



CASE STUDY: EFFICIENT HANDOVER PROCESS



SUMMARY: Providing accurate capital project information during handover is vital to enterprise profitability. Following handover, system information must be kept accurate and accessible for the lifetime of the facility, which typically spans 30-50 years. Inaccurate or missing information can cause lost revenue due to unplanned shutdowns, unnecessary material purchases, production cutbacks, inefficient equipment operation and maintenance, and serious accidents. ***Using SWISS to reduce information loss and inaccuracies can save up to 60% of these costs, resulting in a savings of up to \$10M on a \$400 million project.***

Description:

Handover is the process of transferring the operations and maintenance (O&M) instructions of a facility or plant (e.g. a refinery), a machine (e.g. an aircraft) or other system from the contractor to the owner/operator (O/O). The documentation contains diagrams, policies, standards, specifications, procedures, parts lists, drawings, etc. necessary for the functional, safe, and efficient operation of the system.

Studies by Fiatch estimate that, for a \$400M project, engineering, procurement, and construction (EPC) contractors spend \$1M during handover, but owner/operators (O/O) spend \$8-16M in “hidden” data entry and validation costs. Similar studies have shown that periodic, structured, non-proprietary, automated information exchanges from EPC systems to O&M systems are estimated to save 60% of this O/O hidden cost, resulting in a savings of between \$5-10M on a \$400 million project (MIMOSA, “Problems With Information Handover”, July, 2011).

The potential consequences of inefficient handover and information maintenance are illustrated by one case:

- According to an internal report viewed by the Financial Times in 2014, a top five oil & gas operator came close to at least two potentially lethal accidents as a result of shortcomings in the way it monitors the safety of its refineries and petrochemicals plants. The company absorbed \$258M in lost production.
- At one plant, the failure to operate a piece of equipment in accordance with its manual cost \$35M-\$45M. At the same site, inaccurate and incomplete drawings and procedures led to another potentially fatal incident.
- The lack of systems for accurately storing plans and other engineering data meant staff had to contact colleagues who had left the company to retrieve information.
- Of 500 recent incidents at the firm, information problems caused or contributed to 15% of them, the report concluded.
- The report’s authors — company managers working with IBM and Worley Parsons — said there was an “urgent need” for improvements that would cost \$170M over five years.



How It's Done Today:

During the handover of a refinery (as an example), the contractor assembles the documentation necessary to operate and maintain the refinery in the as-delivered state. This documentation is handed over to the O/O in a plethora of structured, unstructured, proprietary, and standardized formats. Much of this information is in static formats such as PDF, Word, and even print. The O/O must maintain this information in a system that accommodates the enterprise's need for fast and efficient access, and they must also be aware of constant changes that affect the as-built plant and equipment (changes in regulations and industry standards, for example).

The Problems with This Method:

There are many challenges related to the handover process, but in this use case, we address only the problems associated with maintaining (or converting) the information in accessible formats and notifying enterprise users about changes to the information as it occurs.

- Typically, much of the plant engineering information is provided to O/O in unstructured document-oriented formats that are not machine-readable. Examples include PDF, JPEG, TIF, Microsoft Excel, and Microsoft Word. While these formats are useful for human readers, they are of limited value to traditional O&M systems because computers struggle to convert elements from PDF files (for example) into machine-readable digital data format. Manual data entry is required to convert these unstructured documents, and data integrity problems often follow, which can result in operating mistakes.
- Another significant problem is that much of the documentation is in static formats (referred to above), and as such, has no digital or real-time connection to changes occurring in the industry. Although the O/O must maintain information for the system in as-built state, they often make periodic updates according to specifications, standards, and regulations. When their documentation is in static format however, it requires a team of people to monitor industry changes and manually interrogate individual documents to assess the impact of changes on their operation. This process is ongoing for the life of the system and can cost millions of dollars in human resources.
- Another resulting problem is the existence of redundant equipment files, created by both maintenance and engineering, which are not synchronized, creating recurring engineering and maintenance errors. This can result in unplanned shutdowns, delayed maintenance projects, and incidents.

The SWISS Solution:

SWISS is integrated with Microsoft Word and has its own internal document editor for the creation of derivative works such as O&M documentation, work instructions, and test procedures just to name a few. Both tools allow users to create documents with live references to other documents. For example, a set of operating instructions can include content from an ASTM standard and the author(s) can quickly and easily check to see that the documentation is up to date prior to handover. If any documents are out of date, the author(s) can easily identify



exact changes with a one-click redline view. Conversely, the O/O receiving the package can quickly check to see what has changed in the documentation — even years after handover — and the reader will be notified in real-time of any changes to that ASTM standard.

Using the SWISS API, SWISS can also become interoperable with many other systems such as PLM, EPC, ERP, and document management systems. This means that if O&M documentation is stored and accessed from any of these systems, the external references can be integrated and viewed in the specified system, even if the references themselves are not stored in the system.

Lastly, since SWISS is a digital data platform, all content is in industry standard format that can be reused in other applications without conversion or manual work.

Benefits:

Using SWISS before, during, and after handover can eliminate information loss and inaccuracies, automate change management, and maintain a “single source of truth” for O&M documentation, thereby ***reducing unplanned shutdowns, unnecessary material purchases, human resources, and operational and document maintenance costs.***

For a demo or to learn more about SWISS, contact us.



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