



सत्यमेव जयते

भारत सरकार

जल संसाधन, नदी विकास और गंगा संरक्षण मंत्रालय

Government of India

Ministry of Water Resources, River Development & Ganga Rejuvenation

100 years and beyond...



केंद्रीय जल और विद्युत अनुसंधान शाला

खडकवासला, सिंहगड रोड, पुणे-४११०२४

CENTRAL WATER AND POWER RESEARCH STATION

Khadakwasla, Sinhagad Road, Pune - 411024

VISION

To be a world-class centre of excellence in hydraulic engineering research and allied areas; which is responsive to changing global scenario, and need for sustaining and enhancing excellence in providing technological solutions for optimal and safe design of water resources structures.

MISSION

- To meet the country's need for basic & applied research in water resources, power sector and coastal engineering with world-class standards
- To develop competence in deployment of latest technologies by networking with the top institutions globally, to meet the future needs for development of water resources projects in the country effectively
- To disseminate information, build skills and knowledge for capacity-building and mass awareness for optimization of available water resources

MAJOR FUNCTIONS

1

- Undertaking specific research studies relating to development of water resources, power and coastal projects
- Consultancy and advisory services to Central and State Governments, private sector and other countries
- Disseminating research findings and promoting/assisting research activities in other organizations concerned with water resources projects
- Contributions to Bureau of Indian Standards and International Standards Organization
- Carrying out basic and applied research to support the specific studies
- Contribution towards advancements in technology through participation in various committees at National and State Levels





Uma Bharti



Minister

Water Resources, River Development
and Ganga Rejuvenation

Message

I am very happy to know that Central Water and Power Research Station (CWPRS), Pune is celebrating Centenary Year in 2016. Credit goes to the scientists and supporting staff of CWPRS, who have transformed CWPRS from a mere “Special Irrigation Cell” in June 1916, to the principal central agency, catering to the research and development (R&D) needs for evolving safe and economical planning and design of water resources projects, river engineering, power generation and coastal engineering projects, fulfilling the mandate of “Service to the Nation through Research”.

With water resources getting stressed day by day and the Sustainable Development Goals set by the Global community, the role of CWPRS in providing optimum solutions, through R&D, to the current and future challenges in water and power sector is becoming more and more important. I know that with a vast pool of highly qualified and experienced scientists and excellent infrastructure facilities, CWPRS is well prepared and equipped to discharge its obligations effectively and efficiently and become a world-class centre of excellence in hydraulic engineering research and allied areas.

I congratulate all the Officers and Staff of CWPRS for their achievements and wish them a Great Centenary Year.

Uma Bharti





Prof. Sanwar Lal Jat



Minister of State

Water Resources, River Development
and Ganga Rejuvenation

Message

I am very happy to know that Central Water and Power Research Station (CWPRS), Pune is celebrating Centenary Year in 2016. The country's growth in water and power sector is synonymous with the growth of CWPRS. Almost all important irrigation, hydropower, water supply, navigation and ports projects have imprints of this institution. Owing to its receptivity towards incorporating new technology with the changing times, the CWPRS's journey has continued ceaselessly over a century, earning it the stature of a world-class water and power research institution.

This journey would not have been possible without the contributions of highly qualified and experienced scientists and supporting staff of CWPRS. I congratulate all the Officers and Staff of CWPRS for their achievements and wish them a Great Centenary Year.

Prof. Sanwar Lal Jat





Shashi Shekhar



Secretary

Water Resources, River Development
and Ganga Rejuvenation

Message

Year 2016 is the centenary year of CWPRS. I congratulate all the Officers and Staff of CWPRS for their achievements and wish them a Great Centenary Year. It should also be kept in mind that it is not only the year of celebration of successful completion of 100 year to service to the nation through research, but also an opportunity for CWPRS to revitalize itself with the state-of-art technology to meet dynamic challenges in water and power sector. Being the apex research organization in the field of water and power, CWPRS has huge challenges to fulfill its mandate to provide optimum solutions for meeting Sustainable Development Goals in the changing climate scenario.

I am happy to note that CWPRS is poised to serve as a certifying center for hydro-meteorological and water quality equipments and provide overall guidance on instrumentation selection; commissioning and quality control, under the forthcoming World Bank aided National Hydrology Project. This is a big responsibility and opportunity for CWPRS to re-establish itself as a front runner in development of technology and guiding the Central/States agencies. CWPRS should also undertake systematic studies on River Rejuvenation for prioritizing actions for optimum results, dissemination of Traditional Water Wisdoms through development of appropriate models for upscaling and Disaster Management Planning.

I wish CWPRS a success in all its endeavors.

Shashi Shekhar



One should take proper managerial actions to use and conserve water from mountains, wells, rivers and also rainwater for various purposes.

Atharva Veda. 19.2.1

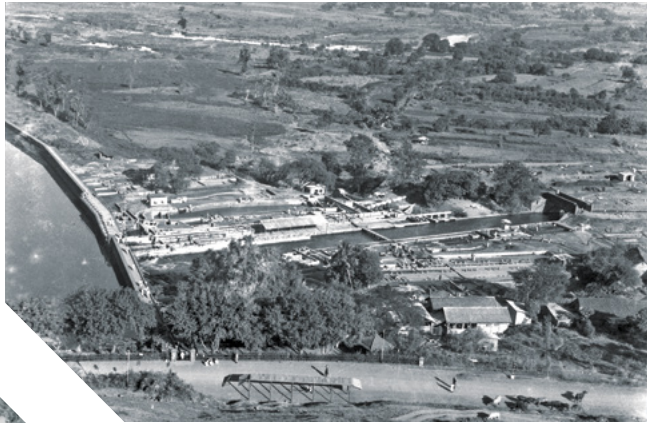
Civilizations have grown with the pace of how well water resources were harnessed to meet the demands of water and power. Central Water and Power Research Station, set up initially as a “Special Irrigation Cell” in June, 1916 by the then Bombay Presidency, has continued to serve for 100 years by catering to the research and development needs for evolving safe and economical planning and design of water resources structures, river engineering, hydropower generation, and coastal engineering projects fulfilling the mandate of ‘Service to the Nation through Research’.

Just like a river acquires depth over time and contributes to making its surroundings lush and productive, the CWPRS has also grown from strength to strength over the hundred years of its existence. Almost all important irrigation, hydropower, water supply, navigation and ports projects have imprints of this institution. Owing to its receptivity towards incorporating new technology with the changing times, the CWPRS’s journey has continued ceaselessly over a century, earning it the stature of a world-class water and power research institution.

Considering the infrastructure and expertise available, CWPRS has been identified under ‘World Bank aided National Hydrology Project’, as a Nodal Agency for providing overall guidance on hydro-meteorological and water quality equipments selection, commissioning and quality control to all States/Union Territories. In this Centenary Year, CWPRS is also opening new divisions for undertaking systematic studies on River Rejuvenation, for prioritizing actions for optimum results, dissemination of traditional water wisdoms through development of appropriate models, for up scaling across the country and Disaster Management Planning.

With a vast pool of highly qualified and experienced scientists and excellent infrastructure facilities, CWPRS rededicates itself to fulfill its mandate to provide optimum solutions for meeting Sustainable Development Goals in the changing climate scenario.





CWPRS campus near Khadakwasla dam, Pune (1951)



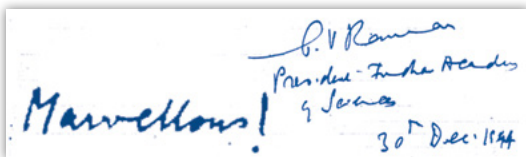
Founder Director C. C. Inglis at CWPRS (1953)



CWPRS campus at present location (1975)



*First President of India,
Dr. Rajendra Prasad at CWPRS (1954)*



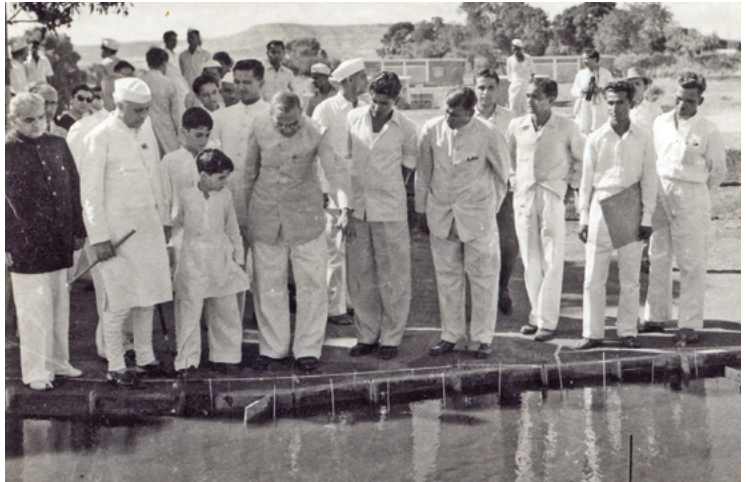
Remark by nobel laureate Dr. C. V. Raman (1944)



Hydraulic Study of Neera Right Bank Canal (1928)



First Vice-President Sarvepalli Radhakrishnan at CWPRS (1954)



First Prime Minister of India Pandit Jawaharlal Nehru inaugurated Ship Testing Tank at CWPRS (1955)



Nikita Khrushchev, Prime Minister of then USSR, visited CWPRS in 1955



Then Minister for Railways Lal Bahadur Shastri at CWPRS (1954)



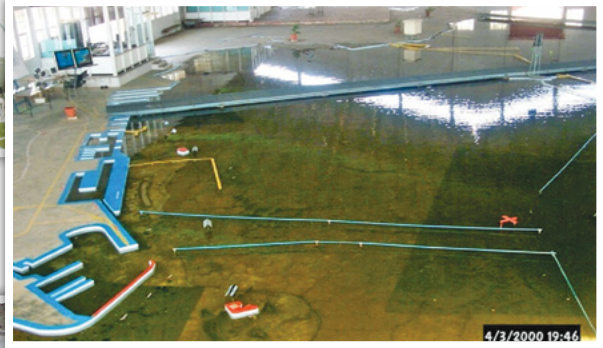
Then Prime Minister of India, Indira Gandhi (1976)



Then Minister for Water Resources Pramod Mahajan (1999)



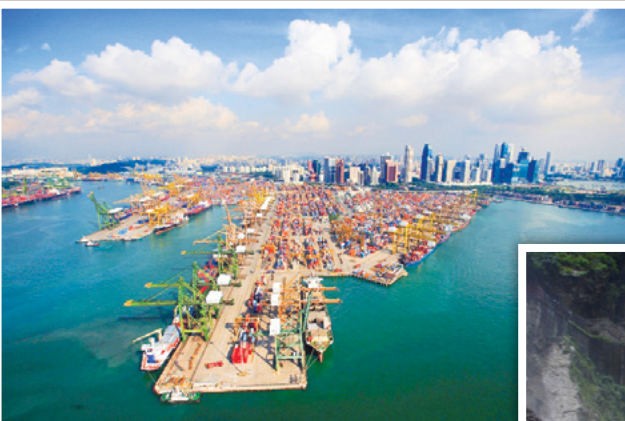
CWPRS study on Tehri Dam for shaft spillway



Physical Model of Mumbai and Jawaharlal Nehru Port



Physical Model of Tapovan Vishnugad hydropower project



CWPRS conducted hydraulic model studies for layout of reclamation for Changi airport at Singapore port

Studies & Projects

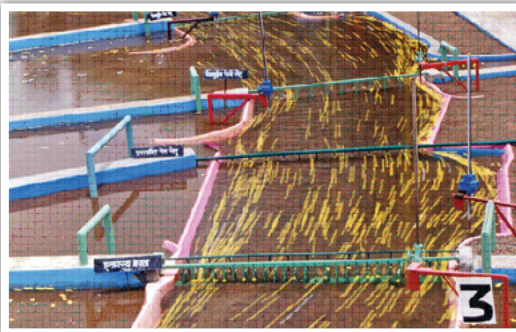
Hydraulic model studies for Tala Project in Bhutan





River Engineering

- Studies related to Flood Control, Hydraulic Analysis and Prototype Testing of Structures
- Studies about Bridges, Barrages, Weirs, River Training-Diversion and Morphological Changes



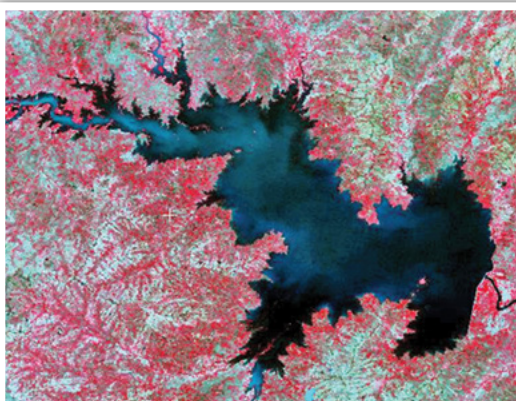
Yamuna Channelisation Model



Permeable Porcupine Spur

River and Reservoir Systems Modelling

- Meteorological and Applied Hydrological Studies
- Physico-Chemical Methods for Water Quality and Surface Water Hydraulics

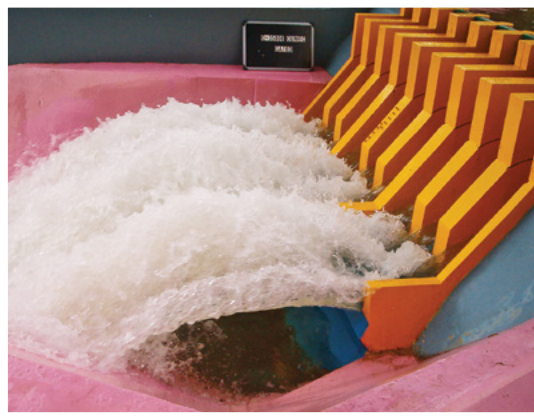


Analysis of water quality in reservoir

Reservoir sedimentation through SRS technique for Girna reservoir

Reservoir and Appurtenant Structures

- Studies of Hydraulic Designs of Spillways, Water Conductor Systems and other Appurtenant Structures



Orifice spillway model of Subansiri Lower Project



Reservoir flushing model

Vortex formation in pumping mode at Srisailem Project

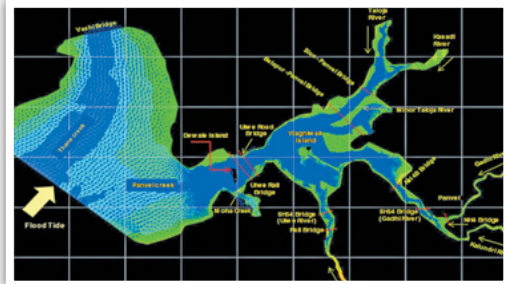


Coastal and Offshore Engineering

- Development of Ports and Harbours,
- Design of Coastal Structures, Coastal Protection, Stability of Tidal Inlets, Intake and Outfall Systems of Coastal Thermal/ Nuclear Power Plants



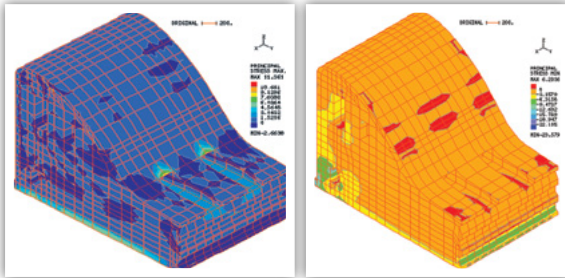
Breakwater at Porbandar



Mathematical Model for Flow Conditions in Panvel Creek

Foundations and Structures

- Deals with Properties of Foundations and Structural Materials using laboratory and field tests as well as mathematical modelling



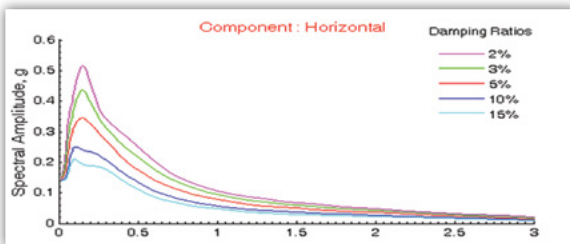
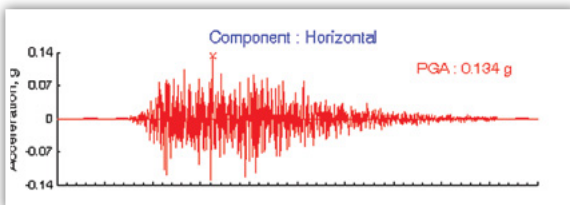
Maximum and Minimum Principal Stress Distribution, in Block 25, Garudeshwar Weir



Geosynthetic tensile testing machine

Applied Earth Sciences

- Studies related to Geophysics, Earthquake Engineering, Tracer Hydrology, Hydrogeology and Vibration Technology
- Studies for foundation evaluation, seismic design parameters for major projects



Site specific design accelerogram and design response spectra

Vibration Studies for Indra Sagar Hydro Power Project, Khandwa, Madya Pradesh



Front view of Current Meter Rating Trolley

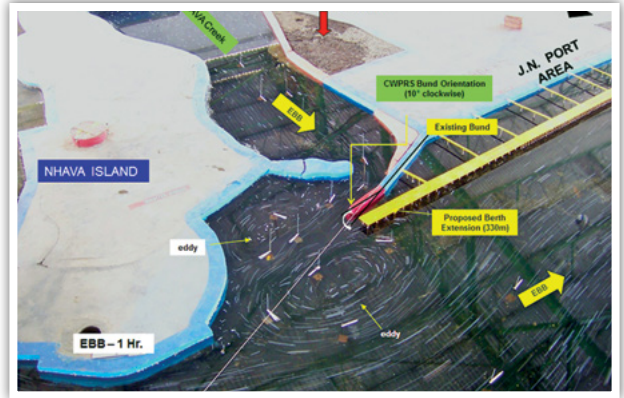
Instrumentation Calibration and Testing Services

- Development of Hydraulic Instruments
- Services for calibration and testing of various Flowmeters, Current Meters and Pumps





Mumbai and Jawaharlal Nehru Port



Physical Model of Jawaharlal Nehru Port

- More than 190 physical/mathematical model studies for Mumbai and JN ports.
- Proper alignment of navigational channel effected the reduced siltation in channel
- Predication of siltation in harbor helped in effective planning for dredging
- Finalization of JN port layout and its smooth operability
- Mumbai Port model extended with Panvel Creek and five rivers to study flow patterns for the proposed international airport
- Estimation of safe-grade elevation for international airport area

Sardar Sarovar Dam Project

- Optimization of layout of spillway
- Design of energy dissipators-sloping-cum-horizontal apron for main spillway & ski-jump bucket for auxiliary spillways
- Estimation of hydrodynamic bending moments, pullout and uplift forces on spillway basin floor, divide walls and training walls
- Various stages of construction studied on comprehensive and sectional model
- Evolved suitable design of low level hump through model studies



Chilika Lake

- Mathematical model studies for restoration of the lake salinity vis-à-vis eco-system by effecting the tidal exchange through single inlet and double inlet system of the Lake
- Study to identify the location for straight cut and assess its effect
- Hydrodynamics & salinity flux computations before & after proposed straight cut
- Study of impact of Naraj barrage on Chilika Lake
- Stabilization of inlets and impact on salinity due to opening of new mouth



Double inlet (2010)

River Yamuna

- River channelisation to improve flow conditions and create extra land
- Studies of feasibility, alignment and width, effect on existing structures
- Studies for bridges for location, alignment, flow conditions, adequacy of water way, scour, protection measures, guide bunds, afflux
- Studies for Lok Nayak Setu, Delhi-NOIDA Bridge
- Studies for Metro Rail bridges
- Replacement of 120 year old Rail-Cum-Road Bridge



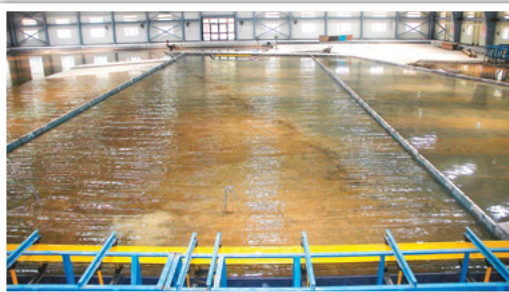
Physical model of river Yamuna

Layout planning of proposed signature bridge on river Yamuna



Capabilities & Facilities

- A premier research institute in hydraulics and allied areas in water and power sector
- Multidisciplinary expertise to provide R&D solutions to the problems associated with water resources, power and coastal projects
- Close association with all major River Valley Projects, Port Developments, and other Organizations
- UN Recognized Regional Laboratory for Economic and Social Commission for Asia and the Pacific (ESCAP) since 1971
- Serves three major sectors
 - Water Resources
 - Hydro Power
 - Ports and Waterways
- Applied research to provide sound and economic solutions for
 - River Engineering
 - Reservoir and Appurtenant Structures
 - Hydraulic Machinery
 - Coastal Engineering
 - Earth Sciences
 - Foundation and Structures
- Applied Research through physical and mathematical modelling; field and laboratory investigations
- Calibration of flow meters and current meters
- Excellent Infrastructure: 490 acres of land, adjacent to Khadakwasla Dam, separate sub-station for uninterrupted power supply, latest equipments and expert human resources



Multipurpose wave basin with random sea wave generating facility



Remote Sensing Centre



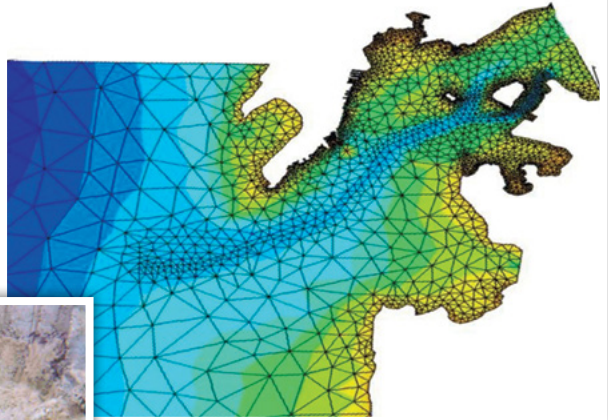
Random sea wave generating flume



Library



Physical Model Studies



Mathematical Model Studies



Field Studies



Laboratory Studies



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