ORIGINAL

"DOCKET No.AD04-4-000,NOTICE REQUESTING APPLICATIONS FOR PANELMEMBERLIST
FOR
HYDROPOWER LICENSING STUDY DISPUTE RESOLUTION".

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1.TECHNICAL EXPERTISE HYDROPOWER

Education: Bachelor of Engineering(CIVIL ENGINEERING)——Annamalai University
P.O Annamalainagar
(TAMILNADU), INDIA

AFFILIATIONS:

Member, American Society Of Civil Engineers.--Elected Nov.1991
Fellow,Institution Of Engineers(INDIA)--Elected June1981--(CHARTERED ENGINEER)
Member,Indian Institute Of Administration,New Delhi(INDIA)

ORGANISATIONS:

PUNJAB GOVERNMENT(IRRIGATION DEPARTMENT)

On Selection by Punjab Public Service Commission,entered PunjabGovt.as Temporary Engineer (under Training) &placed at BHAKRA DAM in Concrete Inspection Division with Director,INSPECTION & CONTROL.Bhakra Dam is a Straight Gravity Dam & was under Construction with US Expertise & Manpower .On Completion of three months Training, started
working as Sub-Divisional Officer incharge of sub-divisionfrom August,1959onwards.Worked for *Project Investigation&Preparation*
as well as O& M of Canal System.
On Creation of Haryana Statein Nov.1966,was allocated to Haryana Govt.
Services placed with BEAS CONTRUCTION BOARD (GOVT .OF INDIA)at Beas Sutlej Link Project ,SUNDERNAGAR(H.P)
While working in Power Plant Division,Sundernagar for EXCAVATION OF DEHAR POWER PLANT,I was promoted as
EXECUTIVE ENGINEER in July,1971and took charge of POWER PLANT DIVISION,SUNDERNAGAR.
On COMMISSIONING of 4x165MW Units of Dehar Power PLant,I was placed as SENIOR DESIGN ENGINEER for
Monitoring Physical & Financial Progress of BEAS SUTLEJ LINK PROJECT for Reporting to Beas Construction Board (GOVT. OF INDIA)_MINISTRY OF ENERGY.
On Commissioning of this project,I was selected as DEPUTY CHIEF ENGINEER in WATER & POWER CONSULTANCY SERVICES-A GOVT. OF INDIA UNDERTAKING--New Delhi (INDIA).I worked in WORLD BANK UNIT of WAPCOS. from 3/1980 on
Subernekha Project for BIHAR,ORRISSA and WEST BENGAL STATES in INDIA.Prepared Reports for
Appraisal by WORLD BANK for Grant of Loan to State Governments of Bihar & Orrissa.(Project since completed)
In January ,1983,was selected UNDP ENGINEER for Foriegn Deputation to Govt.Of SRI LANKA through Govt.Of INDIA.
Worked on KOTMALE HYDROPOWER PROJECT as Section Engineer (POWER STATION) & was responsible from SURGE SHAFT to TAIL RACE ,including Surge
Shaft,Penstocks,Underground Power Station,Cable & Ventilation Shaft,Outfall Works and 220kV Sub Station Civil Works from2/1983 to 6/1986

On Promotion as SUPERINTENDING ENGINEER,worked in BHAKRA BEAS MANAGEMENT BOARD from11/1986 to 1/1991
on O& M of BEAS DAM,DIRECTOR (WATER REGULATION) BBMB and DIRECTOR,DAM SAFETY BBMB & Secretary BBMB Dam Safety Committee for Inspections of Bhakra & Beas Projects.

EXPERIENCE :
Experience in different resource areas & sub -areas is :
MAJOR AREA: HYDRO POWER CIVIL ENGINEERING
1.Construction of Dehar Power Plant (4x165MW) +Extension Project(2x 165MW)
Beas Sutlej Link Project(BEAS PROJECT Unit I) envisaged Diversionof river BEAS Water into river SUTLEJ through a 40Km.
Water Conductor System comprising of Pandoh Baggi Tunnel,Sundernagar Hydel Channel,Sundernagar Sutlej Tunnel & Penstocks
of DEHAR POWER PLANT.
Dehar Power Plant is located on right bank of River SUTLEJ for Generation of Power & augumentation of water resources
for Bhakra Dam .
Excavation was undertaken with Heavy Earth Moving Machines–Showels(Electric & Diesel) Tractors,Euclids,Front end Loaders and portableCompressors for Drilling & Blasting operations for Rock Excavation above & below ground level.Infra structures were built-Haul Roads,Culverts,Aggregate Bins ,Batching & Mixing Plant and Overhead Crane on rails along the length of Power Plant for facilitating Concrete Placement .As Executive Engineer, I was responsible for Excavation,Job Facility works,Carpentry & Reinforcement Shops.
Construction was undertaken with Govt,Equipment & Machinery as well as Direct Labour employed by the BSL Project round the clock in three shifts of 8 hours
each.Accordingly,Carpentry Shop & Reinforcement Shop undertook Fabrication of Formwork & Reinforcement Steel for 165 feet high Reinforced Concrete Power Plant .
Achieved Completion for major components:
Excavation for Dehar Power Plant above & below ground level 1695 feet .Adit for Excavation of Inclined Penstocks was commenced
before undertaking Pit excavation below ground level.Rock Grouting for Coffer Dam Rockledge was also completed by Drilling & Grouting Division.Pumping stations were provided byElectrical& Mechanical Divisions.
Excavation of Horizontal Penstocks commenced ,Portals completed & tunnel excavation for Penstocks completed .
FoundationTreatment was completed & Concrete Placement commenced .
Completion of about 10,000feet Tunnelling for Adit & 6no.Penstocks.Completion of Rail Track & Pedestals for Installation of Penstock Steel Liners.
Fabrication of Formworksfor Concrete Placement
Pre casting ofCrane Beams& Roof Elements & their Placement.Water Proofing Treatment of Roof .
Completion of 9,000T Steel Fabrication & its Installationin situ at Dehar Power Plant area.
Completion of Cable Tunnel from Dehar Power Plant to 220kV Sub-Station.Consruction involved Tunnelling adjoining Power Plant & RCC Cable Tunnel over Fill portion for Horizontal & Inclined reach.
Completion of Concreting around Penstocks.
Civil Works in Switchyard for 33kV,220kV & 400kV Sub-Stations
Completion of Tail Race & Removal of Coffer Dam
Coordination with Power Wing Engineers(Turbine ,Generator,SubStation Engineers) for Second Stage Concreting & Commissioning of 4x165MW Units of Dehar Power Plant.In the Final Stage, I was resposible for concrete Placement.

Senior Design Engineer , Plant Design & Inspection Directorate,I was resposible for preparation of Monthly Physical & Financial Progress Report for submission to Beas Construction Board in Ministry of Energy,Govt.of India--Bringing out Critical Construction Component on BEAS SUTLEJ

LINK PROJECT.

Kotmale Hydro Power Project in Sri Lanka.
As Section Engineer (Power Station),I was responsible for Construction Supervision & Quality Control for Power Station area on Kotmale Project.Skanska AB & Asea AB were Civil & Electo-Mechanical Contractors from Sweden.
Construction of 150m Surge Shaft-Slip forming.
Construction of 200m Cable & Ventilation Shaft for Cables from Underground Power Station to 220 kV Sub-Station.Erection of Precast Beams & Slabs.
220kV Sub-Station Civil Works-Buildings,Roads,Foundations,Drainage,Water Supplyfor Power Plant,Fencing & Landscaping.
Construction of Low Pressure Tunnel ,Concrete Placement around Penstocks.
Underground Power Station Construction & Commissioning.Operation & Investigation of Post-Operation Problem.Implementation of Recommendationsfor Solution.
Tail RaceTunnel & Outfall Works Construction.
In addition, carried out Miscelleaneous construction jobs:
Culverts & Bridges,Excavation 80feet below the Drainage for construction of Inlet Tunnel Portal for Sundernagar Sutlej Tunnel at BSL Project,small buildings,Foundations etc.

Operation & Maintenance of BBMB Beas Dam (BEAS PROJECT Unit II)
O&M of Beas Dam(Major Earth coreGravel Shell Dam -435 feet high),Concrete Chute Spillway,Irrigation& Power Tunnels
Beas Dam Gates,Reservoirwith Storage of about 6 MillionAcre Feet.
,BulkHeads,Trashracks,WATER sUPPLY FOR DAM, HEAVY MACHINERY-Barges & Tugs in Reservoir,Transport System -Road & Rail from Project Township to Beas Dam& Workshop for Maintenance& Repairs.Talwara Township-Roads & Buildings-Residential & Non-residential,Water Supply for the Township,Project Personnel & Procurement.Project Nursery.
Notable Achievements included:
Closure-Inspection & Repairs—Penstock Tunnels P3 & P1 ,Irrigation TunnelsT1& T2
Penstock P3 _Closing,Dewatering & Inspection was completed from Feb10,to Feb18,1988within Scheduled Shutdown.Repairs & Curingof Epoxy Paintwas completed by March15,1988as scheduled.Similarly,Closures,Dewatering ,Inspection & Repairs were scheduled& completed for PenstockP1,Irrigation tunnels T1 & T2 before June10,1988& well before the Onset of Monsoos season-filling of Reservoir.
Under water Inspection,Cleaning& Repainting for Trashracks of Power Tunnels P1& P3 as wellas Irrigation Tunnels T1& T2were completed.
Under water Inspection & repairs for Access Bridgewas done in time
Repaintingof Top Covers,Brackets,Guides forP1,P3,T1& T2 were done.
Active Day to day Coordination among Civil & Power Engineers during the Closure Period was achieved at personal level.

Another important solution related to investigation & remedial action for corrosion observed on 13% CR Stainless Steel Gate Shaft of Irrigation Tunnels.Both Hydraulic oil & water Samples in touch with the Shaft Stem were got tested.Water was found to contain B-coli bacteria .In-Situ repairs were made with METAL EPOXY & Stagnation of water was avoided by periodic test operation of Gates.
O& M of canal system in Tail subdivision ensured the challenging task of irrigating cultivated areas at the tail outlets & providing
Drinking water supply for Township in summer.During this period I acquired insight in the Revenue matters in constant touch with Irrigatorsto understand their needs.Later on,I passed the Departmental Revenue Examination of Punjab Govtin the first attempt
to become eligible for Promotion-I had already passed Departmental -Professional Examination
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BBMB Director Water Rgulation:
Resposible for day to day water releases from Bhakra Dam,Beas Dam & Pandoh dam to meet the Irrigation & Power needs of

BeneficeriesStatesthrough coordination with Director Power regulation,and Directors of State Governments in accordaance with decision of monthly BBMB Board Meeting.BBMB Member (Irrigation) was apprised immediately of request for change.For this purpose,Wireless network provided immediate Communication from Discharge& Precipitation stations in Upstream Catchments of River Basins-Beas,Sutlej & Ravi rivers for Integrated Reservoir Operations for optimization of water use both for Irrigation & Power.
Prepared Agenda for BBMB monthly Board Meetings to-gether with Projections of Water in a Dry Year,Good Year and Wet year and current trend of Inflows.Hydrological models were attempted in consultation with experts from Data of Rain & snow gauges as well as Discharge Stations.
Maintained Water Accounts of Beneficiery States & coordinated with State Directors for Reconcilation before Issue.
Water Regulation of Bhakra Dam during Sptember 1988 Flood of 100year intensity was personally supervised through personal coordination with Member IRRIGATION BBMB & National Weather Forecasting Director .Spillway Gates were half open only.
The Dam DeflectionGauge exceede one inch during full reservoir flooding.
The reservoir level were raised above maximum Flood Level once in constant consultation with Director Designs-Mechanical for Beas Dam Spillway Gate Operation.Ministry of Energy monitored situation every hour till decision was made to fully open
Beas Dam Spillway Gates

Project Design , Planning& Preparation
Carried out Field Surveys along Natural Streams for preparing Canalization Schemes for Major Drainagesin Punjab.
Prepared Baggi Power Plant Project Report.
Prepared Reinforcement Steel Design for Beas Dam-Intake Structure in accordance with Indian & Us codes-Got the Design Computations & Deatailed Drawings Checked Internally & Externally before obtaining Approval from Chief Design Engineer.
Observed Model Studies at Research Station ,Pune for reports to Design office in repect of Beas Project.
Carried out Field Investigations along proposed Dam site & Revised Ghaggar Dam Project Report.
Conducted Feasibility Studies& submitted Subernarekha Multi-Purpose Project Report for States of Bihar & Orrissa for WORLD BANK Appraisal & Grant of Loan.
As BBMB Director Dam Safety,& BBMB Dam Safety Commitee organise Field of Project components of BHAKRA & BEAS PROJECTS .Prepared BBMB Safety Reports for Periodic Inspections.Implementation of Requirements of O& M Project Manualswas enforced in BBMB.Instrumentation Observations were required to be Monitored together with condition of Equipment & Instruments installed at different sites in the Project areas.Annual Observation Reports were required to be ready in time for analysis in Design Directorate.Seismic Observatories around the reservoirs monitored micro-seismic data& Dam Seismic Instruments recorded Macro observations.Guidelines were laid for Safety of Dams & Structures.

In a nutshell,my Technical Expertise broadly covers all important features of Hydro Power Projects & understanding of not only Civil Engineering but also Electo-Mechanical aspects important for Constructio as well as O & M of Hydro Power Projects.
I am Familiar generally with detail of water Quality& Instream flows among Aquatic resources,Land Use,Erosion (GEOLOGY).

2. I have Knowledge of the Effects of Construction and Operation of Hydroelectric projects.
3I understand the Clean Water Act.I am in a position to quickly grasp the working knowledge of relevent laws as applicable
& updated from time to time .
4I had the experience & possess ability to promote constructive communication about a disputed study to arrive at the Truth & facts.