ICID•CIID

CERTIFICATE COURSE ON
DAM AND NETWORK SAFETY ASSURANCE

AF ACADEMY

Presented by
Industry Stalwarts including
(in alphabetical order of first name)

Mr. Ashwin B Pandya
(Secretary General, ICID and Ex-CWC, Chairman)

Dr. A K Dhawan
(Ex-Director, CSMRS)

Dr. B R K Pillai
(Commissioner, CAD, MOJS)

Mr. C S Mathur
(Ex-CWC, Chief Engineer)

Mr. D K Sharma
(Former Chairman, BBMB)

Mr. Gulshan Raj
(CE, DSO, CWC)

Mr. Manohar Singh
(Ex-CWC, CE)

Mr. Murari Ratnam
(Ex-Director, CSMRS)

Mr. N K Mathur
(Ex-CWC, Member)

Mr. N N Rai
(Director, CWC)

Mr. P Ramaraju
(Engineer-in-Chief, Retd., W.R.D., A.P.)

Dr. R Chitra
(Joint Director, CSMRS)

Mr. Rajesh Pandey
(Director, Dynasoure Concrete Treatment Pvt. Ltd.)

Mr. Saibal Gosh
(Chief Engineer, CWC)

Dr. Sam Johnsson
(Member, ICOLD Committee of Dam Monitoring & Surveillance)

Dr. Sanjay Rana
(Chairman, Aqua Foundation)

Mr. S K G Pandit
(Ex-CWC, Member)

Mr. V Subramanian
(Chief Executive/Director, CARPI INDIA Waterproofing Specialists Pvt. Ltd.)

Mr. V V Arora
(Former Joint Director and Head CDR, NCCBM Ballabgarh)

Dr. Yella Reddy
(Dean, Agriculture University & Ex-Director, WALAMTARI)

Mr. Y K Handa
(Ex-CWC, Chief Engineer)

Course Focus:

The course is meant for the professionals directly engaged in the works of maintaining and managing the irrigation and multipurpose projects having headworks in form of storage structures of various sizes and associated water distribution networks for providing water to the beneficiaries. The course aims at improving the skills of the professional entrusted with the responsibility in directly managing the facilities and ensuring their safety as well as reporting the status to the higher level of managements. The works of such nature requires exposure to the basics of the sciences and technologies that go into designing and operationalizing such facilities, deteriorations that can be expected over long years of usage, implications thereof towards continued safety of operators and hazard levels posed to the downstream communities, possible field and laboratory investigations techniques for identification of problems and reporting the observations to the expert personnel in a scientific and lucid manner so that the status at the field level is fully appreciated while planning the remedial measures by them.

The areas of safety assurance in general are very wide and comprise of high degree of expertise and skills extending to the cutting-edge level of technologies and involve a fair amount of in-depth experience in each discipline. However, such level of expertise and skill sets cannot be replicated easily with the growing level of asset base and increasing age of the existing assets. A middle layer is required who is generally aware of the issues that can get generated in such a scenario and how to deal with them as a first line of decision and defense. At the higher levels, such personnel will be the key to the setup to monitor and collate the status of the asset portfolio being managed by an organization or department.

Water management projects especially the irrigation projects are long lasting entities with practically indefinite life. Even if the beneficiary land area changes its character in terms of land use, the utility of the head conservation works and the distribution networks remain or improve as they are required to deliver the water for larger economic good in keeping with development in economy of the area. On the other hand, the tenure of a professional employed for managing the project may be limited in keeping with the shortage of personnel and also the aspirations of the individual towards career progression. Many of the developing countries are facing this problem due to a smaller pool of manpower resources not in keeping with the growth in population of the projects. At any point of time, a change of hands is inevitable with concomitant dangers of gaps in knowledge transfer. Presence of exposure to a course of this nature provides necessary awareness to the incoming professional about the scope and nature of the assignment at hand and also makes the charged professionals aware of standard protocols and procedures involved.

This is a first course in a set of courses of increasing levels of expertise and narrowing of focus for advanced exposure of relevant sub sets of professionals.

The professionals at ICID and Aqua Foundation have witnessed such situations first hand and realize that the skill sets are in need of a wider spread in view of growing importance of an assured delivery of water to the beneficiaries and also a continued assurance of performance worthiness of the components involved.

Dam safety bill has already passed in the Lok Sabha and is now pending with Rajya Sabha. It is likely that the same may come into effect shortly. Already, with DRIP II in place, there is a need of trained dam safety professionals at the field level who are able to coordinate with various expert committees and panels who take up the formulation of remedial measures and also supervise implementation of the same. This course will enable the project authorities to create such a group for better progress in their dam safety related works. Similarly, in India, there is increasing emphasis on demand side management for water resources. In such cases, the status of network capacities for delivering the required volumes will also require assurance. Maintenance of networks will therefore receive increasing importance. In this context, the course will be able to fulfil this gap.

Course Content:

The course content has been designed for fresh and practicing engineers who are involved with the dam operations, surveillance and safety assurance works and dam portfolio managers responsible for setting up dam safety programmes.

Section 1

This section will expose the participants to the following areas:

- Overview of Dam Safety Aspects
- Legislative Provisions of Dam Safety- Existing and Future
- Overview of Basic Design Philosophy of Dam, Defence Measures and Features Provided for Safety
- Preparing and Maintaining Documentation for Dam and Network for Safety Assessment
    - Concrete and Masonry Dams and Canal Network Components
    - Earth and Rockfill Dams and Canal Embankments
    - Pipelines and Control Structures
- Overview of Basic Design Philosophy for Conveyance Networks and Associated Structures- Canals and Pipelines
- Overview of Flood Risks and Handling them in Real Time, Effect of Flood Operations on the Safety and Upkeep of Dams and Networks
- Overview of Seismic Risks and Protocols for Assessment of Safety and Performance Worthiness
- Instrumentation and Structural Behaviour Analysis
- Durability of Concrete Structures
- Behaviour and Performance Observation Programme
- Specialised Materials and Techniques for Repairs and Rehabilitation- Introduction
- Preparing and Carrying Out On-Site Inspection of a Concrete/ Masonry and Earth/ Rock fill Dams
- Hydromechanical Equipment and Dam Safety
- Evaluation of Different Types of Energy Dissipating Arrangements, and Remedial Measures
- Under Water Inspection Techniques
- Use of Hand-Held Mobiles, GPS and Remote Sensing Techniques for Network Status Assessments and Mapping
- Efficiency Measurement of Conveyance Network
- Network Status Assessment Using Mobile Technologies
- Assessment of Emergency Preparedness and Disaster Management Under Normal and Extreme Conditions, Information Communication, Processing and Decision Protocols, Standard Operating Procedures
- Dam Safety Instrumentation Monitoring in Dams and Allied Structures
- Rock Mechanics Investigations for Dams and Reservoir Slope Stability Problems
- Geomembranes for Seepage Control in Dams
- Latest Format being used for Writing Inspection Reports for Dams in India

Section 2

This section will expose participants to the latest investigation techniques in the following areas:

- Geotechnical Investigations of Existing Dams
- Non Destructive Testing and Diagnostics for Distressed Structures Techniques & Case Studies
- Geophysical Techniques for
    - Leak Path Detection
    - Internal Erosion
    - Identification of Zone of Water Accumulation
    - Cavity/ Sinkhole
    - Concrete/ Masonry Degradation (Weak Zones)

- Residual Density Determination
- Stilling Basin Inspection

- Use of Temperature and Strain Sensing for Dams
- Latest Developments including Optical Fibre Sensors
- Geophysical Investigation Techniques
  - Seismic/ Sonic Tomography
  - Electrical Resistivity Imaging/ Tomography
  - Multi-Channel Analysis of Surface Waves (MASW)
  - Seismic Refraction Tomography
  - Streaming Potential
  - Ground Penetrating Radar

Course Delivery Mechanism:

The course will be delivered through a Learning Management System (LMS), where pre-recorded lectures, videos, presentation, reading material etc. will be uploaded, so that participants can go through these at their own pace, within the time frame of 6 months. Live sessions also will be organized wherein participants can directly interact with experts and raise their queries. Preferred mode of receiving questions would remain through email, enabling development of a comprehensive Q&A.

Fee Structure:

Government Departments, Ministries:	INR 6,000	USD 120	per participant
Private, PSUs, Boards:	INR 10,000	USD 200	per participant
Students, Research Scholars (Full Time):	INR 4,000	USD 80	per participant

GST will be charged extra as applicable (present rate of GST is 18%)

Registration Process:

Registration can be done online using the link www.damsafety.co/register. In case of bulk registrations, please contact ICID/ AF Academy at details provided hereunder:

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Contact Details

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