

# SMARTPLANT<sup>®</sup> ENTERPRISE

PROCUREMENT, FABRICATION  
& CONSTRUCTION

INTERGRAPH<sup>®</sup>







# BALANCING ACT

## **PROCUREMENT, FABRICATION, AND CONSTRUCTION**

represent a complex balancing act between profit-making and risk-taking that requires effective planning and control. Otherwise, it could severely hinder a company's ability to supply a product, design and construct a plant, and start up a facility on time and within budget. In today's highly competitive environment, time to market is of highest priority, which results in the major project phases – engineering, procurement, and construction – overlapping more than ever before, adding further complexity to this precarious balancing act.

Frequent changes in market conditions, global sourcing, geographically distributed plant design and engineering, and remote locations of construction sites all make the project life cycle increasingly dynamic by nature. It requires a great deal of communication and supervision to successfully achieve project completion for all stakeholders.

“

**The ability to handle all material management processes, from establishing a corporate material standard to quantification, procurement, and control of material on-site in one integrated environment, helped us to significantly improve efficiency and minimize risk.**

”

Shuji Nagano  
General Manager, Engineering IT  
Chiyoda Corporation

*Chiyoda has also extended the solution globally for use with joint venture partners and suppliers.*

Considering that for a typical industrial facility, 10 to 15 percent of the total cost is for engineering design and 50 to 60 percent of the costs are related to material, it is obvious that surplus materials caused by ineffective materials management, even to levels of only five percent, can result in the loss of millions of dollars on an average capital project.

Without continuous management and project performance, it is difficult to take the appropriate corrective action to prevent schedule delays. These delays can often be even more costly when they affect the owner's ability to produce and sell the product. Effectively managing these complicated business processes in an integrated environment throughout all phases of the project life cycle is vital.

## **SOLUTION**

Intergraph®'s Procurement, Fabrication & Construction solution is made up of SmartPlant® Materials, SmartPlant Reference Data, SmartPlant Construction, and SmartPlant Spoolgen®, provided by Intergraph, and PRISM, offered by ARES Corporation. The solution uses the latest technology to provide efficient, accurate cost and material control for plant owner operators and EPC companies. The Procurement, Fabrication & Construction solution includes all disciplines and partners, such as the client, suppliers, freight forwarders, and subcontractors, spanning the complete project execution life cycle:

- Estimating, budgeting, and cost tracking
- Engineering – materials quantifications with change management
- Procurement, expediting, and shipping
- Construction – receiving, inventories, forecasts, reservations, and material issuing

With materials information from the complete project execution life cycle residing in a single database, organizations can establish information for quick, effective decision support and early warning systems. Additionally, exception reports can be based on data from the entire supply chain, and potential problems that might arise in the future can be more quickly identified. The ability to perform upfront risk assessment and proactive risk avoidance offers a significant savings potential. As a leading expert in this area, Intergraph holds about 45 percent of the materials management market, and is committed to ensuring that the true power of materials management and project controls are brought to your projects. Intergraph's solution enables you to:

- Lower engineering, procurement, and construction labor costs
- Reduce material surpluses and shortages
- Integrate engineering with corporate enterprise resource planning (ERP)
- Increase the visibility of project costs/performance through earned value analysis
- Reduce project risks

Take advantage of earlier, more accurate materials purchase to optimize cash flow and eliminate overspending. This directly reduces CAPEX and ensures that the materials procured are exactly matched to the project's engineering and construction requirements. Our Procurement, Fabrication & Construction solution combines better estimating, detailed tracking of material and costs, and smarter budget-driven purchasing to ensure "right price, right time, right place" on-site delivery of materials. It enables effective construction planning by identifying a continuous material status, such as purchasing, shipping, and arrival-on-site dates.

## PROJECT CONTROL POWERED BY PRISM

### Estimating and Budgeting

The project cost estimate is created in the estimation module by work breakdown structure and will be the baseline for the subsequent budgeting cycle.

### Cost and Progress Management

PRISM offers a fully functional cost management package designed to plan, budget, track, forecast, and report on your project's:

- Cost
- Progress
- Performance
- Productivity

The cost management package meets all criteria for earned value performance measurement. Finally, by integrating PRISM with scheduling systems, your budget, time, and costs (both actual and forecast) can be reported throughout the project life cycle.

## REFERENCE DATA MANAGEMENT POWERED BY SMARTPLANT REFERENCE DATA

SmartPlant Reference Data offers rule-driven and change control mechanisms for defining and maintaining reference data used later in design and purchasing processes. This reference data consists of item descriptions, dimension tables, specifications, client mappings, and best practices – all stored at the corporate or project level. This reference data is the common base for downstream EPC processes.

## MATERIALS MANAGEMENT POWERED BY SMARTPLANT MATERIALS

### Link Engineering with Procurement

Material take-off quantities from the SmartPlant Enterprise will be regularly collected and then compared to previous project phases, enabling you to analyze project trends and make better decisions. The quantity data will be summarized by pre-defined templates into rule-based requisitions. Depending on your workflow needs, you can perform a variety of tasks:

- Make quantity adjustments
- Attach documents stored in the SmartPlant Enterprise to requisitions
- Define and approve additional vendor data requirements
- Release these requirements to the procurement department

### Procurement

Supplier management is an integral part of procurement. It enables you to define elements such as supplier qualifications, addresses, rating, and project short lists. Accessing historical information for suppliers based on their performance rating or purchase order history in previous or current projects will help you to make better decisions during the negotiation phase. All users can take advantage of consistent data in the purchasing cycle (inquiries, bids, and purchase orders) to promote effective data management throughout the workflow. The inquiry cycle time is greatly reduced by involving the suppliers directly in the process by giving them secure online access via the Internet.

### Expediting, Inspection, and Logistics

Purchasing information and modifications can be reused in expediting. SmartPlant Materials' change management functionality ensures your data is always reliable and up-to-date, even during revisions. The Expediting/Inspection/Logistics module can be accessed remotely through the Internet by third parties such as suppliers, freight forwarders, or inspectors.

# STREAMLINED CONSTRUCTION AND ENGINEERING POWERED BY SMARTPLANT CONSTRUCTION

SmartPlant Construction meets the specific needs of construction companies, project management offices, fabricators, and owners in managing construction resources, materials, and schedules. SmartPlant Construction helps companies realize significant savings throughout the life of a construction project.

SmartPlant Construction promotes better planning and management by incorporating the dynamic inputs from engineering, procurement, fabrication, site materials management, and craft labor plans into a solution specifically for construction.

To enhance flexibility and interoperability, SmartPlant Construction offers full integration with the industry-leading SmartPlant Enterprise suite of products. Take advantage of data interfaces and true integration. The solution builds on the proven SmartPlant Enterprise portfolio by offering a wide variety of functionality provided by SmartPlant Enterprise solutions.

SmartPlant Construction benefits the entire engineering, procurement, construction, and operations value chain:

- Owner operators can improve CAPEX efficiency by consistently managing engineering information from concept through operations and maintenance
- Fabricators can provide direct input to facilitate real-world construction plans



“

**Intergraph SmartPlant Materials is positioned to play an important role in Clough's business initiative to provide integrated global collaboration systems for project execution. We anticipate it will significantly complement Clough's well-known logistical strengths. We are also looking to the future in that we are replacing in-house systems with what is increasingly recognized as an industry-standard product that will grow and develop with our company.**

”

Simon High  
CEO  
Clough Services





- Constructors can increase profits with improved visibility on project plans, accelerate their ability to re-plan dynamically in response to real-world changes, and take advantage of enhanced integration with engineering, procurement, and fabrication to optimize both engineering and construction decisions
- Engineering firms can optimize engineering decisions based on construction status, and vice versa

## **AUTOMATIC PIPING ISOMETRICS POWERED BY SMARTPLANT SPOOLGEN**

SmartPlant Spoolgen is specifically designed for piping fabricators who need to add fabrication and construction information to design isometrics delivered by EPCs, generated from 3D models held in plant design systems. Fabricators can use the software to easily split complete pipeline isometric drawings into spool drawings, which are then used to fabricate pipe spools in the workshop. SmartPlant Spoolgen automatically generates all necessary drawings and reports.

The product provides a fast return on investment, is simple to use, and requires minimal training. SmartPlant Spoolgen significantly reduces:

- Labor hours
- Fabrication costs
- Project schedules
- Rework
- Construction errors
- Waste

## **MEASURING THE RETURN**

The power of Intergraph's Procurement, Fabrication & Construction solution translates into significant business savings. Customers have reported:

- Reduced surplus materials to less than one percent
- Reduced total installed cost by up to three percent
- Reduced engineering hours by up to 15 percent

## **THE INTEGRATED SMARTPLANT FAMILY**

Beyond standalone use, Procurement, Fabrication & Construction is also part of the SmartPlant Enterprise. SmartPlant Enterprise offers best-in-class applications and a low-risk, step-wise implementation approach to realizing a truly integrated engineering enterprise.

SmartPlant Enterprise includes:

- 3D Modeling & Visualization
- Engineering & Schematics
- Information Management
- Procurement, Fabrication & Construction
- SmartPlant Alliance Program

## **NEXT STEPS**

The Procurement, Fabrication & Construction solution is fully supported by Intergraph Process, Power & Marine's global service network and can be tailored to meet each user's specific requirements. To discover how this solution can save you money and help you gain you a competitive edge, contact us today.





# 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 PROCUREMENT, FABRICATION & CONSTRUCTION

**SOLUTION**



Intergraph, the Intergraph logo, SmartPlant, and Spoolgen are registered trademarks of Intergraph Corporation. Microsoft is a registered trademark of Microsoft Corporation. Other brands and product names are trademarks of their respective owners. Intergraph believes the information in this publication is accurate as of its publication date. Such information is subject to change without notice.

©2009 Intergraph Corporation.  
06/09 PPM-US-0027A-ENG