CHAPTER 7

Asset Management Integration with Other S/4HANA Business Applications

In the dynamic landscape of modern business applications, seamless integration between various applications is essential for optimizing processes and achieving operational excellence. This chapter delves into asset management integration within SAP S/4HANA and its interactions with other key business applications. By fostering a deep understanding of integration possibilities, benefits, and practical implementations, organizations can harness the full potential of their assets and drive efficiency across their operations. This chapter explores essential integration points and sheds light on their significance.

The following are some of the key topics covered in this chapter.

- Integration with S/4HANA supply chain applications
  - Materials Management
  - Production Planning
  - Quality Management

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- Integration with S/4HANA Financial Accounting and Controlling
- Integration with S/4HANA Project System
- Integration with S/4HANA Environment, Health, and Safety

Integrating modules in SAP S/4HANA means ensuring that different software parts work together smoothly. In S/4HANA, there are various modules (individual business applications), such as asset management, finance, inventory, sales, and human resources, and each module handles specific tasks. When you integrate these modules, it implies that they can share information and communicate with each other.

For example, there's a machine breakdown reported in the asset management module. When integrated with other modules (see Figure 7-1), like inventory management and purchasing, the system can automatically check if there are enough spare parts in stock for the maintenance job. If not, it can trigger a purchase requisition in the purchasing module to order the required parts.

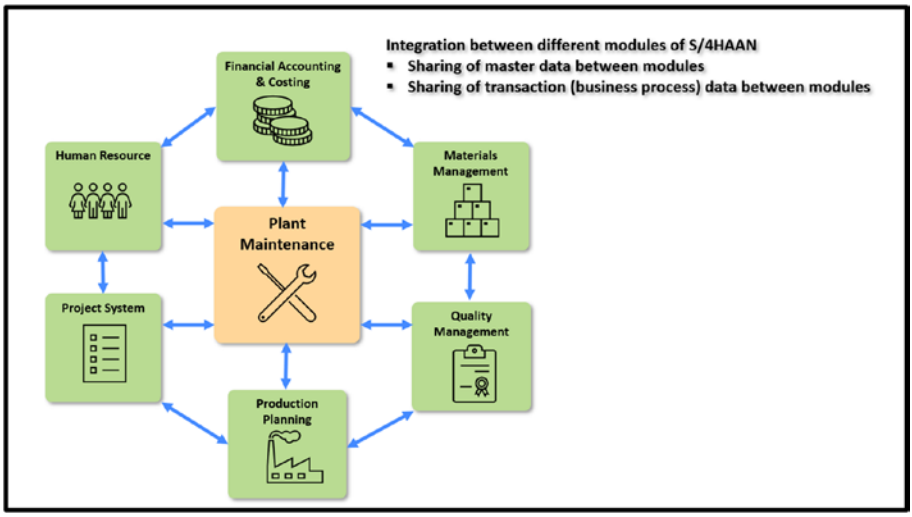

Figure 7-1. *Integration among different S/4HAAN business applications*

The following explains some of the benefits of application integration.

- **Streamlined processes**: Integrating asset management with other modules in S/4HANA eliminates redundant data entry and manual handoffs between departments. This streamlines workflows, reducing errors and improving overall efficiency.
- **Real-time visibility**: Integration provides real-time data exchange between modules, allowing better visibility into material availability, quality inspection results, production schedules, and financial and costing reports. This enables quicker decision-making and better resource planning.

- **Reduced downtime**: Integration with quality management allows immediate inspection of materials and products. This helps identify defects early, preventing production issues and reducing downtime caused by faulty equipment or materials.
- **Optimal spare parts management**: Integration with Materials Management ensures that the right spare parts are available when needed, minimizing downtime due to equipment breakdowns.

7.1. Integration with S/4HANA Supply Chain Applications

S/4HANA Asset Management helps businesses manage their asset maintenance process efficiently. When integrated with other S/4HANA Supply Chain modules, like Materials Management (MM), Quality Management (QM), and Production Planning (PP), it forms a comprehensive solution that optimizes the entire maintenance process by sharing data among these modules.

7.1.1. Materials Management

S/4 HANA Asset Management and Materials Management (procurement and inventory) are two essential modules in the S/4HANA Business Suite that help businesses maintain their assets and manage their material effectively. Next, let's discuss a few important integrations between these two modules.

Initiating a Materials Purchase Requisition from a Maintenance Order

For the maintenance and repair of an asset, sometimes you need materials that are not part of the regular inventory (non-stock materials). For example, it could be a specialized high-cost spare part or a one-time purchase item. If you realize that these non-stock materials are required when planning a maintenance order, you can automatically create a purchase requisition by entering the non-stock material details, such as the material master number, required quantity, and issuing plant and releasing the maintenance order. Releasing the order automatically creates a purchase requisition for the required material and quantity. The purchasing department then takes your purchase requisition and proceeds with the purchase of the material by converting the purchase requisition to a purchase order. When the vendor supplies the material, the maintenance order is debited with the cost of the material upon goods receipt in the Materials Management module.

Initiating an External Service Purchase Requisition from a Maintenance Order

Similar to the purchase requisition for non-stock materials, if you need any specialized workmanship (such as the calibration of an electronic system or specialized welding) from an external supplier, you can automatically create a service purchase requisition.

The maintenance order provides two types of procurement processes for the processing of an operation externally by an external vendor.

Procurement of Service

For a maintenance order operation that needs to be processed by an external vendor, and where the vendor delivers the required service at the customer's location where the technical asset is maintained (meaning the technical asset is not required to be sent to the vendor's location,

and therefore, goods movement of the technical asset is not required), you need to select control key PM03 for the operation. For example, the calibration of a large weighing scale needs to be done by an external vendor, and the vendor performs the calibration at the location where the weighing scale has been commissioned.

An operation with a PM03 control key is not required to be scheduled, and capacity requirements are not generated for the maintenance work center. After entering the control key PM03 and other purchasing-related details (e.g., the service master number, required quantity, and releasing the maintenance order), a purchase requisition is automatically created. The purchasing department then takes your purchase requisition and proceeds with the procurement of external services. A service entry must be performed in the Materials Management application to confirm the operation's completion.

Subcontracting for an Operation

If a maintenance order operation needs to be processed by an external vendor through subcontracting, wherein the technical object may need to be sent to the external vendor's location, then you must select control key PM02. For example, a large electrical motor requires rewinding, and for this, the technical asset housing the motor needs to be sent to the vendor's location since the machines and tools used for rewinding are installed at the vendor's location. Goods movement of the technical asset is required so that the technical asset can be issued to the vendor.

An operation with a PM02 control key can be scheduled; capacity requirements are generated. A purchase requisition is automatically created after entering the PM02 control key and releasing the maintenance order. The purchasing department then takes your purchase requisition and proceeds with the procurement process. After the completion of the required activity by the external vendor, a goods receipt needs to be posted in Materials Management to finalize the delivery of the purchase order.

Reserving, Issuing, and Costing of Inventory Material from a Maintenance Order

For the maintenance of an asset, while planning a maintenance order, you can reserve all the required materials (spare parts) to carry out maintenance operations (tasks). Upon releasing the order after planning, the system automatically creates reservations for the planned materials in the Materials Management module. On the Materials Management module's inventory side, the planned materials' required quantity is reserved for the maintenance order (see Figure 7-2). This implies that a requirement for the necessary material and quantity is generated, and both the warehouse clerk and any other requester can view the total available quantity and total reserved quantity for the material. Upon issuing the planned materials to the maintenance order, the order is debited with the cost of the material. Additionally, as part of the financial accounting, the corresponding G/L account entries (debit and credit) happen automatically.

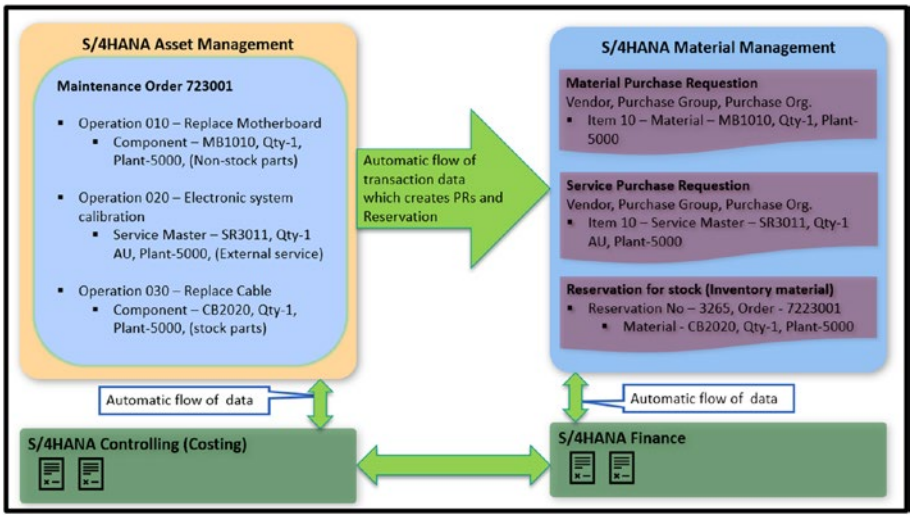

Figure 7-2. *Asset Management and Materials Management integration*

7.1.2. Production Planning

Generally, assets (such as machines, equipment, and assembly lines) are employed in the manufacturing process by using them as production work centers. Consequently, if a maintenance order is created and released for carrying out maintenance work for an asset, the production planner should have the ability to view all released maintenance orders in their planning report (e.g., planning board) for those production orders where the production work center consists of the under-maintenance asset.

To accomplish this, the production work center code must be entered in the master data of the technical asset (equipment master's location data section).

In the header section of the open maintenance and repair order, the "0 – Not in operation" value in the System Condition field must be selected (see Figure 7-3). The maintenance order must be released for execution.

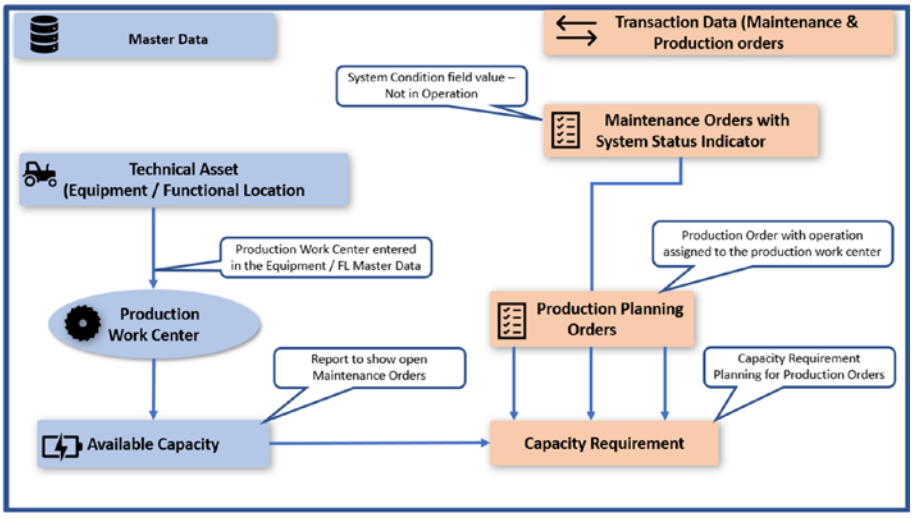

Figure 7-3. *Integration between asset (equipment master) and production capacity planning*

The capacity planning report shows the maintenance order (see Figure 7-4). When the production planner tries to dispatch the production order per the planned schedule, it is moved to the next/previously available capacity based on the scheduling strategy. If the production department needs to use this planned schedule for production, the maintenance order must be moved out of this planned timeline. This can be done by rescheduling the maintenance order.

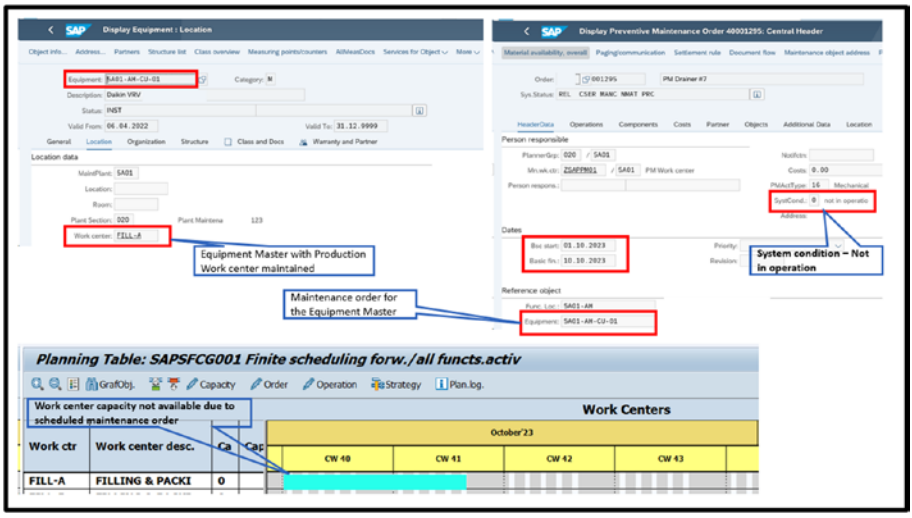

Figure 7-4. *Production work center capacity is not available due to scheduled maintenance order*

7.1.3. Quality Management

Inspecting an asset based on the recommended schedule is required to ensure that the asset meets the quality standard mandated by quality control, which is legally binding. Asset management is integrated with quality management and supports the inspection checklist process, from creating the inspection plan to the resulting recording and follow-up actions in asset management.

To plan the inspection of assets, maintenance planning, and scheduling functionalities are being used to generate maintenance orders regularly as per the required schedule. The inspection checklist (inspection lot) in quality management is generated and assigned to the maintenance order based on

1. The classification data is maintained for the technical asset and inspection plan.
2. The checklist type is assigned to the operation of a maintenance order

The following lists important master data (see Figure 7-5) for the inspection checklist process.

- Equipment master, functional location (technical asset)
- Task list
- Maintenance plan
- Quality management inspection plan

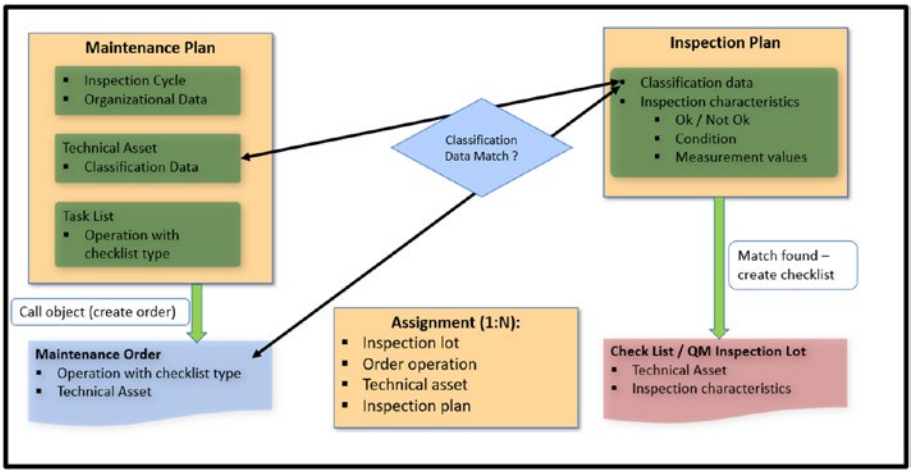

Figure 7-5. *Inspection checklist master data*

Process Flow

Each inspection job is initiated with a maintenance order created using a maintenance plan. The characteristics data of classification maintained in each inspection plan is compared with the classification of the technical asset and the checklist type of an operation in the maintenance order. The complete inspection checklist process comprises the following.

1. Create a maintenance order from the maintenance plan (or manually for ad hoc inspection).
2. Generate object list (automatically or manually).
3. Create an inspection checklist based on the object list.
4. Record results for inspection lot (checklist items) based on inspection lot characteristics.
5. Select a usage decision for the inspection list.
6. Confirm resources and complete maintenance order.
7. Continue with follow-up actions after the usage decision for the inspection lot.

Object Lists

At the time of maintenance order generation or after the order is created, an object list is generated from the header section of the maintenance order or objects from the maintenance plan item. Subsequently, during inspection checklist generation, each technical object (equipment, functional location) in the object list is checked to find a matching inspection plan.

Inspection Checklist and Inspection Lot

After the object list is generated and inspection plans for each technical object have been found, a new inspection lot is created, which can be viewed in the Checklists tab.

Result Recording and Usage Decision for Inspection Checklist

The user needs to record the inspection result based on the inspection lot's characteristics. You can set a usage decision based on the inspected results. When you set a usage decision, all follow-up actions defined are executed for the selected inspection lot and maintenance order.

7.2. Integration with S/4HANA Financial Accounting and Controlling

Integration between S/4HANA Finance, Controlling, and Asset Management ensures a smooth data flow and coordination between financial accounting and maintenance management. It helps maintain accurate asset and equipment information, enables activity-based costing for maintenance operations, and allows proper settlement of incurred costs to relevant financial destinations. This integration ultimately enhances an organization's overall efficiency of financial and maintenance processes. The following are important integrations among these modules.

- Asset master and equipment master synchronization
- Costing value flow in maintenance order
- Maintenance order cost settlement to cost object

7.2.1. Asset Master and Equipment Master Synchronization

In the S/4HANA Finance application, the asset master is created in relation to specific equipment or functional locations in the asset management module. Depending on the organization's process regarding the price value of a technical object (equipment/machines/assembly lines), the object is created as an asset master in finance alongside the creation of the equipment master or functional location in the plant maintenance (asset management) module. Since both the equipment master and asset master represent a single technical object, it is crucial to maintain accurate and consistent master data for reliable business transactions and reports on these data.

The main difference between asset master and equipment master is that the asset master is a central record that contains detailed information about important assets owned by a company, such as machinery, vehicles, or buildings. It serves as a single source of truth for all asset-related data, including purchase information, depreciation values, and useful life. On the other hand, the equipment master in plant maintenance (asset management) stores essential information about specific equipment or machinery that needs maintenance and monitoring. It includes details like equipment type, technical specifications, and maintenance history.

Synchronization between the asset master and equipment master ensures that when you create or update information about an asset in the asset master, it automatically synchronizes with the corresponding equipment master in asset management. The synchronization can also be set up in reverse order so that whenever an equipment master in asset management is created or changed, the corresponding asset master is created or changed respectively in finance's asset accounting. This synchronization helps maintain consistency and accuracy between financial data (asset details) and maintenance data (equipment details) throughout the system.

Information synchronized in the master data includes company code, plant, manufacturer, and cost center. To link the asset master and equipment master for synchronization (see Figure 7-6), the asset master number is maintained in the Asset field in the Organization tab of the equipment master.

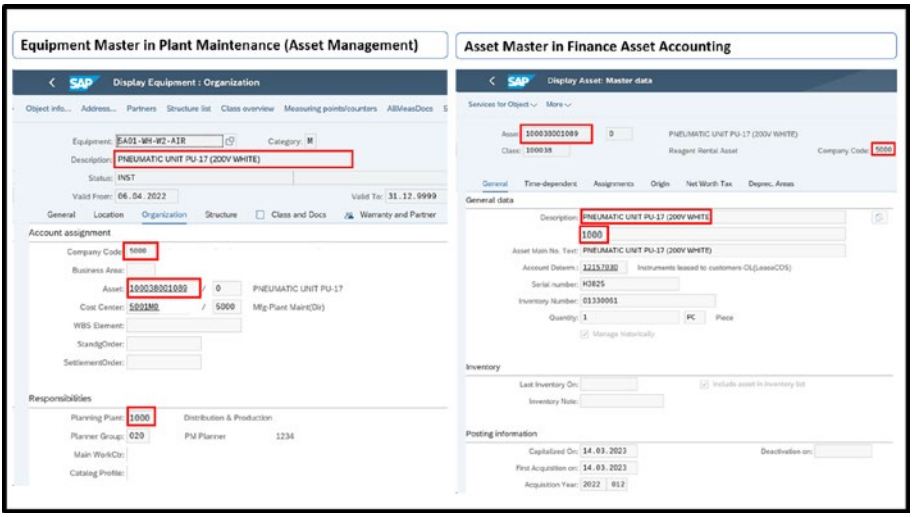

Figure 7-6. *Asset master and equipment master synchronization*

7.2.2. Costing Value Flow in Maintenance Order

Costing in maintenance orders is a way to track and manage the expenses related to maintenance activities in a business. It helps organizations keep a close eye on the costs incurred during the maintenance process (see Figure 7-7), such as servicing equipment, repairing machinery, or any other maintenance-related activities.

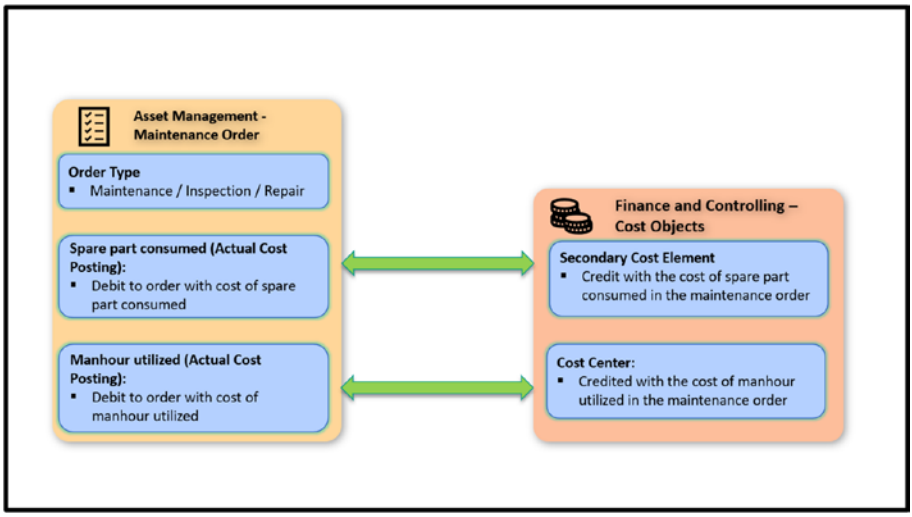

Figure 7-7. *Costing value flow between maintenance order and cost objects*

During maintenance, inspection, and repair of a technical object using a maintenance order in asset management, the order gets debited with planned costs when the required resources, such as spare parts and man-hours, have been planned, and the order has been released (dispatched). The order is debited again with the actual cost when the planned spare part has been consumed, or the utilized man-hours have been confirmed (see Figure 7-8).

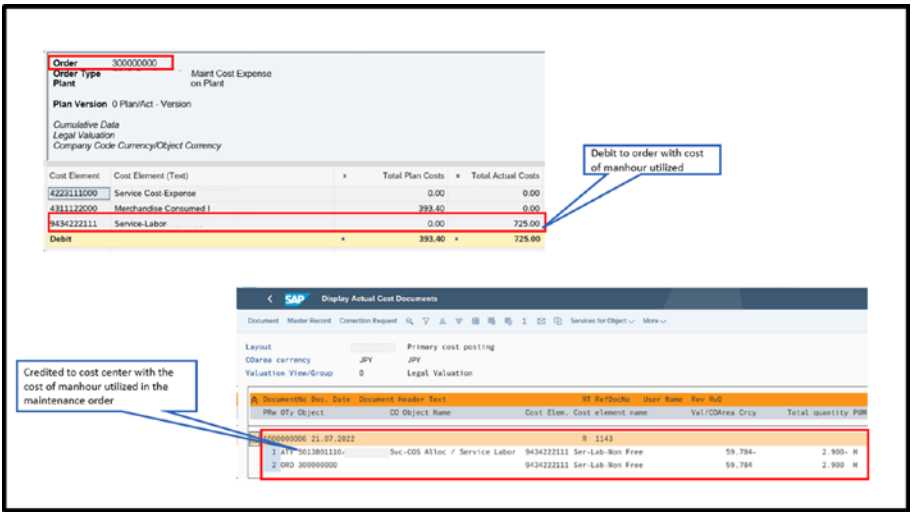

Figure 7-8. *Costing value flow between maintenance order and cost objects*

7.2.3. Maintenance Order Cost Settlement to Cost Object

Settlement is a cost allocation process, fully or partially, from one cost object to another. Settling the maintenance and repair order transfers the costs from the order to the relevant cost centers or other cost objects (see Figure 7-9) where these expenses belong. This way, the financial reports become accurate, and you can better understand the true financial impact of the maintenance activities related to asset management.

During the completion phase of the maintenance order, the order is settled to an actual cost receiver, which means the order is credited by allocating its debit to the receiving cost object.

For example, in a manufacturing industry, the settlement receiver can be a cost center of the repaired technical object. This means the maintenance order collects all the resource costs for reporting and analysis at the maintenance order level. Subsequently, the cost is transferred to receiving cost objects where these expenses belong.

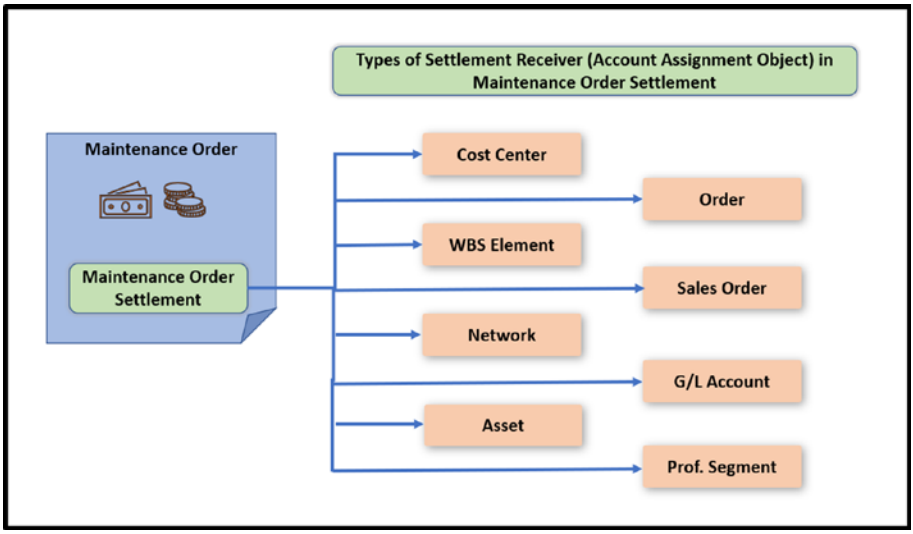

Figure 7-9. *Various types of cost settlement receivers in maintenance order settlement*

7.3. Integration with S/4HANA Project System

Project System (PS) is like a smart organizer for big tasks. It helps companies plan, manage, and track projects, like building a new factory or launching a product. It keeps all the details in one place, so everyone knows what's going on, what needs to be done, and how much it's costing.

Integrating the Project System and Asset Management applications allow you to link maintenance orders with the work breakdown structure (WBS) project. This integration enables accurate cost tracking, as maintenance costs incurred during the shutdown can be directly allocated to specific WBS projects, helping in better cost analysis and reporting.

Organizations treat large and long-duration maintenance jobs, such as shutdown maintenance, as a project in Project System because it offers several benefits that can help streamline and improve the management of maintenance activities during planned shutdowns. The following are some of the key advantages.

- **Structured planning**: Treating shutdown maintenance as a project allows you to create a well-structured plan that outlines all the tasks, resources, and timelines required for the maintenance activities.
- **Budget management**: Managing shutdown maintenance as a project enables you to allocate a specific budget to the project. This budget can be monitored and controlled, helping you keep the costs in check and ensuring that the maintenance activities are completed within the allocated financial limits.

7.3.1. Settlement of Maintenance Order to WBS in Project System

You need to maintain the WBS as an account assignment in the Location tab of the maintenance order and as a settlement receiver in the settlement rule of the order. Once the order execution is complete, the order is settled to the WBS. All the costs in the maintenance order are transferred to the WBS (see Figure 7-10). This enables tracking and managing maintenance costs within your larger project, using the WBS as a connecting point.

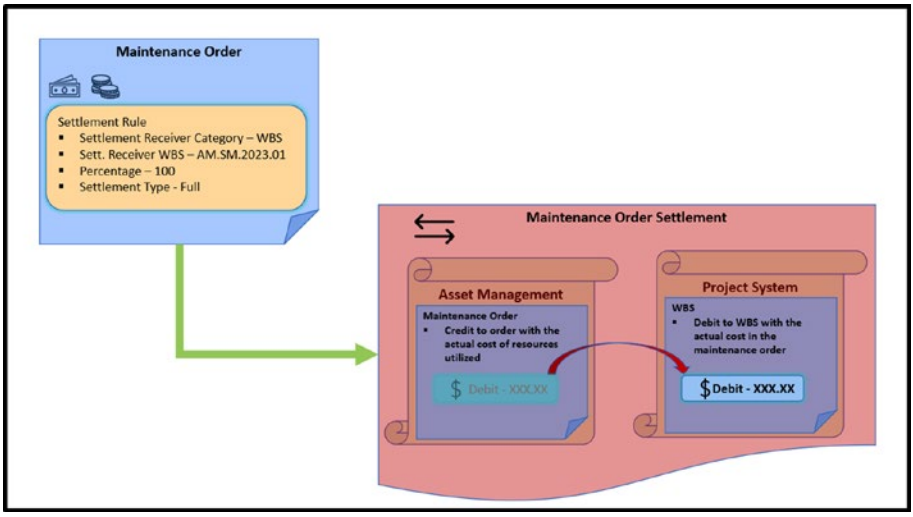

Figure 7-10. *Settlement of maintenance order to WBS in Project System*

The prerequisite customization to allow WBS as a settlement receiver in a maintenance order is to set the settlement receiver category as WBS optional (see Figure 7-11) in the settlement profile used for the order type.

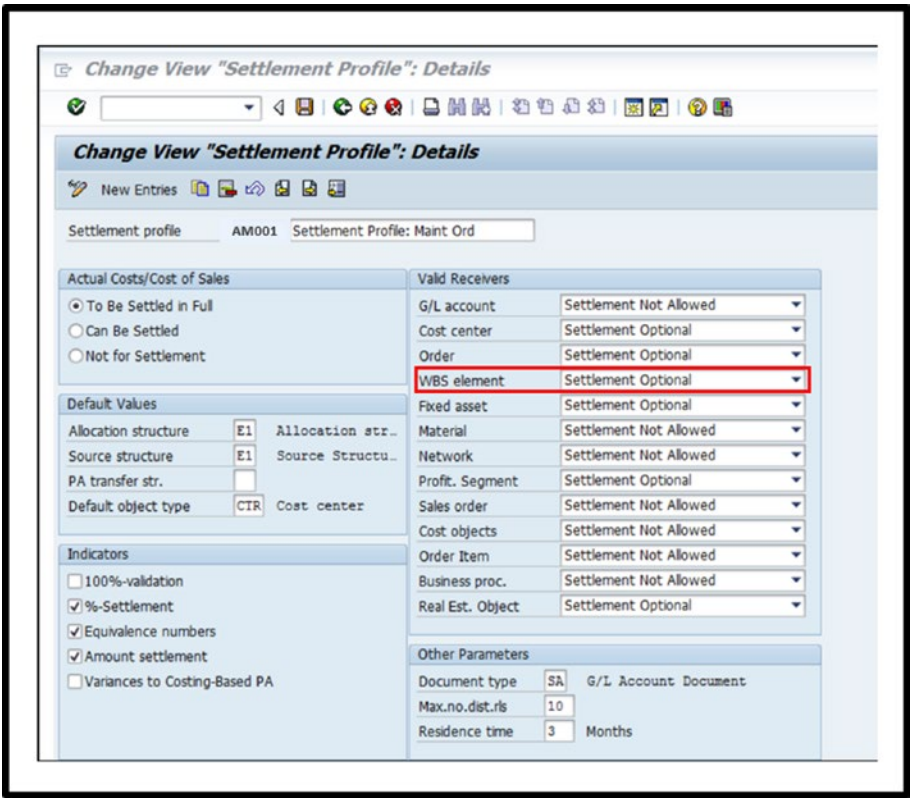

Figure 7-11. *Settlement receiver is WBS optional in settlement profile*

7.3.2. Budgeting for Maintenance Order Using the WBS in Project System

Another integration possibility between the Asset Management and Project System applications is budgeting for maintenance orders using the WBS.

Budgeting in the maintenance and repair of assets refers to the process of setting, monitoring, and controlling the costs associated with performing large and high-cost maintenance activities on assets (equipment/machines/assembly lines). It helps plan and control

expenses related to maintenance activities. At the start of maintenance order processing, the user must calculate and allocate the budget to the respective WBS element. The WBS with the allocated budget must be maintained in the "WBS element" field under the Additional Data tab of the maintenance order.

During maintenance and repair planning for the maintenance order, the system compares the total planned cost for the required resources in the order with the remaining balance of the allocated budget for the WBS. The user can save the order if the budget limit is not reached. However, if the cost of the required resources for the order reaches or exceeds the budget limit (see Figure 7-12), the system does not allow you to save the maintenance order.

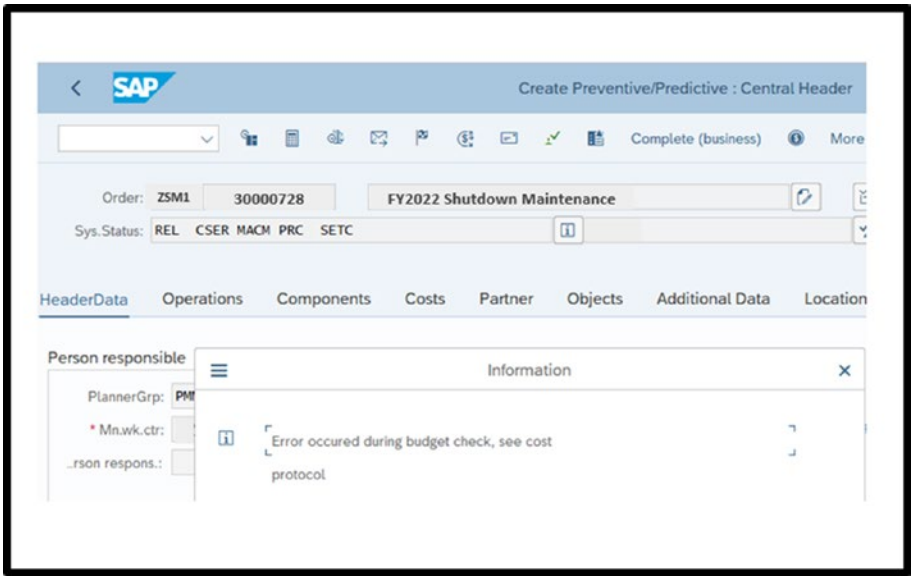

Figure 7-12. *Maintenance order not allowed to save when budget limit reached*

7.4. Integration with S/4HANA Environment, Health, and Safety (EHS)

S/4HANA EHS deals with environment, health, and safety. It's an application module that helps companies take care of essential business processes, such as ensuring a safe environment, maintaining employee health, and adhering to regulations to protect everyone. This module aids businesses in managing aspects like safety procedures, health regulations, and environmental responsibilities, ensuring they take appropriate measures to keep everyone safe and well.

EHS and Asset Management can be integrated if required. Next, let's discuss the two key integrations between these two modules.

7.4.1. Importing Technical Objects as Locations in EHS from Asset Management

In S/4HANA EHS, a *location* refers to a designated area, facility, or geographical site within an organization's operations where specific EHS-related activities, processes, or incidents occur. It serves as a categorization and organizational tool, enabling the linkage of EHS data and processes to particular physical or virtual spaces. This aids in effective tracking, reporting, and compliance management.

Technical objects such as equipment masters and functional locations from asset management (plant maintenance) can be imported and used as locations in EHS. The advantage of this is that you do not have to enter duplicate data; the foundational data for these locations originates from asset management. Alternatively, you can link existing locations in EHS Management with technical objects from asset management. Consequently, the system inserts the location into the location structure, making it available for various business processes within the application, such as reporting incidents (see Figure 7-13).

The following are prerequisites.

- Enable Asset Management integration in Customizing for Incident Management or Risk Assessment in S/4HANA EHS Management.
- Specify location types in Customizing for Incident Management or Risk Assessment in S/4HANA EHS Management.

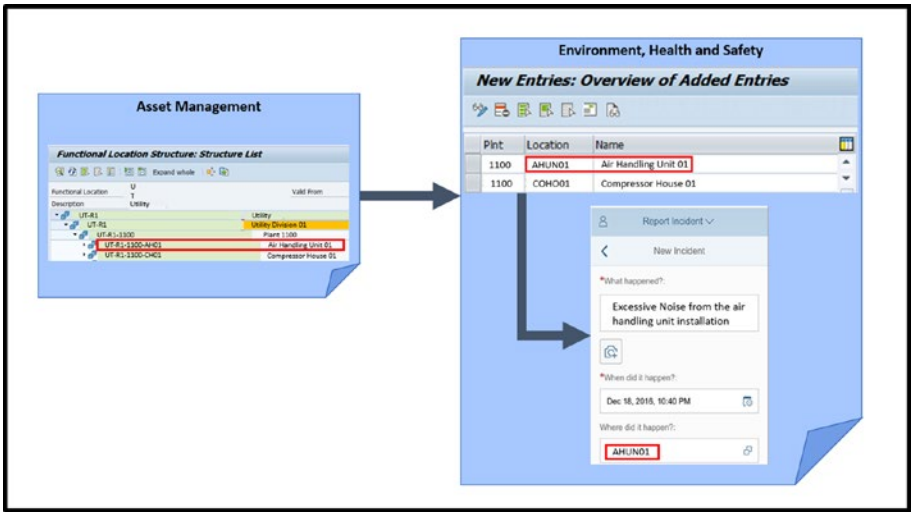

Figure 7-13. *Importing EHS locations from Asset Management*

7.4.2. Triggering Maintenance Notification from S/4HANA EHS Incident Management

The incident functionality in EHS supports you in capturing, processing, and completing events related to work. Here, an event represents everything you must capture or wish to record, such as personal injuries, accidents, damage to facilities, and any abnormalities-related findings.

During incident creation, you can initiate maintenance notifications within the incident management to request the maintenance and repair work required to prevent and rectify an unsafe condition. The user needs to select a notification type. The system assigns a notification ID and adds the maintenance notification as a new process in the Tasks table, and the process appears in the Task Processes table.

For example, a maintenance notification (see Figure 7-14) is created to investigate the root cause of excessive noise from an air handling unit and resolve the problem to stop noise pollution and other risks.

As a prerequisite, if you wish to add notifications, ensure that integration is set up for the corresponding systems.

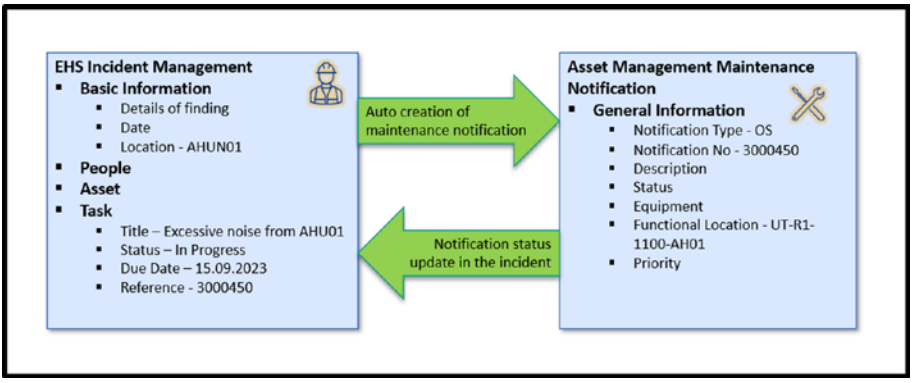

Figure 7-14. *Maintenance notification generation from EHS incident management*

7.5. Summary

This chapter delved into the crucial integration of Asset Management with various other S/4HANA business applications. It underscored the paramount importance of seamless integration, showcasing how these connections enhance operational efficiency, cost management, and overall business performance.