

The Proven Value of AWP & O3: Success Stories

DRIVING THE HEALTH & ADOPTION OF AWP

O3 helps Owners, EPC Firms, and Contractors building industrial capital assets manage their Advanced Work Packaging (AWP) program by setting the conditions for success during implementation, facilitating Best Practice adherence during execution, constantly driving continuous improvement, and effectively scaling across the enterprise over time.

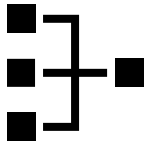


O3 SOLUTIONS

Ownership ■ Oversight ■ Optimization

THE PROVEN VALUE OF AWP: 6 CASE STUDIES

Below are examples of relevant case studies of construction issues which can be addressed through implementing the AWP Best Practice supported by O3.



Case Study #1: Avoid Scaffolding Rework by Coordinating Across Work Packages

Issue: Scaffolding Rework After Installation Crew is Mobilized

Scaffold was erected for the installation of pipe on a pipe rack, with only pipefitters being consulted on the scaffold requirements. When the structural steel team was mobilized to install miscellaneous steel to support the pipe, they discovered the scaffold was 1 ½” too high. Both installation crews had to stand down while the scaffold was reworked to suit the requirements of both crews. Incurred costs included the remobilization of the scaffold crew, demobilization, and remobilization of the piping & structural crews, and 3 days lost from the schedule.

AWP + O3 Improvement

Each planner should coordinate all other interdependent IWPs when preparing the piping installation IWP. This includes reviewing the scaffolding requirements with the other disciplines that need to work in the same area, even if their work does not directly impact the IWP. When this is done properly, the scaffold is designed and installed for multi-discipline use, identifying and eliminating the issue. When planning, it is important to include not only the requirements of installation crews, but the requirements of Commissioning & Start-up, and Operations as well. O3’s AWP Master Index helps identify interdependencies between packages and the Constraint Management component helps to identify constraints that may delay work packages and impact the schedule.



Case Study #2: Provide Better Visibility of Material Readiness by Work Package

Issue: Material Not Ordered in Time

During the weekly coordination meeting, it was discovered that the small valves required for venting and draining the pipe installation during the hydrotest were not ordered. The valve specification contained special trim for the process requirements which meant a 12-week delivery. The Procurement Team tried to mitigate delays by paying a premium to decrease delivery time, but the hydrotest was still delayed. This also delayed the final QA/QC inspection sign-off. In addition to the additional procurement cost, 2 weeks were lost from the schedule.

AWP + O3 Improvement

When following the AWP Best Practice, an IWP is completed 90 days prior to execution. This material issue would have been found and resolved during IWP development. Also, there are 60-day and 30-day (prior to execution) status reviews to ensure that any constraints discovered during IWP development have been mitigated. An IWP cannot be executed until all constraints have been removed, ensuring that the issue above is identified and addressed without causing



further issue. O3's Reporting & Analytics component helps measure and monitor IWP completion.



Case Study #3: Remove Constructability Bottlenecks for Fabrication

Issue: Engineering Documents not Completed Before Fabrication

When faced with a potential failure of an existing system, a fast track project was introduced and approved to commence construction with an incomplete design. This allowed material to be ordered and the civil portion of the project to be completed early. However other aspects of the project encountered problems. Fabrication of the piping and structural was completed concurrently with design. This led to inefficient fabrication and out of sequence deliveries. The construction sequences had been determined by the completion of the design, not on the most efficient Path of Construction. As a result, vendor drawings for equipment were not finalized prior to fabrication, leading to costly rework and delays.

AWP + O3 Improvement

In following the AWP Best Practice, early involvement of teams throughout the project including the Construction Team allows collaboration with designers to determine the Path of Construction and remove constructability bottlenecks. The development of Engineering Work Packages (EWPs) and Construction Work Packages (CWPs) allows identification and management of constraints in order to assist the fast track schedule and identifies long lead time items that need to be ordered during the planning process. Development of IWPs, based on the CWPs, allows for constraint free execution. By utilizing the AWP Best Practice, relevant Engineering Packages are completed prior to fabrication, and an efficient design is completed more quickly, allowing for a structured execution strategy, and addressing the issue. O3's Constraint Management component helps team members collaborate on what may be holding up the release of work packages.



Case Study #4: Streamline Turnovers by Collaborating Early on Work Package Development

Issue: Turnover Documentation

As often occurs, the development of the Turnover Packages (TOP) was left to the end of the project. This caused a delay for the Commissioning & Start-Up Team in commencing their tasks, increasing costs for the facility, and adding additional cost for a dedicated team to assemble the Turnover Packages in an expensive and inefficient manner.

AWP + O3 Improvement

In following the AWP Best Practice, IWPs are developed with Turnovers in mind. During the development of the CWPs, Commissioning & Start-up and Operations are consulted on all the Turnover requirements. This includes the system definitions, required Turnover documentation, and the TOP architecture. The IWPs are developed to ensure a seamless transfer of information to the TOPs, and this issue can be efficiently addressed. O3's Reporting & Analytics component



provides visibility and accountability for all project stakeholders and helps identify any issues with the sharing of pertinent information.



Case Study #5: Make Cost Saving Decisions Based on Complete Information

Issue: Procurement Decision Made without Complete Information

When visiting a project site, it was discovered that a compressor house was completely filled with scaffolding. When asked why it was necessary for the scaffolding, it was explained that the cladding panels needed to be insulated. Upon investigation, it was determined that in an effort to reduce costs by \$100,000, Procurement did not purchase pre-insulated panels. The cost to insulate the panels separately totaled \$1,000,000 and added 3 months to the schedule.

AWP + O3 Improvement

In following AWP Best Practice, early input from Construction would have found this issue during the 30% constructability review. The Engineering Work Package would then specify the need for insulated panels to eliminate the chance for this issue to arise during Procurement. O3's Reporting & Analytics dashboards and scorecards provide visibility and accountability during Interactive Project Planning sessions early in the project.



Case Study #6: Decrease Quality Control & Inspections Time by Closing Out Work Packages

Issue: Long Punchlists at the End of the Project are Cause Schedule Delays

The construction crews relied on the Quality Control group to review the installation and develop punch lists. Because the installation was not complete, this resulted in the generation of a large punch list (a familiar issue on projects not utilizing AWP). This compromised the schedule and increased costs through requiring the remobilizing of crews to complete the punch list, and delayed Commissioning & Start-Up through a late Mechanical Completion.

AWP + O3 Improvement

Following the AWP Best Practice for proper development of Installation Work Packages, the Installation Crew will not only self-punch the job, but Quality Control will have the opportunity for regular inspections. IWPs will not be signed off as complete until these actions are complete. This maintains the schedule and eliminates issues with unnecessary long punch lists that take an excessive amount of time to complete. O3's Reporting & Analytics component provides checklists, rules of credit, and dashboards to provide visibility into the quality control process.

