



Smart ADMS Testing framework

Build resilient grids by smartly implementing ADMS

Introduction:

As residential and commercial power usage and requirements continue to evolve, so do the complexities and reliability needs of the modern distribution networks – which are expected to deliver resilience in the face of natural disasters, reliability and improved power quality – including rising complexity from prosumers who continue to disrupt traditional energy capacity through generation from alternative resources like solar, battery and wind. Gaining real-time visibility into the distribution networks becomes crucial to quicken FLISR (Fault Location, Isolation and Service Restoration) and optimize grid performance. This forms the groundwork for Advanced Distribution Management Systems implementation – an integrated software platform that can enable rapid FLISR, demand management, VAR (volt-ampere reactive) optimization – transitioning paperwork, manual processes and siloed software systems to systems driven by real-time data resulting in automated data-led processes.

As Utilities drive grid modernization programs, including deploying ADMS solutions, testing assumes prime importance whether it is a full implementation, an upgrade, adding or updating an integration, or installing a maintenance patch to a distribution management system that must build confidence by delivering improved performance under stress or heavy loads and accurate outage predictions. The information must be timely and reliable, otherwise faulty switching, grounding, and tagging information could jeopardize repair crew safety – and a utility simply cannot afford sluggish performance, system failures in the face of a diverse set of environmental conditions.

Drivers for ADMS Testing:

Global utility OMS spending is expected to total nearly \$11.8 billion across 2014 to 2023 while global ADMS revenue is expected to grow to \$3.3 billion in 2024

Appropriate warning and violation notifications must be produced. Outages must predict to reasonable devices at the proper speeds Approximately 400 Utilities in US market will go through grid modernization and will need to establish ADMS test labs in a phased manner in next 3-4 years

ADMS must fully support end-to-end business processes. All integration flows must properly function and should be responsive

*Electricenergyonline.com article *US Dept. of Energy, Insights into ADMS report



The **Smart ADMS Testing (SAT) framework by IoT WoRKS™** successfully enables end-to-end planning, management and execution of full-lifecycle ADMS Testing Cycle for utilities customers using Agile methodology. This covers in its scope Functional testing, Integration testing, System Integration testing, Security, Performance testing and User acceptance testing. This framework allows IoT WoRKS[™] to leverage a Testing Competency team from ERS, Power Engineering domain experts, and testing automation tools such as **eDAT, CoSiNe, TAF (Test Automation Framework), Intelligent Test Automation (iTF)** as needed by utilities customers. The well planned **SAT framework** enables effective implementation of ADMSs' for utilities, that respond to high stress and heavy use, ensuring that high availability/failover work as expected – creating robust, responsive systems that can stand up to stresses from heavy loads and diverse, challenging environments – delivering high grid performance, reliability and resilience that match up to end customer expectations and requirements.

Tools and Capabilities



- **Grid Simulator:** A tool-agnostic model-based software simulator that can simulate grid behavior in different scenarios and provide digital and analog telemetry input to ADMS
- Triangle-DTM: A COTS tool for building grid simulation models including substations in the Distribution Grid and other field devices such as Voltage Regulators, Circuit Breakers, Reclosers, Sectionalizers, Static VAR Compensators
- **Optimus:** A Test Automation Framework that is an analytics-based automation suite to test the product lifecycle of field devices in the grid. Possesses the ability to automate and accelerate testing cycles at scale. Features include Test-case Management, Defect Management, Script Generation, Automated Execution and customized test execution engines for web, mobile and desktop environments
- **CoSiNe:** Smart Meter Simulator to simulate smart meters in the Grid
- Load Runner: Enables performance testing
- HP-ALM or X-Ray Plug-in for Jira: Test lifecycle management
- HCL (IBM) Rational or HP-UFT or Selenium (OS): For Test Automation using test automation scripts

Offering Highlights:

Ability to predict outages to reasonable devices at the proper speeds

Automation brings in 30% saving in effort and cost of ownership

Ensures that application is responsive under high stress and heavy use by multiple simultaneous users

Validated data-field-mappings, connecting the data in the source system (e.g., GIS) to where it is used in OMS/EMS/ADMS



Functional Testing: Validation of ADMS product configuration, business rules, UI Navigation. Interface testing with external systems and System & Integration Testing

Field Device Testing: Validation using Smart Meters, RTUs/IED – Substation & Feeder Lines

Integrated Systems: Enables rapid FLISR, Volt/Var Control (VVC), Unbalanced Power Flow (UBPF), Outage Management



Ensure Best Practices: Enable industry best practices in ADMS testing – carried out by planning, managing and executing full-lifecycle ADMS Testing Cycle for clients using an Agile method

Quicken Time to Market: Tools and frameworks helps in reducing testing effort and timelines

Improve Success Rates: Well defined methodologies help reduce risks and improves success rate of ADMS implementation

Enhance Productivity: Improves overall ADMS testing efficiency and resource productivity

Build Resilience: Power reliability and resilience in the modern distribution network capable of catering to changing end-customer needs

Enhance Customer Satisfaction: Eliminate power outages, reduce restoration times, build reliability and drive higher end-customer satisfaction

Recognitions, IPs + Accelerators



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