

Automatic Dam Control System with Vidyut Cable Saver DI-731 for Automation of Barrage Gates



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Advantages of Cable Saver System DI-731

- Saves around **90** percent Cable .
- **For example** : In normal system for a Dam or Barrage with 10 gates, we require 3 cables per gate, each cable of 4 core, so in total we require **30 cables of 4 core**.
- But by using Vidyut cable saver DI-731 we require only 1 cable of 2 core.
- So ,
 - Traditional method → 30 cables of 4 core
 - Vidyut Cable saver method --> 1 cable of 2 core

So we save around 98.333 % of cable cost ...

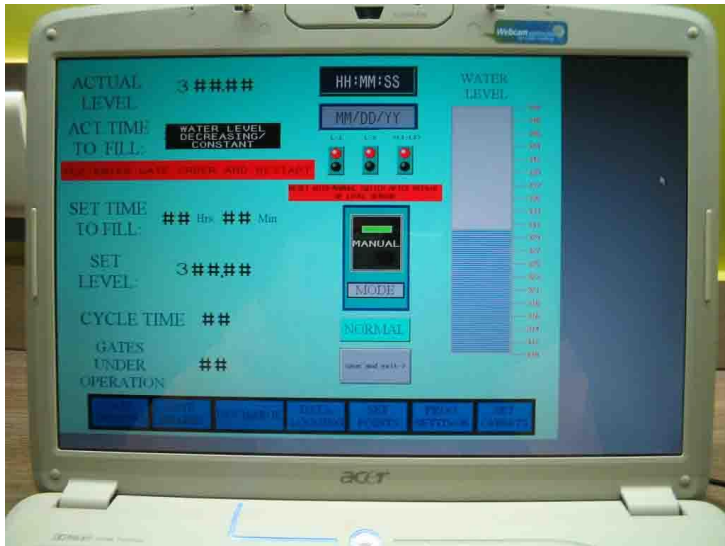
A genuine Cable saver !!!!!

- **Low maintenance and High Reliability**

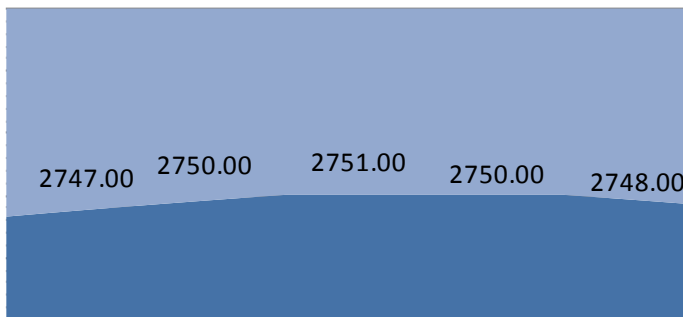
Other Advantages-

- Contains all the Features of ARMAC with other Extra Features
- Artificial Intelligence Based algorithm based system for automatic operation of Gates along with Computerized PLC system
- Automatic system to maintain the water level in dam reservoir by opening and closing the gates of the dam by itself as configured using Fuzzy Logic.
- In-Built Digital Dial Indicator for Gate Position. (No need to buy Gate Position Indicator)
- In Built Limit trip for Gate Full Close & Full Open Limit Switches.
- In Built Limit Trip Indications.
- Data logging for Water Level, Gate Position, etc

Indications



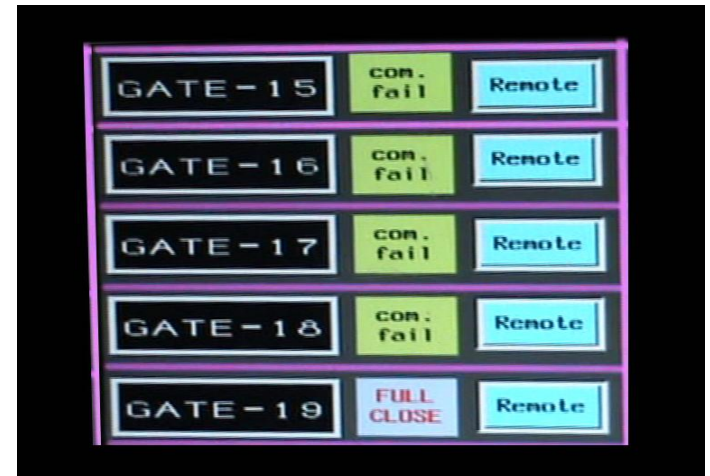
**Water level Measurement
with respect to Time**



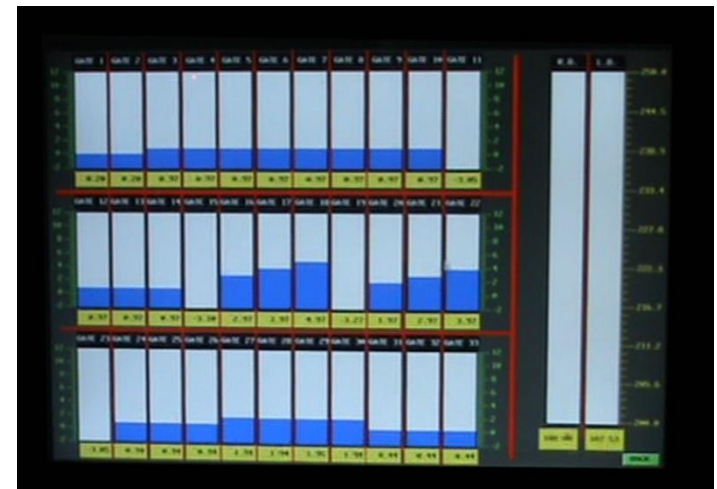
- Provision of **indication of Gate Position** of all Gates in the Remote Control Room
- Provision of **Graphical Visualizations** for Gates
- Provision for **Trends** for Gate openings for Gates
- Provision of **water level** for both the banks
- Provision of **Graphical Visualizations** for **Water Level**
- Provision for **Trends** for **Water Level** for both the Banks

Gate Operation Panel

Operation Screen to Raise, Lower or Stop Gates



Alarm Annunciation Panel



Gate Position Analyzing Panel



System Highlights

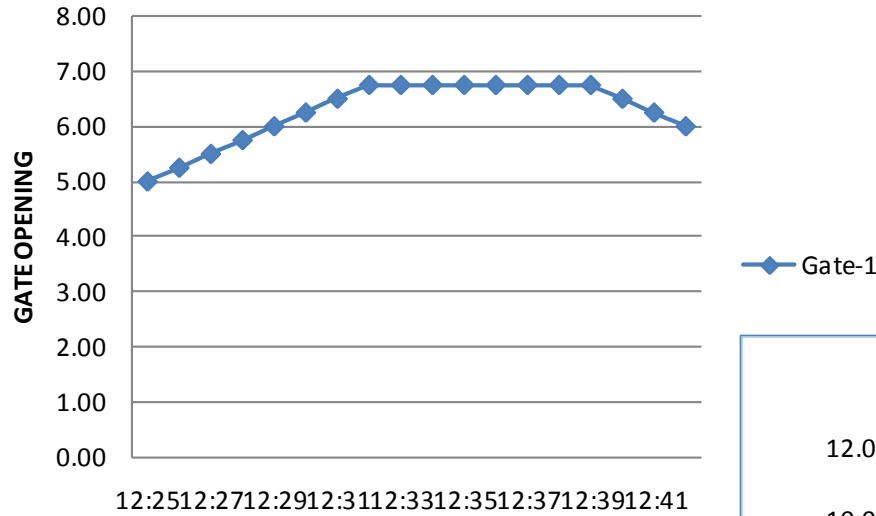
Automatic Dam Control System

- New and efficient complex control method based on the integration of **classical proportional-derivative controller and artificial intelligence controller for real-time operation of spillway gates of a reservoir.**
- Artificial intelligence based automatic system to maintain the water level in dam reservoir by opening and closing the gates of the dam by itself.
- A dynamic algorithm for water inflow and level estimation based on remote measurements (suitable for any dam.) to give advance warning for floods
- The optimal dam operation scheme which minimizes environmental and ecological impacts caused by water level fluctuations with adequate dam safety requirements
- Self diagnostic –automatic fault detection system



Gate Opening Trend Graphs

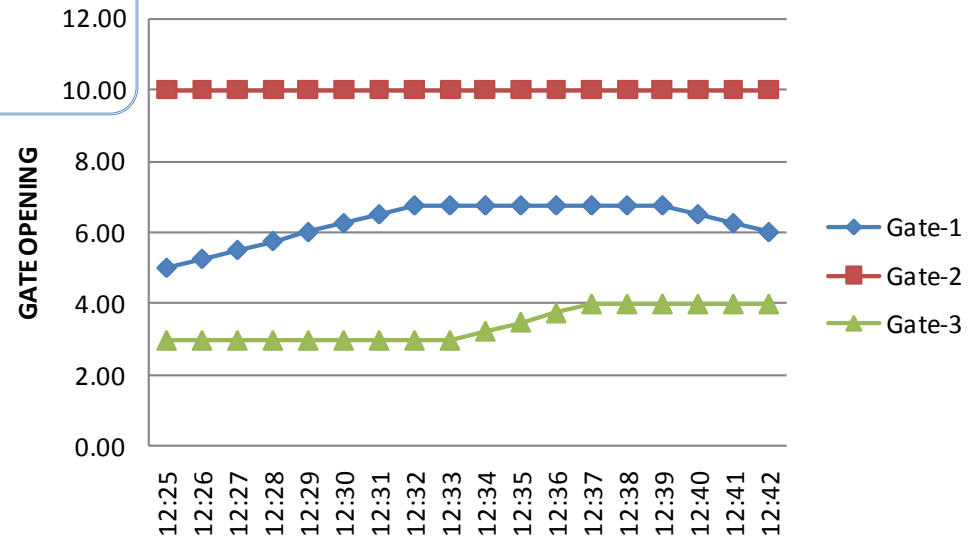
Gate-1



Gate Opening with respect to time

Multiple Gate Openings with respect to time

MULTIPLE GATE TRENDS

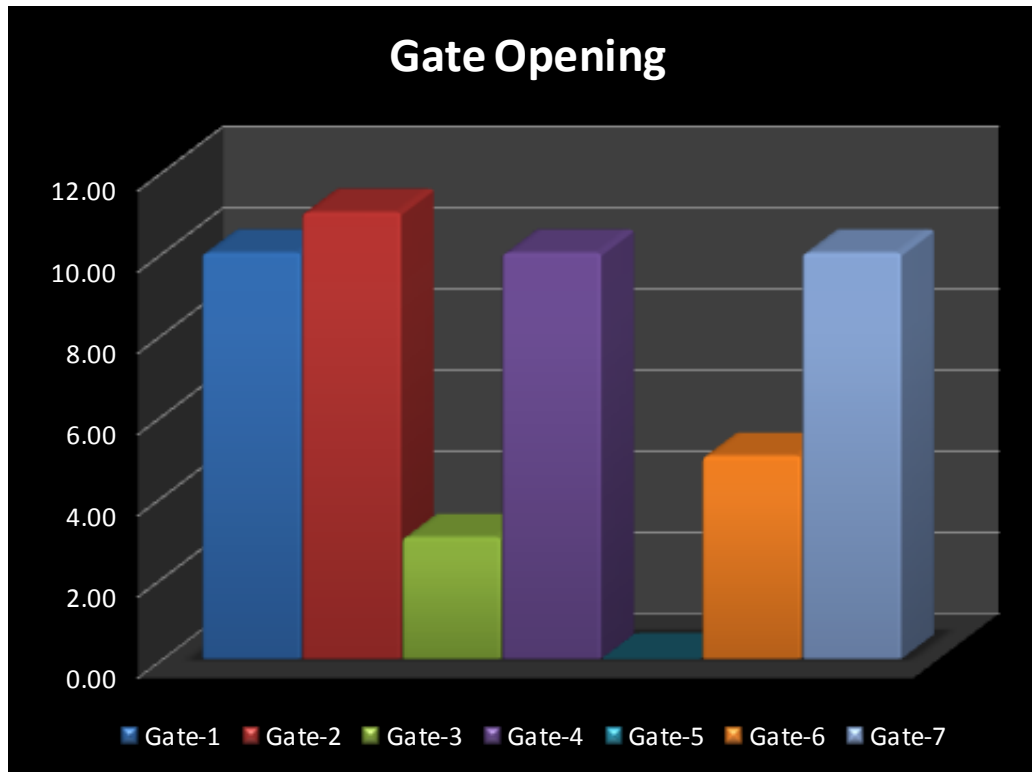


Database Management



- **Data logging for -**
 - Gate Position of all Gates
 - Water level
 - Alarms
- **Data is logged every second, minutes, hours as per requirement**
- **Data is logged in-**
 - Microsoft Excel
 - Microsoft Access
 - Microsoft Word
- **Graphs and Tables can be created according requirement**
- **Alarms are recorded with time**
- **All Gate Open-Close Events are recorded with time**

GATE VISUALISATION PANEL



Gate-1	Gate-2	Gate-3	Gate-4	Gate-5	Gate-6	Gate-7
10.00	11.00	3.00	10.00	0.00	5.00	10.00

Alarms



- **Alarms and Annunciations for**
 - Gate Full Open
 - Gate Full Close
 - Gate Stuck
 - Gate Faulty
 - Sensor fail
 - Customizable Alarm
 - Customizable Event Indications



Data- Logging

Date	Time	Gate-1	Gate-2	Gate-3	Gate-4	Gate-5	Gate-6	Gate-7
5/7/2009	12:25	12.50	11.00	3.00	10.00	0.00	5.00	10.00
5/7/2009	12:26	12.50	11.00	3.00	10.25	0.00	5.00	10.00
5/7/2009	12:27	12.50	11.00	3.00	10.50	0.00	5.00	10.00
5/7/2009	12:28	12.50	11.00	3.00	10.75	0.00	5.00	10.00
5/7/2009	12:29	12.50	11.00	3.00	11.00	0.00	5.00	10.00
5/7/2009	12:30	12.50	11.00	3.00	11.00	0.00	5.00	10.00
5/7/2009	12:31	12.50	11.00	3.00	11.00	0.00	5.00	10.00
5/7/2009	12:32	12.50	11.00	3.00	11.00	0.00	5.00	10.00
5/7/2009	12:33	12.50	11.00	3.00	11.00	0.00	5.00	10.00
5/7/2009	12:34	12.50	11.00	3.25	11.00	0.00	5.00	10.00
5/7/2009	12:35	12.50	11.00	3.50	11.00	0.00	5.00	10.00
5/7/2009	12:36	12.50	11.00	3.75	11.00	0.00	5.00	10.00
5/7/2009	12:37	12.50	11.00	4.00	11.00	0.00	5.00	10.00
5/7/2009	12:38	12.50	11.00	4.00	11.00	0.00	5.00	10.00
5/7/2009	12:39	12.50	11.00	4.00	11.00	0.00	5.00	10.00
5/7/2009	12:40	12.50	11.00	4.00	11.00	0.00	5.00	10.00
5/7/2009	12:41	12.50	11.00	4.00	11.00	0.00	5.00	10.00
5/7/2009	12:42	12.50	11.00	4.00	11.00	0.00	5.00	10.00

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Comparison

Traditional Method

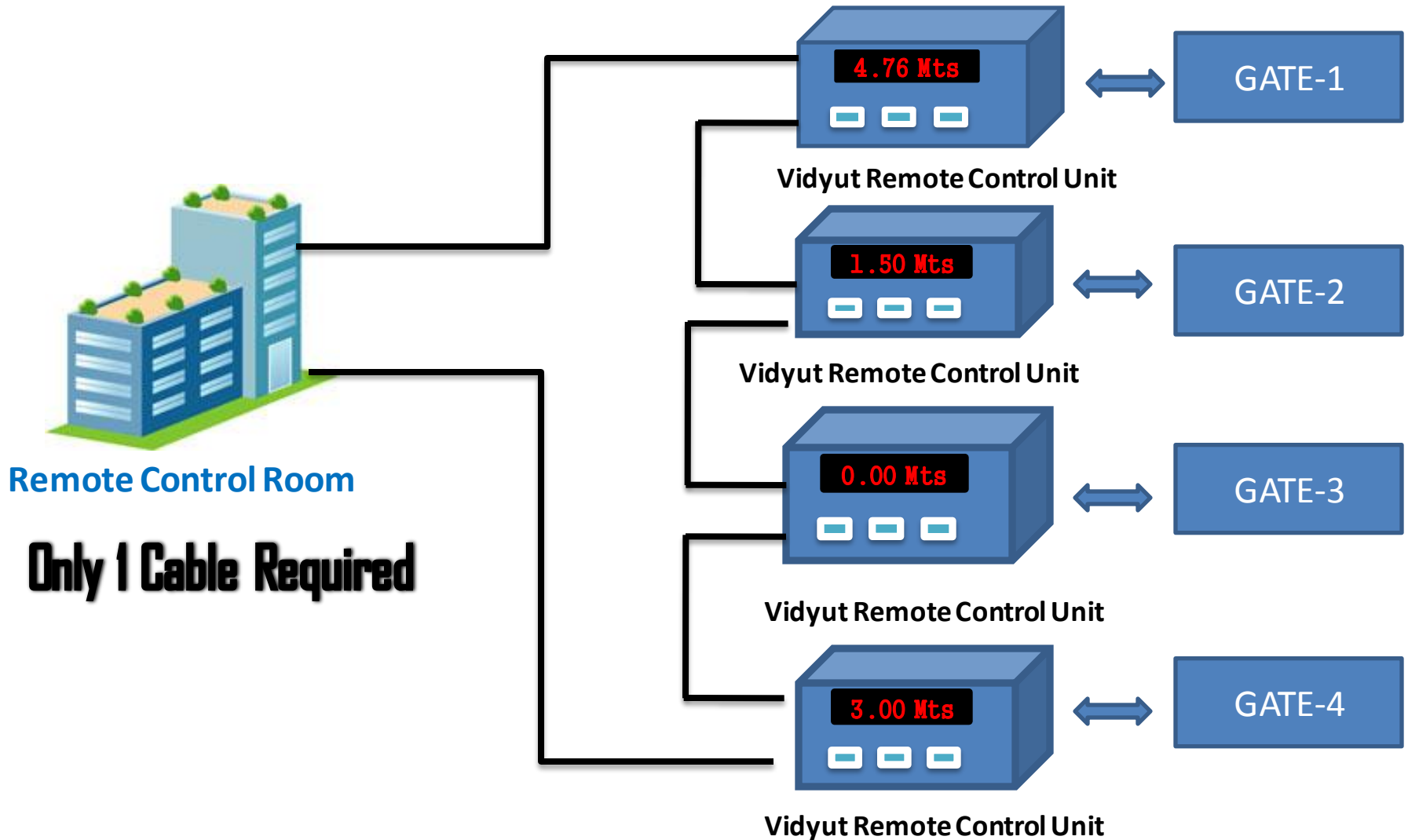
- No of cables required= $3 \times$ number of Gates $\times 4$ core
- More costly
- Maintenance is difficult
- Low Reliability
- Difficult operations
- Gate Position indicator is required
- Limit switches are required.

Vidyut- Cable Saver

- 1 cable of 2 core required
(saves 90 percent cable costs)
- Less Costly
- Maintenance is easy
- As number of cables is less ,reliability is high
- Easy operations
- Inbuilt Gate Position indicator
- Inbuilt limit switches ,so need to buy them



Vidyut Cable-Saver Method



About us - VIDYUT INDUSTRIES

More than 30 years of service in field of Automation Remote Indication and Controls, we provide total automation solutions like Design, Development , Manufacturing, Installations and Maintenance of the Equipment delivering the Turn Key Solutions.

Managed by Engineers having more than 40 years of experience blended with young innovative execution team to attain to the customer's need.

We are well-positioned to provide leading edge solutions for Reservoir Water Level Measurements, Dam Automation & Specialized Automation – Control Equipments with Remote Data Transmission with Remote control.

Major Projects Executed

Some of the major projects where we have supplied our Control equipments are as under:

- (1.) 14 Gates of Mahanadhi Project, Raipur, M.P.
- (2.) 24 Gates of Behar Project, M.P.E.B(M.P)
- (3.) 21 Gates of Bargi Reservoir Project, via.Jabalpur, M.P.
- (4.) 8 Gates of Dev Project, via Halol, Gujrat
- (5.) 13 Gates of Somsil Project, A.P.
- (6.) 13 Gates of Som-Kamla Project, Rajasthan.
- (7.) 13 Gates of Tawa Reservoir Project, Via.Itarsi, M.P
- (8.) 18 Gates of Bisalpur Irrigation Project, Rajasthan.
- (9.) 87 Gates for Sardar Sarovar, Narmada Main Canal from 13 Km to 263 Km.
- (10.) 28 Gates of Tanakpur Barrage, NHPC, U.P.
- (11.) 7 Gates for Owen Falls, Project, Uganda.
- (12.) 9 gates of Kaka Saheb Gadgil Project, Mandisor, M.P
- (13.) 10 Gates of Madikheda project, MP

Major Projects Executed

Some of the major projects Where Our Water Level Indicating Equipment are Supplied are as under:

(1) Purulia Pump Storage Project, West Bengal : Year 2007.

Measurement of Water Level of Upper Dam and Lower Dam and transferring through Fiber Optic Cable to Switch Yard Control Room at distance of 9 KM and connecting to Turbine Control PLC.

(2) Tehri Hydro Development Corporation , Tehri , Uttranchal.

120 meter Measurement of Water Level for the Reservoir and Displaying in Remote Control Room with RS232 output along with Datalogger with hard copy on Paper.

(3) Kurichu Hydro Electric Project, Bhutan. Year 1998 – 2000.

Measurement of Water level for Dam Upstream, Tail Race Level and Displaying at Dam Control Room and transmission to Remote Display in Power House Control Room on 90 mm large display.

(4) Baspa HEP, Himachal Pradesh in the year 2000.

(5) ALLMITY Dam , Karnataka in the year 2002.

(6) Ranganadi Hydro Electric Project , Arunachal in year 1998.

Measurement for Water Level for the Diversion Dam and Displaying in Dam Control Room with output signal of 0 to 10 VDC.

(7) Bisingspur HEP, MPEB, Shedol in the year 1994.

(8) Tanakpur Hydro Electric Project : Year – 1991.

Service Back-up provided till 2006 and continued.

Measurement for Water Level and Displaying in Barrage Control Room complete with Remote control system for 22 nos. Barrage gates & 6 nos. Power Channel gates.

Certificates and Testimonials



VIDYUT
INDUSTRIES

FROM : KPAC(BRANC- OFFICE MONGAR)

PHONE NO. : 9754 744145

Jul. 23 2004 06:19AM P01



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KURICHHU HYDRO POWER CORPORATION LTD.
(A Royal Government of Bhutan Undertaking)
OFFICE OF THE CHIEF ENGINEER

//Os: Gyelpozhing
Mongar, Bhutan
Tel: 04-744208/744161
Fax: 04-744130/744145
Email: khpc@dnuknef.bt

KHPC/O&M/PH-EM/F...../2004/ 410

Date: 19/07/04

TO WHOM IT MAY CONCERN

This is to certify M/s. Vidyut Industries, Mumbai-Ahemdabad, have manufactured and supplied Digital Water Level Indicator and remote reservoir water level Indicator for Kurichhu Power House. The Digital level Indicator supplied and Installed for main reservoir since 2001 and for tailrace water level remote indicator for powerhouse are working satisfactorily.

~~_____~~
CHIEF ENGINEER

Chief Engineer
Kurichhu Hydro Power Corporation
Gyelpozhing : Bhutan

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Certificates and Testimonials



VIDYUT
INDUSTRIES

MITSUI & CO., LTD. Purulia Power Office

PROJECT OFFICE: THE METROPOLITAN CENTRE, HOTEL NIKKO, BANGLA SAHIB ROAD, NEW DELHI 110001
PROJECT SITE OFFICE: A-1 MODULE, D-QUADRANT, 2ND FL. CYBER TOWERS, HITEC CITY, MADHAPUR, HYDERABAD 500081

24/12/2007

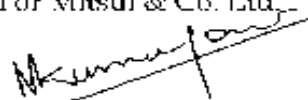
To whom so ever it may concern

This is to certified that M/s. Vidyut Industries has carried out Supply, Erection, Testing & Commissioning work of Remote Indication of Water Level for Upper Dam & Lower Dam for our 2 * 225 Mw Purulia Pumped Storage Project thru Mitsui & Co. Ltd. For West Bengal State Electricity Distribution Company Limited, Purulia West Bengal in the year 2006-07.

The total works executed value is Rs. 2,697,549.00.

The system is working satisfactorily since its commissioning.

For Mitsui & Co. Ltd.


Sanjay Kumar
Asstt. Project Manager

VIDYUT INDUSTRIES, Ahmedabad
email : vidyut_gate@yahoo.com
Mob: +91-9898149917 , +91-9996736087

Certificates and Testimonials

TO WHOM SO EVER CONCERN

This is to certify that Remote Control Panel and Digital Gate Position Indicators, supplied and installed for 21 Nos. Radial Gates of Bargi Dam in the year 1989 by M/s. VIDYUT INDUSTRIES, MUMBAI, is working satisfactorily. The equipments are serviced and repaired regularly as and when required by the Department.



TRUE COPY

S.S. Shah
(SMT. S. J. SHAH)
A. O. & D.D.O.
CIT, GANDHINAGAR,
AHMEDABAD.

M.K. Veshwara
07/10/04
Executive Engineer,
E&I Division No. 2
Bargi Nagar.