



**YOUR SOURCE
FOR ACCURATE,
PRACTICAL AND
UP-TO-DATE
INFORMATION
ON IEC 61850.**



TESCO IS WHERE CUSTOMERS FIND LOYAL, FLEXIBLE AND INNOVATIVE EPC SERVICES

* AN ISO 9001 REGISTERED COMPANY *



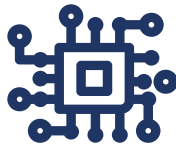
IEEE



UCA
International
Users Group

TESCO GROUP OF COMPANIES

Tesco Automation



POWER SYSTEM DESIGN & ENGINEERING

- * IEC 61850 DESIGN & CONSULTANCY
- * IEC 61850 SYSTEM INTEGRATION
- * IED CONFIGURATION & COMMISSIONING
- * SUBSTATION & PROCESS AUTOMATION

Tesco Electric



ELECTRICAL CONTRACTOR SERVICES

- * P&C PANEL FABRICATION & INSTALLATION
- * PREVENTATIVE MAINTENANCE SERVICES
- * GROUNDING & DUCTING SERVICES
- * MCC, VFD & PLC INSTALLATIONS

Tesco Industries



ELECTRICAL MAINTENANCE SERVICE PROVIDER

- * GENERATOR MAINTENANCE & SALES
- * MOTOR MAINTENANCE & SALES
- * GENERATOR & MOTOR FIELD SERVICES
- * VIBRATION & CALIBRATION SERVICES

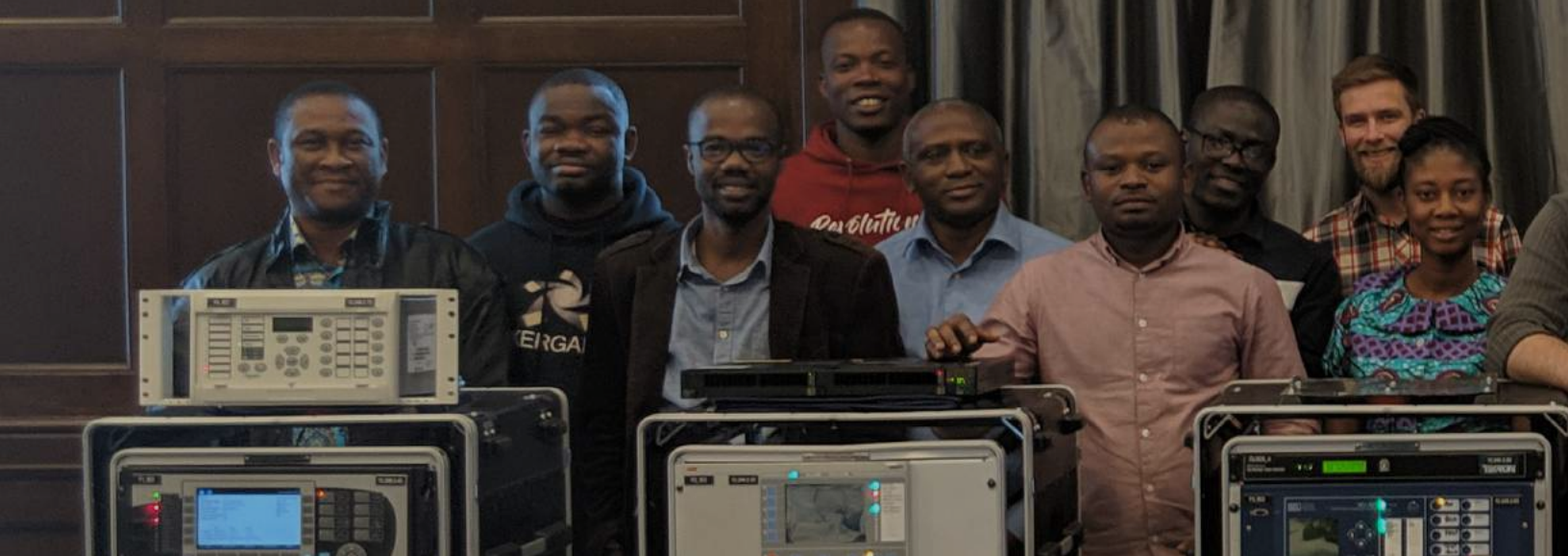
Tesco Mechanical



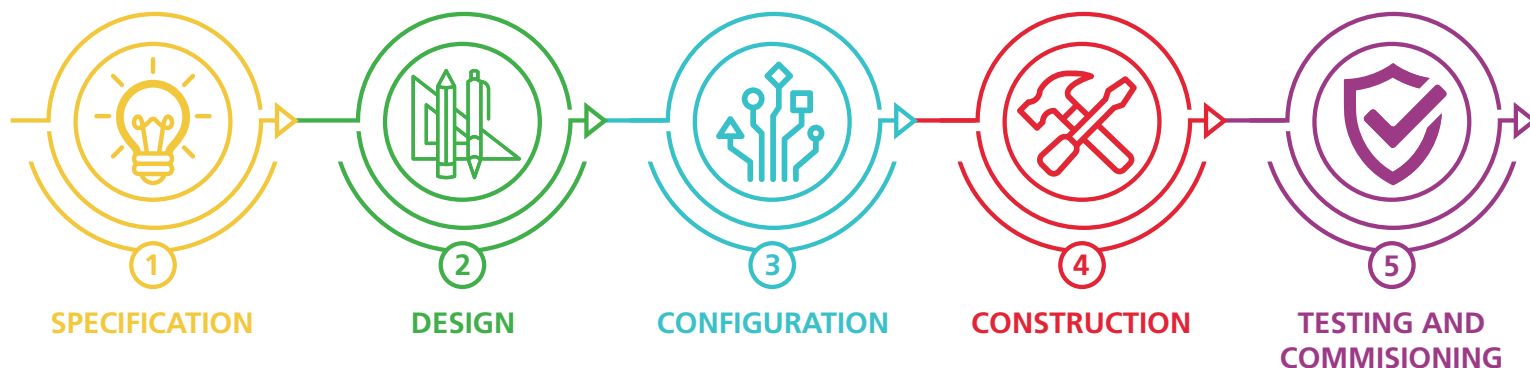
MECHANICAL CONTRACTOR SERVICES

- * HEAVY-INDUSTRIAL WELDING & FABRICATION
- * MODULAR CONTROL BUILDINGS
- * FABRICATION & ERECTION OF SUBSTATION STEEL STRUCTURES & ELECTRICAL APPARATUS

TESCO GROUP CONSISTS OF EACH WITH THEIR OWN COMPANY



TESCO AUTOMATION SUPPLY CHAIN



1. Specification Development

Tesco has over 30 years of hands-on experience specifying, designing, and testing substations, where we have gained proficiencies with all major IED vendors.

- Provide front-end IEC 61850 technical support including the development of business cases, functional and technical design specifications, system architectures, and IEC 61850 application modelling services
- Technical specification development for a major North American utility's next generation of bulk transmission stations (115kV and above).
- Development of high-level requirements and policies for deploying energy storage systems (ESSs), based on latest research & industry best practices. Goals may include renewable integration, reliability, stability & customer service.

- Define requirements and plan strategy for a utility's smart meter (Advanced Metering Infrastructure) roll-out, including reviewing industry best practices and use cases. The Tesco team has been involved in smart meter use case development and analysis since 2005.
- Facilitating requirements development and holding use case workshops.
- Reviewing functional specifications.
- Interacting with vendors and helping to develop vendor specifications.

Developing a new specification for how Distributed Energy Resource (DERs) will connect to a utility based on the new standards IEEE Std 1547-2018 and the AN2018-001 DNP3 profile for Communications with DERs. DERs may include small renewable generation or energy storage systems. Tesco edited and helped author the IEEE AN2018-001 specification.

OF 5 BUSINESS UNITS, RE COMPETENCY.



2. Design & Engineering

At Tesco we provide world-class consulting services in the fields of Substation & Distribution Automation, IEC 61850, DNP3 and other grid modernization technologies.

- Developing system design documents and architecture diagrams.
- Acting as solution architects for portions of the system and developing technical architecture.
- Facilitating and editing the development of grid modernization strategies and roadmaps, including deployment strategies for Digital Substations.

3. Configuration & Programming

- Parameterization of protection, control & SCADA IEDs (via IEC 61850 methods).
- Parameterization of protection, control & SCADA IEDs (via traditional methods).
- Configuration of multi-vendor HMI, RTU, data concentrators, PLC & DCS applications.
- Design & implementation of cyber security architectures and policies.

4. Construction & Fabrication

- Turn-Key control buildings fitted out with protection, control and SCADA panels, complete with battery chargers and banks.
- Engineering, procurement and construction services for the power system, oil & gas, and industrial sectors.
- Tesco's vertically integrated services allow for the bulk of the construction and management to be completed via Tesco's internal resources, which provides a cost-effective delivery model.
- Modular control building design and fabrication.
- **Designing, constructing and commissioning of digital substations.**

5. Testing and Commissioning

- Testing of IEC 61850 process bus system, including lab and field demonstrations.
- New IEC 61850 PLC platform lab testing.
- GOOSE & sampled value testing procedures.
- Factory acceptance testing & commissioning services.
- Site acceptance testing & commissioning services.



PAST PROJECTS

1. Southern California Edison



FAT services for largest, multi-vendor IEC 61850 substations

Supplied and Installed Cabling & FAT Testing Services for One of the Largest Multi-Vendor IEC 61850 Substations in North America.

2. Hatch & Evraz



Turn-key substation - from breaking ground to energization

Complete EPC offering of design, procurement and construction, powering the newest rolling mill in Western Canada.

3. Southern California Edison



IEC 61850 PLC Migration Project

Provided IEC 61850 Engineering and Testing Support for SCE's PLC Migration Program.

4. Entergy



New Orleans IEC 61850 process bus evaluation

Completed the design, configuration and testing of Entergy's IEC 61850 Process Bus Lab Demonstration, which emulated the P&C functionalities from their traditional/legacy design, while integrating value-added features such as IEC 61850 based Reverse Blocking Schemes, Automatic-Fast Bus Transfer, and GOOSE Supervision using the latest Ed.2 features.

5. Southern California Edison



IEC 61850 Operational & Maintenance Manuals

Developed operational and maintenance manuals for use by operators and technicians, covering the IEC 61850 system. Included dedicated chapters for each device and "Troubleshooting Tips" for how best to identify and resolve IEC 61850 related issues.





SPECIFICATION



CONSTRUCTION



DESIGN



TESTING AND
COMMISSIONING



CONFIGURATION

THIS IS WHERE WE FIND LOYALTY INNOVATION

6. Southern California Edison



California IEC 61850 Process Bus Technology Evaluation

Evaluated process bus functionality of each major IED vendor's products, through the development, execution and reporting of custom IEC 61850 process bus test procedures.

9. Southern California Edison



IEC 61850 Consulting & Technical Support

On-going provision of engineering and testing support using IEC 61850 technology for SCE's Grid Technology and Modernization, and T&D Automation departments.

7. Southern California Edison



California IEC 61850 Process Bus Pilot Project

Provided IEC 61850 testing support and test procedure development for multi-vendor process bus pilot project, including sampled values from NCITs and stand-alone merging units.

8. Southern California Edison



California IEC 61850 Substation Automation Architecture

Assisted in the development of the Functional Design Specification (FDS) and Technical Specifications (TS) for the updated IEC 61850 station automation architecture (SA-3).



HERE CUSTOMERS AL, FLEXIBLE AND OVATIVE SERVICES

10. CONCO



IEC 61850 GOOSE Testing Support

IEC 61850 GOOSE testing support for a major South African system integrator, including production of detailed test procedures.



11. Southern California Edison



Grid Modernization Architectural Design

Systems and solutions architect within a massive second-generation grid modernization effort that includes operational systems (advanced distribution management, SCADA, outage management, field area network, DER management) and engineering and planning systems (automated load profile development, forecasting, systems analysis, risk mitigation, project portfolio development and evaluation). Facilitated requirements development and use case workshops, developed system design documents and architecture diagrams, and reviewed functional specifications for architectural issues.

12. EPRI



Protocol specification for DNP3 communication with DERs

Developed a new specification for how Distributed Energy Resource (DERs), such as small renewable generation or storage systems, will communicate with a utility. The "AN2018-001 DNP3 Profile for Communications with DERs" is based on the new standard IEEE Std 1547-2018, the EPRI document "Common Functions for Smart Inverters Edition 4", and IEC 61850-7-420, and has been officially published by the DNP Users Group on www.dnp.org. Developed a gap analysis between this document, IEEE Std 1547, and a utility's existing interconnection specification, and served as editor of the new version.



13. SaskPower



Grid modernization reference architecture

Facilitated the development of a grid modernization reference architecture specification and served as editor, including detailed description of use cases and data flows.

14. SaskPower



AMI and energy storage use case analysis

Developed summaries of possible use cases for Advanced Metering Infrastructure (AMI) and Energy Storage Systems (ESS) from research and industry experience, and facilitated stakeholder workshops regarding which use cases would be applicable.

15. Collaboration with CalPoly University



IEC 61850 University

Tesco is excited to have formed a collaboration between IEC 61850 University and CalPoly University in Southern California! We have incorporated our IEC 61850 training offering - including our Mobile Digital Substation - into CalPoly's College of the Extended University.

16. Meralco, VECO, Daveo Power, Aboitiz Power (Philippines)



IEC 61850 University

Provided IEC 61850 Training Services in the Philippines.

17. Altalink, ATCO, SaskPower (Canada)



IEC 61850 University

Provided IEC 61850 Training Services in Canada.

18. SCE, ConEd, Entergy (USA)



IEC 61850 University

Provided IEC 61850 Training Services in the USA.



IEC 61850
UNIVERSITY

TRAINING • TESTING • CONSULTING

www.61850university.com

EXPERT AND ACTIVE GLOBAL LEADERSHIP

Tesco is actively involved in many standardization activities, and we are your source for accurate IEC 61850 and DNP3 material. We actively participate in the following:

Canadian Chair of IEC 61850 (Substation Automation)
Canadian Chair of IEC 62351 (Cyber Security)
Canadian Chair of IEC 61968 (Common Information Model)
Canadian Chair of IEC Smart Energy Systems Committee
Technical Expert of IEC 61869 (NCIT/SAMU)

19. Australia Training - Endeavour Energy, Powerlink, TasNetworks, SAPower Networks.



IEC 61850 University

Provided IEC 61850 Training Services in Australia.

20. Africa Training - Ghana Electricity A



IEC 61850 University

Provided IEC 61850 Training Services in Africa.

IEC 61850 UNIVERSITY

- The 61850 University is your source for accurate, consistent, current, and practical IEC 61850 information
- Faculty is actively involved in various IEC Working Groups, IEEE and CIGRE initiatives
- Experience providing vendor-neutral IEC 61850 training courses with a practical hands-on workshops
- Real-world experience delivering IEC 61850 specification, engineering and commissioning related deliverables
- Custom build Mobile Digital Substation deployed world-wide for hands-on training with the latest equipment from all major vendors



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