

SMARTPLANT®

Intelligent engineering with efficient support





SMARTPLANT®

CAPEX and OPEX projects demand high productivity and efficiency, both to speed the start of the production of a new plant (reduced time-to-market) or to minimize loss of production due to maintenance (increased time-in-market).

Face to high complexity and great volume of information and documents involved in these projects. It is necessary to create, consult and update it in consistent and structured manner to ensure the enforcement of schedules with safety and quality.

Decades of mapping processes and constant technologic innovation made Intergraph's SmartPlant incomparable and essential for this process. Besides a pioneer technology, SmartPlant product suite is used by the biggest and more complexes industries in the worlds, delivering more productivity, security and reliability to distinct phases of plants lifecycle, from basic design to decommissioning.

The ARC Adivosor Group, a leading industry analyst firm, ranked Intergraph as ne No. 1 overall worldwide provider of engineering solutions for plant design (process, power and marine), according to its "Engineering Design Tools for Plants and Infrastructure Worldwide Outlook Market Analysis and Forecast Through 2019".

"To replicate models is mandatory in this project. Smart 3D's MDR (Model Data Reuse) module ensures consistency between FPSOs, generating significant savings for engineering."

Roger Pinto, technical manager at Promon Engenharia | Petrobras

"Using Smart 3D we were able to reduce project errors in up to 50% and leverage productivity in 10%."

Yeong Soo Bae, R&D executive vice-president at Samsung Heavy Industries

"SmartPlant Construction enables us to integrate engineering, planning, supplies and construction information in a single solution. We have been using SPC to fasten decision making process in a friendly interface."

Luiz Andrade, senior project leader at Vale

EPC | EPCM

Engineering and construction companies from different parts of the world face challenges that are getting even more complex. Global projects are getting bigger, counting on multiple interfaces among EPC, assembler and supplier companies, and must be implemented within even more strict schedules and more overlapping between engineering, supply and construction phases.

SmartPlant product suite for EPC and EPCM brings the state-of-the-art technology to endure automation, integration and collaboration on these projects. Using SmartPlant solutions it is possible to implement engineering projects on the cloud, access project information on tablets, integrate engineering information among disciplines, modularize projects, optimise data reuse and improve commissioning, handover and prompt operation processes.

Manage global teams, implement megaprojects and simplify processes is not easy, but using automation, integration and collaboration it is possible to do much more and in less time.

KEY BENEFITS

- On-time strict schedule and budget;
- Support to entire project lifecycle;
- Suitable for new or existing projects;
- More productivity and efficiency;
- Documents and data management.

OWNER OPERATOR

Unplanned stoppages and accidents involving OPEX projects drastically reduce productivity in an industrial plant, resulting in significant losses of money for Owner Operators. Only one day with no operation in a FPSO that produces 180,000 barrels of oil may result in a US\$9 million loss, directly or indirectly, from personal or environmental countless and irreparable damages.

This is industry does not allow mistakes. These investments, risks and complexities demand control and accuracy that only assets data management can ensure.

KEY BENEFITS

- Minimises CAPEX and OPEX costs;
- Optimisation of the programmed stoppages plan;
- Safe and sustainable production;
- Regulatory service and compliance.



EPC | EPCM



ENGINEERING AND SCHEMATICS

To maintain a plant operating properly for decades it is required to have an efficient engineering, with quality and intelligence since de very beginning. Using SmartPlant all disciplines are integrated to ensure project and plant optimisation and every change affects all objects associated avoiding errors and rework.

3D MODELLING AND VISUALIZATION

We have the best integrated environment technology for 3D modelling for industrial projects with intelligent engineering rules that enable rapid project development, ensuring information quality and consistency among disciplines.

ANALYSIS

Integration among plants and engineering analysis is vital for EPCs and Owner Operators. Separately it may result in expensive delays and unexpected costs. Together it enables project validation during progress, saving time and resources and increasing safety and reliability.

INTEGRATED SUPPLIES, FABRICATION AND CONSTRUCTION

It allows to predict the excess and waste purchase, and on-time delivery of the right materials. Besides support to planning, assembly, test, commissioning and other construction processes to enable EPCs to safely deliver the plant in accordance with the contract.

INFORMATION MANAGEMENT

Electronic management of all information from its concept and drawing to maintenance, operation and decommissioning enables the optimisation of the entire lifecycle of the plant, besides ensuring efficiency on its maintenance and reliability on decision-making activities.

P&ID >> Helps you design and configure your plant processes using design rules that enforce engineering and customer standards.

Electrical >> Supports single line drawings and distribution power line engineering, including a bidirectional interface with ETAP for electric analysis and simulation.

Instrumentation >> Creates a unique source of instrumentation data and tasks that facilitates data exchange and checking with other engineering disciplines.

Reference Data >> Provides a common collaboration platform and project workbench for all partners in any engineering, procurement, and construction (EPC) project supply chain.

Smart3D >> offers powerful rules and relationships that automate repetitive tasks, enforce design standards, ensure design integrity, and protect design consistency. Benefit from enhanced support for mega-projects thanks to global worksharing, model data reuse, and safety-centric rules.

Plants



Metals and mining industry



Marine industry



Caesar II >> Evaluates the structural responses and stresses of piping systems to international codes and standards. It is the pipe stress analysis standard against which all others are measured.

PV Elite >> Complete solution for vessel and heat exchanger design, analysis, and evaluation, which helps to design equipment for the most extreme uses and have done so quickly, accurately, and profitably.

Tank >> Comprehensive, easy-to-use software package for the design, analysis, and evaluation of oil storage tanks that provides you with quick and accurate designs for new tanks and evaluation of existing tanks.

GT Strudl >> Offers engineers the accurate and complete technical data they need for cost-effective and efficient structural engineering and design decision-making. Since 1983, more than 65% of all the nuclear power plants were designed using GT Strudl.

Materials >> Provides a common collaboration platform and project workbench for all partners in any engineering, procurement, and construction (EPC) project supply chain.

Construction >> Dynamic work package planning solution that meets the specific needs of construction companies, project management offices, fabricators, and owners in managing construction resources, materials, and schedules. Offers intuitive, configurable interfaces and integrated materials reports to optimise planning and execution.

Spoolgen >> Fast and accurate spool and erection isometrics for pipe fabrication and construction.

Systems Completion >> Provides consistent correct and complete data to support evaluation, commissioning and maintenance from construction to operation.

Foundation >> Offers a work processes platform for the information and documentation management and interface between tools, ensuring global vision and project consistency.



OWNER OPERATOR



INFORMATION MANAGEMENT

Control tags, documents, GRDs (transmittals), dossiers, plant data, suppliers, risks and other information may be stressful and uncertain. Using SPO Core you manage all information you need with automation and safety.

SPO Core >> Includes preconfigured work processes that are relevant throughout the complete plant life cycle. SPO Core provides rapid access to key information within the engineering design basis via multiple search mechanisms and navigation paths. This reduces the time needed

PROJECT AND EPCs MANAGEMENT

Project changes compromise costs and schedules. Thousands of changes, hundreds of people, attributes and statuses are involved in big projects. SPO Project Execution offers pre-configured processes and management reports that ensure full visibility for you to easily, safely and reliably manage changes.

SPO Project Execution >> Changes are automatically identified and referred, indicating the affected engineering items: tags, documents, parts of the plant's structure etc. The solution enables to analyse how a change impacts in relation to other changes, besides managing legal, regulatory and governance compliance documents, predicting bottlenecks and anticipating

FROM CONSTRUCTION TO OPERATION

Commissioning is the most critical and complex process of a plant's lifecycle. Using SPO System Completion you assure all equipment and components were built and installed, and working in accordance to specification. With SPO System Completion you have access to complete, reliable, visible and available information to support management and decision-making, from the mechanic completion to operation.

SPO Systems Completion >> Leverages engineering design information that was developed during the project, eliminating the time-consuming and error-prone task of re-constituting data from many sources. The software covers all work processes required to transition a facility from construction completion into operations:

- Mechanical completion;
- Static and dynamic commissioning;
- Punch list management;

HANDOVER

Delivery of project information and documents take time, resources and investments, and happen throughout the project, not only during its completion. The growing adoption of SmartPlant Enterprise for Owner Operations and EPCs demanded an integrated platform to simplify handover. Thus, we developed SPO Handover, which allows the user to transfer data and documents among origin and destination systems in a fast, easy and consistent manner.

SPO Handover >> Enables integrate project databases and keep it during the operation. the handover of information between two or more Smart Plant Foundation-based systems. Packages of information and documentation can be handed over on a periodic, incremental basis between project stakeholders – for example, from an EPC contractor using SmartPlant Enterprise to an owner operator using SPO. The transfer of information preserves the inherent intelligence from the source system.

OPERATIONS AND INSPECTIONS

To ensure the accuracy of engineering, maintenance and operation information of a plant is essential for its safety and efficiency. SPO Operating Plant provides a complete changes management dedicated to operation, using automated work processes that allow it to be tracked and audited. The inspection module enables to monitor the scheduling of equipment inspection and its results and field punch items.

SPO Operating Plant >> Supports information synchronization between engineering drawing basis in SPO and other third party system, e.g. Computerized Maintenance Management Systems (CMMS), to ensure all equipment will be identified and have their proper maintenance plans and changes on the drawing basis for the equipment will be reflected on the CMMS in order to ensure the correct acquisition or replacement of equipment and its components. SPO offers interoperability with other enterprise operations systems – such as enterprise asset management (EAM),

to gather necessary information and ensures all relevant information is readily available to facilitate quicker and better decision-making. The solution provides common work processes and is a prerequisite for other SPO solutions.

preventive actions to avoid claims. Control the most critical processes:

- Management of change;
- Management of technical/site queries;
- Management of nonconformities;
- Interface control.



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- Pre-startup Safety Review (SPPR) and readiness;
 - Preservation;
 - Electronic dossiers and graphic status reports



Smart Data Validator >> Validate, migrate and transform project data, ensuring quality, accuracy and integrity of data provided by contractors, providers and fabricators. Avoid validation and mapping errors that can result in unreliable data and recurrent costs along the lifecycle of the plant.non-trustful.

SPO Fusion >> Helps you to find, capture, organize, index and view unstructured data, e.g. engineering documents and drawings, reducing search and validation time. Extracts intelligence from unstructured data and find inconsistency during project execution.

reliability and asset integrity, process safety, and digital control systems – ensuring that information in those systems is maintained to accurately reflect changes in the dynamic engineering design basis. SPO Operating Plant also supports equipment inspections. Inspection scheduling, execution, and punch item follow-up are supported. This provides complete records of inspections performed, results, and identification of overdue and upcoming inspections.





About Intergraph Process, Power & Marine:

Soon to be known as Hexagon Process, Power & Marine, Intergraph Process, Power & Marine is the leading global provider of engineering software for the design, construction and operation of plants, ships and offshore facilities.

Process, Power & Marine is part of Hexagon (Nasdaq Stockholm: HEXA B), a leading global provider of information technologies that drive quality and productivity improvements across geospatial and industrial enterprise applications.

Hexagon's solutions integrate sensors, software, domain knowledge and customer workflows into intelligent information ecosystems that deliver

actionable information. They are used in a broad range of vital industries. Hexagon (Nasdaq Stockholm: HEXA B) has more than 16,000 employees in 46 countries.

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