EXPRO National Manual of Assets and Facilities Management
Volume 8, Chapter 10

AMS Inventory Integration Procedure

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IMPORTANT NOTICE

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1.0 PUROSE

Asset Management Software Inventory integration is paramount to setting up strategies that use materials more efficiently, thus eliminating “shortages or excess inventory”. This procedure explains the management of inventory through the Entities’ Asset Management Software (AMS) and Inventory Systems, working together. The explanation includes both the AMS and Internal procurement procedural aspects.

Inventory and material costs can account high percentage of an Operation and Maintenance (O&M) budget. To manage expenditure, it is vital for Entities to control stocked goods and monitor their stored locations, and the transactions against those goods.

Since inventory is expensive to hold, poor spare parts control and planning can lead to inefficient inventory storage and a shortage of parts when you need them most, which causes unplanned downtime and unforeseen costs.

2.0 SCOPE

This document will discuss the integration between the Inventory Management and AMS systems, and the procedures linking those systems. It includes the monitoring of material availability balances and their location by the AMS, as well as raising Purchase Requisitions (PR) to obtain Purchase Orders (PO), if tools and materials are unavailable.

The procedure discussed in this document shall be adopted by Entities to control inventory using their AMS and procurement systems. Note that some Entities may have additional control requirements based on their own governance.

3.0 DEFINITIONS

Term	Definition
Asset Management Software (AMS)	Dedicated software application used to record and track an asset throughout its life cycle, from procurement to disposal. It provides an organization with vital information, such as asset location, asset users and maintainers, how assets are being utilized, and details about the asset.
Enterprise Asset Management (EAM)	The process of managing the lifecycle of physical assets and equipment in order to maximize its lifetime, reduce costs, improve quality and efficiency, health of assets and environmental safety.
Enterprise Resource Planning (ERP)	A software that allows the integration of operations and resources and manages them through one program. This approach to management is called Integration. Most large companies in the world use ERP to manage various aspects of their businesses. These are product planning, parts planning, parts procurement and inventory management, interacting with suppliers, providing customer service, and tracking orders. It can also include applications to manage finance and human resources.
Items for Incorporation	Parts, consumables, and materials used in planned or unplanned maintenance activities.
Supplier	Supplier is any organization or proprietor that receives a purchase order or enters into an agreement to provide a service, furnish equipment or material, on any Prime Contract, and does not employ on site labor in so doing. It is the intent of this definition that a manufacturer’s service, erection and commissioning supervisors, technical staff, testing engineers, and delivery drivers (e.g., of ready mixed concrete) are not considered as labor employed on the work site, and instead, are classified as employees of Suppliers.

Abbreviations	
BOM	Bill of Materials
EOQ	Economic Order Quantity
KPI	Key Performance Indicator
O&M	Operation and Maintenance
PM	Planned Maintenance
PO	Purchase Order
PR	Purchase Requisition
RACI	Responsible, Accountable, Consulted, and Informed
RFP	Request for Proposal
ROP	Re-Order Point
SLA	Service Level Agreement

Table 1: Definitions

4.0 REFERENCES

- Facilitiesnet (Home of Building Operating Management & Facility Maintenance Decisions) https://www.facilities.com/software
- National Manual of Assets and Facilities Management Volume 8 Chapter 9: Inventory Control Management – EOM-ZI0-GL-000007
- National Manual of Assets and Facilities Management Volume 8 Chapter 4: Procurement Methods – EOM-ZI0-PR-000001
- National Manual of Assets and Facilities Management Volume 8 Chapter 8: Warehousing Management – EOM-ZI0-PR-000006 and Warehousing Template – EOM-ZI0-TP-000001
- International Standards Organization (ISO) 55000:2014 – Asset Management, Overview, Principles and Terminology
- ISO 55001:2014 – Asset Management, Management Systems – Requirements
- ISO 55002:2014 – Asset Management, Management Systems – Guidelines for the Application of ISO 55001

5.0 RESPONSIBILITIES

- The AMS and Inventory teams shall be partners in the efficient control of inventory.

- O&M staff are responsible for planned work and for defining stock levels of spare parts, consumables, materials, and for Defining Re-Order point.

- Procurement staff are responsible for ensuring the prompt restoration of required stock levels.

Inventory-Related Responsibilities of the O&M team are explained in more detail in the table below, and Supply Chain Team Responsibilities are explained in National Manual of Assets and Facilities Management, Volume 8, Chapter 9: Inventory Control Management.

Role	Description
Maintenance Manager	Inventory-related responsibilities include: • Keeping all involved departments up-to-date on the status of O&M activities. • Day-to-day management of the O&M suppliers and vendors. • Ensuring the stock of goods and spare parts is adequate, based on evolving needs. • Reviewing and approving PRs, within pre-set limits. • Defining inventory Key Performance Indicators (KPIs), and tracking them regularly. • Overseeing daily operations and identifying challenges. • Analyzing data to anticipate future material procurement needs. • Suggesting solutions for continuous improvement. • Keeping abreast with the latest technology and best practices. • Using the AMS to monitor demand, and document characteristics of inventory. • Participating in supplier evaluations to achieve cost-effective deals and maintain trusted relationships.
AMS Administrator	Inventory-related responsibilities include: • Managing and maintaining assets data, resources, and preventative maintenance tasks, including parts/materials in the AMS. • Ensuring the integrity of data is maintained in the AMS. • Ensuring the AMS Inventory Management is readily available, according to the Service Level Agreement (SLA). • Promptly addressing any issue relating to the AMS software and hardware. • Managing and maintaining system roles according to Responsible, Accountable, Consulted, and Informed (RACI) guidelines.
Maintenance Planner	Inventory-related responsibilities include: • Supporting the O&M's staff productivity and work-quality, by anticipating and eliminating potential delays through diligent planning. • Coordinating labor, spare parts, materials, and equipment access. • Monitoring stock levels and materials history transactions. • Scheduling equipment downtime. • Assisting with the development of annual overhaul Planned Maintenance (PM), shutdown schedules, and associated Bills of Material (BOM). Communicate with work requestor for complete clarity of work to be performed. • Implementing improvement processes and systems, to minimize materials costs and maximize the asset life cycle. • Managing and running planned inventory. • Collaborating with warehouse employees and other stakeholders to ensure availability of materials and tools required.

Table 2: Responsibilities

6.0 PROCESS

6.1 AMS Inventory Integration within a Platform

It is highly recommended to the Entity to have a single platform AMS “one stop shop” and become a complete system. It enables the integrated management of maintenance and inventory and provides key benefits in relation to data accessibility, consistency and quality. Having data in one place helps with reporting and transferring information efficiently and accurately. Entities O&M benefits significantly by;

- Reducing downtimes
- Improving assets output
- Reducing waste
- Better insights into operations and maintenance
- Lowering maintenance costs
- Improving employees’ productivity
- Greater clarity in compliance with standards and regulations.
- Reducing capital expenditure through a structured intelligent system

Another benefit is that the staff training requirement of a single system is less than that for multiple systems. Entities also save on integration costs by opting for a single system. Multiple systems which need to be integrated require regular IT expenditure for re-integration whenever systems are updated.

When it comes to inventory management:

- AMS will help the Entity to optimize the stock levels by catching patterns of material consumption and adjusting the supply ordering accordingly.

- O&M staff can set desired stock levels for every part. If the number of selected items in stock falls below the set threshold, AMS will automatically notify and order can be made in time.

- O&M staff can perform everything from tracking and information recording to monitoring automatically. With highly accurate and reliable data, the need to conduct manual inventory checks drops down significantly.

Figure1 shows how AMS/Work Management module interacts based on transactions within a single platform with Inventory/Purchasing Management.

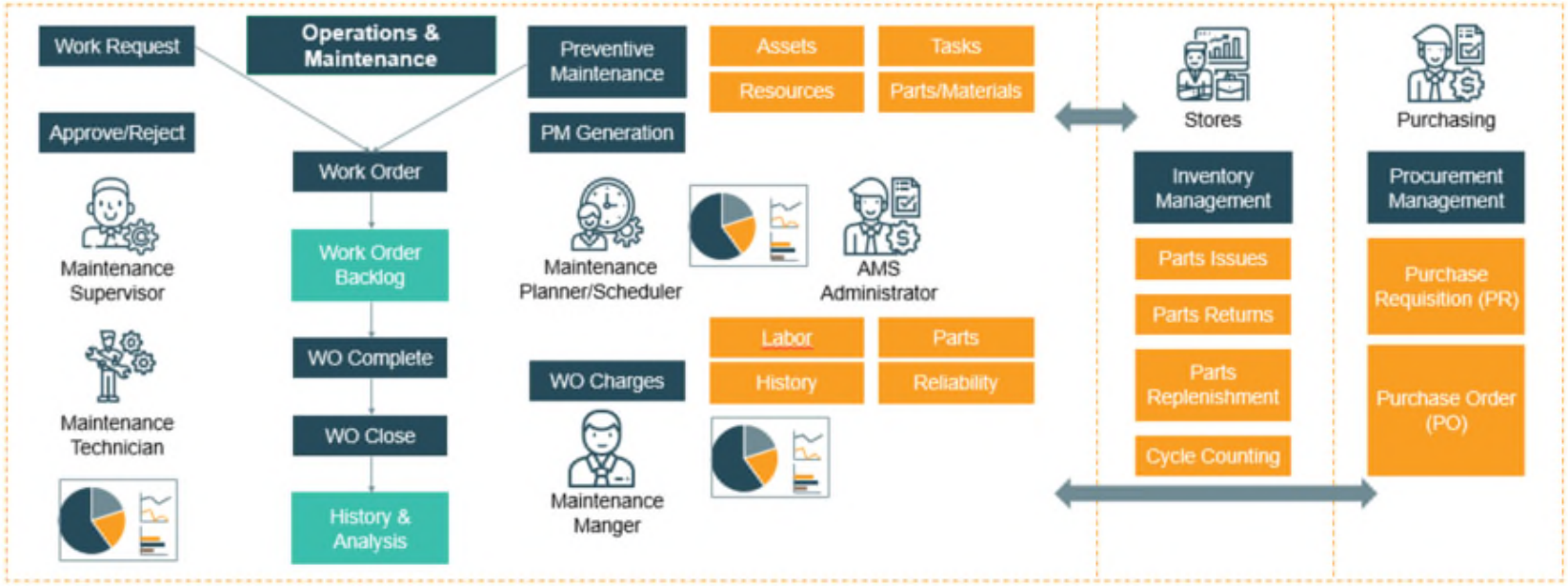

Figure 1: AMS and Inventory Module in a Single Platform

6.2 AMS Inventory Integration with an External Platform

It is not recommended to the Entity to have a standalone AMS and try to integrate it to a current ERP with Inventory Management system in place. It is highly recommended, based on best practice and cost efficiency point of view, to have a license or activate/customize the AMS/EAM module within the ERP.

The cost of integration/implementation and maintenance of two applications is not sustainable, the software alone is a major investment, and the cost of implementation would be considerable. Entity must take into account the cost of specialist resource and time necessary for a successful deployment. It may need to hire additional IT staff, ERP consultants, training specialists from software perspective.
The complexity of ERP solutions provide numerous capabilities, but that also means the software can be complex and difficult to use due to the complexity of its platform.

Figure 2 shows how the AMS would be integrated with an Enterprise Resource Planning (ERP) system to leverage inventory/procurement management. This is an example scenario where an Entity already has ERP and EAM that requires integration.

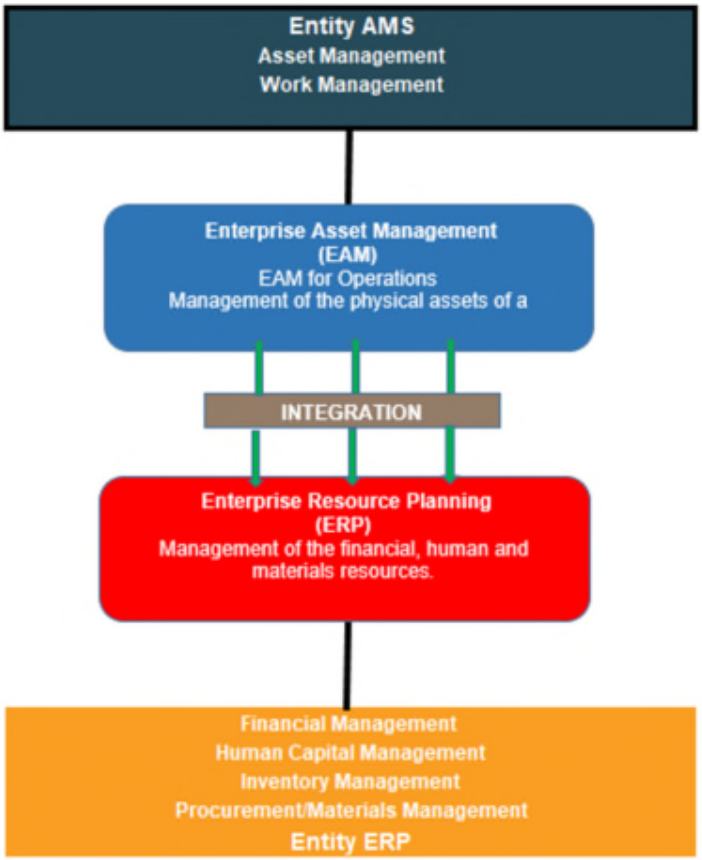

Figure 2: AMS Inventory Integration to an External Platform

6.3 AMS Integration beyond Asset Management

The benefits of a comprehensively designed AMS go beyond essential asset management. AMS provides Entities with a one-stop shop for all information on their physical assets. Not limited to:

- Lifecycle Costs
- Maintenance Histories
- Energy Usage
- Warranty Catalogs
- Audit Records

A unified AMS solution also includes the management of contracts, POs and Request for Proposals (RFPs).

Maintenance managers use the AMS to manage inventory and the location of storage. Entities can establish workflows and checklists to set up consistent best practices using the AMS.

Entities will also benefit from AMS support, in relation to condition monitoring, accounting, cost management, refining their work processes, enhancing equipment operational efficiency, and spotting areas of improvement, in any of the mentioned aspects.

6.4 AMS Inventory Management Strategy

Inventory management sets the direction and rules for having the right stock at the right place, at the right time and at the right cost. The goal is to minimize costs by using the AMS to drive the purchase of parts, consumables, and materials, based on normal usage rates so as to minimize unplanned downtime, and boost O&M staff efficiency.

Maintenance departments depend on reliable inventory to function as intended. The AMS warehouse function, ensures availability of critical parts such as motors, bearings, and filters, to ensure assets can operate as designed.

6.5 AMS and Inventory Management Components

6.5.1 AMS Parts Tracking

The AMS shall be set up to assist stores personnel in knowing where parts, consumables and materials are physically located, including a specific shelf in an individual warehouse, or store. If, as a matter of principle, Entities know where Items for Incorporation are located, then there will be no time wasted in locating them, and issuing them to maintenance staff.

It is easy to underestimate the importance of this, but downtime spent waiting for materials can be a significant cost. Reliable and efficient parts-tracking also prevents the ordering of duplicate parts, which again saves unnecessary expenditure, and prevents capital being tied up in inventory.

6.5.2 AMS Stock Levels

AMS that is designed and managed and fit for purpose will become the ultimate tool to support in managing all work activities and easily acquires material, resources and the inventory system consistently.

Minimum stock levels are determined by identifying the necessary Items for incorporation, in relation to the historical planned and unplanned activities for systems and equipment, and calculating their average use.

This knowledge can be used to fine-tune minimum stock levels and reorder quantities based on supplier lead-time. If done effectively, this process can help Entities O&M employ just-in-time delivery at the Facility. This review is an ongoing process and the exercise should be carried out annually at a minimum, as well as updated after the replacement of every capital asset.

6.5.3 AMS Reordering

Once Entities have established minimum stock levels, well set-up and regulated inventory systems will notify O&M staff when stock levels fall to a minimum. The AMS tracks all POs for inventory, and this will help O&M managers to continuously measure overall maintenance activities, and their financial impact.

The quality of data held will have a significant effect on the ability of maintenance personnel making reliable decisions regarding future inventory.

6.5.4 Managing Inventory at Multiple Locations

Standardized inventory management systems and processes within an Entity are crucial to O&M performance. The AMS has the ability to track Items for incorporation over multiple sites and in various storage locations, and enables O&M staff to perform efficiently. If an Entity has virtual access to resources from multiple locations through the AMS, it can reduce the impact of emergencies. However, this requires an efficient set-up and operation of systems, effective communication, and up-to-date data.

6.5.5 Eliminate Obsolete Parts

Proper monitoring of the lifecycle of spare parts cuts down on obsolete inventory. Obsolete parts held in the storeroom for months can deteriorate, as well as take up space on the shelves, and on the balance sheet. The AMS can highlight lesser-used parts, and decisions can be made by maintenance staff as to whether these need to remain in the warehouse, or whether they can be sold off to the benefit of the Entity, or disposed of. This exercise should be carried out at least once a year.

6.5.6 Inventory Reporting

Building a solid reporting framework for inventory management enables Entities to pin-point trends in consumption, and use this to make informed decisions. Good data can improve the allocation of funds, and allow Entities to work towards automating purchasing. Inventory reports should be studied with the O&M staff at least quarterly, to identify trends and redundant items.

6.6 Inventory Control Management Parameters

The following key Inventory Control Management parameters are described in details in Volume 8 Chapter 9 - EOM-ZI0-GL-000007– Inventory Control Management:

- Re-Order Point (ROP)
- Minimum Stock Level
- Maximum Stock Level
- Economic Order Quantity (EOQ)

6.7 Inventory Management and the Bigger Picture

Systematic and well defined inventory management leads to proactive maintenance. If the right parts are in the proper location, it enables the O&M staff to complete task as quickly as possible.

Setting the system up correctly takes time and effort on the part of the whole team, and requires solid and defined processes for everything, from purchasing to parts tracking.

For further details, refer to the NMA&FM, Volume 8, Chapter 9, Inventory Control Management Guideline EOM-ZI0-GL-000007.