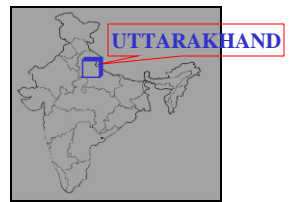




अनुसंधान के माध्यम से सेवा  
Service Through Research

# DHAULIGANGA DAM SPILLWAY, UTTARAKHAND



## SALIENT FEATURES

Location	: Village Chirkila, Dist. Pithoragarh, Uttarakhand	
River	: Dhauliganga	
Power Generation	: 280 MW	
Maximum Discharge	: 3200 Cumec	
Type of dam	: Rock fill Dam, Height 56 m	
Spillway	: <b>Chute Spillway</b>	<b>Tunnel Spillway</b>
	2 spans of 6 m (w) with breast wall Separated by 6 m (w) pier	1 span of 9 m (w)
Radial Gates	: 10.0 m (H) 6.0 m (W)	16.0 m (H) 9.0 (W)
Energy dissipator	: Ski-jump bucket	-

## MAJOR STUDIES

### Comprehensive model scale 1: 70

- Studies for original design of chute spillway of three spans
- Approach flow conditions upstream of chute and tunnel spillway intake
- Performance of chute spillway and ski-jump bucket
- Original design of 3 span spillway modified to 2 span chute spillway with a tunnel spillway

### Tunnel Spillway model – 1:50 Scale

- \* Assessment of discharging capacity
- \* Flow conditions in the tunnel and at the outlet in the river



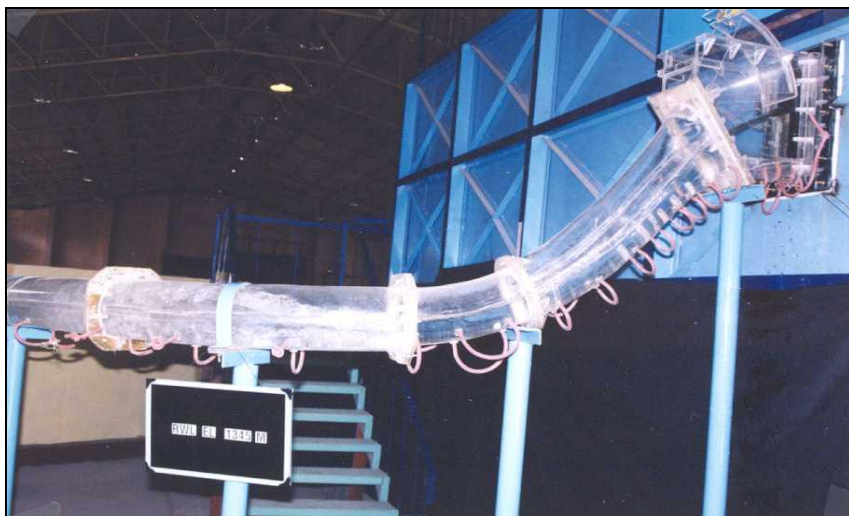
## RESULTS

### Comprehensive Model

- Original design of chute spillway having 3 spans studied on model and modifications to slope of chute and ski-jump bucket suggested
- Location of tunnel spillway found to be suitable in respect of approach flow conditions, studies for improvement along tunnel in progress
- Performance of chute spillway of two spans with modification to ski-jump bucket satisfactory

### Tunnel Spillway Model

- \* Discharging capacity of tunnel spillway found to be adequate
- \* Flow conditions in the tunnel spillway were not satisfactory
- \* Alternative designs for improvement in flow conditions under considerations





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## AREAS OF ACTIVITIES AT THE CWPRS

- \* HYDROLOGY AND WATER RESOURCES ANALYSIS
- \* RIVER ENGINEERING
- \* RESERVOIR AND APPURTENANT STRUCTURES
- \* COASTAL AND OFFSHORE ENGINEERING
- \* SHIP HYDRODYNAMICS
- \* HYDRAULIC MACHINERY
- \* APPLIED EARTH SCIENCES
- \* MATHEMATICAL MODELLING
- \* INSTRUMENTATION AND CONTROL ENGINEERING
- \* FOUNDATION AND STRUCTURES
- \* INFORMATION SYSTEM (WATER AND POWER)

## RESERVOIR AND APPURTENANT STRUCTURES

### FACILITIES

Large size covered and open model trays, Glass sided and Tilting flumes for hydraulic model studies. Precision Equipment for measurement of hydraulic parameters with data acquisition system. Workshop facilities for fabrication models Equipment for Field data Collection, Computer Center Numerical models for aeration devices and water hammer analysis.

### AREAS OF SPECIALIZATION AND MAJOR STUDIES

#### STORAGE AND DIVERSION STRUCTURES

The study of storage and diversion structures include spillways, energy dissipators and appurtenant structures such as training walls, divide walls, downstream protection works.

❖ Spillway and Energy Dissipators : Bhakra, Salal, Sardar Sarovar, Chamera, Srilsailam, Nathpa Jahakri, Dhauliganga, Tala (Bhutan), Kurichu (Bhutan), Chukha (Bhutan), Bekhme (Iraq), Bakurman (Iraq), Khaliikan (Iraq), Sedwagyi (Myanmar), Ukai, Kadana, Dharoi, Baira-Siul, Mahi Bajaj Sagar, Matrikundai, Ranjitsagar, Icha, Rajghat, Khandong, Thoubal, Doyang.

❖ Appurtenant Structures : Assessment of hydrodynamic pressures/forces and bending moments on divide walls, chute, baffle blocks, breast walls, stilling basin apron and plunge pool lining for Sardar Sarovar, Salal, Bekhme (Iraq), Icha, Ranjitsagar, Ranganadi and Koyna Projects.

#### CONTROL STRUCTURES

The study of structures controlling and guiding high velocity flows include gate, tunnels and outlets. The major studies include assessment of hydrodynamic uplift and downpull and estimating air demand of gated outlets. CWPRS is the only laboratory in India using the state-of-art equipments for studies with the help of hydraulic models.

❖ Gates : Sardar Sarovar, Tala, Chamera, Supa, Beas, Mahanadi, Malaprabha, Cheruthoni, Kadana, Ukai, Idukki, Bhira.

#### CONVEYANCE STRUCTURES

The studies include intakes, penstocks, surge shafts, tunnels.

❖ Projects : Sardar Sarovar, Bhira Surge Tank, Indira Sarovar, Kakkad, Indravati, Doyang, Baira-Siul, Beas P3R, T1, T2 Tunnels, Pandoh Baggi, Koyna and Salal Tail Race Systems, Koyna Lake Tape, Srisailam Intake, Kalinadi Surge Shaft.

❖ Mathematical Modelling for water hammer analysis for Ghatghar and Kal Projects.

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