



Consulting Services for GE Transmission and Distribution product lines

System Administration Consulting Offerings

Systems Administration

This service applies to all Transmission and Distribution products (eterra, PO Reliance*, PO Advantage/ADMS Series 6)

Duration: 5-10 days

Location: On-Site and Off-Site

Key Customer Benefits:

- Improved system performance
- Improved customer staff knowledge in configuring, maintaining, and troubleshooting

Description:

The consultancy services address all aspects of system administration and management relating to Digital Energy products. Beyond the structured

Technical Training courses, our SMEs provide customers with expert advice relating to:

- System health checks
- System configuration
- System maintenance
- Customer-led updates
- Troubleshooting
- Tuning
- Analysis and troubleshooting to identify performance issues
- Customer staff mentorship in maintaining Digital Energy products

User Account Propagation Implementation

This service applies to eterra Transmission and Distribution products

Duration: 15 days

Location: Off-Site

Key Customer Benefits:

- Benefit from synchronized AD and PERMIT functionality

Description:

The UAP implementation service addresses the synchronization of Microsoft's Active Directory (AD) with Habitat PERMIT. Our SMEs provide customers with expert advice relating to:

- Review Customer System to determine custom requirements

- Define any custom requirements (scope of customs) in the production system
- Provide specifications to create Active Directory User Groups relative to PERMIT User Database
- Provide User Account Propagation scripts with guidance on best practices
- Support customer in the implementation and testing of scripts
- Tune active directory configuration and user groupings
- Tune, configure, and UAP implementation
- Review final PERMIT database and revise process as needed
- Develop and implement any custom requirements identified above



Systems Health checks

This service applies to all Transmission and Distribution products (eterra, PO Reliance* , PO Advantage/ADMS Series 6)

Duration: 5-10 days

Location: On-Site and Off-Site

Key Customer Benefits:

- Benefit from expert analysis of system health
- Receive knowledge transfer so that health checks may be performed by customer staff (internally)

Description:

The System Health Check service provides the customer with an expert analysis of their system performance and provides solutions to improving that performance. The SME will prepare for the health check remotely by providing scripts to the customer:

- Prepare and supply health check scripts
- Review and analyze results from scripts
- Provide summary report of findings on health of the current system

The SME will visit the customer site to provide:

- Workshop:
 - Review summary report of system health check with customer
 - Prioritize issues that have been identified
 - Provide approaches/solutions/best practices to address any health check concerns that have been identified
- Support to implement a selection of solutions for the high priority issues in remaining time

Customer-based Updates and Upgrades

This service applies to all Transmission and Distribution products (eterra, PO Reliance* , PO Advantage/ADMS Series 6)

Duration: 10-15 days

Location: On-Site and Off-Site

Key Customer Benefits:

- GE SME available to provide expert advice on upgrade/update process
- Additional short-term expert resources to complete the process in a timely manner

Description:

The Customer-based Update and Upgrade service provides the customer with technical assistance in upgrading their system but is not intended to replace a full-service upgrade.

- The SME will prepare the customer for the update and upgrade remotely by:
- Reviewing the existing system

- Identifying minimum software revisions required for this system
- Determining the most appropriate upgrade path
- Providing a summary report on the most appropriate software requirements and upgrade to be implemented
- Advising customer on downloading the required software

The SME will visit the customer site to:

- Assist customer personnel in updating software version to the most appropriate version
- Assist customer personnel in testing system operation and refining as necessary
- Assist customer personnel in testing and verifying fail-over to the backup system
- Advise customer on creating any scripts or other tools necessary to automate this process



Modeling Consulting

Source Consulting

This service applies to all eterra products

Duration: 5-10 days

Location: On-site and Off-site

Key Customer Benefits:

- Use best practices in customer modeling processes
- Provide techniques for more efficient modeling

Description:

Improved customer staff knowledge in Source. The consultancy services address all aspects of database modeling using Source and related SWS products. Beyond the structured Technical Training courses, our SMEs provide customers with expert advice relating to customer-specific modeling processes and database deployment. Some of the activities that our SMEs can assist with are:

- Evaluate existing modeling process flow, enhancing with best practices and plan improvements
- Set up model workspace for optimum resource usage and optimum modeling
- Provide best practices in modeling SCADA and Network systems concurrently including:
 - Make the best use of SCADA and Network containers
 - Review Table usage with respect to concurrent modeling
 - Apply federation of modeling details through SCADA and Network hierarchy
 - Understanding federation of the Generator through Network and SCADA
 - (Optional) Modeling PV and Wind
 - (Optional) Templates for modeling PV and Wind
 - Ensure customer staff are skilled in Generation Telemetry Templates (mapping measurements from SCADA to Gen)
- Developing Templates to improve efficient modeling. This includes:
 - Using Templates for efficient modeling
 - Ensure customer staff are well-versed in the process of creating a Template
 - Review creating a Template for an ACLineSegment
 - Understand creating a SCADA-only Template
- Model merges
- Metamodeling to improve efficiency in UI Interface

- Observe current processes and advise on more efficient approaches
 - Preferred methods of data export
 - Ensuring best validation processes
 - Implementing best practices
 - Use of modeling tools
 - Managing project lifecycles
 - Customer staff mentorship in maintaining SWS products
 - Review modeling processes setup and implementation, including the unique needs of the customer system and environment. Included in this are:
 - Project naming conventions
 - Project lifecycle
 - Mapping from Habitat database to source
 - Review database deployment detailed processes. This includes:
 - Project organization
 - Project dependencies
 - Ensure SCADA modeling is efficient and well implemented. This includes review and improvement of:
 - Measurements and mapping
 - RTU and Front End Modeling
 - Use of Excel and Templates for RTU Modeling
 - SCADA as a client of Alarm
 - Block Load shed, and Rotating Load shed modeling
 - SCADA best practices and things to avoid
- Refine Network Modeling to include
- Optimize Sequencing of Network Modeling
 - Develop separation of modeling functions into different Projects
 - Review Templates for LINES and ACLineSegments for correct use
 - Review of Various methods to create a new Substation
 - Assist customer staff in the creation of a Substation using Deep Clone
 - Assist customer staff in creating a Substation using Graphic Modeler
 - Modeling CTGS in ETS
- Review Generation Modeling to include
- Assist customer staff in creating a new Generator using Deep Copy or Deep Clone



Display Building

This service applies to all Transmission and Distribution products (eterra, PO Reliance*, PO Advantage/ADMS Series 6)

Duration: 3-6 months

Location: On-site and Off-site

Key Customer Benefits:

- Use best practices in customer display building processes
- Provide techniques for more efficient display building

Description:

Improved customer staff knowledge in FG Builder, Substation Editor, and Reliance Display Editor. The display building service addresses all aspects of developing displays for GE's products. Beyond the

structured Technical Training courses, our SMEs provide customers with expert advice relating to:

- Displaying project planning and design
 - Reviewing existing legacy displays and advise on updates using best practices
 - Providing planning of display standards
- Developing display elements and prototypes to provide optimum results
- Building and linking displays to databases
- Providing business processes for maintenance, update, and support of displays:
 - Revision control best practices
 - Define maintenance/configuration control/update process
- Mentoring customer staff in the use of display building tools

Advanced Applications Consulting

Power/Network Applications

This service applies to all Transmission and Distribution products (eterra, PO Reliance*, PO Advantage/ADMS Series 6)

Duration: 3-5 days

Location: On-site

Key Customer Benefits:

- Enhance skill sets of customer Network Applications staff by collaborative development of the use of power system analysis
- To have access to additional short-term resources to meet immediate needs in power system applications

Description:

Power or Network Applications consulting areas include 1-on-1 mentorship with customers to demonstrate and coach the use of best practices and understand the resulting information from studies (beyond formal technical training).

More advanced opportunities include optimization of the system, use of state estimating, best practices using Power Factor Analysis, advanced Contingency Analysis, and Voltage Transient stabilization. In addition, options include assisting customers with (external) model replacement or improvement, and observability analysis (advice on placement of measurement points).

This can also be linked with the use of the DTS to obtain meaningful results from Power System Studies.



Simulator Applications (DTS/DOTS)

Simulator Applications (DTS/DOTS)

This service applies to all Transmission and eterra Distribution products

Duration: Driven by customer requirements

Location: On-Site and Off-Site

Key Customer Benefits:

- Improve operations and leverage available functionality of the software simulator
- Improve simulation experience for end users and provide a more realistic training environment

For DTS:

- Provide knowledge transfer to customer instructional staff to train and prepare the operators for reliable operation and control of the grid (NERC-PER-005 or international equivalent certification) and Outage response/Restoration drills (NERC-EOP-005 or international equivalent) certifications

For DOTS:

- Provide knowledge transfer to customer's instructional staff to train and prepare the operators for internal certification programs
- Provide storm response training at corporate level

Description:

Consulting on advanced uses of the DTS and DOTS applications to enhance the skills and confidence of end-user trainers in customer's organization. GE SMEs will provide mentorship and advanced knowledge transfer to customer trainers so that Operators and Dispatchers carry out their roles efficiently and successfully.

Phase I activities include:

- Initial customer meeting, understanding specific use case scenarios
- Clone the DTS/DOTS environment on the GE customer support system to provide a credible test platform for any software fixes that may be necessary
- Test DTS/DOTS to ensure it is working properly (ensure DTS/DOTS starts up, cycles and simulation time is advancing)
- Perform an initial Health Check of DTS/DOTS System

- *Work with Customer staff to correct any issues discovered*
- *Ensure that the DTS/DOTS is a satisfactory representation of the production environment*
- *DTS specific: Data Model Tuning. Tune data per customer's requirements*

- Document issues uncovered and suggest corrective actions. Work with customer staff to address any issues discovered
- The GE SME will provide recommendations on best practices with regards to keeping the simulator in sync with production, initializing from snapshots of state estimator and/or power flow save cases, and modeling scenarios for realistic training setup. Customer will implement GE recommendations on their own or include requirements in Phase II for GE SME to implement.
- Training courses for DTS/DOTS Instructor and Support Staff (up to 25 training credits included)
- For DOTS Storm readiness training: Identify scenario types (for example storm preparation training based on archived data information or hypothetical statistical damage data)

Phase II activities include (but are not necessarily limited to):

DTS specific:

- The GE SME will assist in designing Black-start scenarios and restoration procedures to create the most realistic situations for customer's trainees. Tuning scenarios and cases for best training performance. This tuning includes the modeling and review of Black-start units to properly handle aspects of grid synchronization
- The GE SME will provide modeling consultancy to help simulate the customer's network analysis applications (state estimation, real-time contingency analysis, power flow studies, automatic generation and control), load shedding procedures and/or other critical operational procedures on the DTS. Depending on the nature of devices involved and level of realism expected, such simulation may require consideration of software enhancements. Tuning power system model to represent utilities equipment
- Where applicable, the GE SME will discuss the scope and requirements for coordinated simulation scenarios such as with neighboring



utilities, ISOs or with another simulator. Depending on the nature of the requirements, software enhancements may need to be discussed and implemented at customer's discretion

DOTS specific:

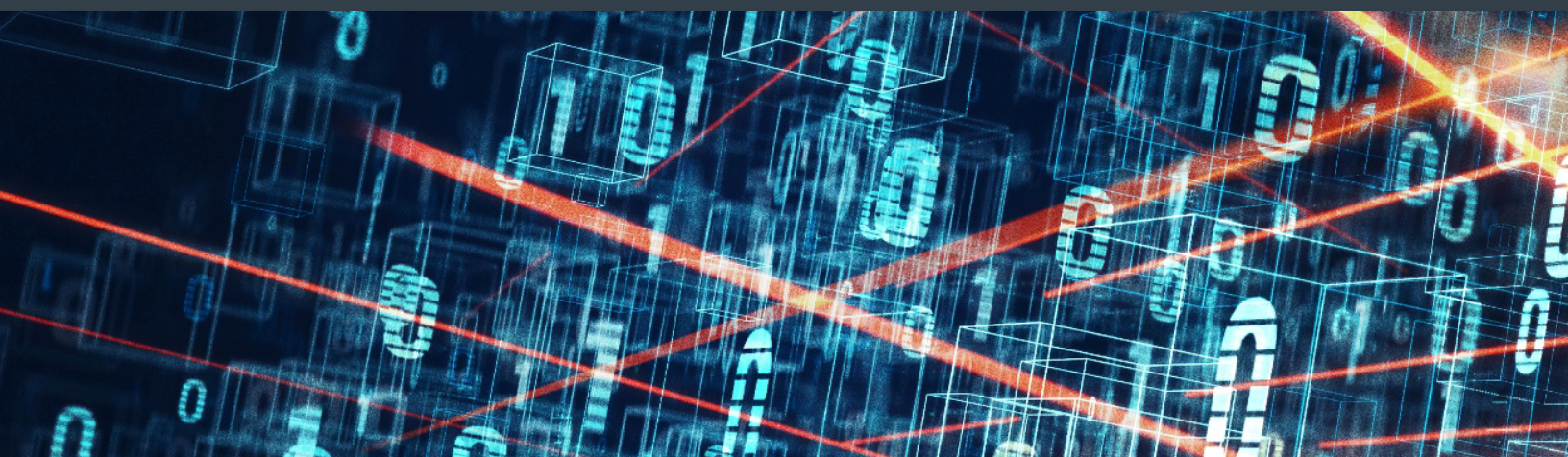
- The GE SME will assist the customer in designing test scenarios and restoration procedures to create the most realistic situations for customer's trainees. This tuning includes the modeling and review of any existing scenarios to ensure they are operating properly
- The GE SME will provide modeling consultancy to help simulate network analysis applications, load shedding procedures and/or other critical operational procedures on the DOTS. Depending on the nature of the devices involved, such simulation may require consideration of software enhancements depending on the level of realism expected
- Where applicable, the GE SME will discuss the scope and requirements for

coordinated simulation scenarios such as with the Transmission simulator for training on major power system event restoration training. Depending on the nature of the requirements, software enhancements may need to be discussed, and implemented at customer's discretion

- For Storm readiness training: Creation of test case scenarios based on archived data information or hypothetical statistical damage data

For DTS and DOTS:

- Set up the training scenarios using customer models
- Testing of scenarios
- Investigate and triage software and model issues found during this service
- Develop training procedures and manuals for customer-specific cases. Create customer-specific processes for maintaining up-to-date training schedules
- Develop and tune fault line scenarios





Data Archiving

This service applies to PO Advantage/
ADMS Series 6

Duration: Driven by customer requirements

Location: On-site and Off-Site

Key Customer Benefits:

Are you concerned about the performance of your system and the volume of data stored? Are you confident all the data maintained is actively being used by your application? Are you looking to optimize your hardware and eliminate unnecessary constraints? This service can achieve it all.

- Improve operations and performance
- Optimize existing software and eliminate unnecessary hardware cost

Description:

With the Data Archiving Service solution, our subject matter experts apply technology knowledge to deliver a preventive maintenance program that provides an appraisal of the Application Database within the Network Management System servers replicated environment. The review can be carried out on-site or remotely by experienced GE technical staff. The Service is designed to ensure that your live system database contains the largest amount of relevant operational data without impacting the storage and performance capabilities of the system.

This service is comprised of three phases (Discovery, Design, and Implementation).

Phase I Discovery

In the initial phase, the Archive Service will comprise the following tasks to accomplish the data gathering, analysis and archiving data based on the problem statement. Activities included in this phase:

- Kick-off & Planning Meeting
 - User review sessions for performance and/or stability concerns
- Review Image Management / System Concerns (Admin and User input)
- Gather initial system structure, environment, and database information
- Configuration of GE analysis tools and data capture using SQL queries

- Table analysis based on the data captured
- Review current archiving policy if applicable
- Application Analysis
- Assessment and Recommendation Report

An Assessment and Recommendations report will be provided at the end of this phase.

Phase II: Design and Preparation

Based on the Assessment and Recommendations Report from Phase 1, a design for the new Archive Database policy will be determined which will include activities such as schema design, scheduled tasks, and configuration. Application areas that we are going to archive data from are Alarms, Jobs, Incidents, Events, and other key elements within system.

- Design profiles: <Customer Name> will work with GE and design ADMS profiles for each table to be archived based on agreed retention period
- Prepare scripts/tools used for archive validation and updates
- Identify repository location for the archived data

A report for the new architecture overview will be provided at the end of this phase.

Phase III: Implementation

During this phase our SME will implement the newly designed archive solution in the QA environment and validate the archive solution meets the requirements (based on retention period and data types).

Following validation of the solution in the QA environment, the newly designed archive solution will be deployed in the Prod environment.

Contact Us
premier.services@ge.com

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