

HALCROW CONSULTING INDIA PRIVATE LIMITED

Hydropower

Introduction

Halcrow has been involved in the design and construction of hydroelectric projects for over 80 years starting with schemes in the Scottish Highlands.

Since 1960, the firm has provided consultancy services for more than 40 schemes ranging from studies for mini-hydropower developments to implementation of large hydropower schemes up to 1000 MW in size. Halcrow can provide a full and comprehensive range of services to meet the needs of the most demanding of projects on a worldwide basis.

Services

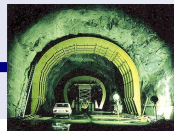
Halcrow provides a full range of engineering, planning and environmental consultancy services for the development of hydroelectric projects. These services include:

- Scoping studies / development options
- Ranking studies
- Pre-feasibility studies
- Feasibility studies / project reports
- Hydraulic & structural design of components
- Geotechnical investigation & geomechanics
- Underground works (shafts, tunnels, caverns)
- Procurement Engineering
- Project Planning, scheduling & monitoring
- Seismic design
- Environmental impact assessment & management plan

Some examples of large hydroelectric schemes are given in the table:

Project Name and Location	Services	Installed Capacity MW	Dates
Siyom Hydro Electric Project	Review of data and preparation of DPR	1000	Jan 2008 - ongoing
Lachung Hydro Electric Projects	Economic and technical viability review	240	2006
Mapang – Bogudiyar HEP	Review of Preliminary Feasibility Study	(200MW)	2005
Bogudiyar-Sirkari HEP		(170MW)	2005
Bowala Nand Prayag , India	Detailed Project Report	225	2005 – ongoing
Alaknanda, India	Detailed Project Report	140	2005 – 2008 ongoing
Maneri Bhali, India	Project Management	304	2006 - ongoing
Rampur, India	Geotechnical studies Transient Analysis	412	2005 - 2006
Rudbar Lorestan Hydropower Project, Iran	Feasibility review and detailed design	400	2003 – 2008 ongoing
Masjed-e-Soleman Dam, Iran	Impounding Engineer and Contractual Advice	1,000	2000 - 2003
Bakun, Malaysia	Bid Design for EPC Contractor	2,400	2002
Sainj, India	Detailed Project Report	100	2002-2003
Shrinagar, India	Feasibility review and Bid Design for EPC Contractor	330	1999 - 2001
Se Kong - Se San and Nam Theun Laos, Cambodia and Vietnam	Master Plan and Outline Design	5,000 total	1997 - 2000
Pelus, Malaysia	Pre-Feasibility Study	160	1997
Merangin II, Indonesia	Tender Design	400	1995 - 1997
Burdekin PS, Australia	Feasibility	150	1996
Pergau, Malaysia	Expert Review	600	1991 - 1995
Achelooos Project, Greece	Feasibility	270 total	1988 - 1990

Halcrow – sustaining and improving the quality of people’s lives



Uttarakhand: Bhilangana III Hydro Electric Project (24 MW) - The 24 MW Bhilangana III HEP is located on the Bhilangana River in the State of Uttarakhand. The Scheme has a design discharge of 15.5m³/s at a rated net head of 210m.

Services comprise review of Detailed Project Report (DPR), risk analysis, preparation of tender documents, tender drawings, assistance in procurement of contract, detailed design & engineering.



Sikkim: Lachung Hydro Electric Projects (240MW) – Halcrow conducted studies to identify the possibility of combining the three schemes (100 MW, 100MW and 40MW) into one large scheme or combining two schemes. For each of the options the economic and technical viability will be evaluated.

Based on the resulted of the studies on the term of reference for preparation of detailed project reports will be drafted. Study also included preparation of terms of references for site investigation.

Uttarakhand: Review of Preliminary Feasibility Study of Mapang – Bogudiyar HEP (200MW) and Bogudiyar-Sirkari HEP (170MW) – The studies of the schemes with the general arrangements as set out in the pre-feasibility reports, that is, for two separate schemes to be operated as a cascade.

The study thus provided a base case for establishing the viability of the projects. The need for a new access road of 22km length in mountainous terrain at high altitude was a major consideration.



Uttarakhand: Bowala Nand Prayag Hydro Electric Project (300 MW) – Preparation of Detailed Project Report for 300 MW scheme in located in Chamoli District of Uttarakhand. Also advice on topographic surveys and geotechnical and geo-physical investigations.

Uttarakhand: Alaknanda Hydro Electric Project (300 MW) – Preparation of Detailed Project Report, including topographic surveys, Geological site investigations and hydrological studies.



Uttarakhand: Rampur Hydro Electric Project (412 MW) – The scope of studies included review of energy yield, geotechnical studies, advice on methodology for tunnelling in poor rock conditions, transient analysis to simulate the tandem operation of Rampur with Nathpa-Jakhri, and preparation of logic diagram for the tandem control system.



Himachal Pradesh: Sainj Hydro Electric Project (100 MW) – Halcrow was assigned to carry out a pre-feasibility study, feasibility studies and preparation of a detailed project report for a 100 MW hydroelectric project in northern India for a private developer.