



## KEY BENEFITS:

- Reuse of the engineering design basis to minimize the effort of gathering and maintaining data and documentation.
- Automated allocation of checklists to eliminate manual effort.
- Compilation of electronic completions dossiers.
- Out-of-the-box set of checklists or customers' own lists can be configured.
- Offline completion of checklists on mobile tablet PCs.
- Graphical reporting of completion and punch list status on intelligent P&IDs and 3D models.
- Library of standard status reports.
- Reuse of checklists for shutdowns, turnarounds, and outages.
- Workflows to monitor, control, and automate processes and distribution of work.
- Mobile viewing and redlining of documents.
- Photo and video attachments from the field.

## SMARTPLANT® ENTERPRISE FOR OWNER OPERATORS SYSTEMS COMPLETION SOLUTION

Systems completion covers the process of taking a project from construction closeout to operations. It is arguably the most critical and complex phase of the facility life cycle.

Every component of the facility must be checked to validate that it is built and installed correctly and functioning properly. Systems and equipment are tested to ensure that they perform as expected. Any defects must be recorded, repaired, and rechecked, and the process is tracked to ensure nothing is overlooked. Fluids and power are introduced to bring the facility online.

Startup is known to be one of the riskiest aspects of operations and proper precautions must be followed. The situation is complicated by the fact that construction is still ongoing while the other activities are taking place. Since there are multiple system dependencies, any slippage in schedule will be magnified. Throughout this entire process, there are many people involved from multiple companies. Responsibility is handed off at various points along the way.

Managing systems completion well can reduce risk, shorten time to market, and improve time in production. Proper planning, up-to-date statuses, accurate information, and well-coordinated activities are essential to delivering the project on schedule.

Intergraph® SmartPlant® Enterprise for Owner Operators (SPO) Systems Completion (SC) Solution provides the tools you need to help you be successful on your next project. SPO SC leverages the engineering design basis in the SPO Core Solution that is built-up during the evolution of the plant design. This ensures an updated, complete, and accurate basis for completions.

Mechanical completions and static commissioning check sheets and certificate templates are included to help you get started. When the SPO SC Solution is used in conjunction with other SPO solutions, it provides a seamless environment with access to all of the information needed to complete the work, without loading data or scrambling to find current, complete, and accurate information.

SPO SC covers the complete systems completion workflow:

**MECHANICAL COMPLETION** – SPO SC offers a tool to create and manage check sheets for the items to be inspected. A rules-driven process creates the proper types of check sheets for each item. The check sheets are intelligent – data captured during inspections is automatically updated in the SPO SC database. Similarly, the database is updated automatically to reflect the inspection status. Checksheets can be completed online or they can be emailed or completed on a mobile tablet PC using the SPO Mo-

ible solution that is available separately. Walkdown checklists can be used to validate completeness before handover. Any defects that are noted result in a punch list item so that the defect can be tracked to resolution. SPO SC creates certificates to document the handover from one group to another. Optionally, you can seamlessly integrate the SPO Project Execution Solution to track changes, interface items, site queries (RFI), and non-conformances. This provides a complete history of not only the design but also the decisions that were made. Having all of the information readily available reduces risk and wasted time when waiting for answers.

**STATIC COMMISSIONING (PRE-COMMISSIONING)** – During this phase, the construction, testing, cleaning, and installation are verified prior to energizing equipment. SPO SC helps you manage these verifications using check sheets that are automatically created and assigned using allocation rules. As in the mechanical completion process, inspection and measurement information is captured electronically to automatically update the SPO SC database. The software generates ready for commissioning certificates which include a listing of any outstanding punch items and incomplete inspections.

**DYNAMIC COMMISSIONING** – The commissioning process ensures that the integrated components of a system safely function as designed and that systems are commissioned in the most efficient sequence. SPO SC automated processes generate notifications and pass the system through the proper review cycles. Status visualization in the P&ID and 3D model as well as standard reports provide clarity of the commissioning progress. Baseline measurements can be captured using check sheets so that the initial values are captured in SPO SC. Ready for startup certificates can be created for handing over the system.

**PUNCH LIST MANAGEMENT** – Recording of defects and/or inspection non-compliance is essential for tracking and planning their resolution. The type of problem recorded might necessitate immediate remediation for a safety issue. But resolution might be delayed for something as simple as missing paint. Attaching a photograph and/or video offers additional clarity about the defect. SPO SC generates lists of punch items and sends them to contractors for resolution. A review process provides a means

for verification. When certificates are created, a listing of the outstanding punch items is included. This enables an informed decision regarding the acceptance or rejection of the handover offer.

**PRE-STARTUP SAFETY REVIEW (PSSR) AND OPERATIONAL READINESS** – This process is essential to ensuring that all elements for a safe startup are in place. A team comprised of engineering, operations, safety, and maintenance uses a process of checklists and walkdowns for verification. With the risk-reducing measures functionality in SPO Core, the team can review the hazards and mitigating factors. They can find the procedures and documentation within SPO SC to validate that all documentation is in place. Using the design information in SPO SC, the team can see that the equipment and construction conform to design. Electronic dossiers can be used to assemble the process safety management books. Then as each step is completed, a sign-off in the workflow is required before the review is complete. Managing the sign-offs in SPO SC prevents overlooked steps in the process. Action items can be assigned and tracked.

**PRESERVATION** – The high incidence of equipment failure during startup is often the result of improper preservation. SPO SC manages preservation activities across the phases from site delivery until after the equipment is in service. This ensures that there is no loss of continuity and all inspection records are maintained. Users can create preservation check sheets to automatically capture the preservation results. A new preservation is scheduled when the current one is completed. Reports indicate when preservation activities are upcoming or overdue. Properly preserving equipment reduces the risk of failure during commissioning and startup. It also maintains the warranty should a failure occur.

**ELECTRONIC DOSSIERS** – SPO SC uses an organized structure to manage the documentation related to the completion process. These electronic books can be easily updated. Since the nature of SPO is that items are stored only once, changes are greatly simplified. Costs associated with creating and maintaining hardcopy dossiers can be averted by handing over the dossiers electronically.

## ABOUT INTERGRAPH

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