ENERGOCENTROMONTAZH INTERNATIONAL Ltd. (ECM Inter)
HYDRO
ECM Group overview

Steam, GT & combined cycle power plants
Design, consulting, supply of equipment, supervision, testing, erection, installation, commissioning, training. EPC and EPCM contracting.

Substations and transmission lines
Design, consulting, supply of equipment, supervision, testing, erection, installation, commissioning, training. EPC and EPCM contracting up to 500 kV range.

Hydropower Plants
Design, consulting, supply of equipment, supervision, testing, erection, installation, commissioning, training. EPC and EPCM contracting. Major equipment design.

Erection & Commissioning
Design, supervision commissioning, testing and commissioning of hydro, nuclear power plants, transport networks and power substations.
Core Activities

ECM Inter is a Russian leading company that, relying on its own resources, performs any work related to design, engineering, construction, installation and commissioning during the construction of power facilities:

- Owner Engineer, EPC or EPCM Contractor;
- Designing of hydro, thermal, gas turbine power plants, heating networks and boiler houses, renewable energy sources (solar, wind, etc.);
- Procurement of equipment;
- Construction, installation, expansion, reconstruction, re-equipping, all kinds of repairs and adjustment of energy facilities and equipment;
- Surveying, engineering, servicing, erection, installation and commissioning works for rehabilitation, construction and operation of power facilities;
- Operation and maintenance of power plants of different type and capacity;
- Transportation of heavy cargo, handling operations, passenger transportation.
The high competence of our specialists and experts who, having decades of experience in hydropower plants engineering, allows us to solve, at a high quality level, a wide range of problems in the field of construction and operation of hydropower projects in difficult natural environments and climatic conditions.
About us

Up-to-date equipment

ECM Inter performs all types of work and services relating to the construction and rebuilding of hydropower plants. We have designed and manufactured our product range in order to suit our customers’ needs, while believing that price, technology and quality are the main considerations.

From water to wire

A key task for ECM Inter is to develop hydropower investment projects overseas, mainly within the framework of bilateral agreements and government programmes. Backed by financial capabilities of Russian banks and our successful experience in providing services to finance power projects, currently we are one of few entities providing a full scope of services – from project financing to power plant commissioning.
Water to wire concept

ECM Inter’s Scope of Work

- River Lake
- Dam Intake Penstock
- Turbine Inlet Valve Governor
- Generator AVR
- Step-Up Transfo. Switchyard HV Line
- Power Grid - industrial - domestic
Site investigations and studies

- Scheme of hydro potential development
- Investment proposals
- Topographical studies
- Ecological studies
- Hydrology studies
- Geological and geomechanical studies
- Economical studies
- Construction safety
- Monitoring of structural behaviour
Design development & Project management

**Design development**
- Feasibility study
- Detailed Project Report
- Working Drawings
- As - built drawings
- Comprehensive technical support

**Project Management**
- Management
- Consulting services to the Client
- Site supervision
- Quality control system
Hydroturbines designing

- Designing of hydraulic turbines of 1-450 MW and valves for the range of heads from 5 to 500 m;
- Carrying out of model tests;
- Carrying out of production and erection supervision of hydropower equipment;
- Commissioning, putting into operation and after-sales servicing.
Hydrogenerators designing

- Design, manufacturing & erection supervision of hydro generators in the wide range of output and rotation speed, from hydro generators for small hydroelectric power station till large and unique with output 600 MW, synchronous and asynchronous electric motors;
- Commissioning, putting into operation and after-sales servicing.
Procurement

- Hydro Turbine / Generator
- Electrical balance of plant
- Instrumentation and control balance of plant
- Hydro mechanical balance of plant
- Complete Hydro electrical mechanical package
Training

- Services in the field of qualification, training and enrichment of plant personnel.
- We provide recognized solutions for all training requirements of our customers.
- Human resources development, in any level of qualification:
  - Management
  - Operator
  - Maintenance (E&M)
- Promote overlapping skills of plant O&M personnel
- Component training of
  - Power generation assets
  - Power transmission & distribution
- Know-how transfer while performing refurbishment
- Ongoing training during the commercial operation
After-sales services

- Spare parts
- Repowering
- Revamping
- Conventional maintenance
- Multiannual maintenance contracts
- Operation support
- Monitoring/Diagnostic
- Operation & Maintenance
ECM Inter

PROCUREMENT
Hydraulic turbines

- The range of products is developed around the 3 main types of turbines, Axial, Francis and Pelton and covers a head ranging from 2 up to 1,000 meters with a unit output up to 100 MW for Axial, up to 400 MW for Francis and 150 MW for Pelton.

- The range of products includes in addition to the turbine itself, all or part of the electromechanical equipment within the powerhouse such as generator, inlet valve, governor, controls, switchgear, transformer.

<table>
<thead>
<tr>
<th>Type</th>
<th>Head</th>
<th>Output</th>
</tr>
</thead>
<tbody>
<tr>
<td>Axial</td>
<td>H ≤ 35 m</td>
<td>P ≤ 100 MW</td>
</tr>
<tr>
<td>Francis</td>
<td>H ≤ 200 m</td>
<td>P ≤ 400 MW</td>
</tr>
<tr>
<td>Pelton</td>
<td>H ≤ 1,000 m</td>
<td>P ≤ 150 MW</td>
</tr>
</tbody>
</table>
Hydraulic turbines

- Runner up to 10 m diameter
- Wicket gate
- Runner chamber
- Turbine shaft, including fittings, sealings and bearings
- Servomotors
- Oil and water pipes, including leakage system
- Spiral case, draft tube cone and elbow
- Turbine stator
- Electronic governors
- Unit and power plant control and protection systems
Generators

- Synchronous hydrogenerators in an output range from 1 000 up to 12 000 kW – horizontal and vertical type;
- Synchronous hydrogenerators from 12 000 to 250 000 kW – vertical type
Generators
Excitation systems

- Static and brushless systems of synchronous motors excitation;
- Fast acting digital control systems for synchronous electric motors, synchronous condensers, turbo and hydrogenerators of power range from tens kWts up to hundreds MWts, protection, monitoring and diagnostic systems.
Electrical Equipment

- Automation, control, protection
- Energy counter
- AC & DC station supply
- LV switchgear
- Transformers
- MV switchgear
- Emergency diesel generator
- MV and LV cables
- Remote control
Some projects realized

At-Bashinskaya HPP

Naglu HPP

Svetlinskaya HPP

Tulomskaya HPP
Some projects realized (cont.)
THANK YOU