ATS
Leading Integration

Company **Profile**

A Strategic Partner of

株式会社 東光高岳
TAKAOKA TOKO CO., LTD.

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Our History

Applied Technical Systems Joint Stock Company (ATS JSC) was found in 1998 and since then has established our position as a provider of solutions for Substation Automation and Power System Control.

ATS has grown steadily since our start in 1998 as the exclusive distributor of Schweitzer Engineering Laboratories, Inc. in Vietnam. We serve industrial customers through the support of SEL products and technical services, at the same time research and develop complete substation automation systems predicated on new design and approach concept. The Integrated Control System **@Station®** is one such solution offered tailor-made to customers.

ATS successfully launched the first @Station® system, at small scale, in 2001 at 220kV Vinh Long Substation. The first large-scaled @Station® system was installed and operational in 2003 at 220kV Thu Duc Substation - the largest substation in Vietnam – marking the beginning of ATS's success in the Substation Automation System field.

Since then, ATS has become increasingly reputed as the credential vendor of substation automation technology amongst international players. We have acquired an unrivaled track record in successful execution of SAS projects for 110kV to 500kV substations.

Our aim of date is to be the leading vendor for the Smart Grid evolution in Vietnam. This movement starts with our first SCADA product being operational in 2008, registered with **@ SCADA+** trademark. In addition, other products and solutions are continuously in development to meet the various demands in the power system and real-time management market. With this current product base and further intensive innovation effort, we will play a proactive role in the **Smart Grid movement** of Vietnam's power system.

Starting 15 June 2018, we underwent a name change from Applied Technical Systems Company Limited to Applied Technical Systems Joint Stock Company. This change will facilitate our future growth in scope and size to better serve our clients, domestically and internationally.

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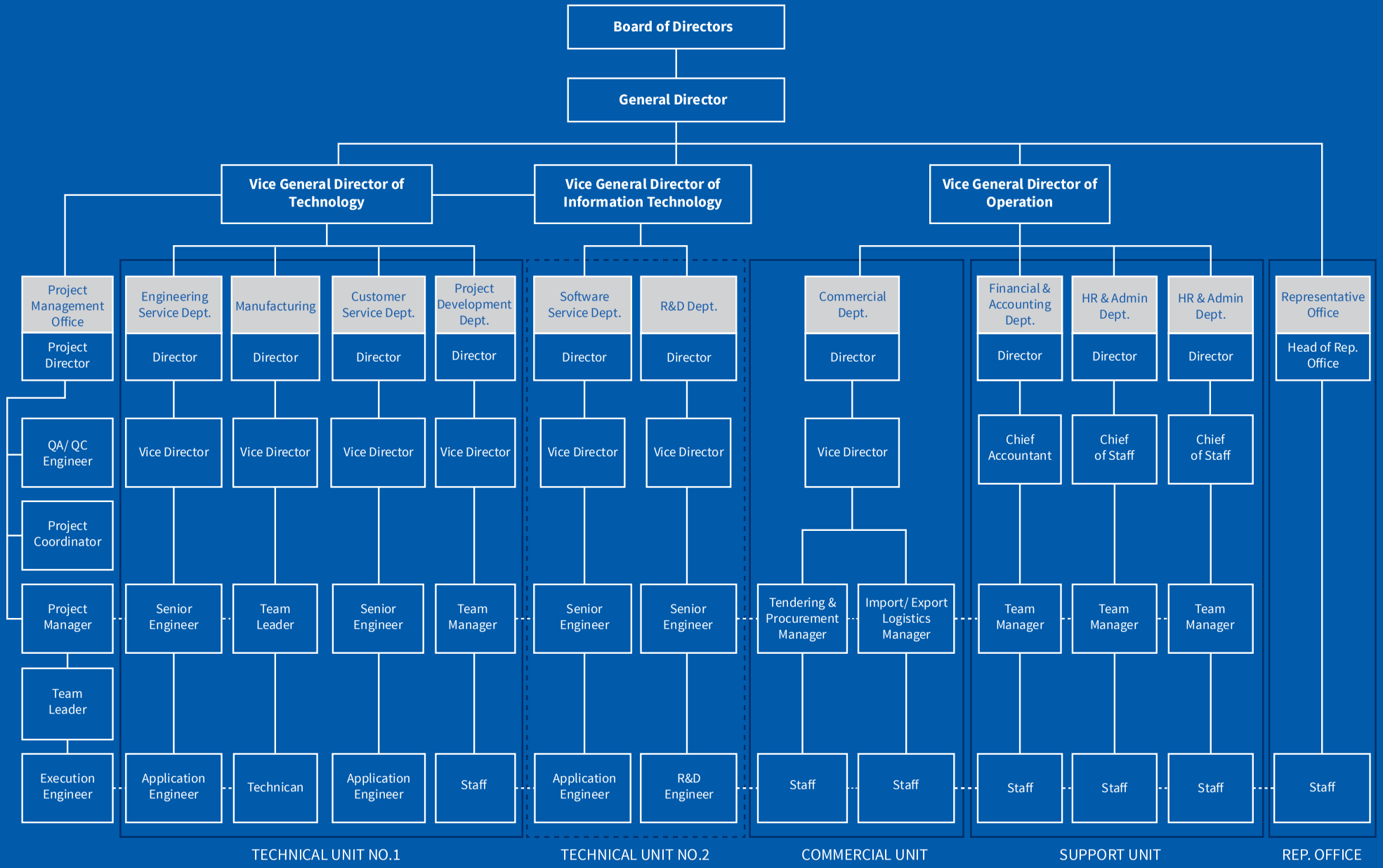
Over 20 years into our existence, ATS is now highly regarded by international vendors and by major participants in Vietnam power market.

Organizational Chart



"Our mission is to be a leading provider of **Integration Systems** for **Substation Automation** and **Power System Control**, to satisfy our customers at the highest level, and to support the continuous improvement of our employees.

Our Features

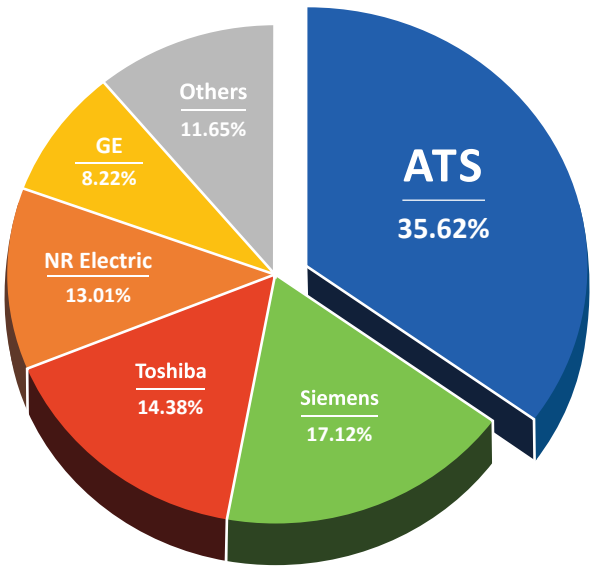
- Rich experience and Accredited qualification
- High quality products and Professional services
- Local understanding and Industry networking

Leading Vendor in Power Sector

ATS has established our status amongst the leading providers of solutions, systems and services for Substation Automation and SCADA/EMS/DMS/GIS in Vietnam since 1998.

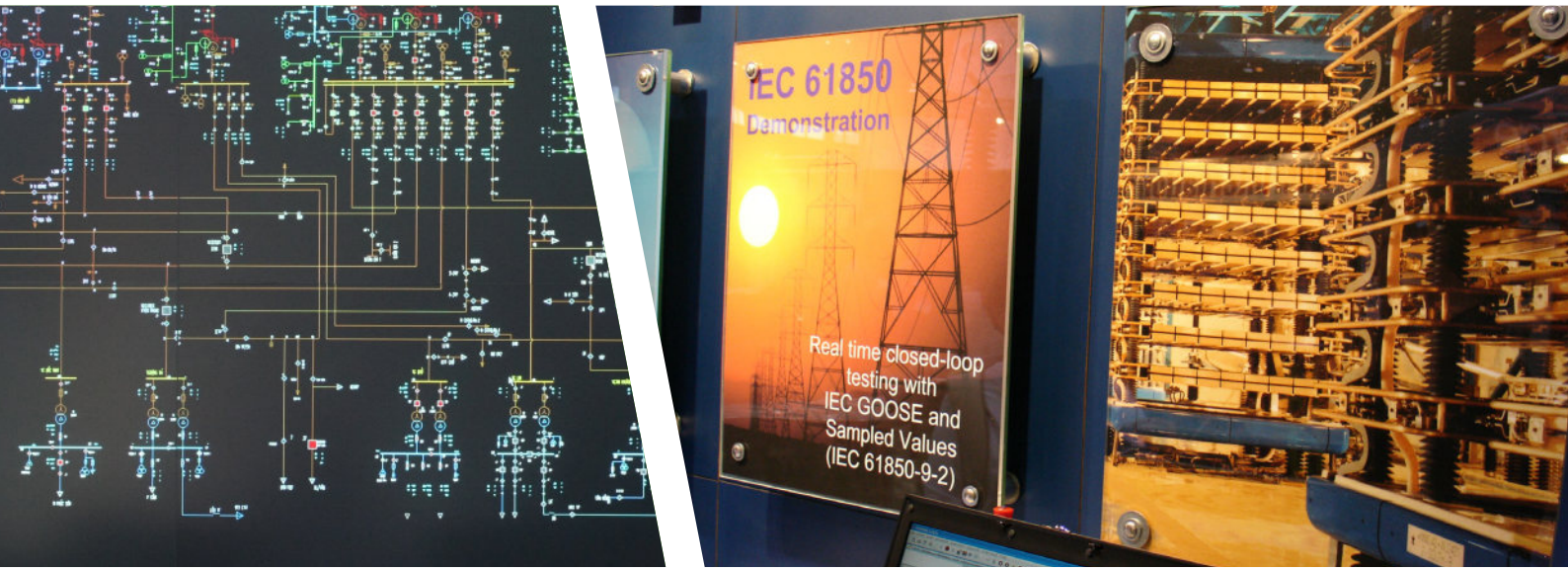
Our scope of works encompasses a comprehensive range from Engineering, Procurement, Construction, Installation & Commissioning, to long-term O&M services, covering full EPC pack for Grid Stations and Power Plants projects.

Since establishment, we have successfully delivered hundreds of contracts providing 110kV-220kV-500kV Substation Automation System (SAS) and Distribution Control System (DCS) for Grid Stations and Power Plants. **Our works occupied more than 35% of Vietnam Utility's market share as of date.**



Market Share Distribution of Substation Automation System in Vietnam Transmission Grid

Data as of 2023 (Source: EVNNPT)



Unparalleled Knowledge of Domestic Power Market

Our extensive track records have afforded us an in-depth knowledge of the structure and operation of the power sector. Our visionary management team is well-versed with industry know-hows and networking.

Capable Local Team to Deliver International-Grade Projects On-Time and Reliably

Our team of **over 150 skillful professionals**, the majority of whom are power system and software engineers, works in close collaboration clients and suppliers in delivering our solutions and services. In addition, a specialized in-house team is designated to dedicate their innovation effort on the research and development of Smart Grid-oriented products and solutions.

With extensive knowledge and experience in the field acquired from years of activity at the forefront of power system development, our local team have implemented hundreds of projects on-time and reliably at optimal costs thus far.

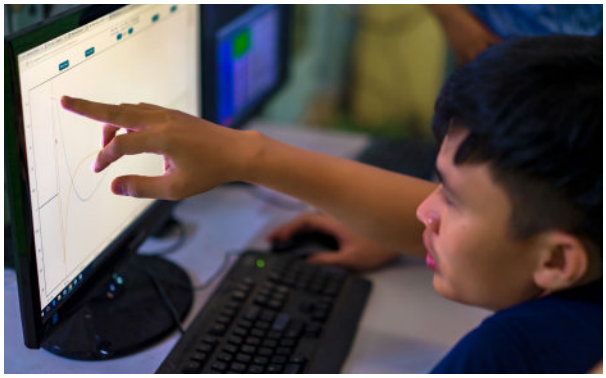
Thai Tran
Vice General Director of Technology

Holding the position of ATS Vice General Director of Technology since 2005, Thai Tran has been the steering force behind the company's technological strategy and innovation.

With more than 35 years of experience in the field - 20 of which had been with Electricity of Vietnam (EVN) in various critical positions including Director of the National Load Dispatch Center (EVNNLDC) – he has garnered a profound set of technical knowledge, a deep insight of the sector operation, and a strong hold of the industry networking.

Our Commitment to Quality and Innovation

Our Quality Policy is to always listen to and understand the needs of our customers, satisfying all of their requirements



International standards and quality control is complied with for our software and integrated products

In ensuring our commitment to customers, ATS has established and maintained a Quality Management System up to the standards of **ISO 9001:2015**.

We achieve our goals through training employees, improving equipment, applying new technology and collaborating with leading providers in developing effective products and technical solutions.

International Standards Compliance

Our products are of the highest quality standards and are tested thoroughly to ensure their effective and reliable functionality.

Our @Station® has been certified to the following standards:

- IEC 61850 Certificate Level A issued by KEMA DNV-GL
- IEC 60870-5-101 Master/Slave Certificate Level A issued by KEMA DNV-GL
- IEC 60870-5-104 Master/Slave Certificate Level A issued by KEMA DNV-GL

Our SmartModem™ (4G Modem of ASM - X200 type) has received Type Test Certification by Vietnam Ministry of Information and Communications.

International Accreditation

Our innovative force is continually steered with our active membership in various collaborative industrial and technical organizations, including CIM Users Group, UCA International Users Group, Open Smart Grid Users Group and OPC Foundation.

International Partners

We closely collaborate with our international partners to ensure the highest quality of our offered solutions. Amongst our renowned vendors are Schweitzer Engineering Laboratories Inc. (SEL), DigSILENT GmbH, DNV GL – KEMA Laboratories, and NeuralWare.

ATS holds active membership with various industrial organizations...

CIM User Group - Provides a forum in which users, consultants, and suppliers could cooperate and leverage IEC CIM international standards to advance interoperability across utility enterprise

UCA International Users Group - A not-for-profit organization focused on assisting users and vendors in the deployment of standards for real-time applications for several industries with related requirement.

Open Smart Grid Users Group - Aims to foster enhanced functionality, lower costs and speed market adoption of Advanced Metering networks and Demand Response solutions through development of an open standard-based information/data model, reference design and interoperability guidelines

OPC Foundation - Dedicates to ensuring interoperability in automation by creating and maintaining open specifications that standardize the communication of acquired process data, alarm and event records, historical data and batch data to multi-vendor enterprise system and between production devices

DigSILENT GmbH - An independent software and consulting company providing highly specialised services in the field of electrical power systems for transmission, distribution, generation, industrial plants and renewable energy.

Our Clients

encompass a wide range of industrial companies and utilities, both in Vietnam and internationally.

VIETNAM ELECTRICITY (EVN)

National Power Transmission Corporation (EVNNPT)
- Southern Power Projects Management Board
- Central Power Projects Management Board
- Northern Power Projects Management Board
- Power Transmission Company No. 1
- Power Transmission Company No. 2
- Power Transmission Company No. 3
- Power Transmission Company No. 4

National Load Dispatch Center

Power Companies
- Northern Power Corporation
- Central Power Corporation
- Southern Power Corporation
- Hanoi Power Corporation
- Ho Chi Minh City Power Corporation

Power Generation Companies
- Da Nhim-Ham Thuan-Da Mi Hydro Power JSC
- Hoa Binh Hydro Power Company

Industrial Clients

- Petro Vietnam Power Corporation
- Nam Pia Hydro Power JSC
- Dong Tien Steel Company
- Dakr'tih Hydro Power Plant
- Mong Duong II Thermal Power Plant
- Vinh Tan II Thermal Power Plant

INTERNATIONAL CLIENTS

Project Developers & Owners
- Super Energy Corporation / Thailand
- Gulf Energy Development / Thailand
- EDPR Sunseap Group / Singapore
- Sembcorp Energy / Singapore
- Deep C Green Energy / Japan

  etc.

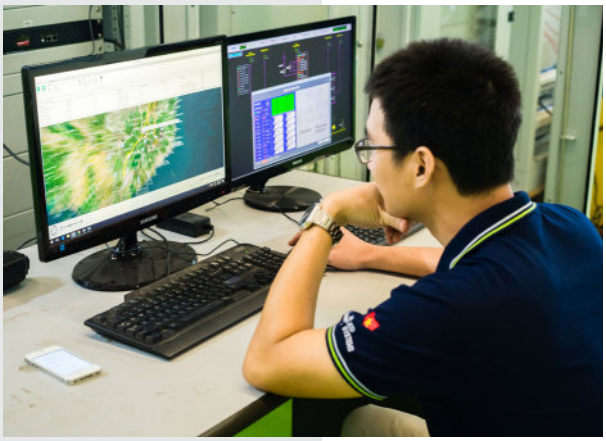
EPC Contractors
- Power Construction Corporation of China / China
- China Energy Engineering Corporation / China
- Bouygues Energies and Services / French
- SHARP Energy Solutions Corporation / Japan
- Sterling and Wilson Renewable Energy / India
- Doosan Heavy Industries & Construction / Korea
- PSD Energy / Australia

  etc.

And Manufacturers in System Control & Protection

We offer comprehensive solutions, from products to services, that are customized to the requirements of our end-users…

Our Scope



ATS specializes in Power Transmission and Distribution Applications, being a system integrator and provider of solutions, systems and products.

We also offer an end-to-end service package encompassing consulting, engineering, EPC contract execution, operation and maintenance as well as offering professional support to our client in dealing and negotiation with relevant Government authorities and Vietnam Electricity (EVN).

Our expertise and qualification extends to the followings:

- Software Research and Development
- Hardware Design and Development
- Manufacturing, Integration, and Testing
- Installation, Commissioning, and Handing-over services
- Maintenance and Upgrades
- Project management
- Consultation
- Training

We offer a comprehensive package of Engineering, Manufacturing, to Installation

Featured Solutions, Services and Products

OUR SOLUTIONS		
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OUR PRODUCTS			
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2		**SmartICCP™** Inter-Control Centers Communication Software	Page 23
3		**DataServer™** Real-time Data Processing Software	Page 23
4	Data Management & Storage	**SmartHIS™** Historical Information System	Page 23
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6	Interface	**SmartHMI Studio™** HMI Builder and Viewer Software	Page 23
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8		**Realtime Portal™** Real-time Portal Website	Page 24
9		**SmartFR™** Fault Acquisition, Analysis and Display Software	Page 24
10	EMS/DMS	**EMS/DMS** Energy Management System/ Distribution Management System	Page 24
11		**SmartRGF™** Renewable Energy Generation Forecasting Software	Page 24
12		**OPMS™** Operation Management System	Page 24
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14		**SmartDER™** Distributed Energy Resource Monitoring & Control Device	Page 25
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Our Scope/ Solutions

@Station®

@Station® is an Integrated Control and Protection System designed for the operation of transmission and distribution substations. The system incorporates the latest technology in the field of substation automation to provide its users with innovative solutions to their requirements.

@Station® is a solution that integrates all monitoring, control, and automation functions in a flexible system structure for ease of operation. Its individual modules are specifically designed and tailor-made for each project.

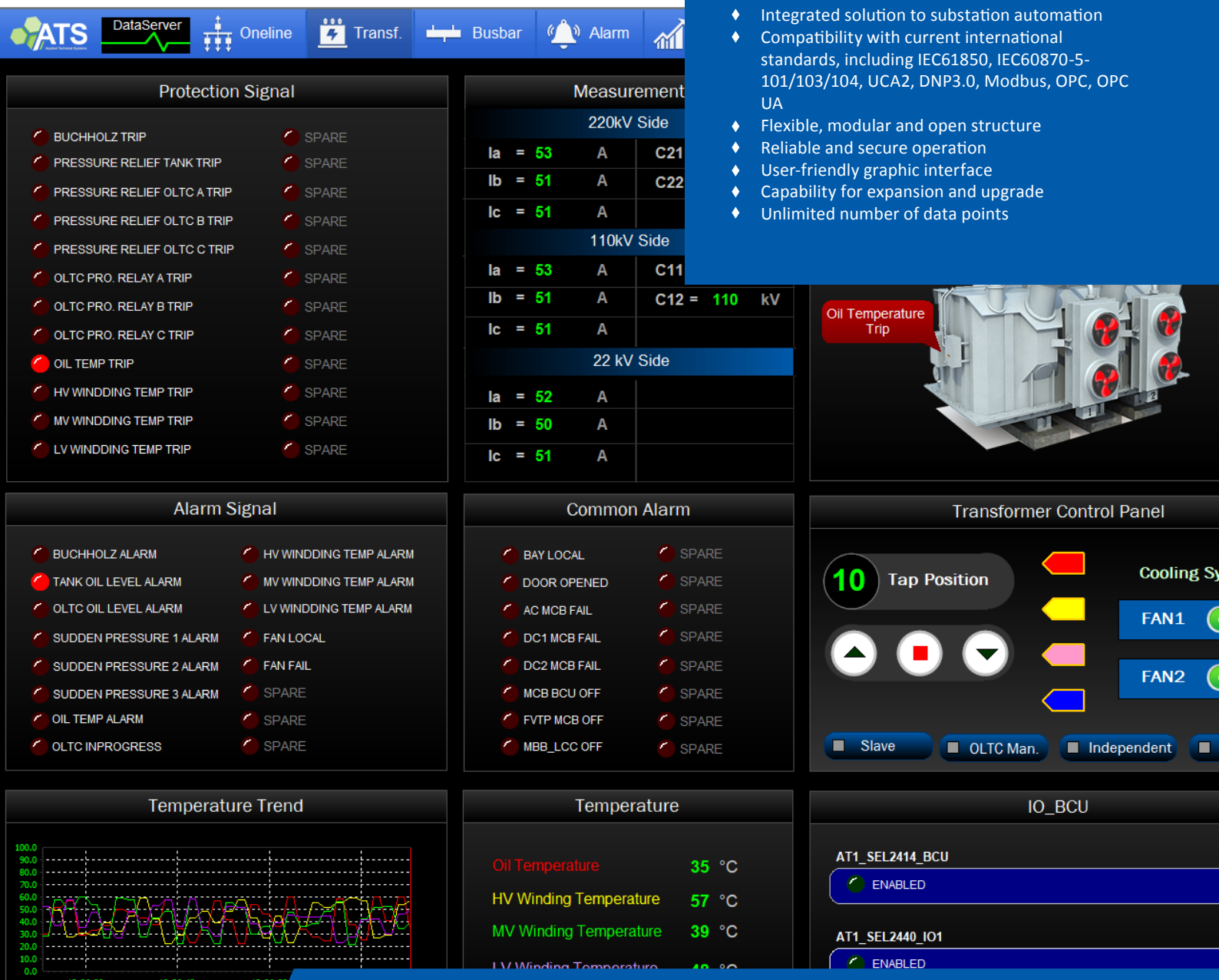
@Station® complies to all current de jure and de facto industrial standards for open system. Such compliance allows for communication between @Station® and other devices and systems from other vendors.

FUNCTION HIGHLIGHTS

- Monitoring of alarms, switchgear status, and measurement parameters for various voltage levels
- Control of switchgear at bay or substation levels as well as from remote control center with high level of security
- Checking of device control logic at bay and substation levels
- Checking of synchronization conditions before breaker tripping
- Ease of substation monitoring and control via user-friendly interface
- Storing of full and complete historical database of all system events
- Online configuration
- Addition of new functions and features allowed

FEATURE HIGHLIGHTS

- Integrated solution to substation automation
- Compatibility with current international standards, including IEC61850, IEC60870-5-101/103/104, UCA2, DNP3.0, Modbus, OPC, OPC UA
- Flexible, modular and open structure
- Reliable and secure operation
- User-friendly graphic interface
- Capability for expansion and upgrade
- Unlimited number of data points



@ReHybrid™ Renewable Power Plant Control & Monitoring System (SCADA & Hybrid PPC)

@ReHybrid™ is a monitoring and control solution package for renewable-energy power plants (solar power plant, wind power plant, energy storage system...) that complies with grid code requirements as well as contributes to improving power system operation's reliability and stability.

FUNCTION & FEATURE HIGHLIGHTS

- **Supervisory:**
  - Monitoring of overall parameters of power plant (Dashboard)
  - Monitoring of detailed operation parameters of inverters, DC boxes, wind turbines, BESS, and tie-transformers
  - Power Quality Monitoring
  - Monitoring and controlling of substations
- **PPC (Power Plant Controller):**
  - Active Power Control
  - Ramp Rate Control
  - Reactive Power/Power Factor Control
  - Voltage Control
  - Energy Optimization or Power Generation Priority Control
  - Fluctuation Control
  - Stability Grid Support

Our Scope/ Solutions

@SCADA+®

@SCADA+® is a solution to supervisory control & data acquisition with system management on a real-time basis for power system dispatching centers and operation control centers. The solution is developed entirely on Client-Server architecture.

@SCADA+® is a complete system with a highly flexible platform, capable of various configuration options to suit the scope and specification of each project. Its flexibility and compatibility with a wide range of devices guarantees users a full and functional solution meeting the latest standard requirements and future expansion needs.

FUNCTION & FEATURE HIGHLIGHTS

- Full features of Supervisory Control and Data Acquisition (SCADA) system for transmission and distribution
- Truly open system architecture through the use of standard hardware and software:
  - De facto Historical Information System (HIS) in use world-wide
  - Multi-protocol speaking, including IEC-60870-5-101/103/104, IEC-61850, ICCP/Tase2/ IEC60870-6, DNP 3.0, Modbus, RP570/571, etc.
  - Multi-communication link: Leased line, Satelline, GSM/GPRS/3G, Corporate WAN, Public Internet/ADSL
- IEC-61970/ IEC-61968 (CIM) model ready for advanced applications
- Unlimited amount of handled data points
- Modular and scalable architecture with off-the-shelf components
- Access security in compliance with Critical Infrastructure Protection (CIP) issued by NERC

Operation Control Center (@OCC™)

@OCC™ is a solution package specialized for the supervision, control, and management of power system of one or more areas/groups of power plants or manufacturing facilities that need to manage a large amount of real-time data.

@OCC™ can help improve the efficiency of system operation and maintenance and therefore reduce related costs for such activities. With @OCC™, the number of staff required for on-site operation as well as those working directly with dispatch centers can be optimized, thus improving labor productivity and efficiency in production and business operations.

FUNCTION & FEATURE HIGHLIGHTS

- Open architecture, modular structure and user-friendly graphic interface (software is developed tailor-made to meet the specific requirement of each system)
- Similar structure to @SCADA+®, including:
  - Hardware system: network communication devices, front-end computers, central database server, application computers, standby power devices, etc.
  - Software system: data acquisition and processing, real-time database, historical database, supervisory control interface, and various other application modules
- @OCC™ and @SCADA+® comparison:

@OCC™	@SCADA+®
Device and equipment operation	System operation
Unmanned substation operation	U/P adjustment for loss optimization
Equipment incident management	Incidents reporting
Maintenance planning	Reliability level calculation
Investment planning	Power shut-down planning
More data required	Less data required

Our Scope/ Solutions

SmartDAS™

SmartDAS™ (Distribution Automation System) is an application software package applies in the automatic detection and isolation of faults in the medium voltage grid with an open-loop operating circuit configuration as well as system restoration afterwards.

SmartDAS™ can help improve various power supply reliability indicators (SAIFI, SAIDI, etc.) for distribution grids.

FUNCTION & FEATURE HIGHLIGHTS

- Collect and process information on switchgear, fault indication,etc. in real-time
- Store and display information in real-time on HMI system
- Implement DAS algorithms in 2 ways
  - FCM: Using information from devices capable of detecting fault currents
  - SR: Using auto-reclosing function based on LBS controller design
- Provide operational decisions to SCADA system (automatic or manual)
- Add or remove devices on the system without having to program the corresponding scripts
- Set up simulation of incident scenarios to evaluate system response
- Store and display incident information, troubleshooting process
- Option to prioritize restore by overload rate or load priority
- Support to calculate the appropriate load according to actual operating data to provide a treatment plan.
- Calculation and handling when the power grid is connected to distributed energy sources (hydroelectricity, solar power, etc.)

Event Message

Device Time	Server Date	Categories	Message
10:28:09.033 2023/05/29			

@DERM™

@DERM™ is a Distributed Energy Resources Management System developed to ensure efficient operation of distributed renewable energy sources in accordance with distribution and transmission grid specifications. @DERM™ can also operate as a Virtual Power Plant (VPP) to help improve participation and cost-effectiveness of Distributed Energy Resources (DERs) in power markets.

@DERM™ together with SCADA/DMS/EMS systems are important monitoring and control solutions for dispatching centers and play a key role in operation of power systems with high penetration of DERs.

FUNCTION & FEATURE HIGHLIGHTS

- Allow fair allocation of power generation when system capacity is reduced.
- Allow flexible operation coordination of various distributed sources to avoid overload and ensure power quality for local power grid.
- Optimally mobilize power sources in a transparent and safe manner
- Support control method according to the power generation chart, manual or calculated value, and mobilizes the power of distributed sources when there is a power limit.
- Control P, Q, U, PF, Ramp Rate, start, stop the plant, set the control modes according to the operation requirements of the grid.
- Reduce generator shutdown/start frequency, increase system reserve.
- Provide power and output forecasting of distributed sources with higher accuracy.
- Gather various distributed sources into a single generating unit (Virtual Power Plant - VPP) with same regulation and operation capacity as a traditional power plant.
- Help DERs to respond flexibly to power tariff, reducing imbalance between generating capacity and load demand in the power system.
- Allow for providing auxiliary services such as voltage regulation, secondary frequency regulation, rotation backup, black start...

Our Scope/ Solutions

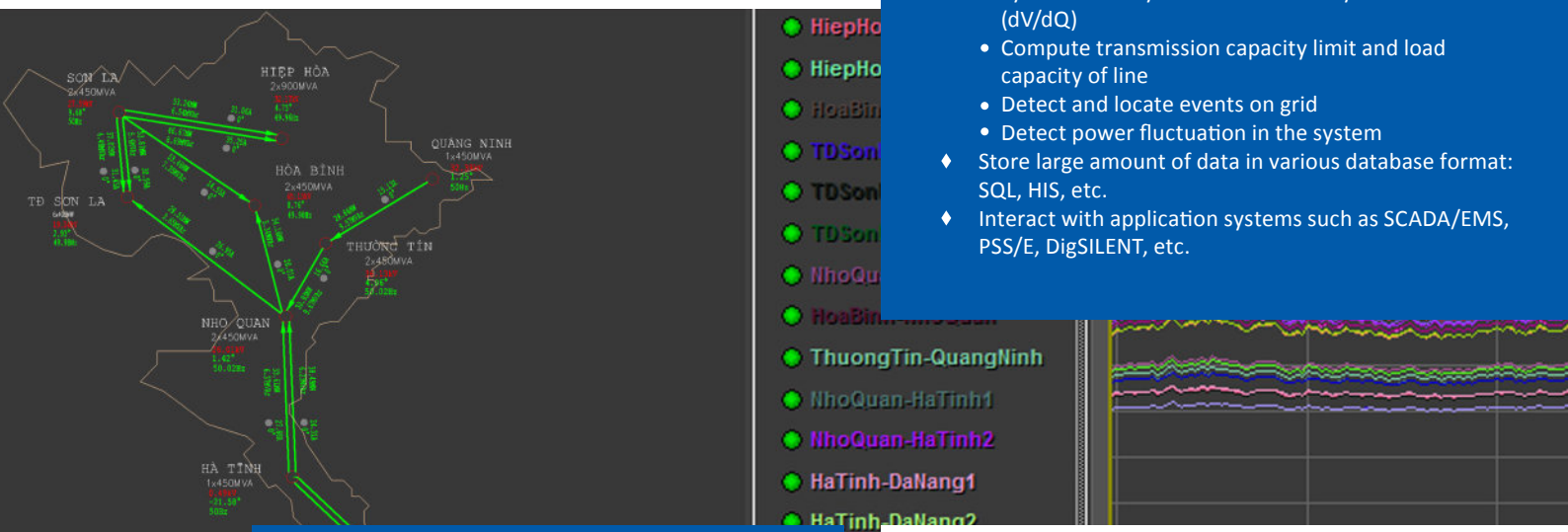
SmartWAMS™

SmartWAM™ (Wide-Area Monitoring System with Synchrophasor) is a wide-area monitoring system that performs the collection, processing and displaying of synchrophasor data on the basis of Phasor Measurement Unit technology to reliably and timely monitor large-scaled power systems.

SmartWAMS™ can be deployed independently of SCADA/EMS system and simultaneously supports SCADA/EMS systems for real-time/on-line monitoring and operation as well as calculation and post-operation analysis of power system.

FUNCTION HIGHLIGHTS

- Collect synchrophasor data in real-time up to 30 samples per second
- Enhance system situational awareness by process and display real-time data of system operation status on wide area:
  - Frequency (f) and rate of change of frequency (df/dt)
  - Magnitude and phase angle of voltage and current
  - Phase angle difference (Δδ)
  - Power flow (MW, MVAr)
  - Voltage & angle sensitivities (ΔV/ΔP, ΔV/ΔQ, Δδ/ΔP)
- Assess system stability and alarm on:
  - Load capacity of power grid based on phase angle difference
  - Frequency stability based on frequencies observed at various areas
  - System stability based on rate of change of parameters (voltage, frequency)
  - Voltage stability based on voltage magnitude and reactive power reserve
  - System stability based on sensitivity assessment (dV/dQ)
  - Compute transmission capacity limit and load capacity of line
  - Detect and locate events on grid
  - Detect power fluctuation in the system
- Store large amount of data in various database format: SQL, HIS, etc.
- Interact with application systems such as SCADA/EMS, PSS/E, DigSILENT, etc.

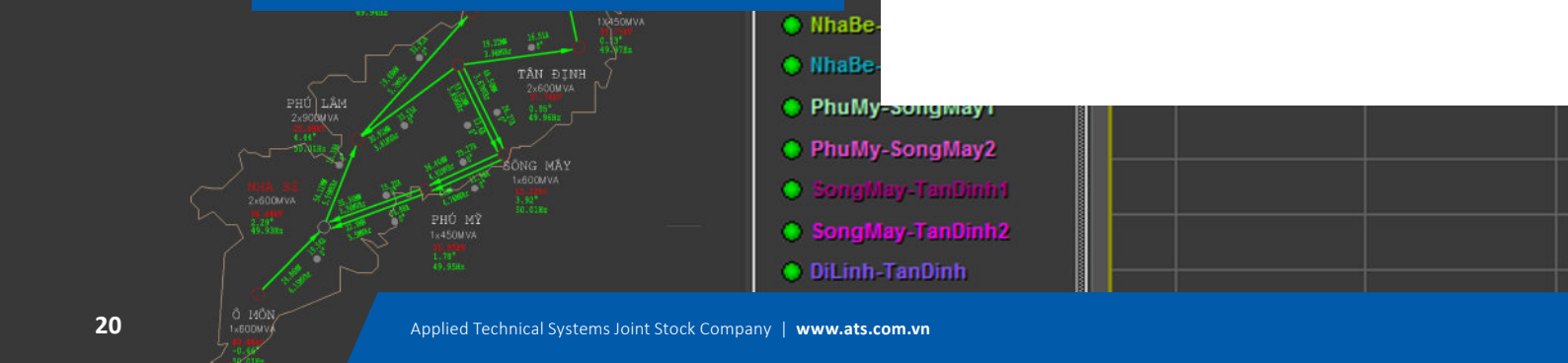


FUNCTION HIGHLIGHTS

- System sizing capacity for over 500 substations, 2000 lines and 2 million stored records
- Distance to fault analysis and calculation by double end or single end method
- Analytic results include: Fault type, Inception time, Duration, Distance, Pre-fault current, Fault current
- Web-based visualized reports
- Automatic notifications to email and/or SMS
- Results export in XML and COMTRADE format

SmartAFL™ (Automatic Fault Locating System)

SmartAFL™ is a Travelling Wave-based and Impedance-based distance-to-fault locating software package. Automatic Fault Location calculation engine gets Travelling Wave and Impedance records of both ends and of the line parameters stored in system database to execute the appropriate distance-to-fault locating algorithms for the calculations.



Design & Engineering Services

for SAS, SCADA/EMS/DMS/GIS and OCC Systems for Power Plant, Transmission Substations & Lines

We provide design and engineering services for integrated control & protection system for transmission and distribution, SCADA/EMS/DMS/GIS, OCC and smart metering management to optimize the use of IEDs. Our service also extends to detailed engineering of Power Plant including transmission substation and transmission line.

Our experienced team of Electrical, Electronics, Mechanical and Civil Engineers are experts in system design in compliance with international standards such as IEC-61850 and IEC-60870-5-101/104.

Main Design Features:

- Simple
- Economical
- Quality
- Operational
- System enhancing
- Capable of Upgrade, Expansion and Interoperation

Installation, Testing and Commissioning

We provide installation, testing and commissioning services for green and brown field projects including substations, power plants and control centers, etc. Our services are in compliance with common industrial practices.

Our Main Scope:

- Installation and cabling service
- Installation supervision and construction service
- Substation and power plant testing and commissioning service
- SCADA Connection Point-to-Point and End-to-End tests
- Maintenance and 24/7 Troubleshooting service

Operation and Maintenance

We provide Operation and Maintenance services to keep your project in ever-green status during its life cycle of up to 25 years.

Our Main Scope:

- Routine check and report
- Maintenance and 24/7 Troubleshooting service

Our Scope/ Services

Consulting Services

Power System Study

We and our credential partner can provide consulting services for power system studies and analysis on the short-, medium- and long-term outlook of operation.

Our Main Scope:

- Grid Impact Study
- Grid Curtailment Study
- Short Circuit Calculation for equipment selecting
- Relay Protection Coordination Calculation and Settings recommendation
- System Static/Dynamic Stability Study
- System SSR and Mitigation Study
- System Reliability and Contingency Analysis
- System Loss and Optimization Study
- Harmonic Study
- Reactive Power Capability calculation
- Technical Due Diligence

Power Market Study

With our deep understanding of and extensive experience with Vietnam power market as well as its principle of operation and offering, we can provide the best quality service for our clients in power market and power operation.

Our Main Scope:

- Load forecasting
- Price forecasting
- Optimization of power plant operation

EPC Service on Renewable Power Project

Project Consulting Services

Involves necessary preparation for the initiation of the project, including:

- Pre-Feasibility Study
- Application for project inclusion in Government Master Plan
- Feasibility Study and Appraisal
- Technical and Specialized reports with EVN and related Authorities
- Technical and Specialized agreements with EVN and related Authorities
- PPA preparation and negotiation
- Energizing & Commissioning Certification of project
- Electricity Generation License
- Commercial Operation Date Certification

Project EPC Execution Services

Covers all aspect of Engineering, Procurement and Construction for the project. Services can include Testing, Commissioning and COD-ready tasks

Project O&M Services

Involves tasks necessary for the ongoing operations, maintenance, including repair and replacement of SCADA and Power Plant Control (PPC) system of power plants.

SmartIO™

SmartIO™ is a data connection software by standard protocols. SmartIO™ is capable of collecting data from devices and also being a data source for other systems.

FUNCTION & FEATURE HIGHLIGHTS

- Support various protocols, including IEC-61850 Client, IEC-101 Master/Slave, IEC-103 Master, IEC-104 Master/ Slave, Modbus Master/Slave, OPC Server/Client, Script, etc.
- Support the ability to convert data between protocols
- Unlimited number of data channels

SmartICCP™

SmartICCP™ is an ICCP OPC interface that provides connectivity to any Windows application that supports OPC. SmartICCP™ provides a standardized communication protocol in accordance with IEC60870-6 TASE.2 that supports OPC without any user-defined scripts.

FUNCTION & FEATURE HIGHLIGHTS

SmartICCP™ is a standardized interface that provides tools to integrate Windows-based OPC applications with a variety of other applications:

- Data exchange between SCADA/EMS/DMS Control Centers
- Interface with power plants/stations for dispatching power system
- Compatible with third-party software and applications that use ICCP Standards

DataServer™

DataServer™ is a real-time data processing software that calculates, processes raw input data and then returns calculation results to other software.

FUNCTION & FEATURE HIGHLIGHTS

- Support function and program declaration, capable of handling all basic mathematical operation in C# Programming Language
- Support OPC Server, OPC Client connection and direct connection to ATS SmartIO™

SmartHIS™

SmartHIS™ is a historical database management system allowing users to collect, process, store, manage and retrieve an extremely large data set (Big Data) from the real-time environment, suitable for high-fidelity time-series data from diverse sources. It has multiple interfaces, compatible with many systems of different vendors and can be applied in many industries.

FUNCTION & FEATURE HIGHLIGHTS

- Historical database using non-SQL database structure to ensure storage rate and ad-hoc query for any array of the large stored data set
- Lossless Data Compression Algorithm for storage space and data preservation, a unique function of the system
- Unlimited data storage period, only depend on capacity of hardware storage device.
- Standardized interfaces for data access and API.

SmartCIM™

SmartCIM™ is a comprehensive CIM-based database for Power System Operation and Management. Unified Modeling Language (UML) and Object-Oriented Model are used to define and simulate power system data. SmartCIM™ provides a CIM Interface tools that helps users to access, edit, update and exploit data quickly and easily.

FUNCTION & FEATURE HIGHLIGHTS

The database is structured in table form with approximately 2,500 data tables and thousands of relationships, classified into three main data packages:

- IEC-61970 package: manages power system data according to physical structure
- IEC-61968 package: asset-, payment-, and customer-related data
- IEC-62325 package: power market-related data

The database can also be customized with more specific data for usage in specific application and power market.

SmartHMI Studio™

SmartHMI Studio™ is a software designed for the development of Human-Machine Interface (HMI) for real-time supervisory control systems used in various industries which require fast responses, management of large amount of data, high level of security, and diverse communication methods. SmartHMI Studio™ is especially fit for use in the power industry as part of Substation Automation System (SAS), Supervisory Control and Data Acquisition (SCADA) and Operation Control Center (OCC).

FUNCTION & FEATURE HIGHLIGHTS

- Distributed structure capable of large-scaled deployment
- SmartHMI Builder Module provides tools for custom-made interface development
- SmartHMI Viewer Module allows users to run programs while building applications
- Recovery and redundancy capability guarantees smooth and continuous operation

Our Scope/ Products

SmartGIS™

SmartGIS™ (Geographic Information System) is a stand-alone application that when integrated with a SCADA/DMS system can provide users with various functional benefits.

FUNCTION & FEATURE HIGHLIGHTS

- Visually display electrical grid pattern on map
- Display real-time operation data
- CIM-based grid topology and asset management
- Integrate calculation results of Distributed Management System (DMS)
- Assist operators with accurate and safe control of actual system as well as fault management and identification
- Manage workforce and outage

Realtime Portal™

Realtime Portal™, a real-time data portal system, is a set of web-applications that provide users with simultaneous access to a large amount of real-time information and historical data. All of these data are continuously collected, archived, and maintained for operation, planning and maintenance of activities as well as large-scaled applications such as power market operation and GIS. The system is designed for quick access to data via a highly reliable security mechanism.

FUNCTION & FEATURE HIGHLIGHTS

- Display operational data in diagram
- Report
- Trending and Query
- Email and SMS notification

SmartFR™

SmartFR™ is a software that can automatically collect and analyze digital fault recording data in control and protection systems, the results of which is presented to operators.

FUNCTION & FEATURE HIGHLIGHTS

- Automatically collect digital fault data recorded by BCU relays by various manufacturers including: SEL, ABB, Siemens, Toshiba, Schneider, etc.
- Archive DFR in a centralized database
- Serve and Analyze fault recording data
- Automatically Report and Notify

SmartRGF™

SmartRGF™ is a software used for forcasting power generation of renewable energy power plants in real-time.

FUNCTION & FEATURE HIGHLIGHTS

- Forecast power generation in the next 4 hours, 2 days, or 7 days
- Summarize forecast value errors
- Prepare analysis reports and extract forecast data

EMS/DMS

EMS/DMS is an Energy and Distribution Grid Management Software that is integrated into the SCADA/EMS/DMS system. The software allows system operators to evaluate and analyze operation status of the power system and provides optimal operation procedures to operate power grid safely, reliably and economically.

FUNCTION & FEATURE HIGHLIGHTS

- States Estimation function (SE)
- Load-Flow calculation
- Contingencies Analysis
- Short Circuit calculation
- Optimal Power Flow calculation
- Optimal Capacitor Placement
- Tie Open Point Optimization
- Volt/Var optimization
- Power Restoration calculation
- Automatic Feeder Reconfiguration
- Fault Location and Isolation and Restoration (FLIR)
- Outage Management System
- Work Order Management System

OPMS™

OPMS™ is a software solution for regulating the implementation of tickets, orders, and related issues for technical works to ensure the safety of people, machinery and equipment during the operation of the power system.

FUNCTION & FEATURE HIGHLIGHTS

- Provide a full range of tickets and orders, including: field survey report, work registration, work ticket, operation ticket, work order, etc.
- Ensure the integrity of data and ability to recover when problem occurs
- Save time while ensuring accuracy of tickets issued
- Lighten management process, allowing operators to avoid the possibility of errors

SmartDER™

SmartDER™ is a Monitoring & Control device for reliable connection, monitoring and grid-compatible power control of Distributed Energy Resources, including Rooftop Solar Power, Battery Storage System, EV-Charger...

FUNCTION & FEATURE HIGHLIGHTS

- Compatible with different connection standards and a wide range of DER devices from different manufacturers.
- PPC function complies with national and international standards
- User-friendly: support to integrate, expand or adjust the system to meet the needs of customers
- Support a variety of connection types (ethernet/serial), standard protocols: Modbus, IEC101, IEC104, DNP, etc.
- Support device management features: check usage data, account status, signal strength, modem status
- Meet industry standards for electromagnetic environment, temperature, humidity, smoke, dust, etc.

SmartModem™

SmartModem™ (4G/5G Modem) meets the growing need for wireless data transmission over long distance with high accuracy and reliable security via GSM/GPRS/EDGE/HSPA telecommunications system. The device functions as a data server and facilitates the connection of multiple devices for construction of SCADA/DMS/AMI systems.

FUNCTION & FEATURE HIGHLIGHTS

- Compatible with various connection standards and a variety of terminal devices: electrical meters, reclosers, capacitor controller, fault indicator, etc.
- Support various protocols, including: IEC-60870-5-103/101/104, DNP3, Modbus, Fast Message (FM)
- Support modem management features including: checking usage data, account status, signal strength, modem status, etc.

Security Gateways

Security Gateways is a security device based on unidirectional gateway technology providing absolute protection to control systems and operations networks (such as critical SCADA Industrial Network) from attacks originating from external networks.

FUNCTION & FEATURE HIGHLIGHTS

- OT/IT separator, allowing data moving one-way
- Zero risk for OT network
- Support SCADA industrial protocol
- Support IEC60870-5-101
- Support IEC60870-5-104
- Support ICCP/TASE2
- None-IP data transmission
- Strong data encryption

Our Projects

Our track record consists of hundreds of projects successfully completed, on-time and reliably...

Substations

More than 100 substations up to 500kV

- 500kV Substations: Cau Bong, Tan Dinh, O Mon, Son La, Van Phong, Long Thanh, etc.
- 220kV Substations: Vinh Long, Thanh My, GIS Tay Ho, etc.
- 110kV Substations: Intel, Binh Tan, Long My, etc

Fault Locating System

Centralized Fault Locating System of 500kV & 200kV transmission OHL:

- 88 line feeders of 500kV Substations supply
- 60 line feeders of 220kV Substations connected
- 4 Centralized Fault Locating Centers

Project Highlights

ATS Control & Protection system at 500kV Thu Duc Substation

SCADA/DMS

Various SCADA/EMS/DMS/GIS projects

- National Load Dispatch Center
- Central Power Corporation
- Ho Chi Minh City Power Corporation
- National Power Transmission Corporation
- Power Transmission Company No. 4
- Other power companies

Operation Control Center

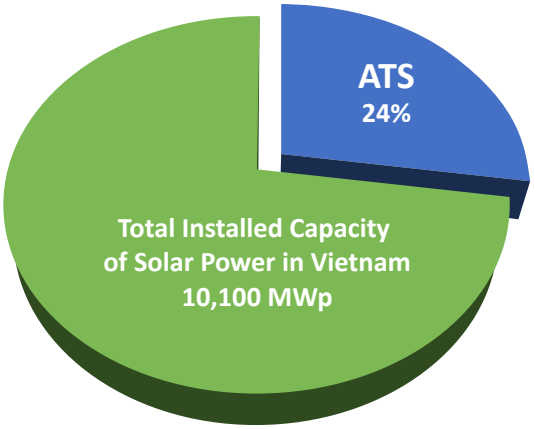
OCC Project Highlights

- Enterprise Operation Control Center for Da Nhim-Ham Thuan-DaMi Hydro Companies
- Remote Power Plant Operation Control Centre for PECC2
- Operation Control Centre for Loc Ninh Solar Power Plants (550MWp)
- Operation Control Centre for Phu My Solar Power Plants (330MWp)
- Operation Control Centre for GULF Power Plant
- Survey, Design, Supply, Installation,Testing and Training for three (03) systems of SCADA/ DMS/ GIS for Central Power Corporation (with connection to 20 of 110kV Substations; 500 of reclosers; 256,000 datapoints)

ATS's Centralized Operation Control Centre for Loc Ninh Solar Power Plants (550MWp)

Our Projects

Renewable-Energy Management Systems



Total installed capacity of projects deploying ATS solutions versus Total Installed Capacity of Solar Power in Vietnam (excluding Rooftop)

Data as of end of 2020

ATS's Renewable Power Plant Control & Monitoring System deployed for BIM 2 (18NX) Solar Power Plant control centre

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