigilance processes give a lot of attention to this area.

Evidence: Site visit. Documentary evidence viewed – 18, 27, 29, 35, 42, 51, 34. Interviews – Teesta-V project procurement staff, Teesta-V and NHPC corporate level vigilance staff.

Aspect Difficulties or Issues: Overall a fairly manageable aspect. Use of sustainability criteria in procurement screening is very difficult to address as presently expressed, and the guidance note suggests that an unrealistic amount of considerations are taken into account than could realistically happen in practice. Stakeholder support is difficult to determine how to score.

Recommendations for Aspect Improvements: Provide better guidance on how to score procurement screening based on sustainability criteria. Stakeholder support, conformance with plans and compliance could be removed.

IV-7: MARKETS, INNOVATION & RESEARCH

Teesta-V context: The NHPC Research and Development Division undertakes studies in a number of areas including vibration, CDM benefits for hydropower, software, efficiency improvements, self-reliance, cost reduction, quicker construction, import substitution, energy audits, and promoting use of renewable energy sources. The Commercial Division of NHPC addresses tariffs, bulk power supply agreements, Power Purchase Agreements, and is responsible for coordination between the Ministry of Power, various Regional Power Committees, Regional Load Dispatch Centres, other power sector utilities etc. NHPC Commercial Division convened a meeting of such stakeholders in Gangtok (2-4/12/2009) to address better efficiencies in Sikkim State.

Evidence: Documentary evidence cited - NHPC website for R&D and Commercial Divisions. Interviews – general interviews with NHPC staff, no interviews with corporate R&D or Commercial staff.

Aspect Difficulties or Issues: This aspect is asking about too many things that are difficult to score, and go beyond the scope of a single project. Consultation and stakeholder support are difficult to address.

Recommendations for Aspect Improvements: Reconsider whether this aspect should be included at all. Could be put as a single consideration under corporate governance, since it is typically a corporate level consideration, or under long-term financial viability with respect to markets.

IV-8: ASSET RELIABILITY & EFFICIENCY

Teesta-V context: Teesta-V is a newly built power station with all new assets, commissioned in March 2008. Network assets are the responsibility of Power Grid Corporation of India Ltd (PGCIL) and were not able to be assessed in this trial. Procedures address maintenance and operations. Permits are given based on power station being fit to operate. Records show beneficiaries receipt of power as per Power Purchase Agreements.

Evidence: Site visit of dam and power station. Documentary evidence cited – 3, 7, 9, 10, 17, 19, 20, 45, 51, 55. Interviews – Teesta-V engineering staff.

Aspect Difficulties or Issues: Question whether network assets should be part of the hydropower project sustainability assessment. In practice they will often be in the hands of another company, and the issues are not unique to hydropower but to any electricity generation infrastructure development. Not sure how to score effectiveness measures.

Recommendations for Aspect Improvements: Delete consultation, stakeholder support and compliance attributes. Remove reference to network assets. Provide better guidance on how to score effectiveness measures.

IV-9: SOCIAL MANAGEMENT PLAN

Teesta-V context: Social impacts of the project were considered in the EIA and EMP, and dedicated plans were made for particular components – for example Resettlement and Rehabilitation, and Public Health. In the Teesta-V audit, implementation of the resettlement commitments was the main focus of discussion for this aspect; health facilities were the focus under the aspect Public Health (IV-15), an adopted village under the Indigenous Peoples aspect (IV-11), and other social benefits under the Additional Benefits aspect (IV-3). Management systems for implementing the EMP and associated plans (including social) are considered under the EMP aspect (IV-17) so are not replicated in the assessment here.

55 families were physically displaced by the Teesta-V project. Original socio-economic baseline very good, and is included in EIA. It covers family members (male, female, children), literacy levels, occupation, land holdings, domestic animals, monthly income, religion, caste, level of project awareness, and degree of affectedness by the project.

The Teesta-V Rehabilitation and Resettlement (R&R) Plan includes compensation for land, house, standing crops and other properties, allotment of 200 m² plots to the 55 eligible resettlers, cash assistance towards construction of house (Rs. 0.2 million to each family), and construction of a community /training centre, primary healthcare centre and a shopping shed at the R&R colony. The R&R village area was created out of levelled land; there was no host community. A permanent and regular job with the power station has been established for one person from each of the fully affected families. Per family cash allowances included Rs. 15,000 for subsistence, Rs. 10,000 for transportation of cattle & household items, Rs. 5,000 for fertilizer & seeds, Rs. 10,000 for disturbance. LPG connection/ gas chulahas have been provided for each land resettlers. In total, Rs. 38.71 million had been spent under the R&R Plan as of end March 2009. A cooperative society was formed by the resettlers, and then the money released to them.

During construction, a number of additional families raised concerns about the impacts of tunnelling on their houses. These were inspected, and compensation provided where required. There did not appear to be ongoing issues in this area in relation to project operations, so this is not considered in this present assessment.

Evidence: Site tour went to the R&R colony. Documentary evidence viewed – 12, 23, 24, 35, 37, 47, 48, 56, 57. Interviews – NHPC staff, resettlers

Aspect Difficulties or Issues: This aspect covers many of the issues that are addressed in other aspects. There is no dedicated aspect for Resettlement and Land Acquisition in Section IV. SIA and SMP were in practice embedded within the EIA/EMP except where there were specific plans (e.g.

R&R, Public Health, and Adopted Village plans). It was difficult to know where/how to address this diversity of considerations with this aspect.

Recommendations for Aspect Improvements: Some of the main intents at the operational stage are to ensure that social commitments have been met, compensation fully paid, and there is a process for ongoing monitoring and adaptive management. Should consider having SMP and EMP integrated to look at the delivery of commitments and the ongoing monitoring and management systems. Should also consider having a separate Resettlement and Land Acquisition aspect in Section IV just like in Sections II and III, because it is still an important issue for ongoing projects where resettlement took place.

IV-10: PROJECT AFFECTED COMMUNITIES

Teesta-V context: Considerations adequately covered under other aspects, so this aspect was not scored.

Aspect Difficulties or Issues: Considerations under this aspect were considered already well covered under other aspects. The main discussion point in the assessment was human rights, which were felt to be covered adequately under specific aspects (one notable one being Labour & Working Conditions). Also consultation and stakeholder support methodologies were very relevant to this aspect, but could be better picked up in their own aspect.

Recommendations for Aspect Improvements: Consider a dedicated aspect to Consultation and Communications. Cross-check that the human rights issues relevant to hydropower project operations are well covered in specific other aspects. If these measures can be done, then would recommend not having this aspect.

IV-11: INDIGENOUS PEOPLES

Teesta-V context: As per various orders of Govt. of India viz. Constitution (Scheduled Castes) Orders, 1950; the Constitution (Scheduled Tribes) Order, 1950 etc. and orders of different State Govts. Scheduled Castes and Scheduled Tribes have been listed, for which special legislative provisions are made. There are two Scheduled Tribes in the Teesta-V project region, the Lepcha and the Bhutia communities. They have a local language and also use the Nepali language. The right bank of the dam was in the Lepcha community's area, and in accordance with their requests, no project infrastructure was developed on this bank. No Lepcha or Bhutia community members were physically resettled, but some land was acquired and they were compensated as per NHPC's Resettlement & Rehabilitation policy. Consultation was undertaken at the villages, with the main concern being maintenance of the tribes' genetic purity and avoidance of social mixing. NHPC was instructed as part of their project clearance to develop the Lepcha village of Loom. The villagers did their own socio-economic baseline and provided it to NHPC. The Department of Rural Development developed a management plan for the adopted village. Through the project grievance mechanisms the villagers communicated that they did not like the plan, and instead requested for a temple to be built, and upgrading of the main access footpath and bridge. The villagers wishes were provided by NHPC in accordance with the agreement of a government, Lepcha community and NHPC meeting on 30/04/2005. NHPC also provided a special grant of Rs. 10,000 per family of Scheduled caste and scheduled tribes. Into the future, the grievance mechanisms are still ongoing and functional, and the Central Level Monitoring Committee is responsible for annual inspections.

Evidence: Did not personally visit the adopted village of Loom, as it is about a 2-hour walk up the slopes from the Dam. Documentary evidence viewed – 4, 15, 22, 25, 35, 47, 48, 56, 57.

Aspect Difficulties or Issues: In the Teesta-V context, this aspect was very straightforward.

Recommendations for Aspect Improvements: None identified at this point in time.

IV-12: BENEFIT SHARING

Teesta-V context: NHPC staff mostly interpreted this in terms of beneficiaries of the power being generated by the power station. Teesta-V power station will entitle 12% free power to Sikkim. Power beneficiaries of Teesta-V are Damodar Valley Corporation (44 MW), West Bengal (122 MW), Bihar (55 MW), Sikkim (67 MW), Orissa (105 MW), Jharkhand (40 MW), Unallocated (77 MW) – total 510 MW. Local people are benefiting from local access to electricity – visual evidence showed lights on at night even in the remotest households far up the mountain slopes. This was not scored, because most of the benefit sharing considerations were picked up under the aspect Economic Viability & Additional Benefits (IV-3).

Evidence: Documentary evidence viewed – 2, 35, 45. Interviews – NHPC staff.

Aspect Difficulties or Issues: High level of overlap with Economic Viability and Additional Benefits aspect.

Recommendations for Aspect Improvements: Create an aspect called Project Benefits, which combines this aspect and the Economic Viability and Additional Benefits aspect

IV-13: LABOUR & WORKING CONDITIONS

Teesta-V context: Teesta-V has about 400 contract labourers for maintenance of offices, health facilities, grounds etc, and has 338 permanent staff. Responsibilities for human resources and staff OH&S are outlined in the Integrated Management System (IMS) Manual. The Indian Factories Act 1948 stipulates requirements to protect interests of industrial labour forces, with respect to OH&S and a number of labour rights provisions – this includes protection from hazardous processes. The Central Government does independent inspections under this act, and gives a licence to operate. The Government of India also has a number of fundamental rights enshrined in its constitution, including equal opportunity, equal remuneration, anti-discrimination, etc. NHPC has a number of policies, and outlines provisions with respect to labour and working conditions in its NHPC Personnel Manual. The Indian Employment Exchanges (Compulsory Notifications of Vacancies) Rules 1960 require notifications and preference to local labour if suitably qualified, and NHPC also has a corporate commitment to do so. NHPC has a number of relevant policies and programmes, e.g. on training and staff development, staff grievances, and induction training. At Teesta-V, there is provision of low rent accommodation for families of permanent staff, plus free health and educational facilities. The overall impression was an excellent system of labour and workforce management and planning, but less evidence of close attention to occupational safety issues (e.g. very little or no evidence of seatbelts, hard hats, safety harnesses, protective clothing, protective railings, signage, etc). Note occupational safety in this aspect is distinct from asset and community safety which are addressed in Aspect IV-16. The relatively low level of attention to occupational safety issues at the Teesta-V project appeared consistent with general approaches elsewhere (e.g. at observed roadworks, construction sites, etc), but the IMS should help address these more systematically in the future.

Evidence: Site visit – viewed a number of workers, worksites and working conditions. Viewed accommodation facilities for permanent workforce and families, plus available facilities such as health and education. Documentary evidence viewed – 3, 6, 17, 18, 19, 20, 28, 30, 31, 32, 33, 39, 41, 50, 51, 52. Interviews – Teesta-V human resources and other staff.

Aspect Difficulties or Issues: This aspect covers a lot which makes it difficult to manage. Generally Teesta-V had very strong performance in this area, with scores brought down by occupational safety issues. Consultation and stakeholder support are difficult to score.

Recommendations for Aspect Improvements: Consider having a single Safety aspect, which combines occupational, asset and community safety. Could consider deleting consultation and stakeholder support attributes.

IV-14: CULTURAL HERITAGE

Teesta-V context: Cultural heritage was assessed in the EIA, but no issues were identified other than one Shiva Temple near the dam that was close to but not in the project affected area. Public hearing transcripts raised no physical cultural heritage concerns. The ethnographic study that was undertaken does not identify any physical cultural heritage features. NHPC ensured protection of the Shiva Temple and improved accessibility. NHPC also built a new temple at Loom, one of the adopted villages, at the request of the villagers.

Evidence: Viewed the Shiva Temple and approaches during the site tour. Documentary evidence viewed - 4, 15, 22, 35, 38, 47, 48

Aspect Difficulties or Issues: In the context of Teesta-V, this aspect was very straightforward, other than inherent difficulties in scoring consultation and stakeholder support.

Recommendations for Aspect Improvements: None identified at this point in time, other than to delete consultation and stakeholder support.

IV-15: PUBLIC HEALTH

Teesta-V context: The project has constructed a fully staffed 22-bed project hospital at the power station site, with 7 doctors, and free treatment and medication for all employees as well as members of the local community. Facilities include an X-ray lab, ECG equipment, a physiotherapy centre, optometric equipment and expertise, and an operating theatre. The hospital delivers several Government of India programmes (tuberculosis, and reproductive and child health) and runs health camps and provides community vaccination programmes, amongst a number of other outreach activities. A health facility is also available at the dam site. These health facilities will be fully funded and maintained by NHPC through the life of the project. Prior to the project, the closest health facility was at Singtam 8 km away, at which a nominal fee was required for consultation, and medicines must be paid for.

Evidence: Had a tour of the hospital, met the doctors, nurses, a number of professional technicians, and saw all the facilities. Documentary evidence viewed – 8, 35, 54, plus a number of hospital records. Interviews – NHPC medical staff.

Aspect Difficulties or Issues: NHPC is a government of India enterprise, and so has a strong social mandate that would extend beyond the expectations for private developers. Consultation and stakeholder support are difficult to score.

Recommendations for Aspect Improvements: Provide some guidance on how to deal with public versus private developments with respect to public health. Could consider deleting consultation, stakeholder support and compliance attributes.

IV-16: ASSET & COMMUNITY SAFETY

Teesta-V context: Safety will be part of the Integrated Management System (IMS) and procedures are under development. The Teesta-V Disaster Management Plan covers a range of community safety scenarios such as fire, power breakdown, communications breakdown, flood, landslides, earthquakes, terrorist attacks, electrocution, local law and order, etc; it includes preventative measures, responsible people, contact numbers, etc. A Fire Safety Manual also fully documents procedures. Training is part of this process, including mock drills. The Powerhouse Operation Procedure addresses community safety with downstream power station releases, which include police notifications (to towns 8 and 20 km downstream) and sirens at five points downstream every time the power station turns on. Flood notifications are also passed on to the police. Fencing is provided around the power station and reservoir at appropriate locations, as is signage warning of staying away from the water. Other community risks include road accidents, as there was considerable traffic on the roads and lots of heavy vehicles. NHPC employee caused road accidents

are recorded in the Teesta-V Accidents file. Road signage is the responsibility of the Border Road Agency.

Regarding asset safety, General Safety Requirements are set out in the India Electricity Rules 1956, and inspections are regularly undertaken and certificates issued saying assets are fit for operation.

Evidence: Viewed power station, reservoir and downstream areas, catchment areas, roads, colonies (residential villages), signage etc. Documentary evidence viewed – 3, 17, 19, 20, 23, 41, 46, 49, 51. Interviews - Teesta-V engineers (one of which has job responsibilities for safety).

Aspect Difficulties or Issues: Need better guidance on how to score effectiveness measures. Also there is sometimes a fine line between community and occupational safety, e.g. with respect to disaster management planning. Consultation and stakeholder support are difficult to score.

Recommendations for Aspect Improvements: Rename aspect to Safety. Merge in occupational safety considerations which are presently in the Labour and Working Conditions aspect. Provide better guidance on the effectiveness measures. Consider deleting consultation and stakeholder support attributes and addressing under a single aspect.

IV-17: ENVIRONMENTAL MANAGEMENT PLAN

Teesta-V context: Because catchment and reservoir area, environmental flows, wildlife, fish, erosion, sedimentation and water quality are dealt with in the following aspects, in this Teesta-V context this aspect was considered to address the management systems in place to comprehensively address environmental issues, and also addresses specific environmental issues not covered elsewhere – management of spoil heaps, ongoing waste management, and air quality.

The EIA and EMP set out the issues and management measures to be addressed by the project, as does the environmental clearance letter for the project. Teesta-V has a dedicated and highly qualified environmental manager reporting directly to the project's chief engineer. An Integrated Management System (IMS) is being set up and is well advanced, with procedures outlined for environmental requirements. Teesta-V Power Station of NHPC is seeking ISO 14001 certification for its environmental management system included within the IMS within the next few months.

Large quantities of earth were excavated for different project components such as dam, tunnels, power house, and adits. Excavated spoil was used for land development for project "colonies" (residential villages), working areas, road widening and stabilisation, use as aggregate (if meeting specifications), and creating level areas for other measures. At Teesta-V, the spoil disposal area have been developed into parks, gardens, helipad, picnic area etc. There were no quarries for Teesta-V but there was a sand pit. Spoil not used for particular measures has been disposed at approved sites, after construction of protection measures such as crate walls.

Ongoing waste management issues include solid waste generated at the colonies, bio-medical wastes from the hospital and health facilities, and hazardous wastes. Solid wastes are composted in a special facility using a microbial process, and the compost utilised in the gardens and planted areas. Bio-medical and hazardous wastes are separated and managed as per regulatory requirements. There is a small deep landfill at the power station.

Air quality issues are dust from construction and roads, and particularly during construction included nitrates and sulphates from blasting activities. Monitoring requirements are specified by the project approval conditions, and an independent institution has undertaken the monitoring and reporting up until 2007. Ongoing monitoring is the responsibility of the State Government.

Evidence: Viewed the spoil dumping areas and the rehabilitation measures taken; the development of parks, gardens etc; the crate walls containing left-over spoil; the solid waste composting facility; and the waste management facilities in the hospital. Documentary evidence viewed - 5, 7, 8, 9, 24, 25, 43, 47, 48, 51, 62. Interviews - environmental and medical staff.

Aspect Difficulties or Issues: Boundaries between this and the following more specific environmental aspects need to be clearly defined. Land rehabilitation from construction scars, management of construction wastes, and ongoing waste management need particular focus. Consultation and stakeholder support are difficult to score.

Recommendations for Aspect Improvements: Consider creating an Environmental and Social Management Systems aspect focussed on the management processes side of things, which merges this and the SMP aspect. Consider creating an aspect called Land Rehabilitation and Waste Management. Remove references to consultation and stakeholder support.

IV-18: CATCHMENT MANAGEMENT

Teesta-V context: Protection of the forest environment and the stability of the steep mountainous slopes is a high priority in this region. Teesta-V has an extensive Catchment Area Treatment plan. This includes immediate protective measures where land is disturbed; tree planting especially fruits and fodder to maintain a good agro-forestry system and to improve economic condition of farmers; landslide control measures in vulnerable places; bench terracing, repair of terraces, drainage line treatment, contour hedges, and a range of soil conservation measures on agricultural land; and small streams being trained to prevent cutting effects especially during the monsoon.

Evidence: Personally viewed most of the catchment area treatment measures. Documentary evidence viewed - 1, 24, 25, 44, 47, 48. Interviews - environmental staff, and Chief Conservator of Forests for the Sikkim Government.

Aspect Difficulties or Issues: This aspect was highly relevant to the Teesta-V context, and relatively straightforward. Consultation and stakeholder support are difficult to score.

Recommendations for Aspect Improvements: Need guidance on how to deal with this aspect in the context where there is a private developer, or where catchment activities are not so closely linked to project operational activities. Could consider deleting consultation and stakeholder support.

IV-19: RESERVOIR MANAGEMENT

Teesta-V context: Teesta-V has a 68 ha reservoir area at full supply level, of which 32 ha was original river bed. It is not a multi-purpose reservoir, but has a diurnal water level fluctuation to provide peak load power. Some of the management issues include community safety (dealt with under aspect IV-16), sediment management and reservoir rim erosion (dealt with under Aspect IV-22), and log removal.

Risk of greenhouse gas (GHG) emissions is low: despite there being a high carbon loading from vegetative matter from the catchment, there are very low water residence times (<1 day), low water temperatures, and a low shoreline length. All vegetation was removed prior to submergence.

Evidence: Personally sited signage and fencing to address community safety issues, reservoir rim treatment, and floating logs. Documentary evidence viewed - 47, 48, 63. Interviews – environmental and engineering staff.

Aspect Difficulties or Issues: A surprising amount of discussion arose on this aspect, given we say this aspect could be considered not relevant for a run-of-river project. Much discussion focussed on Reservoir Operating Rules, which meant considerable overlap with hydrological resource availability and management. This aspect was a very useful cross-check to ensure some of the relevant issues are picked up in other aspects, because the reservoir is so immediate to the considerations of power station staff that they can strongly identify with the assessment and management considerations. The effectiveness measures were not insightful for this project, which is a single-purpose project with no ability to be used for multi-purpose. The GHG effectiveness measure was not possible to score and did not seem to be meaningful the way it is presently expressed. Consultation and stakeholder support are difficult to score.

Recommendations for Aspect Improvements: Never say this aspect could be considered not relevant in certain contexts – even very small reservoirs can have issues. Need better wording and guidance on effectiveness measures.

IV-20: ENVIRONMENTAL FLOWS & DOWNSTREAM SUSTAINABILITY

Teesta-V context: There is a 23-km stretch of river between the dam and the power station from which water is diverted into a tunnel. A 1 m³/s environmental flow is released through a valve at the dam. This is supplemented by 6-7 m³/s of seepage from the dam, and many side flows coming down the hills even during the low season. The agreed flow objective is to keep water moving to avoid stagnant water and risks of malaria, and the level of flow was somewhat arbitrarily determined (i.e. not based on science or any studies).

Evidence: Viewed the valve releasing the environmental flow at the power station; the many small inflow streams along the whole length of the river system with good flows even at the time of the site visit which was the lowest flows time of the year; data showing seepage from the dam significantly supplementing downstream flows. Documentary evidence viewed - 25, 38. Interviews – environmental and engineering staff.

Aspect Difficulties or Issues: The aspect name is somewhat misleading and does not seem to match the intent, which is broader than environment. This aspect seems to imply that scientific studies are required for all operating projects, and a highly consultative process around downstream flows; it is questionable whether this is a reasonable expectation for all operating projects where no issues are being raised with respect to downstream flows. A point of discussion was also on where the environmental flow requirement is measured (at the dam versus some point downstream), because in the case of Teesta-V there is considerable seepage and side channel input of flows which significantly overshadow the committed flow release at the dam. The general consultation measure and stakeholder support were difficult to score, but the more specifically articulated consultation measure is possible to score.

Recommendations for Aspect Improvements: Rename the aspect to Downstream Flows. Provide better guidance on how to deal with this aspect for older projects where no issues are apparent for the downstream flow regimes. Also provide better guidance on acceptance of zones of impact (very low or no flow) for the project, as zones of impact are an accepted norm for most large infrastructure projects.

IV-21: BIODIVERSITY & INVASIVE SPECIES

Teesta-V context: The main focus of attention at Teesta-V has been on terrestrial biodiversity, with a particular focus on the forest environment. The power station and neighbouring land was barren of dense vegetation pre-project development, although some timber was removed from the reservoir. Compensatory afforestation has been taken up on 250 ha of degraded forest land in East, North and South districts of Sikkim, with more than 0.4 million trees planted. A further 0.1 million have been planted under green belt development and voluntary afforestation programmes.

Teesta-V also has established a herbal park at the power station to preserve endangered and rare herbal species found in Sikkim.

Sikkim has a rich diversity of butterflies and moths. To conserve them, a butterfly park is being established in association with the State Forest Department. This is addressed under a Wildlife Management Plan.

With respect to aquatic biodiversity, this has been much less an area of focus. The EIA presented some secondary data on fish, and a following Ecological Assessment was required to be undertaken which presented some primary data on the riverine fish species and phytoplankton. The government approval for the project required development of a fish hatchery which would target 20 fish species, but this has not yet been commenced.

No invasive species issues were identified in the EIA, so no management measures were required. No issues have become apparent since operation has commenced.

Evidence: Visited afforestation works, butterfly park, and herb garden. Documentary evidence viewed - 1, 12, 14, 16, 24, 25, 38, 44, 47, 48, 60. Interviews - power station environmental staff, and Sikkim Government Chief Conservator of Forests.

Aspect Difficulties or Issues: There are many positive biodiversity measures being taken by this project, but most of these relate to terrestrial biota and are captured under the catchment management and additional benefits aspects. There is much less attention on addressing the primary impacts of the project on the aquatic biota. Consultation and stakeholder support are difficult to score.

Recommendations for Aspect Improvements: Could consider having terrestrial biota picked up under Catchment Management, and rename this aspect Aquatic Biota and Invasive Species. Could consider deleting consultation and stakeholder support attributes.

IV-22: EROSION & SEDIMENTATION

Teesta-V context: The Teesta River carries a naturally high sediment load due to the glacial silts plus the young mountains with lots of landslides. The location and angle of the intake gates was based on analyses with a purpose built physical model at the Centre for Water Power Research, with the objective to minimise sediment intake into the power station. After water passes through the intake structures, the silt that is carried through settles out into three desilting chambers. The settled silt particles go back to the river through silt flushing tunnels. The reservoir is routinely flushed of the remaining sediments according to the Reservoir Operating Manual. Effectively, what enters the reservoir is passed downstream again.

Also relevant to this aspect is erosion in the catchment due to landslips which is most predominant during the monsoon season; erosion along the river banks and reservoir rim due to water level fluctuations; and land disturbance and construction spoil dumps. The reservoir fluctuates in level by up to 10m on a daily basis, and downstream water levels also fluctuate because the power station is operated as a peaking station.

Evidence: Engineering drawings of the desilting chambers; photo of these in the power station; turbidity data from the reservoir area. Visual siting of catchment landslip treatments, land disturbance and spoil area rehabilitation, and reservoir and downstream river bank erosion stabilisation works. Documentary evidence viewed - 1, 13, 24, 25, 38, 44, 47, 48, 58, 59. Interviews – power station environmental staff, engineering staff, and Chief Conservator of Forests for Sikkim Government.

Aspect Difficulties or Issues: This aspect is a major issue for these Himalayan area hydropower projects, and the aspect was relatively straightforward to utilise for Teesta-V. Consultation and stakeholder support are difficult to score.

Recommendations for Aspect Improvements: Could consider deleting consultation and stakeholder support attributes.

IV-23: WATER QUALITY

Teesta-V context: There are no identified water quality issues. Water quality was well assessed in the EIA. Monitoring requirements are set out in the environmental clearance letter by the Ministry of Environment & Forests. A credible organisation is undertaking monitoring during and post-construction as per the government licence requirements.

Evidence: Documentary evidence viewed - 5, 10, 25, 43, 47, 48, 62. Interviews – environmental staff.

Aspect Difficulties or Issues: This aspect was relatively straightforward. Consultation and stakeholder support are difficult to score.

Recommendations for Aspect Improvements: Could consider deleting consultation and stakeholder support.

ATTACHMENT 1 – REGISTER OF DOCUMENTARY EVIDENCE VIEWED

1. A Detailed Report on Implementation of Catchment Area Treatment Plan of Teesta Stage-5 1997, submitted by Forest, Environment & Wildlife Department, Government of Sikkim to the Sikkim State Government (cc NHPC) – this is a cumulative report on implementation up to 2007
2. Agreement between Government of Sikkim and NHPC 02/08/2000
3. Book of India Industrial Law
4. Carrying Capacity Study of Teesta Basin in Sikkim August 2007 Exec Summary and Recommendations (166 pages).
5. Certificate of Accreditation for Shriram Institute
6. Certified Standing Orders for Teesta-V under Industrial Employment (Standing Orders) Act 1946 – showed evidence of employee associations in this document
7. Consent to Operate from the State Pollution Control Board under the Air (Prevention and Control of Pollution) Act 1981
8. Consent to Operate from the State Pollution Control Board under the Biomedical Waste (Management and Handling) Rules 1998
9. Consent to Operate from the State Pollution Control Board under the Hazardous Waste (Management and Handling) Rules 1989
10. Consent to Operate from the State Pollution Control Board under the Water (Prevention and Control of Pollution) Act 1974
11. Correspondence from Government of Sikkim to NHPC in November 2009 about delay in implementing the fish farm management plan
12. Document – Acceptance of Land for Oustees – 23/05/2006 – signature of each family in presence of all key government officials
13. Draft Reservoir Operating Manual - January 2008 – being trialled for 2-3 years
14. Ecological Assessment of Teesta-V, March 2000
15. “Ethnographic Study- Impact of Teesta (Stage-V) H. E. Project, Sikkim, on the Tribal Communities with Special Reference to Lepchas and Bhutias”- June 1999
16. Fish Farm Under NHPC Near Makha-Dickchu Road to Sikkim. Plan developed by and responsibility for execution of the Directorate of Fisheries, Government of Sikkim. Approval of this plan given in November 2003.
17. Government of India Electricity Rules 1956 – include General Safety Requirements
18. Government of India Employment Exchanges (Compulsory Notifications of Vacancies) Rules 1960
19. Government of India Factories Act 1948
20. Inspection Report 04/01/2008 from Ministry of Power Central Electricity Authority under Indian Electricity Rules 1956 saying Teesta-V assets are fit for operation
21. Integrity Pact with Transparency International (on NHPC website)
22. Minutes of meeting 30/04/2005 – Sikkim government officials, NHPC project reps, and residents of Lepcha people about commitments to adopted village – documents wishes of Lepcha people and agreement of NHPC to provide these wishes.
23. Minutes of Meeting of the State Level R&R Committee (constituted under the direction of State Govt. Authorities) dated 30/08/2005 to look at oustee grievances (e.g. land sinking concerns, house cracks)
24. Minutes of the 8th Meeting of the Multi-Disciplinary Central Level Monitoring Committee November 2008 (constituted on direction of Government of India; comprises State and Central

Government representatives, corporate and project NHPC representatives, WWF Sikkim Branch representative; meets once each financial year)

25. Ministry of Environment and Forests (Government of India) Environmental Clearance letter – 19/05/1999
26. NHPC Annual Report 2008-09 (not yet publicly released)
27. NHPC Circular 11/20/09 – report of NHPC Project Vigilance Officer “Common Lapses in Execution of Works” – observed at a project bills paid without a signed contract, recording of measurements not in line with procedures, etc. In each case the circular outlines the measures that must be taken to rectify the issue, and disciplinary actions that would ensue.
28. NHPC Employee Handbook
29. NHPC Fraud Policy (on NHPC website)
30. NHPC Grievance Policy and Procedure
31. NHPC Induction Training Programme
32. NHPC Personnel Manual
33. NHPC Policy on Training and Human Resources Development
34. NHPC Procurement Procedure
35. NHPC Scheme for Corporate Social Responsibility Community Development Initiatives at Power Stations
36. Power Development in Teesta Basin, July 2004, Government of India Ministry of Power Central Electricity Authority
37. Proofs of release of allowances – Disturbance Allowance, Assistance Allowance, etc – memos on file
38. Public Hearing Transcript 02 Dec. 1997– contained within EMP document. Has list of attendees including 130 local community members, and copies of newspaper advertisements. Panel comprised 12 members of which 5 were local community representatives and 7 government officials (no one from NHPC).
39. Record of attendance of 26 Teesta-V employees at NHPC Fire & Safety Training Programme in September 2009
40. Revision of Design Energy for Existing Power Stations – report 18/05/2006 as an example of five-yearly updates to long-term hydrological records for NHPC power stations
41. Teesta-V Accident Reports file
42. Teesta-V Annual Procurement Plan 2009-10
43. Teesta-V Consolidated Report on Environmental Monitoring Data April 2004 to January 2009, submitted to NHPC by Shriram Institute for Industrial Research, Delhi
44. Teesta-V Catchment Area Treatment Plan
45. Teesta-V Detailed Project Report (Revised) December 1997
46. Teesta-V Disaster Management Plan
47. Teesta-V Environmental Impact Assessment Feb. 1998
48. Teesta-V Environmental Management Plan 1998
49. Teesta-V Fire Safety Manual
50. Teesta-V Inspection Register for Various Labour Acts
51. Teesta-V Integrated Management Systems Manual
52. Teesta-V NHPC Employees Association Charter of Demands file
53. Teesta-V Power Station Annual Financial Reports
54. Teesta-V Power Station Public Health Plan 03/12/2009 to 12/01/2010

55. Teesta-V Powerhouse Operation Procedure
56. Teesta-V Rehabilitation and Resettlement Plan approved 21/05/2003 by Government of Sikkim
57. Teesta-V Rehabilitation & Resettlement Grievances file
58. Teesta-V Reservoir monitoring data – records on file
59. Teesta-V Reservoir Filling Manual
60. Teesta-V Wildlife Management Plan 2003-04 to 2008-09, Department of Forests, Environment & Wildlife, Government of Sikkim
61. Vigilance section of NHPC internal website: a number of vigilance publications including a Vigilance Manual, Quality Manual of the Vigilance Division, Manual for Intensive Examination of Works/Purchase Contracts, NHPC Vigilance Handbook, Conduct Discipline and Appeal Rules, documents outlining disciplinary proceedings
62. Work Order dated 07/02/2004 for Shriram Institute to undertake the water and air quality monitoring for Teesta-V, including the monitoring locations, time periods and parameters
63. Work Orders for removal of trees from the reservoir by the Sikkim Department of Forests

ATTACHMENT 2 – REGISTER OF INDIVIDUALS INTERVIEWED

NHPC Corporate Office staff

Dr.(Mrs.) Usha Bhat, General Manager (Planning)
Mr. Anil Kumar Agrawal, Chief Engineer (Civil), Vigilance Division
Mr. Rajeev Baboota, Chief Engineer (Civil), Hydrology Group
Dr. S. K. Bajpayee, Assistant Manager (Environment)

NHPC Teesta-V Department staff

Mr. A. K. Chaudhary, Chief Engineer (Civil)
Dr. Devandra Nath, Chief Medical Officer
Mr. Ramesh Mukhiya, Senior Manager (Civil)
Mr. Himanshu Saha, Manager (Electrical)
Mr. R. K. Mitra, Deputy Manager (Project Vigilance Officer)
Dr. Dipankar Deb, Assistant Chief Medical Officer
Mr. Amitabh Jha, Deputy Manager (Procurement)
Mr. Sanjay Kumar Singh, Assistant Manager (Finance)
Dr. Avinash Kumar, Assistant Manager (Environment)
Mr. Jitendra Kumar, Assistant Manager (Human Resources)
Mr R. Bhagat, Assistant Manager (Civil)

Government Officials

Mr. C. Lachungpa, Chief Conservator of Forests, State Forest Department, Government of Sikkim

Project Affected (Resettled) People

Ms. Soma Devi
Mr. Chewan Narayan Regmi
Mr. Sonam Tamang
Mr. Zigmee Yonzon

ATTACHMENT 3 – TIME AND COST REQUIREMENTS BY NHPC TO HOST THE TRIAL

| Training for understanding the protocol | | | | | |
|--|------------|--------------------|--------------------------|-----------------|-----------------------|
| | No. | Person days | Total Person days | Rate/day | Cost (approx.) |
| General Manager | 1 | 1 | 1 | 9100 | 9100 |
| Chief/ Chief Engineer | 2 | 3 | 6 | 7300 | 43800 |
| Manager/ Senior Manager | 3 | 3 | 9 | 6100 | 54900 |
| DM/Asst. Manager/ Engg./ Env. Officer | 2 | 3 | 6 | 4700 | 28200 |
| Preparation for hosting the trial and trialling | | | | | |
| | No. | Person days | Total Person days | Rate/day | Cost (approx.) |
| Chief/ Chief Engineer | 2 | 5 | 10 | 7300 | 73000 |
| Manager/ Senior Manager | 4 | 7 | 28 | 6100 | 170800 |
| DM/Asst. Manager/ Engg./ Env. Officer | 5 | 8 | 40 | 4700 | 188000 |
| Assts. | 2 | 5 | 10 | 3200 | 32000 |
| Travel Cost for training | | | | | |
| For officers coming to Corporate Office | | | | | 50000 |
| For travel of resource person of IHA | | | | | 75000 |
| Travel cost for trialling | | | | | |
| For travel/ boarding / lodging of auditor | | | | | 60000 |
| For travel of Corporate Office representative | | | | | 15000 |
| TOTAL | | | | | 799800 |