Intergraph® is a trusted technology solutions leader with a successful 45-year track record in the engineering, procurement, and construction (EPC) markets. Intergraph’s strong vision will further define the future of engineering. Our customer-centric core values drive us to partner with our customers to better understand their needs and deliver products and solutions that help them succeed.
Our customers in the constantly evolving EPC market demanded better and smarter integration within our own best-of-breed product line and with third-party applications in the EPC ecosystem. Intergraph has responded and delivered with SmartPlant Enterprise (SPE). The SPE solution enables EPCs to achieve integrated project delivery from basic engineering to project close-out, covering all of the virtual project cycle for both greenfield and brownfield projects. This results in improved productivity and efficiency which help address time and cost restraints as well as improve data and document management quality.

No two projects are completely alike. However, closer inspection of work processes within any given project shows a distinct pattern of redundant replication in some cases. In other cases, work processes lack the ability to reuse data and functionality, resulting in a waste of time and project resources while increasing costs and risks.

The integrated SPE solution takes the guesswork out of project management by applying a rule-based philosophy that empowers EPCs to comprehensively master their work processes within the system. SPE simultaneously enables powerful intelligent design, project customization, and change management with integrated, out-of-the-box solutions.

The benefits of the integrated SPE platform address the challenges of managing huge and complex projects within budget and schedule under increasingly demanding conditions, such as:

- Shorter project execution cycles
- Increased price pressure
- Intense international competition
- Growing regulatory and compliance demands
- More intricate coordination and collaboration with clients, suppliers, and joint-venture partners
- Increasing complexity of unstructured data
- Ever-expanding digital handover requirements
- Growing project size with more involved EPCs than ever before
- Greater complexity in all areas of project execution around the globe

For eight consecutive years, Intergraph has been named the global leader in ARC’s global market research study *Engineering Design Tools for Plants and Infrastructure Worldwide Outlook.*

The ARC Advisory Group, the leading research and advisory firm for industry and infrastructure, ranks Intergraph as the No. 1 overall engineering design solution provider for plant design based on revenues.

**KEY BENEFITS**

- Preconfigured solutions support key EPC work processes
- Integrity of engineering information is maintained throughout the virtual project cycle
- Auditable traceability meets regulatory authority demands for demonstrable compliance
- Data handover and validation from projects are managed in a secure and controlled manner
- Collaboration with owner operators is supported
- Work processes are enforced
- Data can be accessed quickly and simply through filtered queries, 2D/3D graphical user interface, and photo-realistic Leica TruView laser scans
- Universal web portal is role-based and user-friendly
- Solution integrates with existing third-party and legacy systems
- Management visibility reports are provided
- Flexible and configurable solution rapidly incorporates customer-specific requirements
Benefit from an integrated, work process-based technology solution for accurate and on-time project delivery.

SmartPlant® Enterprise for EPCs

- **Engineering & Design**: SmartPlant P&ID, SmartPlant Electrical, SmartPlant Electrical Detailed, SmartPlant Instrumentation, SmartPlant Reference Data, Intergraph Smart™ 3D.
- **Analysis**: CAESAR II®, TANK™, PV Elite®, GT STRUDL®.
- **Procurement & Fabrication**: SmartPlant Materials, SmartPlant Spoolgen®.
- **Data Handover & Take-On**: SmartPlant Fusion, Intergraph Smart™ Data Validator, SmartPlant Handover.
- **Mobile Applications**: CAESAR II®, TANK™, PV Elite®, GT STRUDL®.
Intergraph’s Engineering and Design solutions provide comprehensive, integrated, and discipline-specific product solutions for 2D and 3D. These solutions are rule- and specification-driven to ensure data quality and consistency across disciplines.

**SmartPlant P&ID** – Enforces rules-based engineering and customer standards for plant process design, resulting in greater efficiency, especially for downstream design activities such as control systems design and piping.

**SmartPlant Electrical** – Supports power distribution network engineering and design, including a bi-directional interface with ETAP for electrical analysis and simulation.

**SmartPlant Electrical Detailed** – Covers detailed scope with three-line schematics, wiring, panel designs, and PLC configuration.

**SmartPlant Instrumentation** – Creates a single source of all instrumentation data and tasks, facilitating consistency and seamless data exchange with other related disciplines in SPE.

**SmartPlant Reference Data** – Provides materials libraries at the corporate and project levels, enabling better standardization and change management.

**Intergraph Smart 3D** – Offers powerful rules and relationships that automate repetitive tasks, enforce design standards, ensure design integrity, and protect design consistency. It offers the benefit of enhanced support for mega-projects thanks to global worksharing, model data reuse, and safety-centric rules. Effective design reviews using 3D technology can begin at the earliest stage of a project. Smart 3D supports data interchange with complementary tools, including other SPE products.

**CAESAR II** – Offers pipe flexibility and stress analysis, using color-coded stress models and animated displacements for analysis of any stress load case. Powerful tools and wizards further help in creating expansion loops or viewing plant models, resulting in accurate analysis and design changes.

**TANK** – Provides comprehensive, easy-to-use solution for the design, analysis, and evaluation of oil storage tanks, offering quick and accurate designs for new tanks and evaluation of existing tanks.

**PV ELITE** – Supplies complete solution for vessel and heat exchanger design, analysis, and evaluation, supporting the design of equipment for the most extreme uses with quick, accurate, and profitable results.

**GT STRUDL** – Delivers the premier structural analysis and design software for finite element analysis, providing for a comprehensive structural engineering solution. GT STRUDL maintains unparalleled Quality Assurance and Quality Control (QA/QC) program and procedures resulting in GT-STRUDL being fully compliant with U.S. NRC’s 10CFR21 and 10CFR50 Appendix B regulations. GT STRUDL QA procedures are also in full conformance to the ASME NQA-1-2008, including the 2009 Addenda Subpart 2.7 (NQA-1a-2009). Since 1983, more than 65 percent of the world’s nuclear power plants have been designed using GT STRUDL.

**SMARTPLANT MATERIALS** – Provides unique capabilities encompassing integrated materials, supply chain, and subcontracting management. The solution serves as a project collaboration and workbench platform for all partners in the EPC project supply chain.

**SmartPlant Spoolgen** – Enables the creation of piping isometric drawings for fabrication and erection from the design created during the detail engineering phase of projects. The technology is based on Isogen®, the industry-standard software for automated piping isometric generation.
CONSTRUCTION

Intergraph’s construction solutions support the planning, erection, testing, and commissioning and other work processes in the construction phase. This means that the EPC can hand over the plant safely and compliant to contract.

**SmartPlant Construction** – Meets the specific needs of construction companies, project management offices, fabricators, and owners in managing construction resources, materials, and schedules by utilizing configurable interfaces and integrated material availability reports. It offers a unique, real-time link to the SPE engineering design basis and procurement and logistics, revolutionizing the construction planning and execution processes.

**SPE Systems Completion** – Takes a project from the construction phase to operations, providing access to complete, correct, and consistent data. The solution maintains the integrity of virtual plant assets to support mechanical completions, commissioning, preservation, and pre-startup safety checks. It offers user-defined rules to automate check sheet allocation.

THE VIRTUAL PROJECT CYCLE

The SPE solution supports the virtual project cycle by providing an integrated platform and state-of-the-art software that takes advantage of preconfigured work processes. This provides for rapid deployment while reducing risk and delivers consistent project execution.

**SPE Core** – Provides the platform and common processes for managing data and documentation throughout the project life cycle. These include management of the plant breakdown structure; work breakdown structure; central tag allocation and registers; documents and transmittals; tight integration with Microsoft® Office; electronic dossiers such as system operating manuals and vendor data books; and risk-reducing measures. Engineering business rules ensure accurate and unique allocation of tag and document numbers for projects and modifications.
SmartPlant Master Tag Registry – Enables the creation, updating, and consolidation of the millions of records created during projects, just on tagged items alone. The solution enables true concurrent engineering between multiple project stakeholders with a single master tag register synchronized with other disciplines. Additionally, it delivers tag management and tag register production, focused on making tag registers easier to produce for handover to owners.

SPE Project Execution – Manages key processes for successful project delivery which include interface management between project stakeholders, project change management, non-conformities, and technical queries (RFI). SPE Project Execution is suitable for use with both CAPEX projects and turnaround projects.

SPE Requirements Management and Traceability – Designed to support contractors to maintain and demonstrate compliance to changing stakeholder requirements through the plant design and configuration phases. A management of change and impact analysis process ensures that requirements and their associated fulfillment items are re-evaluated when there are future changes to either the requirement or the design basis.

PROJECT DATA HANDOVER AND TAKE-ON

Getting started with the project and assessing the “as-is” situation are some of the first challenges in a CAPEX or turnaround project. Unstructured data, paper, or images of drawings are often the only sources of information available. Additionally, legacy system extractions, subcontractors, vendors, and suppliers deliver enormous amounts of structured data into the engineering process. SPE solutions help solve these problems.

SmartPlant Fusion – Enables the automated processing of unstructured documentation and extraction of available intelligence by utilizing optical character recognition and tag extraction from 2D CAD files.

Intergraph Smart™ Data Validator (SDV) – Manages verification and import of structured data (e.g., Microsoft Excel® and CSV) submitted from contractor or from legacy systems. SDV provides user-definable business rules where data can be selectively exported and loaded from the staging area into target systems.

SPE Handover – Enables the handover of information between different project phases. This is the ideal way to transfer information from a virtual project cycle into a virtual plant environment. The transfer of information preserves the inherent intelligence from the source system.

MOBILE SOLUTIONS

Intergraph mobile solutions enable subsets of data and documentation to be taken into an offline briefcase to support activities where mobile access to data is not practical. These solutions eliminate the need to take costly and cumbersome hardcopies into the field to perform activities such as vendor work inspections, walkthroughs, and mechanical completions. Notes can be made in the field, photos and videos captured, and checklists completed. Information captured in the field may be synchronized back to the server when network connectivity is available.

ABOUT INTERGRAPH

Intergraph helps the world work smarter. The company’s software and solutions improve the lives of millions of people through better facilities, safer communities, and more reliable operations.

Intergraph Process, Power & Marine (PP&M) is the world’s leading provider of enterprise engineering software enabling smarter design and operation of plants, ships, and offshore facilities. Intergraph Security, Government & Infrastructure (SG&I) is the leader in smart solutions for emergency response, utilities, transportation, and other global challenges. For more information, visit www.intergraph.com.

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