

Managing Engineering Data and Documents for a New Global Petrochemical Plant Complex



One of the world's leading petrochemical manufacturers is building a global complex for the manufacture of ethylene products. The complex consists of six separate plants engineered by five different contracting companies.

The engineering and design effort generated approximately 2,400 piping and instrumentation diagrams, 100,000 tags, and 250,000 documents, many through the use of Intergraph's SmartPlant Foundation (SPF) software and Aspen Technology's Aspen Basic Engineering. Essential for continued safety, maintenance, planning, and regulatory purposes, the engineering data is needed for reference during and after the project. The answer is a centralized repository of engineering data generated by the SmartPlant software and other applications as part of data handover to the Owner Operator

Implementing an electronic data and document management system

Rolta engineers were engaged to ensure the creation of a seamless and integrated electronic data and document management system. The engineers audited the SmartPlant databases from each plant against company standards. Each application tool had its own database — SmartPlant Piping and Instrumentation, SmartPlant Instrumentation, and SmartPlant Electrical Diagrams. To consolidate the databases, all data

had to be normalized. Data was validated and custom attributes were mapped using the SmartPlant Foundation software. Providing an open, independent data storage system, SPF forms the common architecture backbone used for the integration hub, the SmartPlant tools, and change management. Engineers also audited the metadata and indexes for non-SmartPlant documents.

Rolta's Quality Check and Data Publisher system

Non-SmartPlant data posed a challenge to the data integration effort. Rolta engineers developed a Data Publisher system to retrieve the relevant engineering information from Aspen Basic Engineering (Zyqad) to an intermediate format and then publish to SPF. Rolta engineers also developed a quality check system (QCS) to validate the data imported from Microsoft Excel spreadsheets, help ensure that it meets company standards, and generate load files with a standard syntax for inclusion in the central repository. Data objects such as tags and documents, associated files, and the relationships among the objects were maintained. Once the QCS was developed, non-SmartPlant data and documents were bulk loaded to the repository. To complete the bulk loading process, SmartPlant data and documents were published to the SPF software.

Handling Management of Change Workflows

Capturing the client's procedures and best practices and developing workflows to replicate them is important. Maintaining the accuracy of essential plant engineering, maintenance, and operations data is crucial to safe and efficient plant operations.

Traceability of plant changes and auditability of the management of change (MOC) process is essential for demonstrating compliance with regulatory requirements. As part of the repository development project, Rolta engineers developed a workflow system for managing document and plant changes that incorporates best practices for change management.

Improved data search productivity

At the project's conclusion, the Rolta team delivered a central data repository for the six manufacturing plants to the client. Now, all engineering data and documents can be searched

through a single SPF window and are associated with the proper plant and unit, tags, and related reference files. Search times for data and documents is drastically reduced, and the repository supports data and documents from SmartPlant tools as well as other software

Tasks Performed

- Created a centralized repository to contain all engineering data and documents associated with the proper plant or unit, tags, and related reference files
- Developed a system and a methodology for integrating Aspen Basic engineering data with SmartPlant Foundation.
- Produced a workflow system to manage document and plant change requests
- Audited, validated, and mapped database elements for successful integration
- Developed a system for bulk loading into the repository

Implementing Automation and Best Practices

- Drastically reduced search times by automating searches for data and documents that can be performed within a single data store.
- Formulated a procedure that incorporates best practices for handling document and plant change requests

By implementing this comprehensive solution, the customer was able to

- Effectively manage all the data and documents in a single environment.
- Streamline procurement and ensure accurate material quantities, eliminate costs
- Have access to the right data and documentation at the right time.
- Bridge the data handover gap between engineering and maintenance operations

About Rolta

Rolta International, Inc. is the U.S. subsidiary of Rolta India Limited, a multinational engineering consulting organization that has executed projects in over 35 countries over 25 successful years. With more than 4,000 professionals around the globe, Rolta is a leading provider of engineering design services and developer of information technology-based, software development, advanced security

and network management, and enterprise resource planning (ERP) consulting and deployment services worldwide. With an unrelenting focus on client perspectives for success resolution, Rolta offers a complete range of advanced engineering design services for cost-effective and state-of-the-art solutions tailored to suit the specific needs of manufacturing and engineering customers.