

# SMARTPLANT<sup>®</sup> ENTERPRISE FOR OWNER OPERATORS

LEVERAGING THE ENGINEERING DESIGN  
BASIS ACROSS THE PLANT LIFE CYCLE







# BUSINESS CASE

## OWNER OPERATORS

currently face unprecedented demands to:

- Deliver multiple new plants and major expansions of existing facilities more rapidly while utilizing finite resources
- Maintain adequate safety levels
- Deliver projects on schedule and within rigid budget constraints
- Manage time to market and deliver a high-quality product in a competitive environment
- Create facilities flexible enough to meet market demands in production and product offerings
- Avoid adversely impacting the functionality and production of the existing plant while undertaking complex plant modifications
- Maintain safe, predictable production levels from existing plants, at the lowest sustainable cost
- Demonstrate to regulatory authorities the integrity of plant-maintained information
- Provide assurance that the owner operator's "virtual plant," in-plant documentation, and IT systems are consistent with the current physical state of the plant in operation
- Demonstrate that a controlled management of change (MOC) process with auditable traceability is enforced within plant operations
- Retain plant knowledge and experience in the face of increasing rates of workforce retirement

One barrier owner operators face in meeting all of these challenges is interoperability. Interoperability can be defined as the ability to manage and communicate electronic product and project data between collaborating firms and within an individual company's design, construction, maintenance, and business process systems.

The National Institute of Standards and Technology (NIST) report<sup>1</sup>, which examined the cost of inadequate interoperability in the U.S. capital facilities industry alone, estimated the cost of poor interoperability across the complete design, build, and operate supply chain to be US\$15.8 billion annually for a total capital expenditure of US\$374 billion, or a loss of 4.2 percent of the installed cost.

Two-thirds of this loss is estimated to be borne by owner operators and represents a 2.8 percent ongoing loss on Return on Capital Invested (ROCI). For a large refinery, this represents a loss of millions of dollars each year.

Owner operators must find a way to address these interoperability issues, while focusing on their core businesses of exploration and production. Intergraph® SmartPlant® Enterprise for Owner Operators has been designed to help owner operators address the issue of interoperability by providing prepackaged solutions that can be rapidly rolled out, incorporating customer-specific requirements at low risk.

## Key features

- Rapid, low-risk implementation ensured by leveraging industry-leading, proven Intergraph Smart Technology tools and out-of-the-box preconfigured, best-practice solutions for key owner operator work processes
- Flexibility to rapidly incorporate customer-specific requirements within predefined work processes
- Synchronization of information in maintenance, reliability, and other operations' systems to reflect changes to the dynamic plant design basis
- Reduced training needs, discovery time, and better decision-making supported through the universal, user-friendly, role-based Web portal providing seamless access to data across operations' systems
- Flexible platform for third-party and legacy tool integration using leading service-oriented architectures
- Integration and interoperability provided through adoption of leading integration technologies
- Simple access to data through filtered queries and 2D/3D graphical user interface
- Traceability and auditability for key owner operator work processes such as management of change
- Secure, controlled management of data handover from projects and brownfield data take-on using a staging area for the validation, transformation, and loading of operations' systems
- Management of key project execution work processes, such as MOC for projects, interface management, non-conformity/waiver management, and technical query management

<sup>1</sup> Cost Analysis of Inadequate Interoperability in the U.S. Capital Facilities Industry, National Institute of Standards and Technology, NIST GCR-04-867.

## YOUR SOLUTION FOR MANAGING THE ENGINEERING DESIGN BASIS

Throughout the years, many leading owner operators have chosen Intergraph's industry-leading SmartPlant Enterprise integrated suite of tools to manage their dynamic engineering design basis. Building on this success, Intergraph provides SmartPlant Enterprise for Owner Operators (SPO), offering preconfigured work processes covering the complete plant life cycle, interoperability with maintenance and other operations' systems, and a common Web portal designed for owner operators.

### Powered by leading integration technologies

SmartPlant Enterprise for Owner Operators uses leading integration technologies such as SAP® NetWeaver® and Microsoft® SharePoint®. These technologies power the synchronization of data between the engineering design basis and other operations' systems, including legacy systems, and provide the role-based Web portal.

### Managing change to ensure consistency with ERP and other operations' systems

SmartPlant Enterprise for Owner Operators offers interoperability between SmartPlant Enterprise and other operations' enterprise systems. This ensures that information in enterprise resource planning (ERP), reliability, process safety, digital control systems, and more is maintained to reflect change in the dynamic engineering design basis.

Information from Intergraph's SmartPlant Enterprise and other operations' systems will be seamlessly presented to

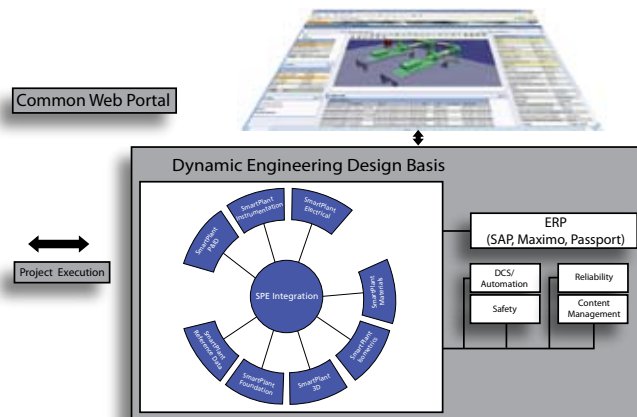


the user via a common, role-based Web portal. This portal will filter and structure search results based upon user role and privileges, reducing discovery time and leading to better, faster decision-making.

## Supporting engineering and managing project execution

During the plant design, construction, and completion/startup phase of greenfield or brownfield projects, SmartPlant Enterprise for Owner Operators provides preconfigured processes to support engineering and project execution work processes. These include document and data interdisciplinary review, management of project change, interface management, non-conformities/waiver management, technical queries, and more. These processes are suitable for both CAPEX projects and turnaround projects.

These processes provide for complete auditable traceability and provide a management overview of the status of these processes on projects, enabling CAPEX cost reductions and compressing project schedules.



A secure Web portal will promote simple access to the “single source of truth” where information and documentation from across the project is assembled in a common, globally accessible repository, eliminating the need for traditional document and data distribution.

## Common plant-centric data model for low risk, rapid implementation

SmartPlant Enterprise for Owner Operators is built on Intergraph’s proven, industry-leading, multi-discipline toolset.

The SmartPlant Enterprise for Owner Operators Core Solution includes a site license for SmartPlant Foundation, SmartPlant Reference Data, SmartPlant Isometrics, and SmartSketch®. Other integrated SmartPlant Enterprise tools such as SmartPlant 3D, SmartPlant Instrumentation, SmartPlant Electrical, and SmartPlant P&ID are licensed separately and can be included as required. These tools are integrated around a common, plant-centric data model and integration hub, ensuring data consistency between tools and facilitating low risk, rapid implementation.

## Project Data Handover and Brownfield Data Take-On

The Validation, Transformation, and Loading (VTL) solution manages:

- Handover and verification of data submitted from contractors and suppliers on projects
- Verification of information from legacy systems or from scanning document files as part of brownfield data take-on

Data is imported into a staging area where it is held in quarantine prior to validation. Many different types of validation rules may be easily configured in the solution to

verify a number of conditions, such as:

- Naming rules have been followed
- Values are within pre-defined ranges
- Units of measure are valid
- Mandatory data is present
- Relationships exist and are valid

More complex business rules can also be defined and data in the staging area can be compared with data already loaded into the target SmartPlant Foundation system as part of validation routines. Validation rules may be run on data submitted and a complete history of which checks have been performed by whom, when, and the results are held in the system. Data can be selectively exported and loaded from the staging area into target systems. These can be Intergraph or third-party systems.

The VTL solution enables improved management of the take-on of data from projects and brownfield facilities, reduces the time and effort needed for verification, and ensures a higher level of data quality.

## **SOLUTIONS SUPPORT THE COMPLETE OWNER OPERATOR LIFE CYCLE**

Each SPO solution will include business packages that offer preconfigured owner operator work processes.

These business packages will be released in phases and are expected to offer a 60- to 80-percent fit for most owner operators. The work processes can be easily and rapidly adjusted to meet the specific needs of any customer.

# **POWERED BY SAP NETWEAVER, CERTIFIED BY SAP**

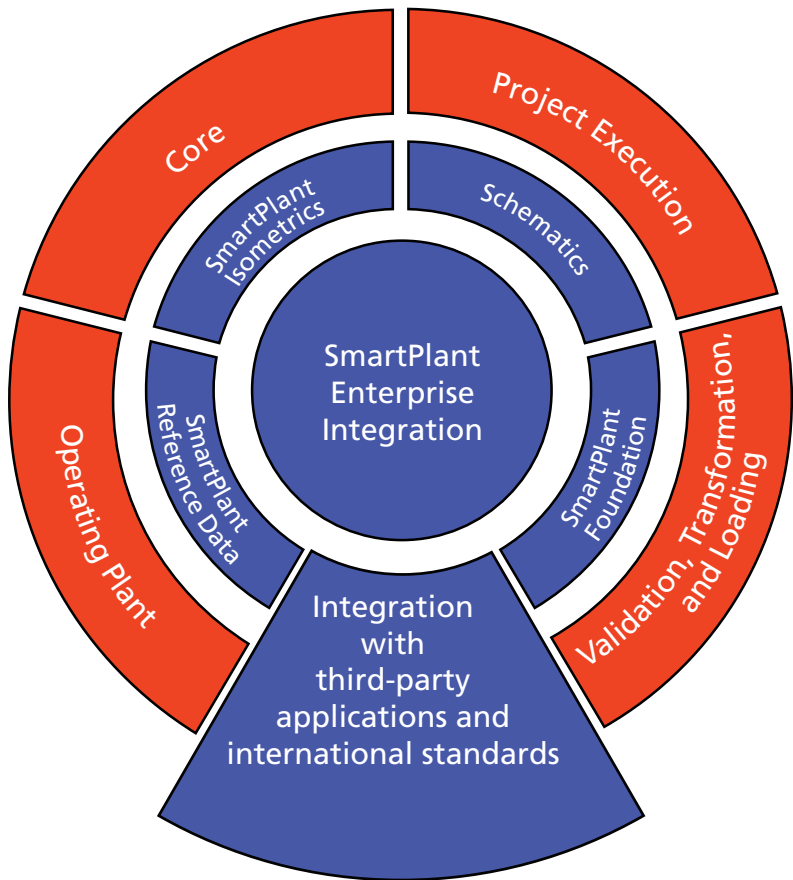
SPO supports SAP NetWeaver and integration with SAP Service and Asset Management. The SmartPlant Enterprise for Owner Operators integration with SAP has been awarded “Powered by SAP NetWeaver” certification status by SAP AG. SmartPlant Enterprise for Owner Operators exploits the power of the SAP NetWeaver platform to help ensure data synchronization and interoperability between Intergraph’s industry-leading plant engineering automation suite and the enterprise asset management capabilities of the SAP Service and Asset Management solution. SmartPlant Enterprise used with SAP Service and Asset Management (through integration with SAP ERP) helps ensure synchronization between the plant engineering and plant maintenance environments, employing best-practice work processes for plant management of change.

The SAP Integration and Certification Center has certified that SmartPlant Enterprise for Owner Operators properly integrates with the SAP NetWeaver Exchange Infrastructure (SAP NetWeaver XI) component of the SAP NetWeaver platform. It exchanges critical data with instances of the SAP Business Suite family of solutions, and is integrated successfully with business functions exposed through the SAP NetWeaver Portal.

# SMARTPLANT ENTERPRISE FOR OWNER OPERATORS

| Solution                                    | Business packages and work processes included  |   |
|---|--|---|
| SPO Core                                    | <ul style="list-style-type: none"> <li>• Plant breakdown structure and work breakdown structure management</li> <li>• Document management</li> <li>• Transmittals</li> <li>• Tag management</li> <li>• Plant data loading</li> <li>• Engineering data browsing</li> <li>• On-plant engineering design</li> <li>• Conceptual engineering</li> </ul> |   |
| SPO Operating Plant                         | <ul style="list-style-type: none"> <li>• Management of change for operations</li> <li>• Synchronization of changes in the dynamic design basis with the plant maintenance system</li> </ul>  | <p><b>Future business packages planned include:</b></p> <ul style="list-style-type: none"> <li>• Lock-out/tag-out</li> <li>• Permit to work</li> <li>• Process safety integration</li> <li>• Brownfield data capture</li> <li>• Engineering assistant for maintenance</li> <li>• Engineering assistant for reliability</li> <li>• Engineering assistant for safety</li> <li>• DCS change management</li> <li>• Intelligent manuals</li> <li>• Plant optimization assistant</li> </ul> |
| SPO Project Execution                       | <ul style="list-style-type: none"> <li>• Management of project change</li> <li>• Non-conformity (waiver) management</li> <li>• Technical query and site queries</li> <li>• Interface management</li> </ul>   | <p><b>Future business packages planned include:</b></p> <ul style="list-style-type: none"> <li>• Risk and uncertainty management</li> <li>• Supervision (audit) management</li> </ul>   |
| SPO Validation, Transformation, and Loading | <ul style="list-style-type: none"> <li>• Import of data submissions to staging area</li> <li>• Definition of validation rules</li> <li>• Execution of validation jobs</li> <li>• Reporting validation results</li> <li>• Filtering, export, and loading data to target systems</li> </ul>  |   |





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**SmartPlant Enterprise for Owner Operators is designed to enable asset owners to fully exploit this engineering design data to manage asset performance and give them a means to ensure proper maintenance of information integrity across the owner operator system landscape.**

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# ABOUT INTERGRAPH

Intergraph is the leading global provider of engineering and geospatial software that enables customers to visualize complex data. Businesses and governments in more than 60 countries rely on Intergraph's industry-specific software to organize vast amounts of data into understandable visual representations and actionable intelligence. Intergraph's software and services empower customers to build and operate more efficient plants and ships, create intelligent maps, and protect critical infrastructure and millions of people around the world.

Intergraph operates through two divisions: Process, Power & Marine (PP&M) and Security, Government & Infrastructure (SG&I). Intergraph PP&M provides enterprise engineering software for the design, construction, and operation of plants, ships, and offshore facilities. Intergraph SG&I provides geospatially powered solutions to the defense and intelligence, public safety and security, government, transportation, photogrammetry, utilities, and communications industries.

For more information, visit [www.intergraph.com](http://www.intergraph.com).

# SMARTPLANT<sup>®</sup> ENTERPRISE FOR OWNER OPERATORS LEVERAGING THE ENGINEERING DESIGN BASIS ACROSS THE PLANT LIFE CYCLE

**SOLUTION**



[www.intergraph.com](http://www.intergraph.com)

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06/09 PPM-US-0023A-ENG