

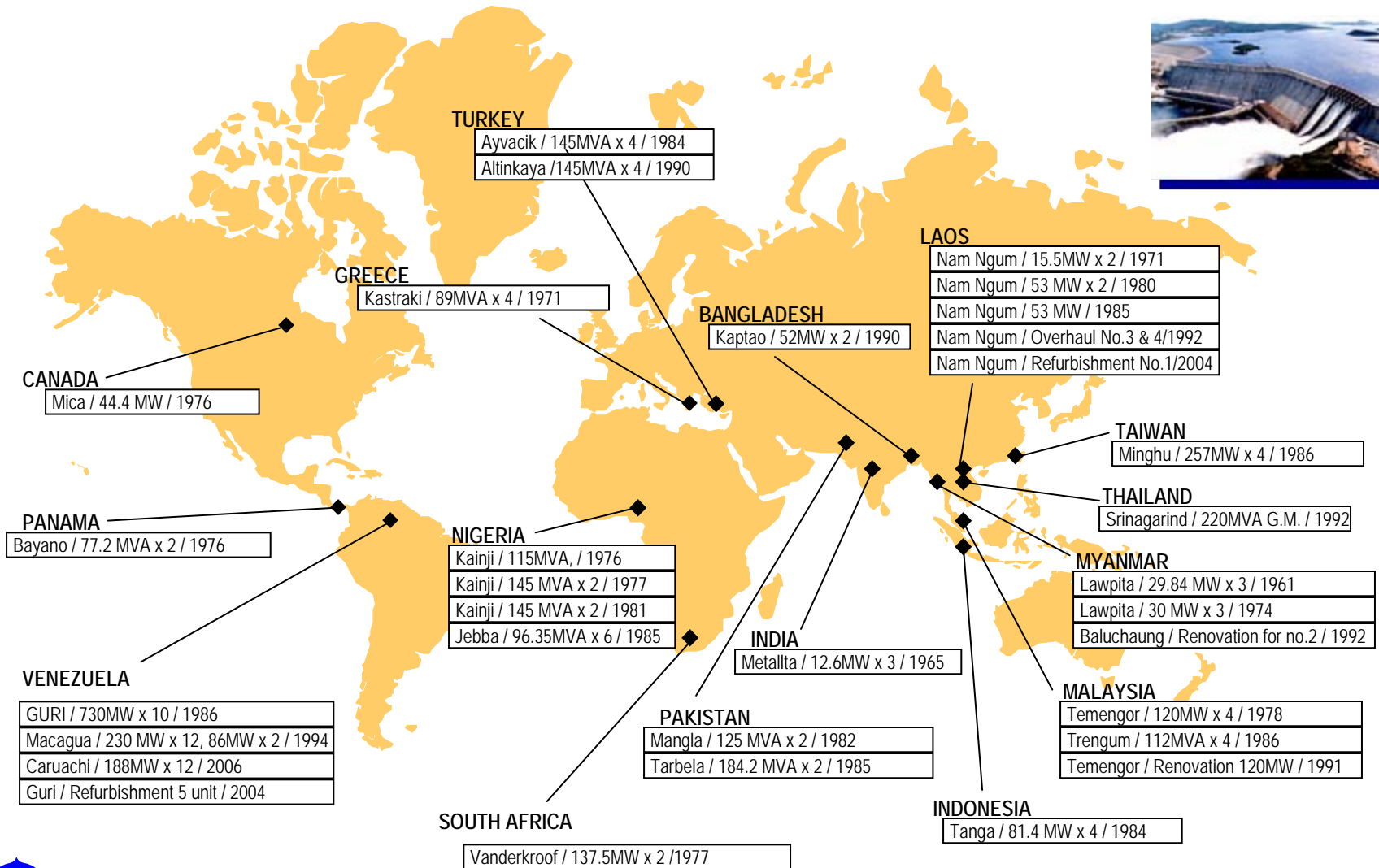
# HPT's Activity in Hydropower Plant Projects



**Hitachi Plant  
Technologies, Ltd**

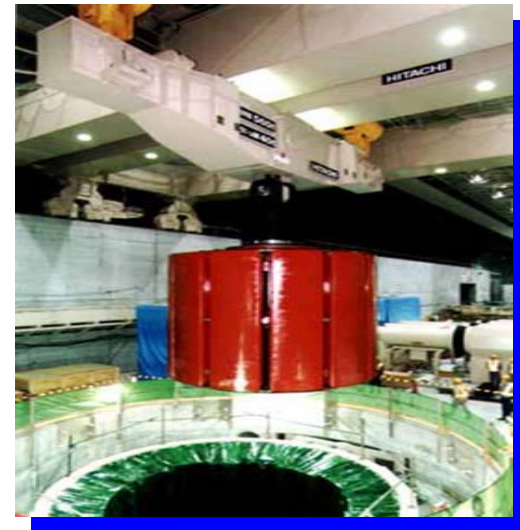
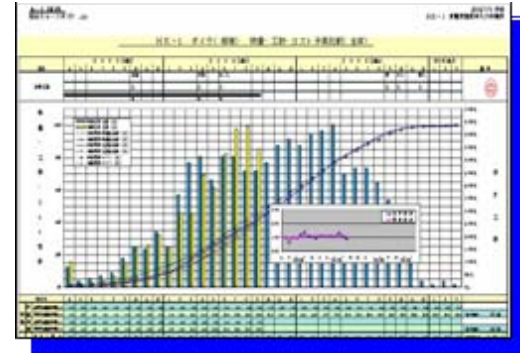
**Oct 2008**

# Project Experience - Hydropower



# Scope of Work

- ◆ **Construction Management**
- ◆ **Detail Design for Construction**
- ◆ **Scheduling for Construction**
- ◆ **Supply of Materials**
- ◆ **Transportation (Ocean & Inland)**
- ◆ **Field Works**
  - **Mechanical Installation**
  - **Electrical Installation**
  - **Piping work**
  - **Insulation work etc**
- ◆ **Assistance for Commissioning**



# Business Area

- ◆ Installation of New Equipment
- ◆ Overhaul
- ◆ Renovation
- ◆ Replacement
- ◆ Maintenance



# Execution Record: GURI



- **1978 - 1986**
- **GURI HYDRO ELECTRIC POWER STATION STAGE II**
- **Owner : C.V.G. ELECTRIFICACION DEL CARONI C.A (EDELCA)**
- **Main Equipment Supplier: Hitachi Ltd.**
- **Installation of 10 units of 730 MW water turbine and 805 MVA AC generators including associated utility system.**
- **Supply and/or installation of auxiliary equipment which included 42 transformers, 9 overhead cranes, 38 vertical pumps, 10 sets of insulated phase bus ducts, 5 units of 765 KV SF-6 gas insulated bus duct, 6 elevators, 3 diesel engine generators, structure bridge for discharge canal, complete set of electrical panels, instrumentation, piping, cabling, illumination and painting work.**



# Execution Record: GURI



*GURI II Hydropower Station (Venezuela)*



Installation of 730MW WT-G for 10units



# Execution Record: Macagua



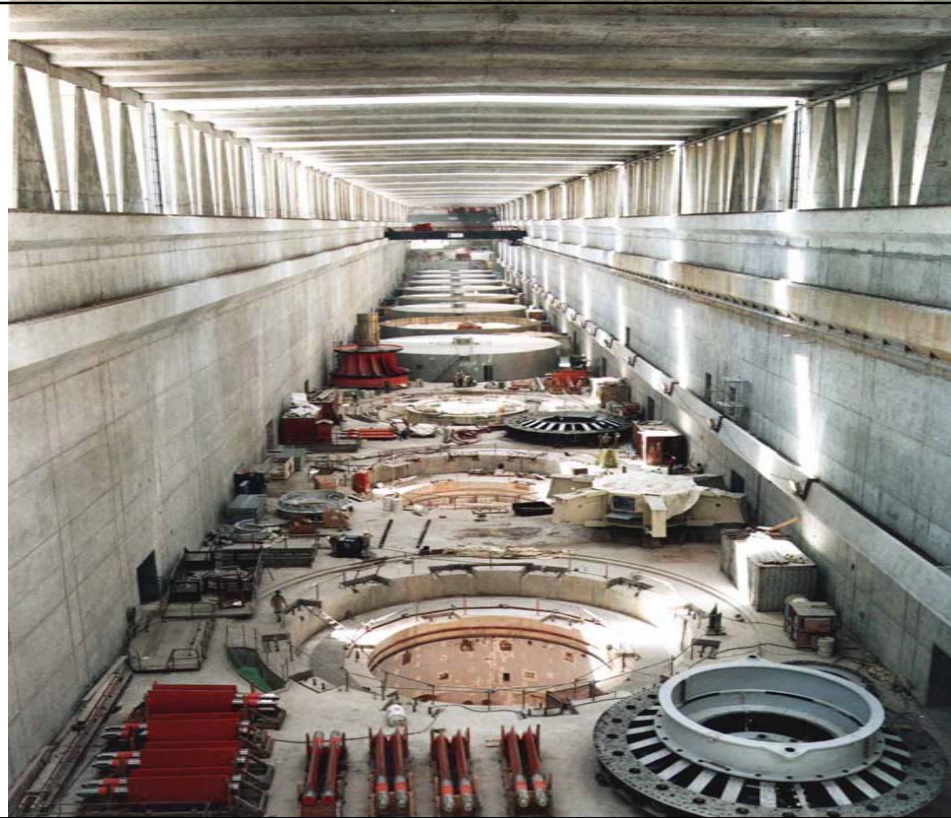
- **1988 - 1998**
- **MACAGUA II AND III HYDRO ELECTRIC POWER STATIONS**
- **Owner : C.V.G. ELECTRIFICACION DEL CARONI C.A (EDELCA)**
- **Main Equipment Supplier: Hitachi Ltd., Toshiba, Mitsubishi.**
- **MACAGUA II: Installation of 12 units of 216 MW FRANCIS type water turbines and 250 MVA generators.**
- **MACAGUA III: Installation of 2 units of 86 MW KAPLAN type turbine and 102 MVA generators.**



# Execution Record: Macagua



## ***MACAGUA II Hydropower Station (Venezuela)***



Installation of 216MW WT-G for 12units



# Execution Record: Macagua



## *MACAGUA II Hydropower Station (Venezuela)*



Unloading and Transportation  
of 216MW Water Turbine

# Execution Record: Macagua



## MACAGUA III Hydropower Station (Venezuela)



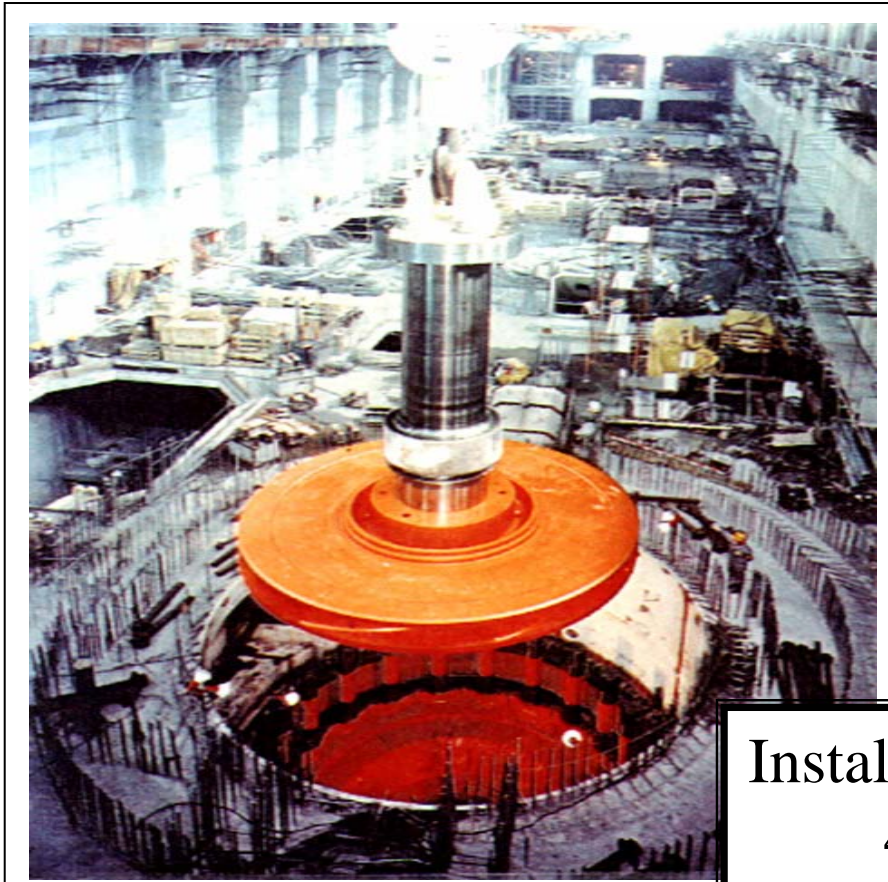
Installation of 86MW Kaplan Turbine for 2units



# Execution Record: OKUKIYOTSU



## OKUKIYOTSU Hydropower Station (Japan)

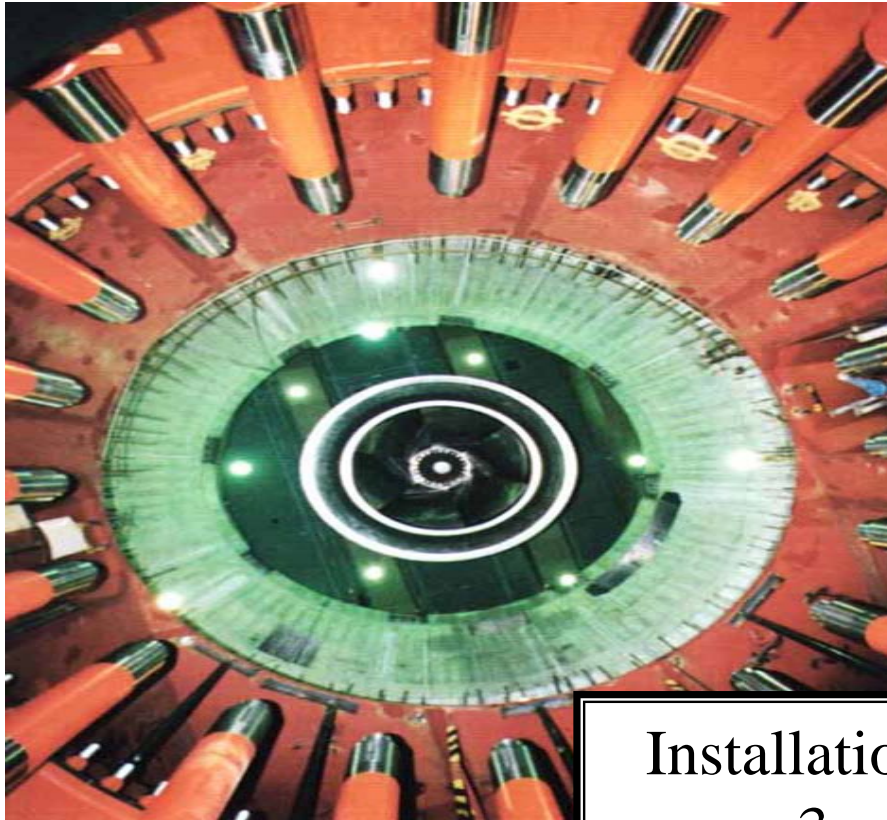


Installation of 260MW WT-G for  
4units (Pump-Turbine)



# Execution Record: SHIOBARA

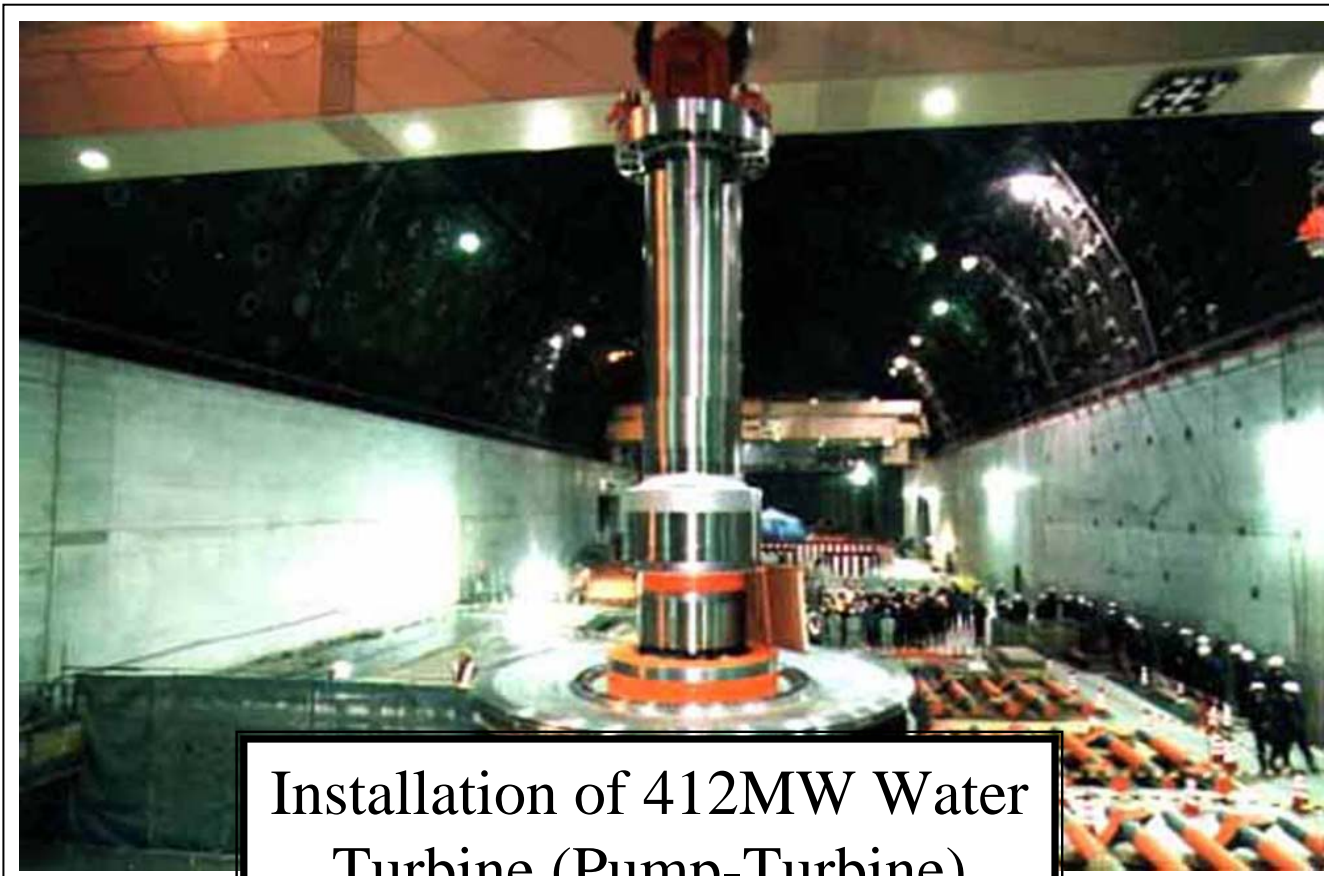
## ● SHIOBARA Hydropower Station (Japan)



Installation of 308MW WT-G for  
3units(Pump-Turbine)

# Execution Record: KAZUNOGAWA

## ● KAZUNOGAWA Hydropower Station (Japan)



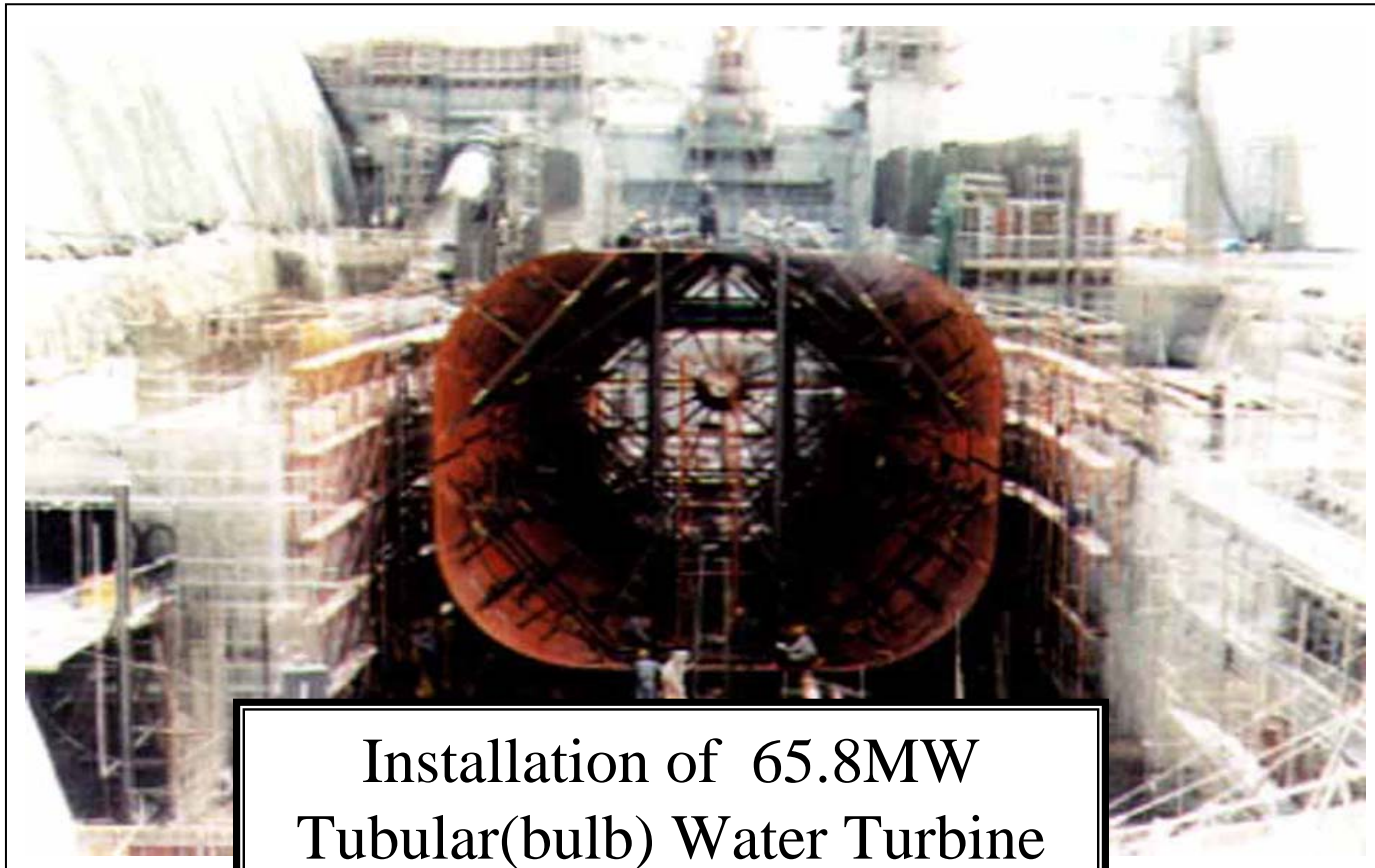
Installation of 412MW Water  
Turbine (Pump-Turbine)



# Execution Record: TADAMI



## TADAMI Hydropower Station (Japan)



Installation of 65.8MW  
Tubular(bulb) Water Turbine

# Execution Record: OKUMINO



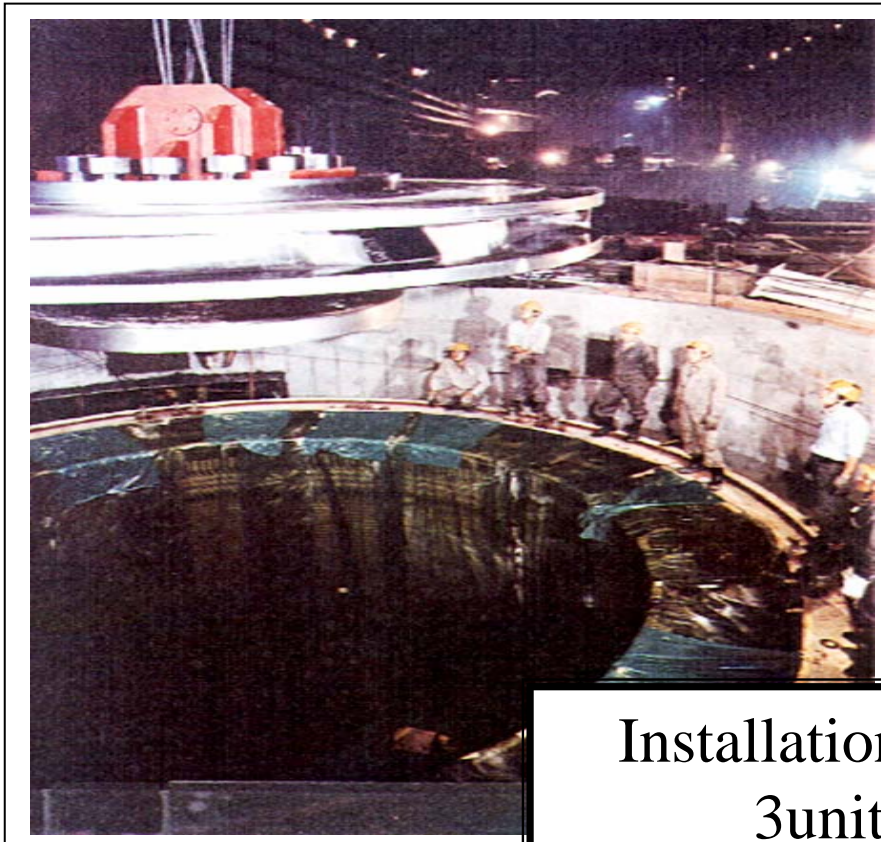
## OKUMINO Hydropower Station (Japan)



Installation of 266MVA ACG for  
2units(Rotor)

# Execution Record: OKUTAHAGI

## ● OKUTAHAGI Hydropower Station (Japan)

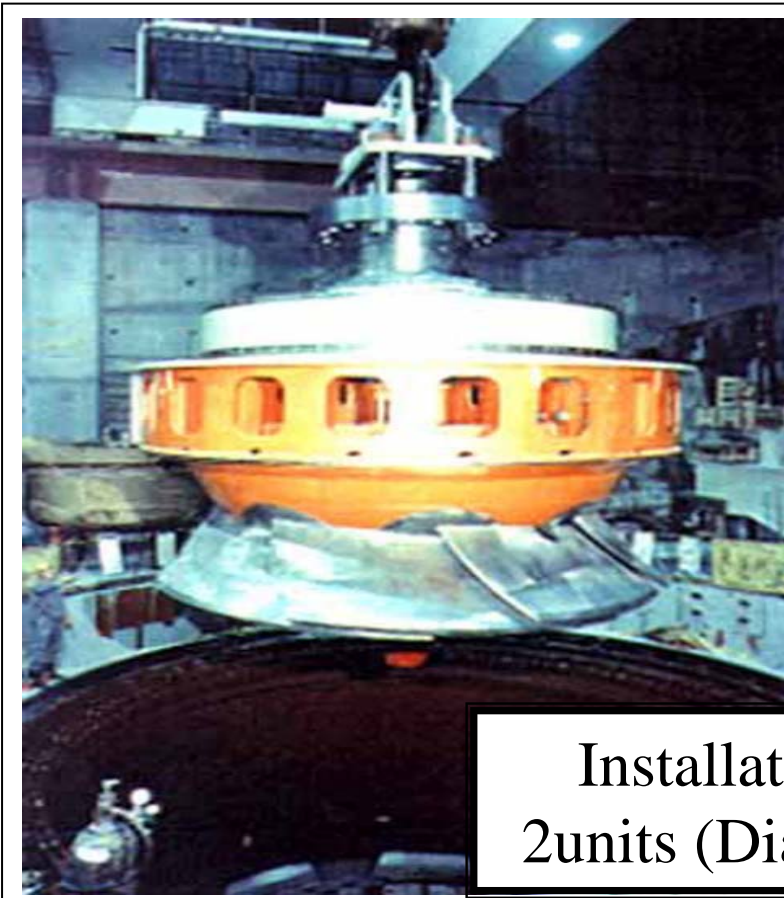


Installation of 268MW WT-G for  
3units (Pump-Turbine)

# Execution Record: MASEGAWA



## MASEGAWA Hydropower Station (Japan)



Installation of 149MW WT-G for  
2units (Diagonal flow-Pump Turbine)



# Execution Record: JEBBA



## JEBBA Hydropower Station (Nigeria)



Installation of 96.4MW WT-G  
for 6units



# Execution Records: Nam Ngum Hydro in Lao



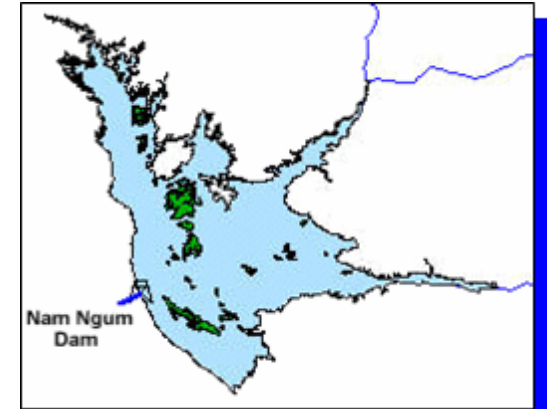
1. **Installation of 15.5MW WT/ 17.5MVA ACG 2 units: completed in 1971**
2. **Installation of 53MW 2 units: completed in 1980**
3. **Installation of 53MW / 50MVA WT/ ACG:completed in 1985**
4. **Overhaul work of No. 3 unit: completed in 1991**
5. **Overhaul work for No.4 unit: completed in 1992**
6. **Refurbishment for No.1 unit: completed in 2004 (see next page)**



# Execution Record: Nam Ngum (Laos) No.1



- 2003-2004
- LAOS NAM NGUM Unit No.1 Refurbishment
- Owner : Electric de Laos
- Supplier: Hitachi Ltd
- Rehabilitation work for 1 unit of hydroelectric power plant

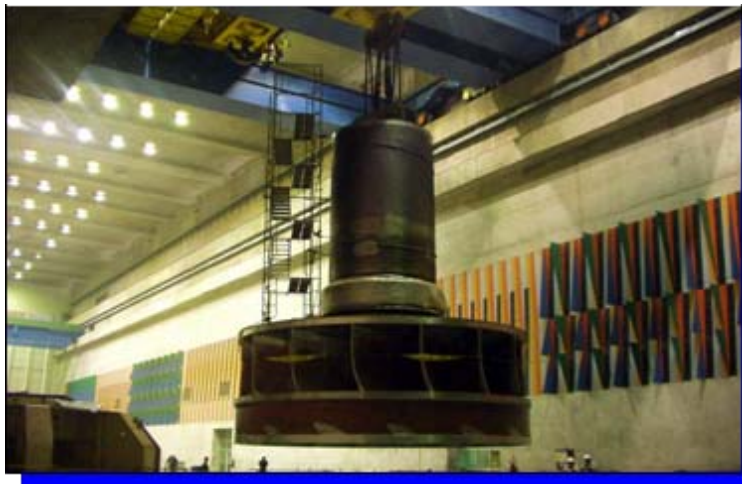


# Execution Record: Guri II Hydro Power 5units (1)



- ◆ **Construction period: 2002 - 2005**
- ◆ **Project name: GURI HYDRO ELECTRIC POWER STATION  
STAGE II – 5 units**
- ◆ **Owner : C.V.G. ELECTRIFICACION DEL CARONI C.A  
(EDELCA)**
- ◆ **Purchaser: GE Hydro (NORCAN)**
- ◆ **HPC & VHPC's scope**
  - **Disassembly, Refurbishment and Reassembly work**

# Execution Record: Guri II Hydro Power 5units (2)



# Execution Record: Caruachi Hydro Power (1)



- ◆ **Construction period: 2000 - 2006**
- ◆ **Project Name: CARUACHI HYDRO ELECTRIC POWER STATION  
281MW x 12 units**
- ◆ **Owner : C.V.G. ELECTRIFICACION DEL CARONI C.A (EDELCA)**
- ◆ **Purchaser: GE Hydro (KENSA)**
- ◆ **HPC & VHPC Scope**
  - **Installation and Testing of KAPLAN Type Water Turbines and Generators.**
  - **Installation and Testing of the excitation systems, Transformers (7 Units) and Power House Bridge Cranes (3 Units)**





# Execution Record: Caruachi Hydro Power (2)



# Guri II Hydro Power: No.15 Generator

- **Construction period: 2006 - 2007**
- **Project name: GURI HYDRO ELECTRIC POWER STATION STAGE II – Rehabilitation work of No.15 generator**
- **Owner : C.V.G. ELECTRIFICACION DEL CARONI C.A (EDELCA)**
- **Purchaser: ALSTOM Hydro Venezuela S.A.**
- **VHPC's scope**
  - **Rehabilitation site work**

# Guri Hydro Power: Overhead Crane

- **Construction period: 2006 - 2009**
- **Project name: GURI No.2 HYDRO ELECTRIC POWER STATION–  
Renovation of overhead crane**
- **Owner : C.V.G. ELECTRIFICACION DEL CARONI C.A (EDELCA)**
- **Client: ALSTOM Hydro Venezuela S.A.**
- **VHPC's scope**
  - Renovation of site work

**Under Construction**



# Guri Hydro No.1 Power 4units Rehabilitation

- **Construction period: 2007 - 2010**
- **Project name: GURI HYDRO ELECTRIC No.1 POWER STATION  
Unit #7- #10 (4units) Renovation project**
- **Owner : C.V.G. ELECTRIFICACION DEL CARONI C.A (EDELCA)**
- **Client: ALSTOM Hydro Venezuela S.A.**
- **HPT & VHPC's scope**
  - Site field work
  - Material supply

**Under Construction**

# Guri No.1 &2 Control system Renovation

- **Construction period: 2008 - 2010**
- **Project name: GURI HYDRO ELECTRIC No.1 &2 POWER STATION, Control system renovation**
- **Owner : ELECTRIFICACION DEL CARONI C.A (EDELCA)**
- **Client: Asea Brown Boveri (ABB) Venezuela S.A.**
- **HPT & VHPC's scope**
  - Site field work

**Under Construction**



# Tocoma Hydropower project

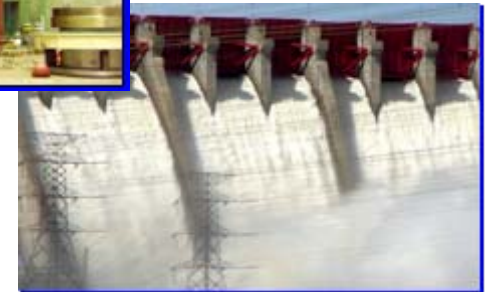
- **Construction period: 2008 - 2014**
- **Project name: Tocoma Hydropower project (216MW x 10 units)**
- **Owner : ELECTRIFICACION DEL CARONI C.A (EDELCA)**
- **Client: IMPSA**
- **HPT& VHPC's scope**
  - Site field work
  - Material supply
  - Warehouse, temporary facility



**Under Construction**

# Guri II Hydro Power: 5 units Second stage

- Construction period: 2008 - 2012
- Project name: GURI No.2 HYDRO ELECTRIC POWER STATION STAGE II – 5 units
- Owner : ELECTRIFICACION DEL CARONI C.A (EDELCA)
- Client: Consorcio EURO-BRAS Guri (VA tech & Voith-siemens)
- HPT & VHPC's scope
  - Disassembly, Refurbishment and Reassembly work



**Under Construction**

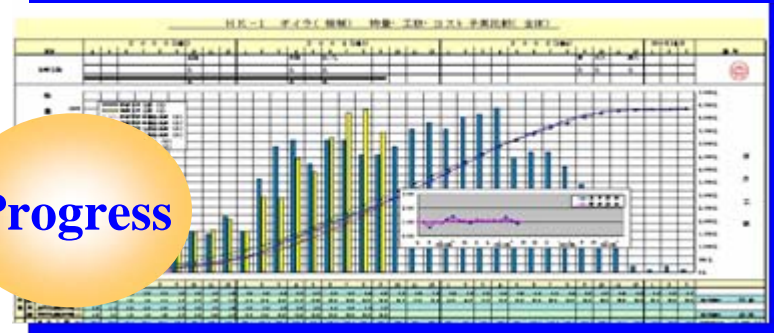
# Project Management System

## Material Control Sys.

管理コード	名称	材料コード	工場材料コード
01	電気管	1-10	
02	電気管		
03	電気管		
04	電気管		
05	電気管		

Material

## Progress Management Sys.



Progress

System

Documents

## Document Control Sys.

The form contains various fields for document control, including:

- 管理元会社: 日立プラント建設(株)
- 請負会社1: 日立プラント建設(株)
- 請負会社2: 日立プラント建設(株)
- 部門コード: 電気(ボイラ)
- 職種コード: 電気
- 資格年数: 3年
- 住所: 東京都中央区
- 入用日: 1997/10/15
- 退用日: 2000/04/15
- 退用事由: 業務完了

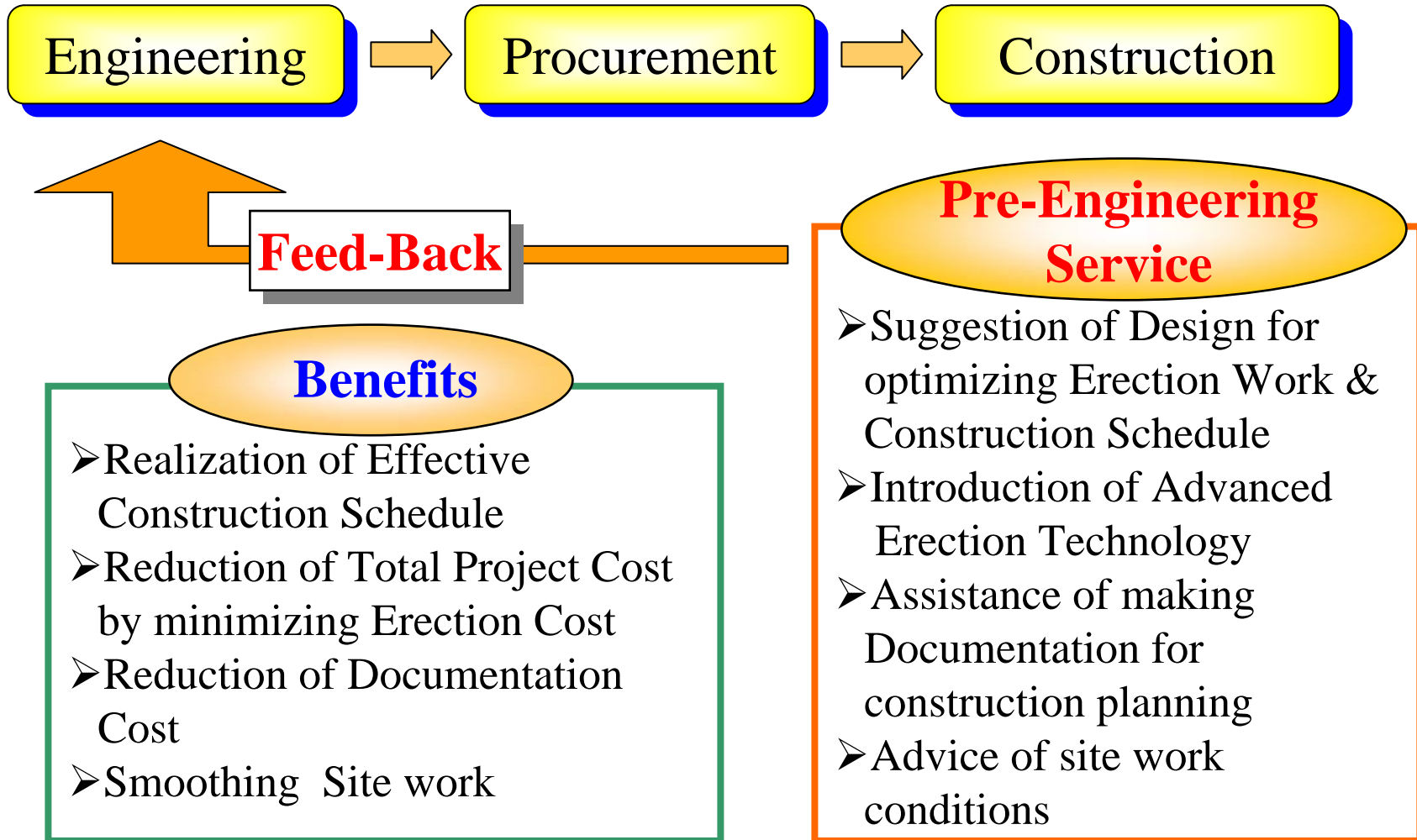
## Human Resource Management Sys.

Schedule



## Constructing Management Sys. (Primavera / MS Project)

# Pre-Engineering : Benefits to Customers





# Our Advantages: Benefits to Customer

## Cost

## Our Advantages

## Benefits to Customer

- ◆ Wide Range of Work Scope
- ◆ Accumulated Project Knowledge & Experience
- ◆ Advanced Construction Technology
- ◆ Global Networks
- ◆ Skillful Human Recourses
- ◆ Pre-engineering Service

**Minimum  
Cost**

## Schedule

- ◆ Advanced Project Management
- ◆ Systematic Schedule Management
- ◆ Interface management with Other Parties

**On Time**

## Reliability

- ◆ Long-term Experience
- ◆ Sound financial background
- ◆ QA/QC, Safety Policy

**Total Satisfaction**



# Conclusion

- ◆ **We can make projects very successful !**
- ◆ **We can provide variety kinds of benefits to Clients!!**
- ◆ **We can provide continuous services for future projects in other countries !!!**

