



 **S.T.E.** energy

**"General Contractor"**  
*Organizes and Coordinates  
International Engineering  
Works in the Energy and  
Plants Fields*

# OUR ACTIVITIES in the HYDRO FIELD

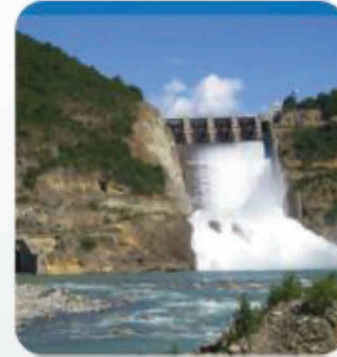
**General Contractor**

**EPC Contractor**

**Turnkey Solutions**

**Balance of plant (B.O.P.)**

- Development of hydroelectric sites
- Detailed Engineering
- Project management
- Erection
- Assembly
- Commissioning
- Operation & Maintenance
- After Sales Service Support



# OUR SUPPLY

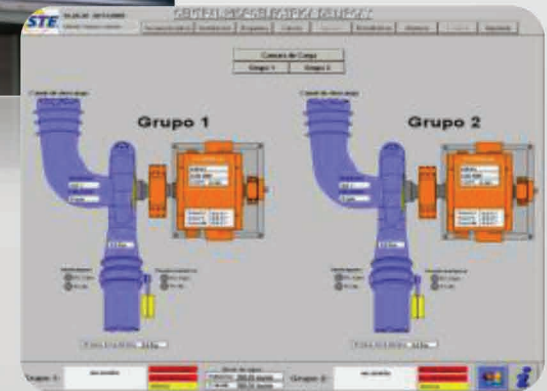
Turbines

Generators

Mechanical works (gates, valves etc.)

Electrical Balance of Plant (E.B.O.P.)

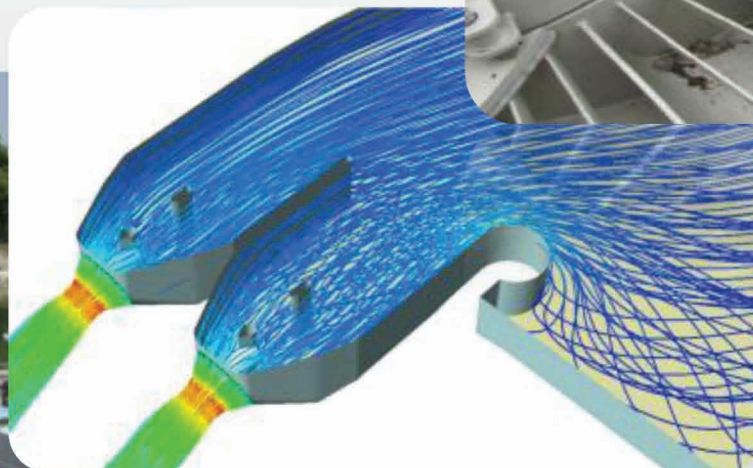
- HV Substation (GIS, hybrid and standard)
- HV, MV, LV Transformers
- MV, LV cubicles
- Protection system
- Supervision and control system
- SCADA System
- Remote control
- Diesel generator, Batteries and UPS
- Communication system
- Video surveillance



# INNOVATION & DEVELOPMENT <sup>(1/2)</sup>

## Mechanics

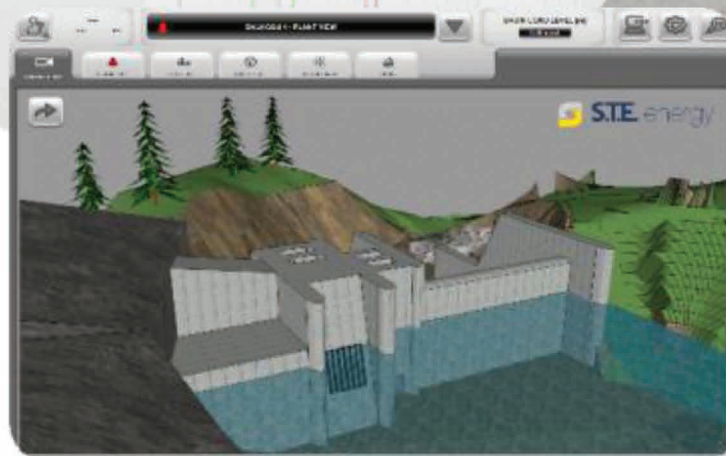
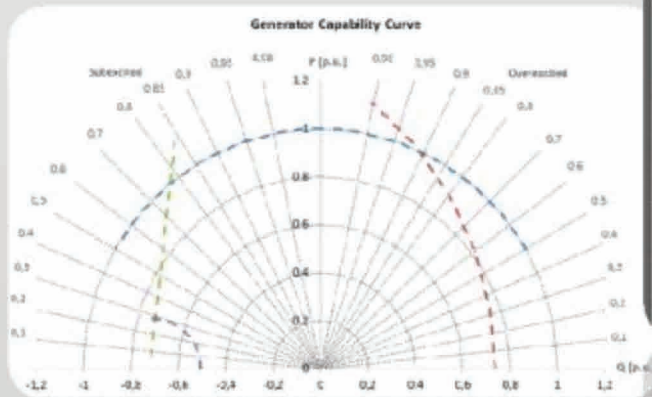
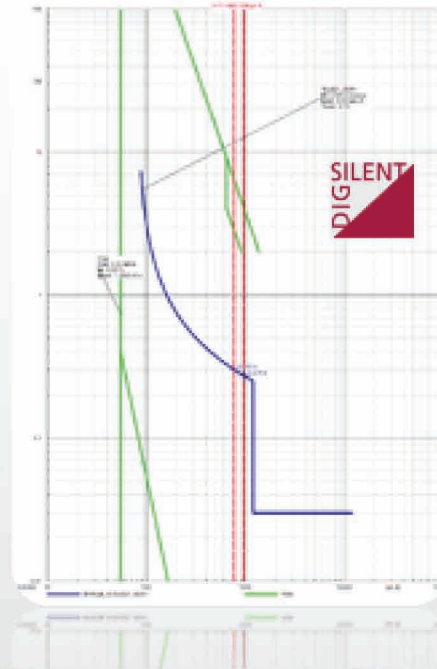
- VLH Turbine for very low heads
- Variable speed turbines
- Tests on new hydraulics models
- CFD simulation and fluid dynamics studies
- Low environmental impact plants



# INNOVATION & DEVELOPMENT (2/2)

## Electrics

- Permanent magnets generator
- Frequency convertor
- Hybrid compact high voltage substation
- "Smart grid" system
- RTU
- Power flow calculation
- Short-circuit current calculation
- Studies about protections coordination
- Studies about electrics dynamics
- Centralized SCADA system
- PLC programming



# CENTRALIZED REMOTE CONTROL SYSTEM (1/2)

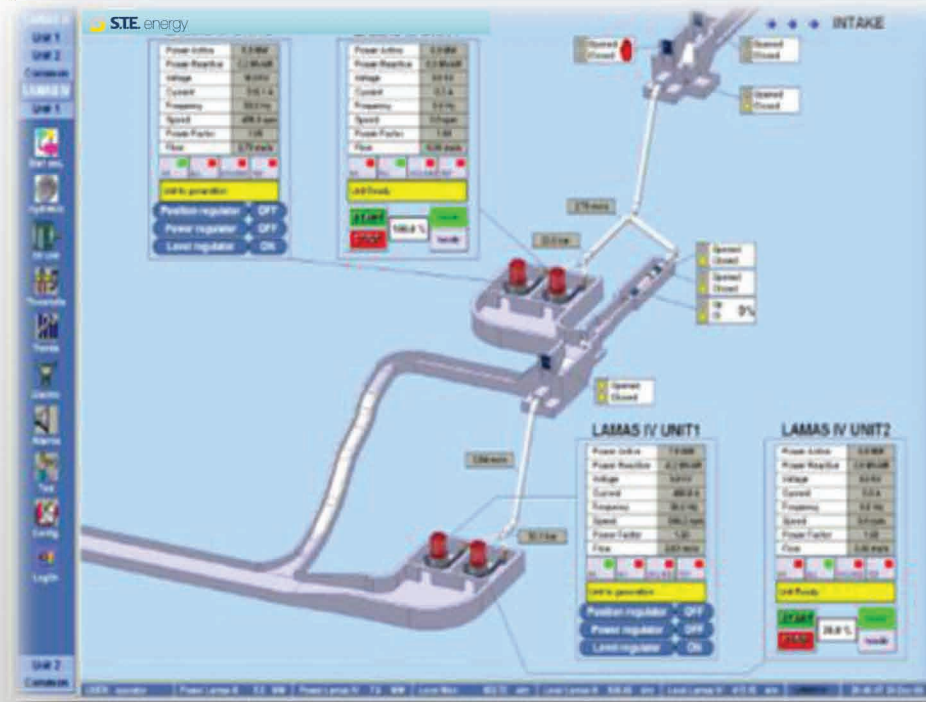
- In order to allow a Continuous and Centralized Control of the energy production, *STE Energy* developed a comprehensive Remote Control System based on SCADA (*Supervisory Control And Data Acquisition*) interfaces
- Through the centralized control room at *STE Energy* facilities in Padua (Italy) or other local control rooms, the *STE Energy* Remote Control System monitors on a 24/7 basis all the main operations parameters of several power plants and remotely supports its scheduled and unscheduled maintenance.



Main advantages of the STE Remote Control System are Optimization of Production Output and Reduction of “out of order” Time thanks to a timely alarming service

# CENTRALIZED REMOTE CONTROL SYSTEM (2/2)

## Example of a series of plants



- In case of a series of plants and substations, the main parameters of the plant and/or the substation (e.g. by-pass water flow, energy flow, interlocks etc.) can influence the performance and safety of the other plants/substations; therefore a proper monitoring of all plants and substations can help in defining compensation and recovery actions.
- The availability of a centralized control system maximizes the efficiency of all plants and substations allowing a coordinated management of the plants
- Verification of the correct plant operation, through comparison of performances of several plants connected at the same time

Each power unit is considered not only as an independent complex, but as part of an integrated system of energy generation

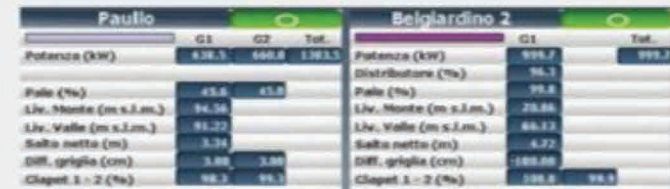
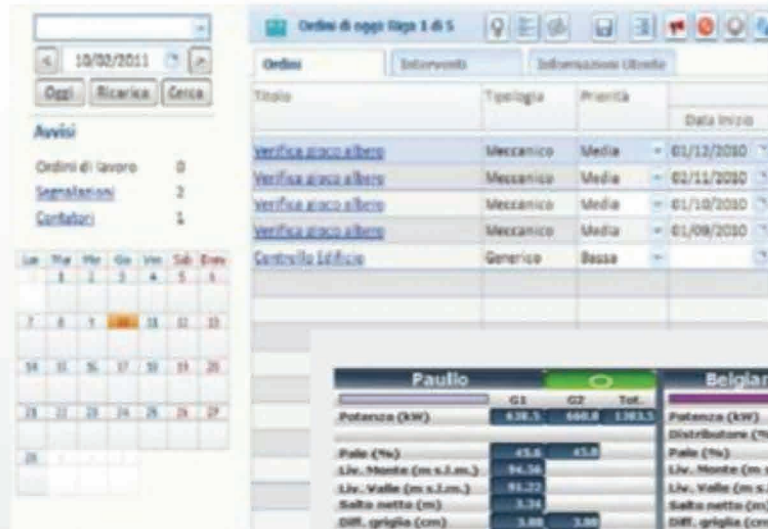
# STE GUARDIAN: O&M everywhere & anytime



STE Guardian is a web-based application meant to optimize the plant O&M mangament.

## STE Guardian main functionalities:

- Plant statistics monitoring
- Advanced documetation filing
- Centralized plant monitoring system
- Production output report in real-time
- Works orders simulation
- Maintenance Plan set up
- Reports about plant keepers' interventions
- Counter reading
- Spares warehouse management
- Plant daily status check up
- Alarms management



Componeta	Defini di lavoro	1	2	3	4	5	6	7	8	9	10	11	12
Locale Interne	Controllo stato dello stato												
Locale Interne	Verifica rapporto di lamina												
Locale Interne	Controllo stato degli isolati												
Locale Interne	Controllo edificio nuovo order												
Cassa (Punto Snc)	Verifica integrità e scateni												
Estero	Revisione/colore degli esteri												
Estero	Revisione/colore degli esteri												
U.P.S.	Verifica gruppo UPS												
U.P.S.	Verifica gruppo di controllo												
Controllo	Verifica stato Controllo												
PC	Verifica stato PC												
Parole Parole	Parole - controllo serraggio												
Controllo Obiettivo	Verifica qualità olio												
File Aspettazioni	Sostituzione filo di controllo												
File Stato	Sostituzione filo di stato												
Quadranti	Parole - Verifica gestione												
Parole	Verifica qualità dei cavi												
Locale Interne	Controllo edificio nuovo order												
Talco	Verifica sicurezza												
Parole Clapnet	Parole - controllo serraggio												
Controllo Obiettivo	Verifica qualità olio												



# STE After-Sales Service Packages



## OPERATION & MAINTENANCE

- Collection and archive of all plant performance data
- Guaranteed production levels
- Basic & Plus Services included

## «PLUS» SERVICE PACKAGE

- Periodical verification of plant status
- Predictive Maintenance
- Extension of technical support on a 24/7 basis
- Recurrent training for customer personnel

## «BASIC» SERVICE PACKAGE

- Remote technical support for all unscheduled events
- Guaranteed service level: first level answer within 4 hours
- On site intervention within 1 week (if necessary)

WARRANTY

