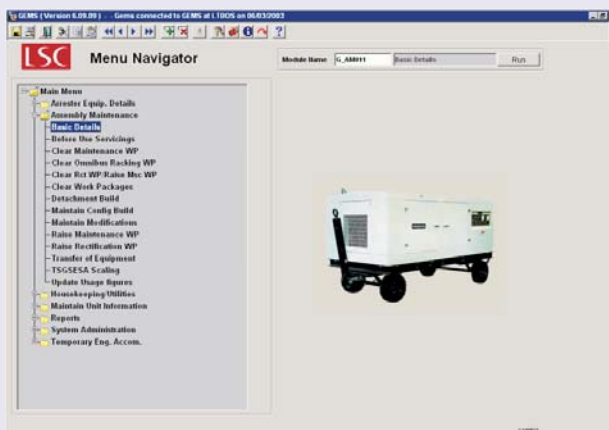


Ground Equipment Management System

The Global Service Environment for Ground Support Equipment



Ground Equipment Management System

GEMS ensures that aircraft operators have the correct, serviceable support equipment in the right place at the right time, minimising aircraft on-the-ground or turn-around time

Although many Ground Support Equipment (GSE) items are expensive assets, GSE has traditionally been the "poor relation" of aircraft operations and, as such has been maltreated and poorly managed.

Items which are "lost" or subject to high failure rates can adversely affect costly aircraft operations, resulting in passenger frustration and missed "slots" It is also highly probable that the assets are not being sweated to extract their full value across the whole life cycle.

The Solution

GSE used in support of aircraft operations requires a comprehensive management system to ensure that maximum potential is derived from these expensive assets.

The GEMS application ensures that monitoring and control of such assets is achieved easily, cost effectively and efficiently throughout their complete life cycle.

GEMS, utilising the latest Client-Server, Web-based, or e-business portal technology, from Oracle, provides a robust, scalable system, which is easy to implement, configure and use. Moreover, it can be readily upgraded to maintain currency with the latest technical innovation, and customised to ensure that it meets the requirements of individual customers.

Configuration Management

One of the core elements managing GSE is to understand exactly what it is and, if necessary, what it consists of. The user is able to configure assets, whether hardware or associated firmware, in terms of their physical component make-up, with life usage parameters being applied as required. Where the category of equipment requires special detail descriptions (e.g. racking), the form layout changes to accommodate the differences.

Other characteristics pertaining to the item/sub component can also be entered, for example:

- manufacturer details
- location - where necessary this can include bays in workshops and the team nominated to work on the item
- responsible inventory holder - for linking to the supply chain
- related technical documents
- test and Safe Working Load data
- dimensions and capacity

Life Usage Management

It is important to monitor the implementation of preventative maintenance activities and just as importantly, when to carry out such activities. Timing of these activities may be defined by calendar period or a number of operational parameters such as hours run.

One or more user-configurable life usage parameters (hours run, fuel used, starts etc.) can be applied to any item of equipment. Where applicable, current values of these lifing parameters are recorded as part of the routine data collection. The system then compares this against the life usage parameters entered for the item, and calculates when the associated maintenance event is due. Regular reports are produced which detail the items that are due particular maintenance events in the period selected for the report.

Recording Maintenance Events

To maintain an accurate record of the availability, reliability and other maintenance performance data for an item of GSE, all maintenance activities must be faithfully recorded, whether it be routine inspections, refuels, major scheduled servicing or defect rectification.

Before Use Inspection sheets are produced by the system for maintenance personnel to record details of the inspections as they are carried out. The results of these inspections are recorded within GEMS, ensuring an up-to-date record of routine servicing, consumption (e.g. fuel, oil) and life consumed is maintained.

Scheduled maintenance events can be programmed and planned according to life usage. These events and unscheduled maintenance activities employ Work Order Control to record and monitor:

- activity progress
- man-hours consumed, by trade
- details of any replacement parts fitted
- supervisory confirmation that the work is complete

On completion of scheduled maintenance events that are cyclic, the cycle is reset to enable the system to monitor the next occurrence of the event.

All such details are consolidated into the event history for the item.

The screenshot displays the GEMS software interface for equipment management. The main window is titled "GEMS (Version 6.09.09) - Assembly Basic Details G_AM011 - Gems connected to GEMS at LEEMG on 06/03/2003". The interface is divided into several sections:

- Selection:** Contains fields for Type Code (DFK), Serial Number (DFK182001), and Equipment Ref No (4FE2570023).
- Details:** A large section with multiple tabs and fields for equipment configuration, including Status (SERV), Condition, Usage (204:00), Position (MAJOR), and Inventory Code (BBU).
- Manufacturer Detail:** Shows Manufacturer Serial (GSE131).
- Location Detail:** Includes Location Code (LEEMG) and Physical Location (S GN H6).
- Report Dates:** A section for generating reports, with a "Start Date" field.
- Assembly Detail:** A section for assembly information, including Order By, Type Code, Location, Team and Bay, and Lifing Params.

GEMS optimises the availability, reliability and maintainability of each asset, which are the vital prerequisites to ensure that the maximum benefit is extracted from investment in that asset.

Tracking the Asset

To ensure maximum utilisation of GSE, it cannot be allowed to be lost, and normal operations require that it is often moved from one place to another to meet aircraft operational requirements. Equipment locations are recorded and if the equipment is to be moved from its current location, it can be dispatched from there and received at the destination location. As the transaction is completed, the basic details for the item will now indicate the new location, ensuring near real-time information being displayed to the user.

As an alternative, for long periods away from the home base of operations, the necessary equipment can be transferred to the detachment, the database records for the concerned items being exported to a ruggedised laptop computer, and the equipment supported from this database subset for the period of detached operation.

Maintenance Management

The optimisation of the availability, reliability and maintainability of an asset is a vital requirement to extract the full benefit from investment in IT. To ensure the comprehensive management of an asset's maintenance, GEMS records and retains all performance related information. System serviceability is recorded together with all failure occurrences, with exception reporting being available for noteworthy failures. Standard reports are available to detail maintenance management information such as:

- Mean Time Between Failures
- equipment running hours
- overall maintenance man-hours expended per item
- man-hours expended by trade
- spare parts consumed

In addition to predefined standard reports, the Oracle Discoverer tool provides the ability to easily produce user-defined reports from ad-hoc queries, facilitating management decision-making based on the appropriate set of current data.

Modification Management

Correct analysis of maintenance data frequently results in the identification of requirements to modify equipment. Accurate recording of the embodiment of all modifications to an equipment is essential to monitor implementation of a fleet-wide programme. Users need to ensure that unmodified equipment is not selected for use where a modified item is mandatory.

GEMS provides the facility to enter details of any modification or engineering instruction that is to be embodied on an equipment type. For each item of that type, identified by serial number, the required modification/engineering instruction is entered together with its current status (e.g. outstanding, embodied, cancelled). This is updated by the maintenance team as the programme progresses, providing operational users with current status information.

