

Maintenance Functionalities*

Perform **Preventative Maintenance (PM)**, **Periodic Maintenance (PeM)**, **Predictive Maintenance (PrM)**, **Reactive Maintenance (RM)**, and **Repairs Preventative Maintenance (RPM)**. Automatically schedule preventive maintenance (PM) for all equipment units (using unit type) based on PM programs defined for equipment PM classes or for individual units; Hierarchically schedule PM's; Adjust early/late hierarchically scheduled PM services; PM becomes due based on the earlier of elapsed time, meter usage (odometer or hour meter), or fuel consumption.

PM-due list analyzes equipment usage and fuel consumption rates to project when units not due for PM today will become due, and includes them on the list when appropriate.

Examples of meter units might be hours (from an equipment hour meter), miles (odometer reading), days (a calendar-based meter), etc

Track unlimited PM cycles for each unit in any combination by time, meters, fuel consumption, a set monthly date, or a set annual date;

Automatically update the next PM due when each job has been completed;

Users can define the update process for calculating next PM due using actual transaction date and current meter or previous date and meter;

Establish a hierarchy for PM services and define the highest level for the grouping;

Create/edit a shop schedule for list of PM's due;

User can define what working days will be included on the PM schedule, the total number and type of PM services included on the schedule and create a PM services repair record from the PM due listing;

Track jurisdictional inspections, annual renewals, smog inspections and any other site specific inspections; Generates annual and semi-annual inspection-due list by department, class, shop, or date; Supports PM frequency by time, miles, hours, fuel consumed, or any combination; Automatically update next-PM-due upon completion of the current PM; Scheduler accounts for differences due to age, usage and manufacturer.

Unlimited frequency of service for each piece of equipment; Track unlimited PM's for all components; List associated components in a PM-due report; Capitalize maintenance costs; Create and track work orders; View work order processing on screen; Print work order; System assigned work order numbers; Multiple users can edit the same work order Central (batch) input of data; Track real time data entry; Assign W/O by task type classification with or without option of bulk generation of W/O by class.

Combine Preventative Maintenance and corrective work, but retain separate cost centers / codes; Get W/O assignment by originating department; Process notification for previously worked on component

with defined timeframe (i.e. warranty); Process notification for legal requirements (i.e. alerts from DOT, FTA, etc.); Child/Parent sub-component tracking (i.e. A/C unit - bus).

Maintain revenue coaches and non-revenue automobiles, vans and trucks; Maintain leased or contracted-out unit, each with separate budgets.

Ability to segregate and maintain 3rd party vehicles; Administration of estimate with auto creation of subsequent W/O; Dispatch notification of vehicle availability/non-availability; Track distance and time-rated units (Example: mileage, hours); Track Fluids (fuel, lubrication, oil etc.); Track and report taxes, permits, licenses paid/owed (i.e. fuel); Track cost; Time and cost capture by employee and task; Track and compare Performance/efficiency amongst and between vehicle types; Labor and shop productivity analysis; Rent vs. Buy analysis; Rebuild vs. Purchase analysis.

Component rebuild Costs follow a part until installed in a unit, then costs assigned to the unit.

Integration with financial applications; Integration with purchasing; Integration with payroll applications; Road call tracking; Track unit downtime; Shop scheduling feature for labor, parts, bays, equipment; Track Project unit is used in; Accident information tracking (insurance claims administration); Integration with Inventory; Bar coding capabilities to track parts issued to vehicles; Track vehicle license/certifications (i.e. smog); Multiple user-defined PM intervals/schedules include mandatory inspections (DOT, Smog, etc).

Hierarchical, nested and tiered PM schedules.

Example: Service A, B and C. Thus C is nested in B while B is nested in A. If C is performed, A and B are automatically performed.

Assign, maintain, track, forecast PM intervals/schedules on all assets. Allow PM assignment by individual asset and by class, group, types, etc; Define PM frequency by miles, time, cycles, fuel consumed, etc, or any and all combination; Define multiple PM intervals/schedules on one asset; Generate PM-Due report based on user selected criterion (Example:, 60-day, 100-gallon, by dept, class, location, date, type, age, etc); Generate PM-Due report and export the output; automatically email operators/drivers and/or dept coordinators; Automatically create W/O from PM-Due List with tasks to be performed to include time standards, parts, check-lists, instructional/description texts.

Associate the list of tasks to each type of PM.

Example: For Service A, perform tasks 1, 2, and 3.

Automatically update the PM schedule when a PM is completed and advance to the next PM in sequence.

Example: Immediately Service B is performed, move from Service B to C.

Defer PM tasks and allow W/O process to continue; Report PM performance by assets, asset classes, asset types, departments, locations, drivers, etc; Analysis of PM performed over time and recommend

necessary adjustments; Custom PM scheduling by manufacturer, age, usage, and other unique requirement; Tracks OEM and add-on warranties for the entire vehicle or a specific component.

Tracks past activities and allows scheduling, generating and tracking of maintenance activities and maintains a history of all activities including all costs; Tracks complete maintenance history allowing for analysis of assets and performance of assets; Records and tracks customer service and is able to generate reports of various natures of services; Tracks when and where parts & materials have been issued and posts the transaction against the appropriate inventory item; Allows entry and/or selection of time interval and/or milestone interval including years, months, weeks, days, hours (run time), number of uses, etc; Use single screen to aggregates all items requiring approval for easy access by the approver; Use single screens to conduct basic functions (i.e. Work Order Creation, Approval, and/or Completion); Search and display scheduled work orders by a combination of criteria such as; type, item ID, user, value, work order template, location and scheduled date range; Link scheduled work order to one or more asset inventory items, either by type, inventory ID, or user field and value; Link one or more addresses to a scheduled work order in lieu of, or in addition to, asset inventory; Specify one or more time periods during which the scheduled work orders should not be generated (locked).

Option to specify that these dates should be enforced every year such as not scheduling Work Orders for specific staff when they are on vacation; Create preventative scheduled and reactive work order that can be scheduled for the future and/or on a recurring basis; Document equipment warranty information and tracking warranty periods with automated expiration reminders; Create Scheduled Work Orders based on any required elapsed period of time or user defined schedule type such as mileage, hours, event, etc; Specify a combination of scheduling criteria such as a number of miles or a period of time, whichever comes first; Link scheduled work orders to one another in a parent-child relationship (i.e. 15,000-mile service should also include work done as part of the 5,000-mile service), eliminating the need to enter redundant information; Issues inspections, system operations, and repair/replacement work orders automatically via email or print to the assigned user.

Preventative Maintenance track unlimited PM cycles for each piece of equipment in any combination by time, meters, fuel consumption, a set monthly date, or a set annual date.

Automatically update the next PM due when each job has been completed; User-defined update process for calculation of next PM due using the actual transaction date and current meter or previous date and meter; Establish hierarchy for PM services and define the highest level for the grouping.

Create shop schedule for a list of PM's due; User defines what working days will be included on the schedule.

Define total number and type of PM services included on the shop schedule; Create PM services repair record from the PM due listing.

Automatically email PM-due capability; Track jurisdictional inspections, annual renewals, and any other site-specific inspections.

Fax/email standard letter to vendors upon receipt of the equipment notifying them to provide estimate and prohibiting any repairs unless specifically authorized through a purchase order (P/O); Mechanics have access equipment history files, repair files, and modules as identified by the system administrator; Equipment/Vehicle users can create a request for service to notify other Departments or customers of temporarily out-of-service equipment; Fuel and fluid tracked by equipment, department, operator, supervisor, department, etc; Fuel use batch-interface automatically updates with correct mileage, unit number, date, time, and operator a minimum of once a day; Variance report user-generated (Example:, gasoline used in a diesel vehicle or under or over consumption); Exception reports triggered by type of variance; Tracks unlimited number of fluid types (Example:, gasoline, diesel, hydraulic fluid, ATF, manual transmission fluid, axle fluids, transfer case fluid, antifreeze, engine oils (5+), brake fluid, windshield washer fluid, and power steering fluid; Usage for each fluid type listed by equipment number, sub-fleet (Example: backhoe or compressor), and fleet-wide; Fluid consumption (in gallons, quarts, liters, pints, as needed, etc) listed per mile/km or hour of operation (Example: 15 mpg of diesel); Usage falling outside user-defined parameters trigger exception report (i.e., list all engine oil consumption greater than 500 miles per quart); Tracks fuelling of ancillary equipment through alternate coding (Example:, truck 1106 will fuel under its own number and fuel other equipment under 1106A and Dispatch will need to log fuel usage for Fire Trucks); Unusual fuelling patterns, such as a truck odometer apparently losing mileage or truck getting 50 mpg, will appear on exception reports identifying the driver/operator, supervisor, location, and fuelling history; Tracks proper fuel (such as diesel vehicle cannot requests gasoline); Reasonableness check for odometer and meter reading; Abnormal oil analysis report.

HemSys has query and exception reports: List of repairs, PM, down vehicles, fuel/fluid usage [by equipment number, sub-fleet, and/or fleet, etc].

Maintenance report records listed by query by date, individual equipment number, vendor, department, cost, frequency, repair type, etc; report on, through both query and exception reporting, repeat repairs for a particular equipment number, department, or fleet.

Example: fuel tank replacement on Sterling trucks within last four years.

Track equipment repairs, PM, bodywork, maintenance, usage, location, rental or leasing information, insurance, down equipment, licensing, licensing requirements by department, supervisor, operator, crew, etc; Track problems that might indicate a need for individual operator training.

Example: An operator driving a truck needing frequent clutch or transmission repair.

Generate and track W/O separated into active, completed, deferred, and archived categories. Evaluate the performance of vendors, drivers, and mechanics for tasks such as repeat repairs, price comparisons, cost effectiveness, reliability of diagnosis, and ability to recognize ancillary problems.

Billing broken down into operating departments, etc with parts and outside service (sublet); User with appropriate rights can edit markup/margin; Labor billing allow hourly labor cost; Fuel billing include a surcharge to the fuel cost; Separate billing available for accident, abuse, capital items, rehabilitation, etc; Create service requests to notify other Departments or customer of broken or down equipment.

The system's ability to establish **hierarchical scheduling** of PMs is illustrated as follows:

If an "A, B, C" methodology is used, when a "C" is done it is assumed an "A" and "B" have been done and automatically reschedules all three.

Adjust for early/late hierarchically scheduled preventive maintenance services; User can place PM tasks and/or equipment on hold bypassing PM work order scheduled; Individually scheduling PMs to account for differences due to age, usage, and manufacturer; Multiple parts, labour, special tools, and equipment can be assigned to each PM task; Set work order exception triggers based on: usage, time, historical maintenance cost, salvage value, net present value, etc.

Work orders created outside established parameters are routed for approval in order to compare planned value of a work order to the current depreciated value of the asset.

Track and report trends by vehicle class and unit; Analyze to root-cause part / process / life cycle; Differentiate types of work and how / where the work is triggered (i.e. planned vs. unplanned, call-in vs. service bay); Track warranty claims against components.

Usage History Fuel / Km Transactions recording of vehicle's km and fuel usage stored in system to enable vehicle performance analysis Vehicle's Fuel Transactions (with associated kms) record by record stored for audit and performance analysis; Equipment Performance Reporting Mean Miles between Service Events (**MMDB**, **MTTF**); Consumables Usage per mile (fuel, fluids etc); Integration to external fuelling systems such as Cardkey technology Keypad Barcode/Hub Odometer mag-card key fob chip key.

Periodic Maintenance and Warranty Tracking; Periodic maintenance tracking by vehicle and equipment Periodic maintenance work order scheduling vehicle user and operator; Warranty tracking by vehicle and equipment Warranty work order scheduling with vehicle user and contractor Email notification to users and contractors for periodic maintenance, warranty, licensing etc.

Process – Maintenance/Inventory Description

Built in integrated solution that manages both maintenance and inventory; Create automated event triggers that will notify by email or other means when new or existing work orders are created or modified; Use color-coded status for differing time range of trigger alerts such as Green (3 months prior to due-date), Yellow (just past due), red (well past due); Triggers manages hours, weeks and month timeframes and at a minimum accommodate configuration for color-coded statuses; Generate notifications (email or other means) trigger scenarios; Upon the completion of a task such as requisition for replacement part, the buyer should receive the requisition through a notification method; Over-due work order task is red flagged and a notification (email or other means) is sent to the Maintenance coordinator; Escalation email is sent to his manager if the Maintenance coordinator does not take action within the specified time.

Notifies user during primary data entry such as save of requisition form, if required fields are not completed; User prompted to fill in required information before re-submitting form.

Process – Maintenance Description

Track high level maintenance categories such as Refit, Operational, etc; Maintain status, certification expiry and renewals dates for jurisdictional and federal mandatory certifications required for asset to operate such as Medical certifications (crew medical certifications, first aid training); and In class / out of class exams/requirements; Monitor and track manufacturer recommended maintenance schedules for each piece of equipment; Automatically generate work orders (based on date) for scheduling and assigning purposes of all regulatory and statutory certification requirements; Displays on asterisked lines (or a “check box”) on a work order for tasks that have been completed as sublets (by external contractors); Record unscheduled reactive maintenance tasks not associated with asset certification tasks; Log W/O tasks that are unable to be completed immediately, and need to be scheduled during an asset refit or another suitable time; Record and upload any amendments received to existing certifications that were received from an external third party (Example: DOT, FTA, Transport Canada, Classification Societies).

Plan, assign, track and schedule work orders on hourly, daily, weekly and monthly basis for each vessel; Optional interface of hand-held device used in recording metering, time frame data, etc can be used to transfer data from the hand held device to **HemSys**; Track machine operating times; Track labour and material (spare parts) costs it took to complete the work order task; Associate multiple rates for labour, burden and overhead for both employees and sub contractors; Track parts used in the completion of work orders; Parts used in closing out a work order task are recorded; Trigger creation of a work order based upon a specified meter reading or range of value; Allow authorized users, Head Office Personal, Maintenance Coordinator, to monitor and track overdue scheduled W/O categories such as refit, operational work; If a work order task (such as engine hours, required renewal task) has not been completed on schedule, a notification (email or other means) is sent to the Maintenance Coordinator; Tracks time taken to complete a work order task; Detailed work plan can be created for operational and refit maintenance and associate resources assigned to complete the task; Tracks key equipment maintenance history for the life cycle of the asset (Example: engines, hydraulics, ramps, rudders, and gearboxes); Upload, store and retrieve technical drawings / schematics and link the drawings to scheduled work order tasks; Drawings can be stored locally or on networked location; Associate inventory parts to work order tasks; Inventory item is automatically reduced in count once it has been associated to a work order task performed; Users can complete each section of both reactive and preventive maintenance work orders, in a non-sequential manner.

* Some versions and/or modules of the HemSys application may not have all of the functionalities stated above.