OIIE Use Case 1 – Information Handover from EPC to O/O

This Use Case describes the handover of O&M oriented information from the EPC community to the owner/operator in a properly sequenced way during the Design and Construction phases prior to Commissioning. While there are massive amounts of information that an EPC may need to exchange with other EPCs and the Owner/Operator engineering and construction team, this use case is focused on the information that is needed to properly populate and commission a sustainably interoperable Operations and Maintenance Execution Environment. This information falls into two basic categories. The first category is engineering information about the plant breakdown structure and system design models (Logical P&ID and PFD), which provide the identifiers and logical engineering structure to which all other information, systems and services must be related. The second category is the portion of as-built information detailing serialized assets that have been installed in specific structural locations.

Background

A core problem for Owner/Operators (O/O), vendors, and systems implementers is the lack of good mechanisms for managing the needed information exchanges between EPC activities and the O&M related systems, applications and technologies. The problem has a variety of sub-parts, all of which are exacerbated when multiple EPC firms using multiple Design, Engineering and Construction Management tools are engaged, either in parallel or over time.

Success for individual project teams and sub-teams is often measured only against a discreetly identified set of work, without a requirement to make sure that the information envelope contains everything required to properly support the overall enterprise knowledge and information management requirements. While sustainable interoperability between various systems is increasingly critical for effective O&M, the basis for achieving interoperability is often made more difficult by the lack of appropriate interoperability requirements for each individual project that would enable a comprehensive solution.

There is also a lack of maturity in the engineering reference standards models. No single standard has broad, in-depth support for capturing all the required process, structural, mechanical, electrical, electronic and software information elements that are required for full-lifecycle interoperability. In order to progress from the current model where much of the information is managed through proprietary methods, multiple standards need to be harmonized so they can be used together in a portfolio. This portfolio approach leverages a combination of external reference data libraries and published standards for format, content and services – properly addressing the interoperability requirements for process industries.

The key to making required progress on a timely basis is leveraging the established MIMOSA and OpenO&M models, and methods for O&M interoperability while constraining the information being exchanged to the subset required to populate the O&M Execution Environment. Using these methods and constraints in conjunction with the ISO 15926, ISO 18435, ISO 13374 and ISO 14224 communities offers the best chance for achieving sustainable lifecycle interoperability.

Scope

The scope of this use case is limited to the transfer of plant breakdown structures, logical P&ID and PFDs, as well as installed serialized assets, their installation (logical) location, and the functional requirements (or functional specification datasheets) associated with the installation locations.

Preconditions

This Use Case is the logical first step as it describes the population of the Operation and Maintenance Execution Environment from the EPC data. As such, all other Use Cases are predicated on this; however, it has no preconditions itself within the current set of defined Use Cases.

NOTE As the set of Use Cases is expanded to cover Capital Project activities, these preconditions will need to be updated.

Successful End Condition

The O&M Execution Environment has been populated with the necessary plant breakdown structures, system design models, and installed assets required to proceed to Commissioning.

Actors

Business Actors

- EPC Team
- Commissioning Team

System Actors

- Engineering Design Systems
- Construction or Commissioning Management System
- Structured Asset Registry
    - REG-LOCATION
    - REG-ASSET

Triggers

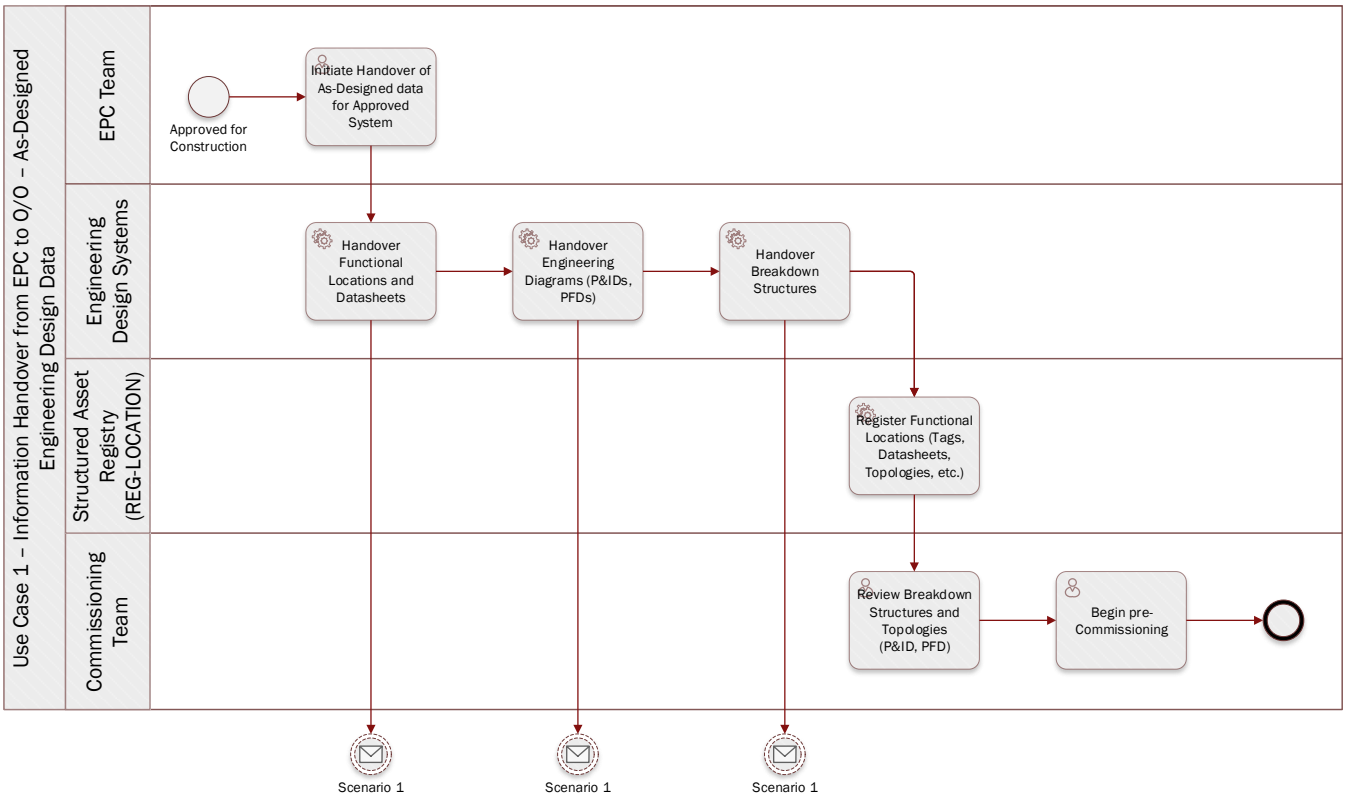
The primary information flows typically occur after passing the gates: Approved for Construction (representing *Issued for Construction* data) and Approved for Commissioning & Closeout (representing *As-Built* data). The handover of information is conducted on a systems basis – as different sections of the plant are approved and signed-off, the related and relevant information can then be incrementally exchanged.

The list of serialized assets and their corresponding installation information are typically exchanged at the Approved for Commissioning & Closeout gate, after the completion of the construction phase. In some instances, this information may be handed over incrementally throughout the construction phase.

Main Success Scenario

The following is a simplified workflow of information handover at the gates Approved for Construction and Approved for Commissioning & Closeout, prior to commissioning. It identifies the interoperability-based interactions between enterprise systems within the context of a general business process. The workflows exclude the actual construction process and may be triggered many times as each system or section of the plant is approved and proceeds through the lifecycle. During the construction process, modifications may be made to the logical structure of the plant, which may trigger Use Case 2: Engineering Updates. Regardless of the enactment of Use Case 2, handover of the As-Built logical structure of the plant is performed, updating the data previously sent to the O&M Register and tracking the data revisions from the previous data. This revision tracking may use the same mechanism as used in Use Case 2 for updates. After handover of the As-Built logical structure us complete, the handover of serialized asset related data is performed.

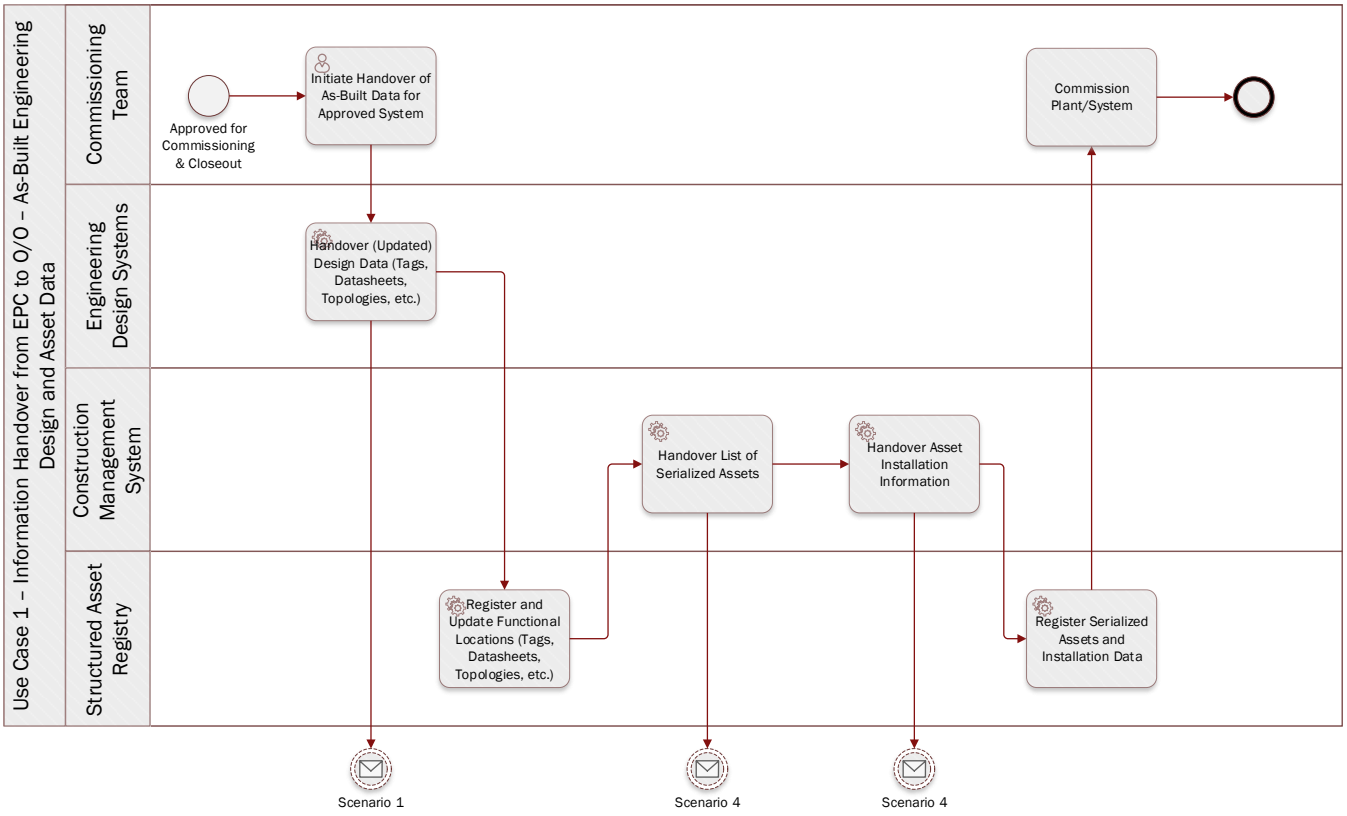
The first workflow illustrates the handover of *Issued for Construction* data after passing the Approved for Construction gate:



Initiate Handover of As-Designed Data	The EPC Team gathers the relevant documents and design engineering data of a particular plant section for handover to the O/O.
Send Functional Location Data	The Engineering Design System(s) publishes data regarding the set of functional locations, including identification properties (e.g., Tags), functional specification datasheets, and other metadata.
Send Engineering Diagrams	The Engineering Design System(s) publishes the topology data: P&IDs and PFDs describing the logical structure of the plant section, the interconnections and flows of the functional locations.
Send Breakdown Structures	The Engineering Design System(s) publishes the relevant breakdown structures detailing the hierarchical structure of the system and the composition its functional locations.

Register Functional Location Data	The O&M Register records the functional locations and all related data published by the Engineering Design System for the plant section undergoing handover.
Review Engineering Design Data	The Commissioning Team reviews the populated engineering data.
Begin pre-commissioning	Once the review has been completed, the pre-commissioning process for O&M systems commences.

The second workflow illustrates the handover of *As-Built* information triggered by the passing of the Approved for Commissioning & Closeout gate.



Initiate Handover of As-Built Data	The Commissioning Team gathers the relevant documents and data sets for the particular plant section for handover to O&M.
Send updated Design Data	The Engineering Design System(s) publishes any updated functional locations, datasheets, logical structure diagrams (P&IDs, and PFDs), and breakdown structures.
Register updated Functional Location Data	The O&M Register updates the previously registered functional location data based on the newly published data from the Engineering Design System(s). Changes to existing data is tracked.
Send Serialized Assets	The Construction Management System (or Commissioning Management System) publishes the serialized asset data for each asset installed in the plant section undergoing handover.
Send Asset Installation Data	The Construction Management System (or Commissioning Management System) publishes the installation data detailing to which functional location each serialized asset is installed.

Register Asset Data	The O&M Register records the serialized asset data and related installation information.
Commission Plant/System	Once the As-Built data has been populated in the O&M environment, the Commissioning Team proceeds with the commissioning process.

System Interoperability Scenarios

- Scenario 1 – Publish As-Designed/As-Built Engineering Network/Segment/Tag data from ENG to REG-LOCATION
- Scenario 4 – Publish As-Built Engineering Asset data from ENG, CONSTRUCT to REG-ASSET

Version Applicability/Alignment

Use Cases do not specify generic or specific data requirements; however, they have a lifecycle and can be associated with versions of CCOM and other MIMOSA standards based on when they are introduced, updated, or deprecated. For example, newer Use Cases may not be able to be supported by older versions of CCOM, while older Use Cases may become obsolete as the standards and OIIE evolves over time.

This Use Case is applicable to the following versions of CCOM:

- CCOM 3.x (part of OSA-EAI 3.x)
- CCOM 4.x

NOTE Use of 'x' in the version number indicates a variable version. For example, "4.x" indicates applicability to all versions of CCOM with the MAJOR version '4', regardless of MINOR and PATCH versions.

Document Versioning

Version	Date	Major Changes
1.2	2020-06-29	Updated to use OpenO&M template
1.1	2020-02-11	Corrections resulting from review from OIIE OGI Pilot phase 3.1
1.0	2019-01-03	Imported from website-based documentation. Added scope, triggers, successful end condition, main success scenario to match the new architecture.