

Keppel Steria Consortium (KSC)

LAND TRANSPORT AUTHORITY



MAINTENANCE MANAGEMENT SYSTEM

OPERATION MANUAL COSWIN WORK VOLUME 5 OF 11

Ref.: 756/PMP/8029e/A-

KSC Version: 2.10

Date: ~~213 June~~August 2002



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1. INTRODUCTION

This Operation Manual shall describe in details all the functionalities of the Maintenance Management System (MMS).

COSWIN is a maintenance management tool specialised in assisting the monitoring and tracking maintenance works. It provides a set of comprehensive and configurable options for users to customise the software to meet their operational needs.

This document is the COSWIN Work of the MMS Operation Manual. It describes how maintenance jobs are planned and executed in COSWIN.

Chapter 1 provides a general introduction to COSWIN.

Chapter 2 describes the Resources modules provided by COSWIN.

Chapter 3 describes how COSWIN handles Shift and Roster Management.

Chapter 4 describes Unplanned Maintenance.

Chapter 5 describes Planned Maintenance.

Chapter 6 describes Condition Based Maintenance.

Chapter 7 describes Job Request and Planner Review.

Chapter 8 describes Work in Progress and Feedback to Work Orders.

Chapter 9 describes Work Order History module.

Chapter 10 describes Repairable Equipment Management.

Chapter 11 describes Maintenance Graphics and Analysis.

Chapter 12 describes Hazard Monitoring.

Chapter 13 describes Permit to Work.

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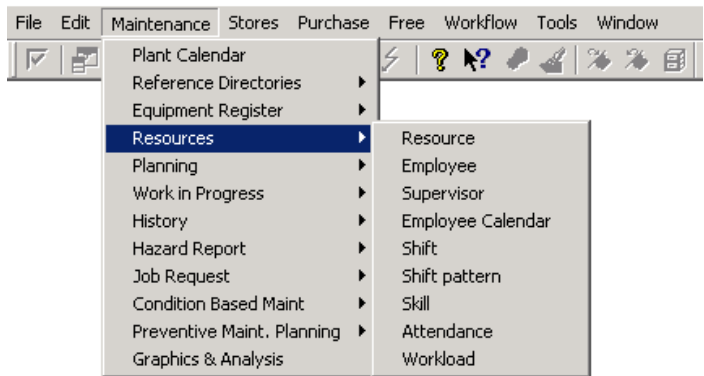
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2. RESOURCES

The purpose of maintenance resources is to provide the facilities to:

- Define the trades and their rates used in maintenance activities
- Define the employee that perform maintenance activities
- Visualize / define employee attendance at site
- Define maintenance activities supervisors and planners
- Manage the maintenance shifts



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2.1 SKILLS

Path: Maintenance / Resources / Skill

A skill represents the ability to perform a job and the ability is acquired either from talent, training, or practice.

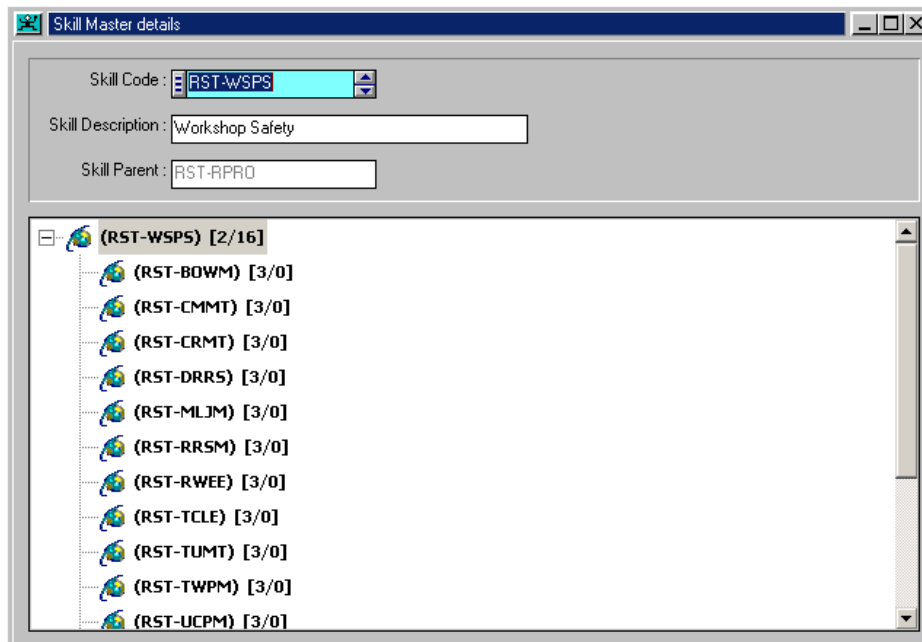
COSWIN provides for a set of parent-child relations between skills. The following rules must be respected for the skill hierarchy structure:

- The skills structure is tree-like
- Each skill has maximum 1 parent
- All skills can have any number of children
- There are no loops in the structure

The child skill is sufficient to perform a job that requires a parent skill but a parent skill will not be competent for a job that requires a child skill.

Select from COSWIN menu *Maintenance / Resources / Skill* to launch the Skill Details module.

The Skill Master Details window looks by default as follows:



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Detailed Field Descriptions:

Resource

This is the Resource identifier, a mandatory information of maximum 10 alphanumeric characters. It must be unique among all Resources.

A selector trigger button (or F2 key) linking to Resource Selector is available.

Name

This is the Resource description, an optional information of maximum 25 alphanumeric characters.

DETAILS TAB:

PM Jobs Factor

Preventive Maintenance Job Factor defines in percentage the portion of Wrench Hours which is available for PM Jobs for the resource. This factor is used in Resource balancing process. For example, if the Wrench Hours for a resource is 10.00 Hours/day, a PM Jobs factor of 80% indicates that for planned PM Jobs, the user can assume resource availability for 8 hours every day. The remaining two hours are reserved for unplanned jobs such as breakdowns, emergency jobs, etc. PM Jobs factor can be more than 100% provided multiplication of Wrench Hours with PM Jobs factor yields a value less than or equal to 24 Hours. It is an optional positive numeric information. COSWIN will automatically a value of 0.

Paid Hours/Day

This is the resource's number of paid hours per day, an optional positive numeric information. This value must be less or equal to 24.00 hours.

Wrench Hours/Day

This information represents the number of hours for which employees of the trade would be available for actual Maintenance work i.e. after discounting time for breaks etc. It is an optional positive numeric information, less or equal with the number of resource's number of paid hours. In addition, multiplication of Wrench Hours with PM Jobs factor should yield a value less than or equal to 24.00 hours.

Run Date

This is the date when resource availability was last run (see Planning module). It is a read-only information automatically managed by the system.

From Date

This is the beginning of the interval of resource availability computation, a read-only information automatically managed by the system. See Resource Availability Computation module.

To Date

This is the end of the interval of resource availability interval ending, a read-only information automatically managed by the system. See Resource Availability Computation module.

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Fixed Rate

This is the fixed cost, which is charged against a Work Order only once when the trade is being used. It is an optional positive numeric information, automatically proposed by COSWIN as 0.

The rates are used to compute standard labour cost for maintenance jobs, taking into account their resource requirements. When employees are defined, the employee rates are considered the default hourly costs of their resource.

Normal Rate

This is the first of the nine cost rate of the resource, an optional positive numeric information. The description of this rate is defined in Rate Headings parameter of COSWIN Configuration's Maintenance module.

Double Rate

This is the second of the nine cost rate of the resource, an optional positive numeric information. The description of this rate is defined in Rate Headings parameter of COSWIN Configuration's Maintenance module.

Triple Rate

This is the third of the nine cost rate of the resource, an optional positive numeric information. The description of this rate is defined in Rate Headings parameter of COSWIN Configuration's Maintenance module.

O / Time Rate

This is the forth of the nine cost rate of the resource, an optional positive numeric information. The description of this rate is defined in Rate Headings parameter of COSWIN Configuration's Maintenance module.

On-Call Rate

This is the fifth of the nine cost rate of the resource, an optional positive numeric information. The description of this rate is defined in Rate Headings parameter of COSWIN Configuration's Maintenance module.

Holiday Rate

This is the sixth of the nine cost rate of the resource, an optional positive numeric information. The description of this rate is defined in Rate Headings parameter of COSWIN Configuration's Maintenance module.

Un-named Seventh Rate

This is the seventh of the nine cost rate of the resource, an optional positive numeric information. The description of this rate is defined in Rate Headings parameter of COSWIN Configuration's Maintenance module.

Un-named Eighth Rate

This is the eighth of the nine cost rate of the resource, an optional positive numeric information. The description of this rate is defined in Rate Headings parameter of COSWIN Configuration's Maintenance module.

Un-named Ninth Rate

This is the ninth of the nine cost rate of the resource, an optional positive numeric information. The description of this rate is defined in Rate Headings parameter of COSWIN Configuration's Maintenance module.

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Default Rate Code

This is the default cost rate used for the current resource. It is a mandatory information and it must be selected among the above ones.

The default rate is used to compute the standard labour cost for a maintenance job.

NB: Refer to Section 8.1.3 for Currency Conversion for the above rates.

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SKILL TAB:

This tab displays the list of skills of the resource. Double click on any of the displayed skill will present the selected record in the **Resource Skill Details** window.

Code	Description	Level	Qualifying method
RST-DESC	Rolling Stock Description	5 0 - TRAINING	
RST-DRRS	Driving Road/Rail Shunter	5 0 - TRAINING	
RST-DRRS	Driving Road/Rail Shunter	5 0 - TRAINING	
RST-DESC	Rolling Stock Description	5 0 - TRAINING	
RST-DESC	Rolling Stock Description	5 0 - TRAINING	
RST-DESC	Rolling Stock Description	5 0 - TRAINING	
RST-DESC	Rolling Stock Description	5 0 - TRAINING	
RST-DESC	Rolling Stock Description	5 0 - TRAINING	
RST-DESC	Rolling Stock Description	5 0 - TRAINING	
RST-DESC	Rolling Stock Description	5 0 - TRAINING	
RST-DESC	Rolling Stock Description	5 0 - TRAINING	
RST-DESC	Rolling Stock Description	5 0 - TRAINING	


Resource Skill List Box

Code	This is the reference code of the skill the employee has.
Description	This is the maintenance skill description.
Level	This is the level of proficiency representing the degree of skill for the employee.
Qualifying method	This is the method used to qualify the employee with the skill.

2.2.1 To Add a New Resource

Minimum information required to add a resource, is:

- Resource identifier

Click on the  icon to launch the ADD window.

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2.3.3 To Delete a Supervisor

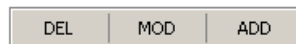
A Supervisor cannot be deleted, if:

- It has Employees assigned to him
- It is engaged in the Maintenance activity, i.e. there are Jobs / Work Orders supervised by him

Click on the  icon to delete the current Company Type.

2.3.4 To DEL/MOD/ADD an Associated Employee

Clicking into the More Tabs, 3 non-standard buttons, namely DEL, MOD, ADD will be appeared in the COSWIN toolbar:



You may use these buttons to delete (DEL) an associated employee record, modify (MOD) an associated employee details, or even add (ADD) a new employee to the system.

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2.4 EMPLOYEE

Path: Maintenance / Resources / Employee

Maintenance departments consist of one or more maintenance employees, each having skills in a specific field of activity, therefore belonging to a specific trade or resource. These employees are either permanent employee or temporarily hired and they perform maintenance work throughout the plant.

The employee related information is used basically to compute resource availability and to provide employee usage feedback on work orders, establishing work order labour costs.

An employee can only belong to a single resource. It is not mandatory to allocate a supervisor to the employees.

Only employee who are defined in COSWIN database can provide feedback. Everybody coming up during the feedback (add the hours) must be given a reference by an employee no in the COSWIN database.

Select from COSWIN menu *Maintenance / Resources / Employee* to launch the Employee Details module.

The Employee Details window looks by default as follows:

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Detailed Field Descriptions:

Employee No

This is the Employee identifier, a mandatory information of maximum 10 alphanumeric characters. It must be unique among all Employees.

A selector trigger button (or F2 key) linking to Employee Selector is available.

Employee Name

This is the Employee Name, an optional information of maximum 25 alphanumeric characters.

Resource

This is the identifier of the Resource, to which the Employee belongs, a mandatory information. It must exist in the directory of Resources.

When the employee is assigned to a resource, the following information is proposed by default from the given resource:

Paid and Wrench Hours/day

Fixed Rate

the nine cost Rates and the Default Rate code

A selector trigger button (or F2 key) linking to Resource Selector is available.

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This is the date on which the Employee is (or is to be) hired, an optional information.

Review Date

This is the date when the Employee status was last changed, a mandatory information.

Social Security

This is the Employee's Social Security number, an optional information of maximum 16 alphanumeric characters.

Emergency Contact

This is the Employee's Emergency Contact (address), an optional information of maximum 25 alphanumeric characters. This may be a name of a person, an address or telephone number to be used in case of emergency.

Phone

This is the Employee's Telephone number (residence/office telephone), an optional information of maximum 20 alphanumeric characters.

Blood Group

This is to record employee's blood group.

Permanent Employee

This information specifies whether the Employee is hired permanent (if checked) or temporarily.

ID DETAILS TAB:

This tab displays the various identification details pertaining to the employee.

The ID Details tab of Employee Details window looks by default as follows:

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Details	ID Details	Shifts	Skill	Preferred	More	Allocated On
<p>Identity Card No : <input type="text"/></p> <p>Passport No : <input type="text"/></p> <p>PIN : <input type="text"/></p> <p>Worker ID : <input type="text" value="010101018BHF1D0E"/></p> <p>Financial Authority Level : <input type="text" value="0"/></p> <p>Sex : <input type="radio"/> 0 - Male <input type="radio"/> 1 - Female</p> <p>Status : <input type="radio"/> 0 - Retired <input type="radio"/> 1 - Active</p>						

Identity Card No

This is the identify card number of the Employee, an optional information of maximum 16 alphanumeric characters.

Passport No

This is the passport number of the Employee, an optional information of maximum 16 alphanumeric characters.

PIN

This is the personal identify number of the Employee, an optional information of maximum 16 alphanumeric characters.

Worker ID

This is the worker ID assigned to the Employee, an optional information of maximum 16 alphanumeric characters. This information is also used to store the employee room access card ID for use with AMS interface.

Financial Authority Level

This is the employee level of financial authority for purchasing spares, an optional positive information.

Sex

This radio-button specifies the sex of the employee.

- 0 - Male** The sex of the employee is male
- 1 - Female** The sex of the employee is female

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Date	This is the qualifying date (date when the employee was qualified with the skill).
Valid until	This is the date until when the qualification is granted.
Qualifying Authority	This is the authority that qualified the employee with the skill.

PREFERRED TAB:

This window displays the list of equipment jobs that have indicated the current employee as the preferred employee to perform the job. The information displayed is read-only, automatically managed by the system.

Details	ID Details	Shifts	Skill	Preferred	More	Allocated On
Eqpt Code	Job ID	Planned Hrs	Job Description			
AFCALB17/GTAC01	N-JOB 2	1.000	New Job ID 2			

Employee Preferred List Box

Eqpt Code	This is the equipment identifier of the equipment job on which the employee is the preferred employee to perform the job.
Job Identifier	This is the job identifier of the equipment job on which the employee is the preferred employee to perform the job.
Planned Hours	This is the number of hours planned for this employee to perform the job.
Job Description	This is the description of the equipment job on which the employee is the preferred employee to perform the job.

MORE TAB:

This window provides information on the Employee's Cost Rates. An employee more than one (up to 9) cost rates associated, depending on the difficulty degree of the work order assigned to, or other criteria.

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Details	ID Details	Shifts	Skill	Preferred	More	Allocated On
Fixed Rate	<input type="text" value="200.00"/>	Normal Rate	<input type="text" value="15.00"/>			
Double Rate	<input type="text" value="15.00"/>	Tripple Rate	<input type="text" value="15.00"/>			
O/Time Rate	<input type="text" value="15.00"/>	On-Call Rate	<input type="text" value="15.00"/>			
Holiday Rate	<input type="text" value="15.00"/>		<input type="text" value="0.00"/>			
	<input type="text" value="0.00"/>		<input type="text" value="0.00"/>			
Default Rate Code : <input type="text" value="1. Normal Rate"/>						

Fixed Rate

This is the fixed cost, which is charged against a Work Order only once, if the employee is being used. It is an optional positive numeric information.

The rates are used to compute actual labour cost for work orders, taking into account the actual employee time feedback.

Normal Rate

This is the first cost rate of the employee, an optional positive numeric information. The user can define up to nine rate costs for a specified employee, depending on COSWIN configuration.

Double Rate

This is the second cost rate of the employee, an optional positive numeric information.

Tripple Rate

This is the third cost rate of the employee, an optional positive numeric information.

O / Time Rate

This is the Over Time cost rate of the employee, an optional positive numeric information.

On-Call Rate

This is the On-Call cost rate of the employee, an optional positive numeric information.

Holiday Rate

This is the Holiday cost rate of the employee, four optional positive numeric information.

Default Rate Code

This is the default cost rate used for the current employee. It is a mandatory information and it must be selected among the above ones.

The default rate is used when employee time feedback is entered for a work order. If no charging rate is specified, the default rate will be used by default.

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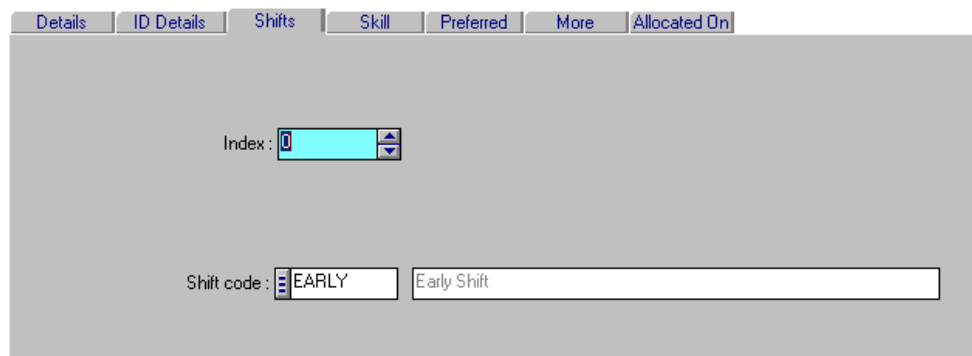
2.4.4 To Delete an Existing Employee

An Employee cannot be deleted if it is referred to in the Maintenance activity, i.e. is currently allocated for a Work Order.

Click on the  icon to delete the current Employee.

2.4.5 Employee Shift Details

The Employee Shift Details window looks by default as follows:



Detailed Field Descriptions:

Index

This is the index of the shift in the employee shift pattern. It is a positive integer value unique and contiguous for each employee. Index 0 denotes the first shift in the employee shift pattern.

Shift

This is the shift to which the employee shall be assigned in the corresponding day. It is a mandatory information. It must exist in the directory of Maintenance Shifts.

A selector trigger button (or F2 key) linking to Shifts Selector is available.


Description

This is the description of the maintenance shift. It is a read-only information automatically managed by the system.

2.4.5.1 To Add a New Employee Shift

Minimum information required to add the employee shift pattern, is:

- o Shift Code

Click on the  icon to launch the ADD window.

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2.5 EMPLOYEE CALENDAR

Path: Maintenance / Resources / Employee Calendar

In COSWIN, the calendar modules are used to define the calendars of the production department in the plant, on different levels.

Each employee has a calendar, defined for the Mandatory Period, based on the plant calendar. The employee calendars can be customised for each employee.

The Mandatory Period is the period which lasts between the years BEGIN and END established in COSWIN Configuration's Maintenance / Calendar Control.

The rules to obtain an employee calendar from a plant calendar are:

- The holiday and weekly off days from the plant calendar remain holiday and weekly off days in the employee calendar
- The shutdown days from the plant calendar become leave days in the employee calendar
- All the other days from the plant calendar become working days in the employee calendar

The Employee Calendars store the following information on the type of day:

Normal working day, Peak Production, Weekly off, Holiday, Leave, Absence

Select from COSWIN menu *Maintenance / Resources / Employee Calendar* to launch the Employee Calendar module.

The Employee Calendar window looks by default as follows:

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Employee Calendar

Empl.: 01546545

Name: Gustave

September 2000

L	M	T	W	T	F	S	S
35				1	2	3	
36	4	5	6	7	8	9	10
37	11	12	13	14	15	16	17
38	18	19	20	21	22	23	24
39	25	26	27	28	29	30	

October 2000

L	M	T	W	T	F	S	S
39							1
40	2	3	4	5	6	7	8
41	9	10	11	12	13	14	15
42	16	17	18	19	20	21	22
43	23	24	25	26	27	28	29
44	30	31					

November 2000

L	M	T	W	T	F	S	S
44							1
45	6	7	8	9	10	11	12
46	13	14	15	16	17	18	19
47	20	21	22	23	24	25	26
48	27	28	29	30			

Décembre 2000

L	M	T	W	T	F	S	S
48							1
49	4	5	6	7	8	9	10
50	11	12	13	14	15	16	17
51	18	19	20	21	22	23	24
52	25	26	27	28	29	30	31

From: 1998 To: 2000 Abs. Hours:

OK Cancel Save Go To... Up Down Plant Cal. Prepare

Work Leave Holiday Work Off Absent

The interface includes the Calendar layout, from which the user can select a period. In the status bar, the following information is displayed:

- The entire Calendar period (lower and upper limits)
- The Employee's number of absence hours

As the Employee's Calendar consists of only the mandatory period of the Plant Calendar, therefore it is not possible to add periods to the Employee's Calendar, or delete periods from the Employee's Calendar.

Detailed Field Descriptions:

Employee

This is the Employee identifier, for which the Calendar is displayed, a mandatory information and must exist in the directory of Employees.

A selector trigger button (or F2 key) linking to Employee Selector is available.

Name

This is the Employee description, a read-only information automatically managed by the system.

Detailed Descriptions on the Functional Buttons:

Go To

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Displays a user-specified period, among the existent Calendar periods.

Up

Displays the previous month from the current year.

Down

Displays the next month from the current year.

Plant Calendar

Opens the Plant Calendar window, in order to display the plant's Calendar.

Prepare

Opens the Prepare Calendar for Printing window, in order to provide printing options.

Work

Specifies that the user selected period (the user selects a Calendar period, by highlighting it using the mouse or the keyboard) is further considered a working period.

Leave

Specifies that the user selected period (the user selects a Calendar period, by highlighting it using the mouse or the keyboard) is further considered a period of absence due to an external task assignment.

Holiday

Specifies that the user-selected period (the user selects a Calendar period, by highlighting it using the mouse or the keyboard) is further considered a holiday period.

Weekly Off

Specifies which of the user selected period days of week will be considered free days.

Absent

Specifies that the user selected period (the user selects a Calendar period, by highlighting it using the mouse or the keyboard) is further considered a period of absence. It is specified in hours, which cannot be greater than the employee's wrench hours.

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2.6 ATTENDANCE

Path: Maintenance / Resources / Attendance

The module is used to enter and visualise the site attendance time for the employee. Attendance at site can be also entered automatically using the interfacing mechanisms available in COSWIN.

Select from COSWIN menu *Maintenance / Resources / Attendance* to launch the Attendance Details module.

The Attendance Details window looks by default as follows:

Centre	Site	Enter Date	Enter Time	Enter Room	Exit Date	Exit Time	Exit Room	Total Hours	
0	SIG	15/04/2002	17:09	Rom1	15/04/2002	19:00	Room2	1.850	0

Double click on any of the employee attendance records will present the selected record in the **Employee Attendance Details** window.

Detailed Field Descriptions:

Employee No

This is the identification of the employee, a mandatory information. It must exist in the directory of Employees.

A selector trigger button (or F2 key) linking to Employee Selector is available.

Employee Name

This Is the full name of the employee that attended the site, a read-only information automatically managed by the system.

Attendance List Box

This list box displays the past entry and exit movement of the employee at various locations.

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Cost Centre	This is the cost centre reference of the employee.
Site	This is the code of company entity representing the site attended.
Enter Date	This is the date on which the employee entered the site.
Enter Time	This is the time when the employee entered the site.
Enter Room	This is enter room for the attended place.
Exit Room	This is exit room for the attended place.
Exit Date	This is the date on which the exit the site.
Exit Time	This is the time when the employee exit the site.
Total Hours	This is the total number of hours the employee was inside the site.
Rate	This is the code of the employee's rate for the work done inside the site.

2.6.1 To Add a New Attendance Details

Minimum information required to add a new employee attendance, is:

- The Employee number
- The Employee name
- Enter Date
- Enter Time
- Enter Room
- Exit Room
- Exit Date
- Exit Time
- Total Hours
- Site
- Cost Centre
- Rate ID

Click onto the Attendance tab and then on the  icon to launch the ADD window.

2.6.2 To Modify an Attendance Details

The information that can be modified is:

- Enter Date
- Enter Time
- Enter Room
- Exit Date or Exit Time or Exit Room if not already entered

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- o Cost Centre
- o Rate ID

2.6.3 To Delete an Attendance Details

There is no restriction in deleting Attendance Details.

Click on the  icon to delete the current Attendance Details.

2.6.4 Employee Attendance Details

This window displays the details of the particular attendance of an employee.

The Employee Attendance Details looks by default as follows:

Attendance

Enter

Date : 14-09-2001
Time : 15:44

Site : SIG
Signalling

Room :

Exit

Date : 14-09-2001
Time : 15:44

Site : SIG
Signalling

Room :

Cost Centre : 5211320
SIG Workshop

Rate Code : 2. Double Rate
Total Hours : 0.000

Detailed Field Descriptions:

Enter Date

This is the date on which the employee entered the site, an optional information.

Enter Time

This is the hour when the employee entered the site, an optional information.

Enter Site

This is the code of company entity representing the enter site attended. It is a mandatory information and must exist in the directory of Company Entities.

A selector trigger button (or F2 key) linking to Company Entity Selector is available.

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Right-mouse click (or F7 key) will activate the Company Entity Details window for the current code.

Enter Site Description

This is the description of enter site attended, a read-only information automatically managed by the system.

Enter Room

This is the enter room for the attended place an optional information of maximum 20 alphanumeric characters.

Exit Date

This is the date on which the exit the site, an optional information.

Exit Time

This is the hour when the employee exits the site, an optional information.

Exit Site

This is the code of company entity representing the site attended. It is a mandatory information and must exist in the directory of Company Entities.

A selector trigger button (or F2 key) linking to Company Entity Selector is available.

Right-mouse click (or F7 key) will activate the Company Entity Details window for the current code.

Exit Site Description

This is the description of exit site attended, a read-only information automatically managed by the system.

Exit Room

This is the exit room for the attended place, an optional information that can take up to 20 alphanumeric characters.

Cost Centre

This is the cost centre reference of the activity performed during site attendance, an optional information and must exist in the directory of Cost Centres. If no information is provided the system will propose the employee's cost centre.

Cost Centre Description

This is the cost centre description, a read-only information automatically managed by the system

A selector trigger button (or F2 key) linking to Maintenance Cost Centre Selector is available.

Right-mouse click (or F7 key) will activate the Maintenance Cost Centre Details window for the current code.

Rate Code

This is the code of the employee's rate for the work done inside the site. The system will use the employee default rate if no information is provided.

Total Hours

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This specifies the total number of hours the employee was inside the site. It is a read-only information automatically computed by the system if both enter and exit information was provided.

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3.1 DEFINE SHIFT

Path: Maintenance / Resources / Shift

The shift module is used to define the basic shift information. The information stored in the shift is:

- Shift Reference code like: M(orning), E(arly), A(fternoon), N(ight)
- Short description of the shift
- Start hour of the shift
- End hour of the shift

Select from COSWIN menu *Maintenance / Resources / Shift* to launch the Shift Details module.

The Shift Details window looks by default as follows:

Detailed Field Descriptions:

Shift Code

This is the shift reference code, a mandatory information of maximum 6 alphanumeric characters. The shift code must be unique among all Maintenance Shifts.

Shift Description

This is the short description of the maintenance shift, an optional information of maximum 40 alphanumeric characters.

Start Time

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This is the starting hour of the shift, a mandatory information.

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End Time

This is the ending hour of the shift, a mandatory information.

3.1.1 To Add a New Shift

Minimum information required to add a new maintenance shift is:

- Code
- Start Hour
- End Hour

Click on the  icon to launch the ADD window.

3.1.2 To Modify a Shift


The information that can be modified is:

- Description
- Start Hour
- End Hour

3.1.3 To Delete a Shift

Maintenance shifts cannot be deleted if:

- They are the preferred shift of an equipment job
- They are the planned shift of a planned job
- They are the planned shift of a work order
- They are referred by daily shifts
- They are referred by assigned shifts

Click on the  icon to delete the current Shift.

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3.2 DEFINE SHIFT PATTERN

Path: Maintenance / Resources / Shift Pattern

The module is used to manage the weekly shift patterns, their daily shifts and resource requirements. A weekly shift pattern is built upon a combination of the daily shifts over one week.

Information stored in each daily shift includes the number of leaders, number of assistants and ordinary staff per each shift of a day and the necessary resource requirements. These resource requirements will be used as matching criteria when assigning employees to roster during roster creation.

A resource may be required:

- Globally for the whole shift pattern (each daily shift in the pattern will inherit it)
- For a specific daily shift
- For both the whole shift pattern and a daily shift

Resources required both global and specific are added when the resource requirement is computed for the daily shift.

The system checks that the resource requirements are not greater than the staff available in the daily shift pattern:

Leaders + Assistants + Staff = SUMOF required shift pattern resources + SUMOF required daily shift resources

Select from COSWIN menu *Maintenance / Resources / Shift Pattern* to launch the Shift Pattern Details module.

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The Shift Pattern Details window looks by default as follows:

Shift code	Shift description	Day of Week	Staff	Leaders	Assistants
ERLY	Early Shift	Monday	6	1	0
LATE	Late Shift	Monday	6	1	0
NGHT	Night Shift	Monday	6	1	0
NORM	Normal Shift	Monday	6	1	0
OFF	Off	Monday	6	1	0
REST	Rest	Monday	6	1	0
ERLY	Early Shift	Tuesday	6	1	0
LATE	Late Shift	Tuesday	6	1	0
NGHT	Night Shift	Tuesday	6	1	0
NORM	Normal Shift	Tuesday	6	1	0
OFF	Off	Tuesday	6	1	0
REST	Rest	Tuesday	6	1	0

Detailed Field Descriptions:

Pattern Code

This is the shift pattern identifier, a mandatory information of maximum 10 alphanumeric characters. It must be unique among all Shift Patterns.

A selector trigger button (or F2 key) linking to Shift Pattern Selector is available.

Description

This is the shift pattern's description, a mandatory information of maximum 40 alphanumeric characters.

Last Update

This is the shift pattern creation or last updating date, a read-only information automatically managed by the system.

Usable

This check box specifies if the current shift pattern can be adopted by the company entities.

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DAILY SHIFTS TAB:

Double click on the any of the displayed Daily Shifts in the list box will present the selected record in the **Shift Pattern Daily Shift Details** window.

Daily Shifts List Box

This list box displays all the shifts defined against each day for the shift pattern.

Shift Code	This is the shift reference code.
Shifts Description	This is the shift description.
Day of week	This is the index of the day in the week for which the daily shift is defined.
Staff	This is the number of employee in the daily shift.
Leaders	This is the number of team leaders in the daily shift.
Assistants	This is the number of assistants in the daily shift.

RESOURCE TAB:

The Resource Tab of Shift Pattern Details window looks by default as follows:

Daily Shifts | Resources

Resource Code	Resource Description	Required No
SIG-TH	Signal Tech	6

Global Resources Requirements List Box

This list box displays the resources required globally for the entire shift pattern.


Resource Code	This is the resource reference code.
Resource Description	This is the resource short technical description.
Required	This is the number of resources required for the daily shift or the shift pattern.

3.2.1 To Add a New Shift Pattern

Minimum information required to add a shift pattern, is:

- Shift pattern code
- Shift pattern description
- At least one daily shift

All created shift patterns are usable.

Click on the  icon to launch the ADD window.

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This is the identifier of the Shift Pattern to be adopted. It must exist in the directory of Shift Patterns.

A selector trigger button (or F2 key) linking to Shift Patterns Selector is available.

Right-mouse click (or F7 key) will activate the Shift Pattern Details window for the current code.

Start date

This is the begin date of the period that the shift pattern will be used by the company entity. The period between the Start date and the End date cannot be less than 6 weeks.

End date

This is the end date of the period that the shift pattern will be used by the company entity. The period between the Start date and the End date cannot be less than 6 weeks.

In Use

If checked, indicates that the shift pattern will be in used.

3.3.2 To Modify the details of an Adopted Company Shift Pattern

The only information can be modified in an Adopted Shift Pattern is:

- Start Date
- End Date

3.3.3 To Detach an Adopted Shift Pattern from a Company Entity

To detach the adopted Shift Pattern from the Company Entity, the following criteria applies:

- The Shift Pattern must be expired more than 1 years.
- The Shift Pattern must not be in use.

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3.4 DEFINE EMPLOYEE'S SHIFT PATTERN

Path: Maintenance / Resources / Employee

The employee's shift pattern tab defines the cyclic pattern of daily shifts adopted by the employee:

Employee Details

Employee No : 057444

Resource : PWY-TO PWY Tech Officer

Supervisor : S1 ☐ Update Roster Entity : SIG

Details ID Details Shifts Skill Preferred More Allocated On

Index	Shift Code	Shift Description
0	REST	Rest
1	MORN	Morning

3.4.1 To Add a New Employee Shift Pattern

Minimum information required to add the employee shift pattern, is:

- o Shift Code

The pattern always begins with index 0.

Click on the icon to launch the ADD window.

3.4.2 To Modify an Employee Shift Pattern

The information that can be modified is:

- o Shift Code

3.4.3 To Delete an Employee Shift Pattern

There is no restriction for deleting employee shift pattern.

Click on the icon to delete the current Employee Shift.

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3.5 CREATE SHIFT ROSTER FOR A COMPANY ENTITY

Path: Maintenance / Reference Directories / Company Hierarchy / Roster

This module generates, displays and updates the roster list (roster) for each company entity. System uses the schedule in the roster list to auto-allocate employees to work orders.

The roster list contains the assignments of the employee to the different daily shifts in the roster interval. From the roster list, it is possible to find out the availability of employee in the various shifts over the roster interval.

The roster algorithm will match the employee to the adopted shift pattern as follows:

- Employees must belong to the specified company entity
- Available employee of required resources will be allocated whenever possible. The employee's calendar is referenced for the employee's availability.
- When employees of a different than required resource are allocated they are flagged accordingly

Roster lists are used to allocate employee to work orders. Therefore the roster lists cannot be deleted while it is active (system date is between start and end date). Assigned shifts and assignments are not deleted individually. All assigned shifts and assignments are deleted when the roster list is deleted.

The Roster Details window looks by default as follows:

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This is the creation date of the roster list or the date of the last modification of the roster list assignments. It is a read-only information automatically managed by the system.

Entity

This is the code of the company entity for which the roster list is drawn. It is a mandatory information. The company entity code must exist in the directory of the Company Entities.

A selector trigger button (or F2 key) linking to Company Entity Selector is available.

Entity description

This is the description of the company entity for which the roster list is drawn. It is a read-only information automatically managed by the system.

Shift pattern

This is the code of the adopted shift pattern of the company entity for the period within the Start and End Date. It is a read-only information automatically managed by the system.

Shift pattern description

This is the description of the currently adopted shift pattern by the company entity. It is a read-only information automatically managed by the system.

Assignments List Box

This tab displays the list of employees being assigned to the shift requirements of the company entity.

Date	This is the date of the assignment. This is the date of the assignment
Day of Week	This represents the day of week
Shift	This is the shift code
Shift Description	This is the shift description
Correct	This flag specify if the employee was assigned to a shift respecting the shift pattern and daily shift resource requirements.
Employee	This is the employee identifier
Available Hrs.	This is the employee number of hours allocated for planned maintenance in the assignment
Planned Hrs.	This is the number of hours already planned for the employee (allocated for work orders) in the assignment.
Employee Name	This is the employee name

Unassigned Tab:

This tab displays the list of shift requirements of the company entity not able to be assigned with employees.

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Assignments Unassigned Shifts						
Date	Day of Week	Shift Code	Shift Description	Required No.	Resource Code	Resource Description
01/03/2002	Friday	ERLY	Early Shift	6 SIG-STH		Signal Snr Tech
01/03/2002	Friday	ERLY	Early Shift	1 SIG-TO		Signal Tech Officer
01/03/2002	Friday	LATE	Late Shift	6 SIG-STH		Signal Snr Tech
01/03/2002	Friday	LATE	Late Shift	1 SIG-TO		Signal Tech Officer
01/03/2002	Friday	NGHT	Night Shift	6 SIG-STH		Signal Snr Tech
01/03/2002	Friday	NGHT	Night Shift	1 SIG-TO		Signal Tech Officer
01/03/2002	Friday	NORM	Normal Shift	6 SIG-STH		Signal Snr Tech
01/03/2002	Friday	NORM	Normal Shift	1 SIG-TO		Signal Tech Officer
01/03/2002	Friday	OFF	Off	6 SIG-STH		Signal Snr Tech
01/03/2002	Friday	REST	Rest	6 SIG-STH		Signal Snr Tech
01/03/2002	Friday	REST	Rest	1 SIG-TO		Signal Tech Officer

Unassigned Shift List Box

Date	This is the date of the assignment. This is the date of the assignment
Day of Week	This represents the day of week
Shift	This is the shift code
Shift Description	This is the shift description
Required No.	This is the required number of the specified resource
Resource	This the resource required
Resource Description	This is the description of the resource required

Shifts Tab

This tab displays the shift requirements of the company entity under the specific pattern at the specified period.

Double click on any of the Shifts displayed will activate the **Roster Shift Details** window.

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This flag specifies if the employee was assigned to a shift respecting the shift pattern and daily shift resource requirements. It is automatically computed by the system.

Planned hours

This is the number of hours already planned for the employee (allocated for work orders) in the assignment. The information is read-only and managed by the system. The default value proposed is 0. The value should be less than or equal to the employee number of available hours in the assignment.

Available hours

This is the employee number of hours allocated for planned maintenance in the assignment, a mandatory information. The system proposes by default the employee's available hours.


3.5.5.1 To Add a New Employee to a Roster Shift

Minimum information to add a new employee assignment in a generated assigned shift is:

- Identifier
- Available hours

The rest of the information is automatically retrieved by the system from the generated assigned shift to which the new employee assignment is added.

The assignment date must be later the current date.

Click on the  icon to launch the ADD window.

3.5.5.2 To Modify Employee Details in a Roster Shift

The only information that can be modified is the number of available hours for planned maintenance.

The assignment date must be later the current date and the number of planned hours of the assignment must remain greater than the modified number of available hours.

3.5.5.3 To Delete an Employee from a Roster Shift

To be confirmed.

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4. UNPLANNED MAINTENANCE

Unplanned Maintenance refers to works performed for breakdown or corrective maintenance.

A *Work Order* is the written instruction to perform a maintenance job on specific equipment. *Feedback* is the action of providing data concerning the work performed to accomplish the tasks of the work order.

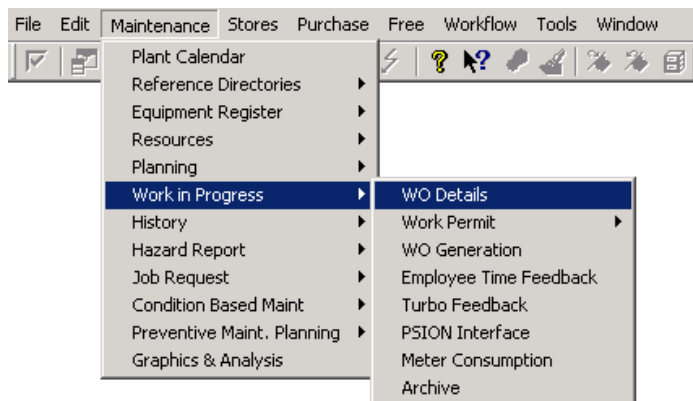
Work orders in the system have been categorised as follows

- **Planned** - work orders created by planning and release modules. These are work orders that have been planned in advance and therefore do not cause disruption to production activities.
- **Unplanned** - work orders created in Work Order Details Module for breakdown/corrective maintenance.
- **Other** - work order performed for project maintenance jobs.

Work orders for unplanned maintenance are created in **Work Order Details** module.

This chapter will explain the procedure to creating of unplanned Work Order. The subsequent chapter **Work In Progress** will explain in details on how feedback can be provided to the Work Order.

Select from COSWIN menu *Maintenance / Work In Progress / Work Order Details* to launch the Work Order Details module.



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The screenshot shows the 'Work Order Details' window with the following sections:

- Top Section:** WD ID, Status (Not Started), Schedule Date (08/05/2002), Eqpt Code, Job ID, Job Type, Job Class, Priority Code, Supervisor, Cost Centre, and Criticality (0. Normal).
- Details Tab:**
 - WD Duration:** Target Date, Start (00:00), Finish (00:00), Total Cum. Units, Total Labour Hours (Planned, Actual).
 - WD Source:** Prev. WD ID, Plan ID, Job Req ID, Report By, Date/Time (08/05/2002 13:34), Phone, and Options (Skip SubContracted Jobs, Allocate Employees, Check Skills).
 - WD Costs:** Labour, Material, Misc., Facility, Recovery, Total, and Repairable checkbox.

4.1.1 List of fields to Define during Work Order Creation

The followings describe all the fields in the main section, Details tab and More tab of the Work Order Details window. The fields are listed in the appearance order from top to bottom, left to right.

Status

This is the work order *user status*, a mandatory information of 1 alphanumeric character. It must be one of the already defined Work Order User Statuses.

A selector trigger button (or F2 key) linking to Status List Selector is available.

Status description

This is the work order user status description, a read-only information automatically managed by the system.

Schedule date

This is the date when the work against the work order is to begin, a mandatory information.

The schedule date should not be earlier than one year from the work order creation or feedback date.

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This represents the time when the work against the work order started. It is an optional information.

If employee time usage feedback has been provided, the default start time is internally computed by the system from the time inputs, otherwise the system proposes the current time as default work order's start time.

Finish date

This represents the date when the work against the work order was completed.

It is only accessible as well as mandatory for work order with system status equal 2 – Finished or 3 – Archivable.

If employee time usage feedback has been provided, the default finish date proposed by the system is internally computed as the latest date on which the employee worked against the work order.

If employee time usage feedback has not been provided, but the work order start date has already been provided, then the finish date is computed from the start date and the job duration with the following formula:

Finish date = Start date + job duration - 1

If the both the work order's start date and finished date are not specified (for work orders progress from status '0 – Not Started' to '2 – Finished' or '3 – Archivable' directly), then the current date is proposed as default finish date and the work order's start date is computed based on the finish date and the job duration.

Finish time

This represents the time when the work against the work order was finished.

If employee time usage feedback has been provided, the default finish time is internally computed by the system from the time inputs, otherwise the following rules apply to the default value of work order's finish time proposed by the system:

- The work order's finish time is the same as work order's start time when the start date is different from the finish date.
- The work order's finish time is one hour later than the work order's start time when the start date and the finish date are the same.
- In case the start time is not specified, the start time is considered the current time.

Total cumulative units (T. Units)

This represents the cumulative units of the job's meter at the end of work order's execution. The total cumulative units is an read-only information, automatically provided by the system when the work order is progressed to archival status.

The Total cumulative units (TCU) is computed using the following formula:

new TCU = old TCU + (LMRV - PMRV)

where: LMRV is the last meter reading value

PMRV is the previous before last meter reading value

Total planned hours

This information represents the number of resource hours required to accomplish the work order job (from the resources requirement specified for the work order). It is an optional numeric information.

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If the work order's job is an existing equipment job, then system will propose the total labour hour of the equipment job as the default value for this information.

Total actual hours

This information represents the actual number of worked hours against the work order. It is an information not accessible to the user, automatically derived by the system from the employee time usage feedback.

Previous work order

This is the previous work order identifier, an optional positive numeric integer value. The entered value must exist in the directory of Work Orders. It specifies the identifier of the work order from which the current work order is created.

This field will be automatically updated by system in those work orders created using the non-standard button operation **Create Work Order**. Like in the case of repairable management, a second work order is created from the first work order to move the faulty unit to the repair yard.

In all the other cases, the previous work order has no relevant significance, although it can be assigned when work order is at 1 – In Progress or 2 – Finished status.

A selector trigger button (or F2 key) linking to Work Order Selector is available.

Plan No

This is the plan number under which the work order was released. It is a read-only information automatically updated by the system for work orders generated from Release Jobs Module.

Job Request ID

This is the Job Request number under which the work order was released. It is read-only information automatically updated by the system for work orders generated in Planner Review Module.

Report by

This is the name of the person who requested for the maintenance job to be carried out. It is an optional information of maximum 13 alphanumeric characters. If the work order is generated from the Planner Review module, then the system automatically assigns the person who raised the job request as the work order's reporting person.

Reporting date

This is the date when the work order is first requested, a mandatory information. If the work order is generated from the Planner Review module, then the system automatically propose the job request's date as work order's reporting date. Otherwise, the system will propose the current date as work order's reporting date.

Reporting time

This is the time when the work order is first requested, an optional information.

If the work order is generated from the Planner Review module, then the system automatically propose the job request's time as work order's reporting time. Otherwise, the system will propose the current time as work order's reporting date.

Reporting phone

This is the phone number from where the work order was reported (see paragraph Report by). It is an optional information of maximum 13 alphanumeric characters.

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If the work order is generated from the Planner Review module, then the system automatically propose the job request's phone as work order's reporting phone.

Skip SubContracted Jobs

When checked, system will disable the release of work orders whose jobs are sub-contracted. The default status of this flag is established in COSWIN Configuration's Maintenance / Work Order / Parameters.

Allocate Employees

When checked, system will automatically allocate employees to the work orders. The default status of this flag is established in COSWIN Configuration's Maintenance / Work Order / Parameters. The system allocates employees to the work order based on:

- o The resource requirements of the planned job
- o The preferred employee of the equipment job
- o The available roster list
- o The planned shifts of the planned job released in Work in Progress.

The system allocates the job's preferred employees to the work order whenever possible (employees are available in the shift and not overloaded).

Check Skills

When checked, system will automatically check the skills of the employees allocated against the equipment job skill requirements. The system flags the allocated employee as REJECTED when none of its skills does not match any of the equipment job skill requirements.

The default status of the check box is established in COSWIN Configuration's Maintenance / Work Order / Parameters.

Actual labour costs (Lab.)

This is the total manpower cost (labour cost) incurred against the work order. It is a positive numeric value automatically computed by the system, on the basis of employee time usage feedback.

The information is accessible to the user only in case of work orders having contract jobs with third parties. For those work orders the user will be allowed to specify the cost of contracted labour hours.

The formula used to compute the value is:

$$CCLH + \sum_E (FR_E + \sum_A (H_A * R_A))$$

Where:

- CCLH is the cost of contracted labour hours
- FR is the fixed rate of the employee E
- H is the number of hours worked by employee E to perform the activity A
- R is the rate under which employee E performed the activity A

Actual material costs (Mat.)

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This is the total material cost incurred against the work order. It is a positive numeric value automatically computed by the system, on the basis of stock usage feedback and the issues against work order.

The information is accessible to the user only in case of work orders having contract jobs with third parties. For those work orders, the user will be allowed to specify the cost of materials provided by the sub-contractor.

The formula used to compute the value is:

$$CM + \sum_s (QTY_s * UP_s)$$

Where:

- CM is the cost of materials provided by the sub-contractor
- QTY is the quantity used (issued) of the spare S
- UP is the unit price of the spare S

Actual miscellaneous costs (Misc.)

This information specifies the miscellaneous costs that may have been incurred against the work order. It is an optional positive numeric value. It can be accessed only for work orders with system status not equal to '0 – Not Started'.

Actual recovery costs

This information specifies any other costs as adjustments (recovery costs) that may have been incurred against the work order. It is an optional positive numeric value. It can be accessed only for work orders with system status not equal to '0 – Not Started'.

For example, if a replaced component has some value as it can be repaired and reused, then certain costs of the component can be specified as recovery.

Actual total costs

This information specifies the total work order costs. It is a read-only information, automatically computed by the system, using the following formula:

Total costs = Labour costs + Material costs + Miscellaneous costs - Recovery costs

Repairable

This information specifies whether the work order is a repairable one, i.e. the work order is made against a repairable equipment using the non-standard button operation **Create Work Order**. It is not accessible to the user.

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Fields under the More tab:

Details	More	Job Activ.	Spe. Text	Notes	Employee	Allocated	Resource	Stock
Work Permit : <input type="text"/> Meter ID : <input type="text"/> Reading : <input type="text"/> Down Time : <input type="text"/> Production Loss : <input type="text"/> WO Type : <input type="text" value="U Unplanned"/>		Dir. wise <input type="checkbox"/> Eqp. wise <input type="checkbox"/> Contract <input type="text"/> Cost Type : <input type="text" value="Internal"/> <input type="checkbox"/> Safety Involved Project Code : <input type="text"/> Eqp Phone : <input type="text"/> Eqp Srl. No. : <input type="text"/> New Srl. No. : <input type="text"/> Zone : <input type="text"/> Function : <input type="text"/> PM Job Covered : <input type="text"/> Entity Request : <input type="text"/> Action : <input type="text"/>						
Auto Replan <input type="checkbox"/> Clash <input checked="" type="checkbox"/> Old Occur. <input type="button" value="Delete"/> <input type="button" value="Move"/>								

Work Permit

This is the identifier of the work permit raised under the work order. It is a read-only information, automatically provided by the system when work permit is created for the work order (using the Create Work Permit operation of the non-standard button)

Meter ID

This is the identifier of meter specified in the work order's job. It is a read-only information, automatically managed by the system.

Reading

This is the meter reading observed at the time of work order completion. This information can be accessed and is mandatory only for work orders made for meter based jobs. It is an optional numeric information.

When the work order progresses to '3 – Archivable' status, the system computes and proposes a default value for the reading based on the meter's forecast. However, user is still able to update it if actual value differs from the computed one.

Meter unit

This is the measurement unit for the meter reading a read-only information automatically provided by the system.

Down time (D/Time)

This is the time interval (in hours) when the equipment was down because of the work against the work order. It is an optional numeric value, accessible to the user when the work order is at '1 – In Progress', '2 – Finished' or '3 – Archivable' status.

Production loss (P/Loss)

This is the number of hours the production has stopped because of the work against this work order. This is an optional numeric information, accessible to the user when the work order is at '1 – In Progress', '2 – Finished' or '3 – Archivable' status.

Work order type

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Costs type

This is the type of the work order's costs. The available cost types are:

Internal when the work order is performed by the local team

External when the work order is performed by a third party

The following rules are applied to establish the default proposed costs type during work order creation:

- The internal costs type is considered first
- If the work order's job is already defined for the work order's equipment, then the job's costs type are considered
- If a contract is specified for the work order, the system will automatically change the costs type to external

The information is accessible to the user when the work order is at '1 – In Progress', '2 – Finished' or '3 – Archivable' status.

Safety Involved

This flag specifies if the corrective maintenance covered by the work order involve safety. The system automatically set this flag to false when the work order is created.

Project

This is the maintenance project under which the work order's job is performed. It is an optional information of maximum 10 alphanumeric characters. If the work order's job is an existing equipment job, then the equipment job's project is proposed as default value during the work order creation. This field is accessible to the user when the work order is at '1 – In Progress', '2 – Finished' or '3 – Archivable' status.

Equipment phone

This is the work order's equipment nearest phone number, an optional alphanumeric information of maximum 13 alphanumeric characters. The equipment phone is proposed by the system as default value during work order creation. This field is accessible to the user when the work order is at '1 – In Progress', '2 – Finished' or '3 – Archivable' status.

Equipment serial number

This is the equipment serial number valid at the work order's creation for any work order made for repairable equipment, a read-only field automatically managed by the system.

In order to repair an item, two work orders are to be generated: one for replacing the item with defects, and the other that actually repairs the work order. This serial number keeps track of the item that is replaced.

New serial number

This is the serial number of the item issued from the stock to replace the one with defects, a read-only field automatically managed by the system.

Zone

This is the zone identifier of the work order's equipment, a read-only field automatically read and updated by the system.

Function

This is the function identifier of the work order's equipment, a read-only field automatically read and updated by the system.

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Specific Text tab contains the specific instructions pertaining to the particular equipment job. It is maintained in the Job Guidelines module of the same equipment and job code.

For unplanned jobs, user is able to specify some specific information, regarding the equipment on which the work is to be performed, under this tab of the Work Order Details window.

Otherwise, for planned jobs, this tab displays the specific text specified in the equipment job (in Job Guidelines module) and is not editable by the user.

4.1.5 To Allocate Employee to the Work Order

Employees can be allocated only to work order at status '0 – NOT STARTED'.

User may either let system assigns employees to the work order according to the resource requirement specified and available roster, or manually pick the employee from the Employee Directory to assign to the work order.


Auto Employee Allocation:

To automatically allocate employee to work order, the following must be specified in the Work Order Detail:

- The checkbox option Allocate Employees under the Detail tab must be checked
- The resource requirement for the work order must be defined under the Resource tab.

The system allocates employees to the work order based on:

- The resource requirements of the work order 's equipment job
- The preferred employee of the equipment job
- The available roster list
- The planned shifts of the work order.

Click on the non-standard  button at COSWIN Toolbar. COSWIN will automatically assign employee to the work order based on the currently in-use company roster.

Manual Employee Allocation:

- 1) Select the **Allocated Tab** and click the  icon. The following screen will appear:

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Details	More	Job Activ.	Spe. Text	Notes	Employee	Allocated	Resource	Stock
---------	------	------------	-----------	-------	----------	-----------	----------	-------

Employee :	<input type="text"/>
Allocated Date :	<input type="text" value="26/03/2002"/>
Planned Hours :	<input type="text" value="1.000"/>
Schedule Time :	<input type="text" value="00:00"/>
Allocation :	<input type="text" value="0. Manual"/>
Rejection :	<input type="text" value="0. No objection"/>
W.P. Raised :	<input type="text" value="0. Not raised"/>
Schedule Date :	<input type="text"/>

2) Enter the details of the allocated employee as follows:

Employee

This is the allocated employee, a mandatory information. It must exist in the directory of Employees and should be unique among the employees allocated to a work order.

Name

This is the name (description) of the allocated employee, a read-only information automatically provided by the system when the employee identifier is selected.

Allocated Date

This is the date when allocation was performed, a read-only integer information automatically managed by the system

Allocation

Specify if the allocation was 0 - manual or 1 - Automatic. It is a read-only information automatically managed by the system.

Planned Hours

This is the number of hours allocated to the employee to accomplish the work, a mandatory strictly positive numeric information.

Rejection

Specify if the allocated employee was initially rejected due to lack of skills. It is a read-only integer information automatically managed by the system.

Work Permit Raised

Specify if the work permit request was raised or not for the allocated employee. It is a read-only information automatically managed by the system.

Schedule Time

This is the time that the employee is schedule to perform the job.


Schedule Date

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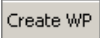
This is the date that the employee is scheduled to perform the job.

3) Save the record by clicking on the  icon.

4.1.6 To Generate Work Permit Request

The following conditions must apply when generating a work permit request from work order module:

- It must be an unplanned work order
- The status of the work order must be 0-NOT STARTED
- Employee must have been allocated to the work order

Click the non-standard  button on COSWIN toolbar and the Work Permit Request will be generated.

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5. PLANNED MAINTENANCE

Work orders that are created by Planning and Release modules are categorized as PLANNED by the system. These are work orders planned in advance and therefore do not cause disruption to production activities (downtime is zero).

COSWIN provides two types of planned maintenance jobs, namely **Time based** and **Meter based** job.

In Time based job, the maintenance work will be performed periodically per certain time interval.

In Meter based job, the maintenance work will be performed periodically per certain meter value interval.

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For the computation of the forecasted consumption rate of cumulative meters, a **CONSTANT** value, indicating the relative weight to be given to the latest reading against the first meter readings, must be defined. It must be in range 0.00 and 1.00, and the default proposed by COSWIN is 0.5.

$F = [(LV - NLV) / \Delta T] * ct + [(LV - FV) / \Delta T] * (1 - ct)$	LV: Last Value. NLV: Next to last value. FV: First Value ΔT: Time Interval. ct: Constant
--	---

READING	Time in Secs	Time period
First on 10/01/96 (FV)	100	ΔT(for LV-FV) = 3
Second on 12/01/96 (NLV)	200	ΔT(pour LV-NLV) = 1
Last on 13/01/96 (LV)	400	

If ct (constant) =	0	0.5	1
Forcase (F) =	100	150	200

System uses this forecast to estimate future reading value of the meter so as to plan the next schedule dates for the meter-based maintenance jobs.

5.1.1.2 Cumulative Increment Meter

Cumulative Increment meter behaves very similarly to the Cumulative Total meter. It accumulates the meter reading value but receives the consumption feedback in term of the increment of value since the last feedback, instead of the total cumulated reading of the meter.

As each consumption feedback is provided, the cumulative value will be re-computed as follows:

NEW cumulative value = OLD cumulative value + Incremented value

System will compute consumption forecast as per that in the Cumulative Total meter.

5.1.1.3 Non Cumulative Meter

Non-Cumulative meter is like a periodic counter with a fixed consumption rate. Therefore it is usually not necessary to provide feedback to such meters except on those days that the consumption differs from the default rate.

Non-Cumulative meter have a straightforward formula to forecast the consumption, that is, the Default Rate x number of days, taking into consideration any feedback updated.

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5.1.2 Meter Details

Select from COSWIN menu *Maintenance / Reference / Meter* to launch the Meter Details module:



The Meter Details window looks by default as follows:

The screenshot shows the 'Meter Details' window. The 'Meter ID' field contains 'ACT_WO_END_PT'. The 'As on' date is '26/04/2002'. The 'Description' field contains 'Actual WO Chainage End Point'. The 'Cumulative' checkbox is checked. The 'Default Value' field is empty. The 'Details' tab is selected. The 'Constant' field is '0.50', 'Cumulative Run Units' is '1.10', 'Forecast' is '1.00', 'Last reading DD/MM/YY' is '25/04/2002', and 'Total Cumulative Run Units' is '0.00'. The 'Type' field is empty, 'Unit of Measurement' is 'KM', 'Start Date' is '25/04/2002', and 'Frequency of Measurement' is '1 Days'.

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Readings List Box

Reading Date	This is the Meter Reading date.
Reading Time	This is the Meter Reading type.
Meter Value	This is the Meter Reading value.

It is used to capture the feedback for non-cumulative meters

NOTE: Feedback on the meter readings for cumulative meters can only be captured through COSWIN *Maintenance / Work In Progress / Meter Consumption* module. See the chapter on Work In Progress for details.

5.1.2.1 To Add a New Meter

Minimum information required to add a Meter, is:

- The Meter identifier
- The Constant and the Forecast, if the Meter is a cumulative one
- The Default Value of Meter Readings, if the Meter is a non-cumulative one
- The initial meter reading

Click on the icon to launch the ADD window.


5.1.2.2 To Modify a Meter

The information that can be modified, is:

- o The Meter description
- o The Meter user-defined Type
- o The Meter Start Date (must be less than current date)
- o The Meter Unit of Measurement
- o The Meter Reading Default Value, if the Meter is a non-cumulative one
- o The Meter Constant, if the Meter is a cumulative one
- o The Meter Forecast, if the Meter is a cumulative one
- o The Meter Frequency of Measurement, if the Meter is a cumulative one

5.1.2.3 To Delete a Meter

A Meter cannot be deleted if there are Equipment Jobs or Technical Specifications defined on it.

Click on the  icon to delete the current Meter.

5.1.2.4 To Initialize the Meter Readings


Modify the latest meter reading under the More tab of Meter Details window, will initialise the meter to new input value. This will result in all past readings except the newly modified one being deleted.

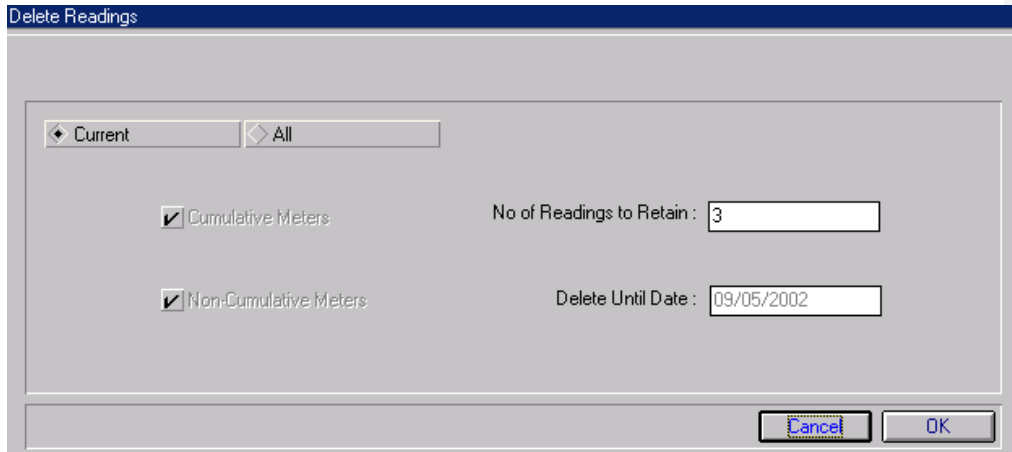
Keppel Steria Consortium (KSC)		C756
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5.1.2.5 To Delete a List of Meter Readings

Click on the non-standard  button to delete a list of meter readings:



The dialog box titled "Delete Readings" contains the following controls:

- Two radio buttons: "Current" (selected) and "All".
- Two checked checkboxes: "Cumulative Meters" and "Non-Cumulative Meters".
- A text field "No of Readings to Retain" with the value "3".
- A text field "Delete Until Date" with the value "09/05/2002".
- "Cancel" and "OK" buttons at the bottom right.

Detailed Field Descriptions:

Target (Current / All)

This radio-button specifies which readings will be deleted:

- Current** For the current Meter
- All** For all Meters

Cum.

This check box specifies whether Cumulative Meter Readings are to be deleted, or not.

Non Cum.

This check box specifies, whether Non-Cumulative Meter Readings are to be deleted, or not.

No of Readings to retain

This is the number of readings to retain for cumulative meters, an optional positive integer information, not less than 3, automatically proposed by COSWIN as its minimum value (3).

Delete Until Date

This is the Meter Readings last updating date until which readings will be deleted for non-cumulative meters, an optional information automatically proposed by COSWIN as the current date.

There must be minimum 3 readings to be retained from deletion.

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The Job Guidelines window looks by default as follows:

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Job Guidelines Details

Eqpt Code: AFCALB17/GTAC01AC-DC Convertermodified on: 06/05/2002

Job ID: 868-3PM

Job Type: PMPreventive MaintBehaviour: 1. Start date

Job Class:Duration: 1 Days

Cost Centre: 2714300Supervisor:Priority: 3

W.P. Type:Priority Code:

DetailsJob SpecsJob Activ.Spec. TextStock Req.Res. Req.ActionsPref. Empl.Do / Do n

Job StructureLevel: 3Multiplicity:

FrequencyInterval: 1 WeeksTake into account working days only:Min: 1 WeeksMax: 1 WeeksShift / Day:Valid From/To:Meter ID:Meter Interval:

Job OccurrenceLm. action: COSWINLastDD/MM/YY:Meter Value:WD ID:NextDD/MM/YY: 13/05/2002Meter Value:

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Detailed Field Descriptions:

Eqpt Code

This is the equipment/group identifier on which the job is to be performed, a mandatory information. It must exist in the directory of Equipment or Groups of equipment.

A selector trigger button (or F2 key) linking to Equipment Selector is available.

Equipment description

This is the description of the equipment selected for the work order, a read-only information automatically provided by the system once the equipment identifier is assigned.

Modified On

This is the Job creation or last updating date, a read-only information automatically managed by the system.

Job ID

This is the Job identifier, a mandatory information of maximum 16 alphanumeric characters. It must be unique among all the Job identifiers defined for the current equipment.

A selector trigger button (or F2 key) linking to Equipment Jobs Selector is available.

Right-mouse click (or F7 key) will activate the Jobs Directory window for the current code.

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Job description

This is the Job description, a mandatory information of maximum 40 alphanumeric characters. If the Job ID is selected from the existing equipment jobs then this description will be automatically provided by the system.

Job Type

This is the Job Type identifier, used to categorise the equipment jobs, a mandatory information of maximum 6 alphanumeric characters. It must exist in the directory of job types. Job Types are defined through *COSWIN Configuration's Maintenance / Job / Type*.

A selector trigger button (or F2 key) linking to Job Type Selector is available.

Type description

This is the Job Type description, a read-only information automatically managed by the system.

Behaviour

This combo box is used to select the Job Behaviour, a mandatory information values from 0 to 5. Refer to the previous section on Concept on Job Behaviours for detailed explanation.

During ADD mode, COSWIN will propose the behaviour defined in the selected Job Type as the default.

Job Class

This is the Job Class identifier, an optional alphanumeric information that can take up to 6 alphanumeric characters. It must exist in the directory of Job Class. Job Classes are defined through *COSWIN Configuration's Maintenance / Job / Class*.

A selector trigger button (or F2 key) linking to Job Class Selector is available.

Class description

This is the Job Class description, a read-only information automatically managed by the system.

Duration

This is the estimated duration of the job, a mandatory positive numeric information.

It may be specified in days or weeks. The minimum job duration is one day.

Duration unit

This combo box is used to define the measurement unit for the job duration in terms of DAY or WEEK.

Cost Centre

This is the identifier of the Cost Centre to which the cost of the job is to be allocated, a mandatory alphanumeric information. It must exist in the directory of Cost Centres.

When an equipment job is added, the system proposes by default the equipment's cost centre as the job's cost centre.

A selector trigger button (or F2 key) linking to Cost Centre Selector is available.

Right-mouse click (or F7 key) will activate the Maintenance Cost Centre Details window for the current code.

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Supervisor

This is the identifier of the supervisor responsible for this job, an optional alphanumeric information, which can take up to 6 alphanumeric characters. The provided value must exist in the directory of Supervisors.

A selector trigger button (or F2 key) linking to Supervisor Selector is available.

Right-mouse click (or F7 key) will activate the Supervisor Details window for the current code.

Priority

This is the priority of the job for Equipment Job planning, a mandatory numeric information (from 0 to 9, with 9 being lowest priority). During ADD mode, COSWIN will propose the behaviour defined in the selected Job Type as the default.

W. P. Type

This is the type of work permit requested by default for the equipment job. It is an optional information. The provided value of work permit type must exist in the directory of Work Permit Types.

A selector trigger button (or F2 key) linking to Work Permit Type Selector is available.

Right-mouse click (or F7 key) will activate the Work Permit Type Details window for the current code.

Priority Code

This is the priority of work defined for the equipment job. It will be assigned by default to the work orders released against this equipment job. It is an optional information. The provided value must exist in the directory of Priority of Work.

A selector trigger button (or F2 key) linking to Priority Selector is available.

Right-mouse click (or F7 key) will activate the Priority Details window for the current code.

Priority Description

This is the description of the priority of work, a read-only information automatically managed by the system.

Under Details Tab:

Job Structures (Read-Only Information):

Job Structure Level : Multiplicity :

Level

This is the Job level identifier of the job, in the Job structure. It is a read-only numeric information automatically managed by the system. This information is defined in Jobs Directory module under COSWIN menu *Maintenance / Reference Directories / Jobs*.

Multiplicity

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This check box specifies whether only working days are to be taken into account for job planning (if checked), or to include the weekly off days for job planning (if unchecked).

Shift

This is the identifier of the shift in which the Job is to be executed an optional positive integer information.

Day

For behaviour = 1, 2 or 4, this is the day of the week in which the particular job is to be scheduled an optional integer information (1=Monday, 2=Tuesday, ..., 7=Sunday). The jobs will first be scheduled based on the interval defined. If the preferred day is specified, then the job is scheduled again (within that week) for the indicated day of the week.

For behaviour = 5, this is the day of the month (values 1 to 31) that the job will be scheduled.

Meter ID

This is the identifier of the meter to which the job is linked, an optional alphanumeric information that can take up to 10 alphanumeric characters. The provided value must exist in the directory of Meters.

Any equipment jobs with the behaviour code 3 cannot have an associated meter identifier as their periodicity is only time-based.

A selector trigger button (or F2 key) linking to Meter Selector is available.

Right-mouse click (or F7 key) will activate the Meter Details window for the current code.

Meter Interval

Specify the consumption expected on the meter in order for the job to be scheduled. It is a mandatory information if the job is meter-based. Otherwise, it should be blank.

Meter Unit

This is the measurement unit for the meter readings, a read-only information automatically managed by the system.

Valid From

This is used to specify jobs applicable only for certain seasonal period. It is an optional numeric information.

For job behaviour 1, 2 or 3, this is the validity start week of the Job for a specified period during any calendar year.

For job behaviour 5, this is the validity start month of the Job for a specified period during any calendar year.

Valid To

This is used to specify jobs applicable only for certain seasonal period. It is an optional numeric information.

For job behaviour 1, 2 or 3, this is the validity end week of the Job for a specified period during any calendar year.

For job behaviour 5, this is the validity end month of the Job for a specified period during any calendar year.

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Job Occurrences:

Job Occurrence	Lm. action : COSWIN	Job Occurrence	Lm. action : COSWIN
Last	DD/MM/YY : <input type="text"/>	Last	DD/MM/YY : <input type="text"/>
	Meter Value : <input type="text"/>		Meter Value : <input type="text"/>
	WO ID : <input type="text"/>		WO ID : <input type="text"/>
Next	DD/MM/YY : 12/06/2002	Next	DD/MM/YY : 20/04/2002
	Meter Value : <input type="text"/>		Meter Value : <input type="text"/>

Last DD/MM/YY

This is the last occurrence of the job, a read-only information automatically managed by the system.

This information is automatically updated when a Work Order, created for this equipment job, is passed to archival status during Feedback operations (for example in Work Order Details, Employee Feedback or Turbo Feedback Modules).

If nothing is displayed, it means that the equipment job has not been executed since creation.

Last Meter Value

This is the reading value of the meter at the time of last occurrence of the job, a read-only information automatically managed by the system. This information is updated only if the job periodicity is based on a cumulative meter. The value displayed here is the value of the Meter Reading given when the most recent Work Order created for this equipment job was passed to archival status during Feedback operations.

If nothing is displayed, but the job is based on a cumulative meter, it means that the job has not been executed since creation.

Last WO ID

This is the last Work Order executed for the Job, a read-only information automatically managed by the system.

Next DD/MM/YY

This is the next job occurrence date.

This information is skipped for jobs based on a cumulative meter. It is automatically computed after entering a valid next meter level, based on the meter forecast.

Otherwise, it is a mandatory information and cannot be less than the current date. By default, the current date is proposed as the next occurrence of the job.

Next Meter Value

This is the next meter level, a mandatory numeric information for jobs based on a cumulative meter. Otherwise, it is read-only and empty. Based on this value, the next job date is computed, using the meter forecast.

Job Specification Tab:

The Job Specification tab of Job Guidelines window looks by default as follows:

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Details	Job Specs	Job Activ.	Spec. Text	Stock Req.	Res. Req.	Actions	Pref. Empl.	Do / Do n
<div> <div>Costs</div> <div> Cost Type : <u>Internal</u> Contract No : <input type="text"/> Resource Cost : <input type="text" value="0.00"/> Material Cost : <input type="text" value="1250.48"/> Facility Cost : <input type="text" value="0.00"/> Total Cost : <input type="text" value="1250.48"/> </div> </div> <div> <div>Miscellaneous</div> <div> Project Code : <input type="text"/> Total Labour Hrs : <input type="text"/> #W/O Completed : <input type="text"/> Down Time : <input type="text" value="2.00"/> Hours Terminate Wk/Yr : <input type="text" value="52"/> <input type="text" value="2002"/> Preferred Shift : <input type="text"/> <input checked="" type="checkbox"/> Hazardous </div> </div>								

Detailed Field Descriptions:

Cost Type

This is the Job's Cost Type: Internal or External.

By default, the cost type is internal, if the job is not sub-contracted and external, if the job is performed based on a Contract.

Contract No

This is the Contract identifier, if the Job is to be executed on a Contract basis (e.g. with another plant). It is an optional information of maximum 10 alphanumeric characters. The provided value must exist in the directory of Contracts.

A selector trigger button (or F2 key) linking to Contract Selector is available.

Right-mouse click (or F7 key) will activate the Contract Details window for the current code.

Resource Cost

This is the total cost planned for the equipment job's resources (specified under the Resource Requirement tab), a read-only information automatically managed by the system.

Standard resource cost for manpower requirements is computed with the following formula:

$$(\text{\#Worker} * \text{RFR}) + (\text{\#PH} * \text{RDR})$$

where:

#Worker - the required number of workers of a given resource R

RFR - resource R fixed rate

#PH - number of planned hours

RDR - resource R default rate

Material Cost

This is the total cost planned for the equipment job's stock (specified under the Stock Requirement tab), a read-only information automatically managed by the system.

Standard material cost for stock requirements is computed with the following formula:

$$\text{\#ST} * \text{UP}$$

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The purpose of this information is to periodically review the job definition and has no impact on job planning (the equipment job will still be considered for planning even if the current date has exceeded the terminate date).

Preferred Shift

This is the preferred shift code to perform the job, an optional information. This will be default shift during job planning unless stated otherwise by the planner. The provided value must exist in the directory of Shift.

A selector trigger button (or F2 key) linking to Shift Selector is available.

Hazardous

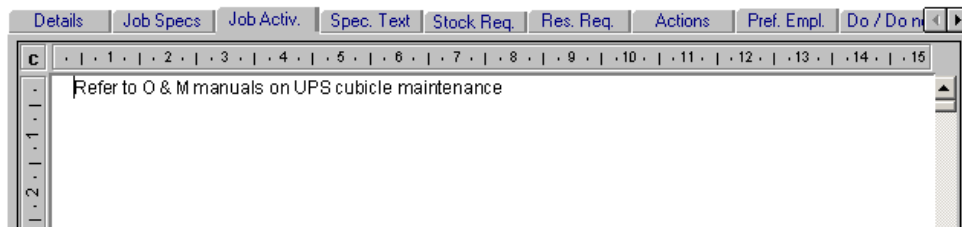
This flag specify if the job involve the use of hazardous materials. It is a mandatory information. The system proposes FALSE as the default value for the new jobs.

Job Activity Tab:

Job activities allow the user to record the detail steps of work to be performed during the job. The entry of this information is optional. It is possible to print the activity details both in Job Guidelines and in the work order.

All equipment jobs with identical job identifier will have the same Job activity data defined.

The Job Activity tab of Job Guidelines window looks by default as follows:

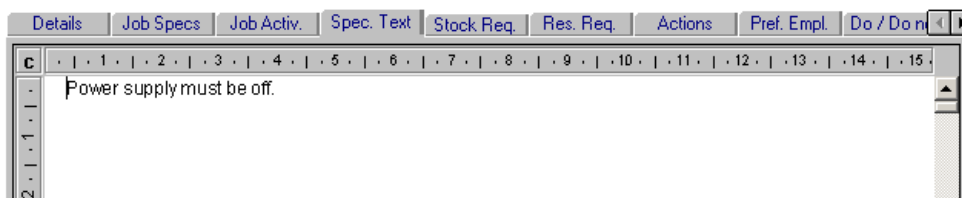


The interface consists of the drawing layout, where the user can write text and / or append pictures, drawings, spreadsheets and any other form of OLE information.

Specific Text Tab:

This window records the details of the job related to the equipment itself. It is possible to print the specific text both in Job Guidelines and in Work Order.

The Specific Text tab of Job Guidelines window looks by default as follows:



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The list of items for Job's current Action, that is, items that belong to the current selected Job Action.

It will be the default selection if the list is opened from a Job Action; it is active and selectable only in this case.

Item Source radio button (Kits details / Eqpt. wise)

This radio button specifies the source from where the items are to be selected to the current Job or current Job Action.

Kits details

Items are to be added from a kit, using the Kit Items Selector

Eqpt wise

Items are to be added from the equipment spares, using the List of Spares Selector.

Stock List Box

Item Code	This is the identifier of the item.
Description	This is the description of the item.
Type	The required quantity of the item.
Syst. / Cond.	This column specifies if the item is to be replaced systematically (0) or depending on certain constraints (1).
Group	The spare/tool group identifier.
UOM	This is the unit of measurement of the stock item.
Total Qty.	This is the total quantity of the item required for the job (in global mode only).

Resource Requirement Tab:

The Resource Requirement Selector is used to manage the manpower requirements of planned equipment job. It specifies the amount of human resources required to perform an equipment job.

Manpower requirements can be defined:

- For the equipment job (GLOBAL), not linked to any equipment job action
- For a job action (SPECIFIC), linked to a specific equipment job action and to the equipment job in the same time

Requirements for the same manpower cannot be global and specific at the same time. Since a manpower requirement may be attached to different equipment job actions the system computes and displays the list of TOTAL manpower requirements.

The Resource Requirement tab of Job Guidelines window looks by default as follows:

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Details	Job Specs	Job Activ.	Spec. Text	Stock Req.	Res. Req.	Actions	Pref. Empl.	Do / Do n										
<div> Global Details For Action </div> <table border="1"> <thead> <tr> <th>Resource</th> <th>Name</th> <th>Reqd No</th> <th>Plan Hrs</th> <th>Start Day</th> </tr> </thead> <tbody> <tr> <td>AFC-OSC</td> <td>AFC Outsource Contractor</td> <td>1</td> <td>1.000</td> <td>1</td> </tr> </tbody> </table>									Resource	Name	Reqd No	Plan Hrs	Start Day	AFC-OSC	AFC Outsource Contractor	1	1.000	1
Resource	Name	Reqd No	Plan Hrs	Start Day														
AFC-OSC	AFC Outsource Contractor	1	1.000	1														

Resource List Box

Resource	This is the identifier of the resource
Name	This is the name (description) of the resource
Reqd No	The number of Resource required for this Job
Plan Hrs.	The total number of hrs planned for this Resource
Start Day	The Day when the Resource has to start the Job. This depends on the duration of the job and the Start Day must be less than or equal to the Duration.

Actions Tab:

Actions are subdivisions of the Job, that is, a collection of more specific operations that activates upon a sub-equipment of the equipment, or, upon a device of the sub-equipment. They are very much like Jobs, but usually are shorter and their behaviour falls under the Job's general directions and specifications.

As like for the Job, an Action can be allocated with:

- Resources
- Stock items /Spares/Tools

The actions of a Job can have the same periodicity as the job (i.e. they will be performed exactly once when a Job is executed), or they can have a smaller periodicity, which must be a sub-multiple of the Job periodicity. In this second case, the action will be performed many times during the Job's execution.

Actions that belong to a Job have a sequence number within that Job; this sequence number specifies the order in which Actions are to be performed.

The Actions tab of Job Guidelines window looks by default as follows:

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Details	Job Specs	Job Activ.	Spec. Text	Stock Req.	Res. Req.	Actions	Pref. Empl.	Do / Do n
TSeq No	TSub Equipment	TAction Code	TAction Description	TSub Eqp. Description	TElement	TEqp. Status		
1	/EQPT-STD	ACTN000002	TEST	Eqpt STD				

Double click on any of the displayed Actions will activate the **Job Action Details** window.

Detailed Field Descriptions:

Actions List Box

Seq. No.	This is the sequence number of the Action in the Job's list of Actions.
Sub Equipment	This is the identifier of the equipment for which the Action was generated.
Action Code	This is the identifier of the Action.
Action Description	This is the Action's description.
Element	This is the description of the specific element in the sub-equipment upon which the action is to be performed.
Equipment Status	This is the equipment status for the equipment for which the Action was generated.
Duration	This is the estimated duration of the action activity.
Interval	This is the action's time interval, a sub-multiple of job's time interval
Interval Unit	This is the measurement unit for the Action time interval.
Operation Type	This is the description of a manual which in turn explains how to complete such an action on the equipment.
Device	This is the equipment's device identifier, upon which the selected Action activate.
Action Kind	This is the Action's kind identifier
Action Kind Description	This is the Action Kind's description.
Sub Equipment Description	This is the description of the equipment for which the action was generated
Meter Interval	This is the job action's meter periodicity, which must be a sub multiple of job's meter periodicity.
Limit 1	During action's execution, there can be certain parameters that must restrict to certain values. Two such restricted values can be defined for an action. This is the first restricted value.
Unit 1	This is the measurement unit for the first restricted value.
Limit 2	This is the second restricted value.


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Unit 2 This is the measurement unit for the second restricted value

Text This information field provides supplementary information on the job's action. It is an optional information.

Click on the non-standard  button will open the Resource Requirement tab and display the list of resources allocated for the selected Action.

Click on the non-standard  button will open the Stock Requirement tab and display the list of stock items allocated for the selected Action.

Preferred Employee Tab:

The Preferred Employee Selector is used to manage the preferred employees for the planned equipment job. It specifies the planned hours required for the preferred employees to perform the job.

The Preferred Employee tab of Job Guidelines window looks by default as follows:

Details	Job Specs	Job Activ.	Spec. Text	Stock Req.	Res. Req.	Actions	Pref. Empl.	Do / Don't
Employee No	Planned Hours	Employee Name						
057444	1.000	Ronald Tan						
0770	1.000	Signal Employee						

Double click on any of the displayed preferred employees will activate the **Preferred Employee Details** window.

Detailed Field Descriptions:

Preferred Employee List Box

Employee No This is the identifier of the preferred employee for this equipment job.

Planned Hours This is the number of hours planned for this employee to work on this job.

Employee Name This is the name of the preferred employee for this equipment job.

Do / Don't Tab:

The Do / Don't selector is used to manage the lists of indications and restrictions for equipment job.

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The Skill Requirement tab of Job Guidelines window looks by default as follows:

Job Specs	Job Activ.	Spec. Text	Stock Req.	Res. Req.	Actions	Pref. Empl.	Do / Do not	Skill
Skill Code	Skill Description	Required No	Level					
AMS-DSOP	DSMS Operation	1	5					

Double click on any of the displayed skill requirement will activate the **Skill Requirement Details** window.

Detailed Field Descriptions:

Skills Requirement list-box

Skill Code	This is the reference code of the skill.
Skill Description	This is the description of the skill.
Required No	This is the required number of workers having the skill to accomplish the job.
Level	This is the level of proficiency required for the skill.

Facility Requirement Tab:

The Facility Requirement Tab is used to manage the facility requirements of planned equipment job. The module specifies the amount of time the generic facilities are used and the standard (planned) cost of facilities to be used to perform the equipment job.

Every time the list of required facilities is updated the system computes and updates the standard facility cost at the level of the equipment job.

The Facility Requirement tab of Job Guidelines window looks by default as follows:

Spec. Text	Stock Req.	Res. Req.	Actions	Pref. Empl.	Do / Do not	Skill	Facility	Linked Job
Facility	Description	Planned Time	Time Unit	Rate	Planned Cost	Start day	Total Time	Used Time
F1	Facility 1	2.50	1	150.000	375.00	1	0.00	

Double click on any of the displayed facility requirement will activate the **Facility Requirement Details** window.

Detailed Field Descriptions:

Facility Requirement list-box

Facility	This is the reference code of the generic facility.
-----------------	---

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The Linked Job tab of Job Guidelines window looks by default as follows:

pec. Text Stock Req. Res. Req. Actions Pref. Empl. Do / Do not Skill Facility **Linked Job**

Next Job ☒

Eqpt Code :

Eqpt Desc :

Job ID :

Job Desc :

Interval : ☐ Time ☐ Meter

Time Interval Value :

Meter Interval Value :

Detailed Field Descriptions:

Next Job

This check box, if checked, specifies that the details in this window refer to the Job that is to follow the current Equipment Job. If unchecked, the link with specified Job (if any) is deleted and all the other information in this window becomes inaccessible.

Eqpt Code

This is the linked Job's Equipment identifier, a mandatory information. It must exist in the directory of Equipment and it must have at least one associated Job.

A selector trigger button (or F2 key) linking to Equipment Selector is available.

Eqpt Desc

This is the linked Job's Equipment description, a read-only information automatically managed by the system.

Job ID

This is the Linked Job identifier, a mandatory information. It must be an existing equipment job and it mustn't be already linked to another Job.

A selector trigger button (or F2 key) linking to Equipment Jobs Selector is available.

Job Desc

This is the Linked Job description, a read-only information automatically managed by the system

Link radio button (Time / Meter)

This is the Job link criterion:

Time	The Linked Job has time periodicity
Meter	The Linked Job has meter periodicity, available only if the primary Job has a meter specified

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Time Interval Value

This is the time interval used to plan the linked job when the parent job's Work Order is passed to archival status, an optional numeric information. It is added to the finish date of the parent job to compute the next job date for the linked job.

Value Interval Unit

This is the measurement unit for the linked job interval (days or weeks).

Meter Interval Value

If the primary job is meter-based and the link criterion is set to 'Meter', the interval has to be defined by a meter value. Otherwise, the meter value is empty.

This is the consumption of the meter between the end of the primary job and the beginning of the linked job.


5.2.3 To Add a New Job to an Equipment

Minimum information required to add a job to an equipment is:

- Job identifier
- Job description
- Job type
- Job behaviour
- Job duration
- Job cost centre
- Time and/or meter periodicity, if the job behaviour is not 0 («just in time»)
- The next meter level, if the equipment job is based on a cumulative meter.
- The next job date, if the equipment job is time based. System will the current date as default.

To add a new equipment job:

1. Select the equipment for which the job to be created at the **equipment** field of the Job Guidelines Details window.

2. Click on the  icon to launch the ADD window.

(to furnish details in selecting jobs.)

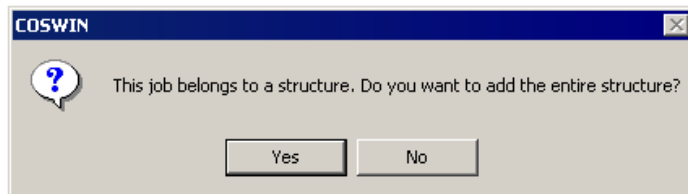
5.2.3.1 When the New Job belongs to a Job Structure

When the new job selected belongs to a Job Structure, COSWIN will prompt whether to create new equipment jobs for the entire structure:

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If YES option is selected, equipment jobs for the rest of the jobs in the job structure against the current equipment will also be created into the Job Guidelines.

The job interval in the job guidelines for the rest of jobs in the job structure will be computed by the system according to the Multiplicity specified in each parent job in the job structure.

However, if there already exists an equipment job in the Job Guidelines defined for this job against some other equipment, system will propose the Interval defined in that equipment job as default interval.

Whenever the interval of one equipment job is modified, system will re-compute the interval for the rest of the job in structure according to the Multiplicity specified.

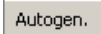
5.2.4 To Auto-Generate Equipment Jobs

COSWIN provides an option to allow users to create many similar Jobs (destination Jobs) for the same equipment from an existing Equipment Job.

This option allows users to

- Create one or more identical equipment jobs from an existing equipment job (using 'From current job' mode), or
- Create one or more identical equipment jobs from a blank job guideline template whose details to be specified by user (using the 'Create pattern' mode)

To use the Auto-Generation option, the Job Prefixes must first be defined in COSWIN Configuration's Maintenance / Job Identifiers.

From the Job Guidelines Details window, click on the non-standard  button and the following window appears:

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Detailed Field Descriptions:

Generation Criteria (From current job / Create pattern)

This radio button specifies the source of the destination Jobs:

- From current job** Current Job
Create pattern From a new Job that is to be created

Job ID prefix

This is the destination Jobs prefix identifier, a mandatory information of maximum 4 alphanumeric characters. It must be one of the existing Job Prefixes.


A selector trigger button (or F2 key) linking to Job ID Selector is available.

Job ID suffix

This is the destination Jobs suffix start number, a read-only numeric information automatically managed by the system.

Jobs to generate

This is the number of destination Jobs to generate, a mandatory positive numeric information greater than 0.


After fill in the criteria to generate equipment jobs, click on the non-standard  button to activate the generation:

If **From current job** mode is selected, a few new identical equipment jobs will be created with exact quantity dictated by the value stated in *Job to generate* field. All new jobs created will have the prefix equal to that stated in the *Job Prefix* field, and their suffix begin with the number displayed in the *Job Suffix* field.

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If **Create pattern** mode is selected, then a blank Job Guidelines window will appear for user to specify the details for the new jobs to be created. After specifying the details for the jobs, click on the  icon to proceed with the job generation.

5.2.5 To Modify an Equipment Job

The only information that cannot be modified, is:

- Equipment identifier
- Equipment description
- Job identifier
- Structure information
- Last Job Date
- Last Meter Reading
- Last work order number

5.2.6 To Delete an Equipment Job

An equipment job cannot be deleted if:

- It has been referenced for planning (See Planning module)
- There are work orders on this equipment job that are still in Work In Progress (that is not been archived yet)
- There are job requests raised on this equipment job
- There are measurement points defined for it (See Condition Based Maintenance modules)
- The job is included in a job structure and it has a parent

Only the job occurrence for the specified equipment will be deleted; the jobs with the same identifier, but for different equipment, will not be affected by the deletion.


However, if there are no other equipment jobs with that identifier, the user may choose to delete the general job too.

Click on the  icon to delete the current equipment job.

5.2.7 To Release Work Order from an Equipment Job

COSWIN provides an option to release a Work Order into work in progress from an equipment job.

Select the equipment job, on which the work order is to be released, from the Job Guidelines Details window.

Click the non-standard  button and the following window will be prompted:

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Enter the date on which the work order should be scheduled

Enter Job Schedule Date:

Specify the schedule date of the work order and click on the button. A work order will then be generated.

5.2.8 To Reset the Next Due Date of the Equipment Job

COSWIN provides an option to reset the Next Due Date of an equipment job.

The due date of a job can only be reset, if

- There are no Work Orders for the equipment job still in Work-In-Progress, and
- There are no plan exists on this equipment job.

Select the equipment job, whose next due date order is to be reset, from the Job Guidelines Details window.

Click the non-standard button and the following window will be prompted:

Prepare Job for Reset

Modification :

Next Job Date :

Next Job Level :

Specify the next due date of the job in the *Next Job Date* field and click on the button. The equipment job's due date will be modified accordingly.

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5.2.9 Stock Requirement Details

The Stock Requirement Details window looks by default as follows:

Detailed Field Descriptions:

Item source (Kit / Eqpt wise / Maint wise / Stock)

This radio button specifies which item selector will be used to choose the item identifier:

Kit Items	Kit Items Selector
Eqpt wise	List of Spares
Maint. Wise	Spares/Tools Selector
Stock	Stock Items Selector

Item Code

This is the identifier of the stock item that is to be allocated, a mandatory information. It must exist in the directory of spares/tools or in the stock item register.

A selector trigger button (or F2 key) linking to Item Selector or Spare/Tools Selector, depending on the item source radio buttons selected, is available

Right-mouse click (or F7 key) will activate the Stock Items Details window or Spare/Tools Details window, depending on the item source radio buttons selected, for the current code.

Item description

This is the description of the item, a read-only information automatically managed by the system.

Group

This is the identifier of the group to which the item belongs, a read-only information automatically managed by the system.

Required Quantity

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This is the stock item required quantity, in order to perform the Job, a mandatory positive numeric information.

Units

This represents the measurement unit defined for the specified item, a read-only information automatically managed by the system.

Days Required

This information represents the number of days for which the tool is required, if the item refers to a tool, otherwise is meaningless. It is an optional positive numeric information, which cannot be greater than the Job's duration.

Replacement (Systematic / Conditional)

This radio button specifies the way in which the item should be replaced when a work order based on the job is performed:

Systematic Always

Conditional Depending on certain conditions

Sequence No

This is the Action's sequence number. It will only be used if the stock item is to be allocated against a job action.

Action

This is the Action identifier, if the stock item is to be allocated against a job action. It is a read-only information automatically managed by the system.


Description

This is the description of the Action, if stock item is to be allocated for a job action. It is a read-only information automatically managed by the system.

5.2.9.1 To Add a New Stock Requirement to an Equipment Job


Minimum information required to ADD a stock item is:

- Item identifier
- Required Quantity

Select the Stock Requirement tab and click on the  icon to launch the ADD window.

5.2.9.2 To Copy Stock Requirement to another Equipment Job

COSWIN provides an option to copy the Stock Requirement from a source Equipment Job (the one from which the window is opened) to a destination Equipment Job (the one specified in the Copy window).

In order to copy stock items from one Job to another, the source Job must **not** have Actions attached, and the user must have selected one or more of the Job's stock items. Otherwise, the non-standard  button will not be enabled.

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This is the index of day from which the resource begins its work on the Job, counting from the Job start date, a mandatory integer and positive value. The default value is 1 (the first day of the job).

Sequence No

This is the Action's sequence number. It will only be used if the resource is to be allocated against a job action.

Action

This is the Action identifier, if the resource was allocated for an Action. It is a read-only information automatically managed by the system.

Description

This is the description of the Action, if resource was allocated for an Action. It is a read-only information automatically managed by the system.

5.2.10.1 To Add a New Resource Requirement to an Equipment Job

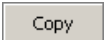
Minimum information required to add a resource, to an Equipment Job or to an Equipment Job Action, is:

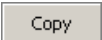
- Resource identifier
- Required number
- Planned hours
- Start Day

Select the Resource Requirement tab and click on the  icon to launch the ADD window.

5.2.10.2 To Copy Resource Requirement to another Equipment Job

COSWIN provides an option to copy the Resource Requirement from a source Equipment Job (the one from which the window is opened) to a destination Equipment Job (the one specified in the Copy window).

In order to copy resources from one Job to another, the source Job must **not** have Actions attached, and the user must have selected one or more of the Job's resources. Otherwise, the non-standard  button will not be enabled.

Under the Resource Requirement tab of the source Equipment job, select the resources to be copied and click on the non-standard  button. The following window will be activated:

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Specify the destination Equipment Job in the window and click on the non-standard button to confirm the copy.

OK


5.2.10.3 To Modify a Resource Requirement under an Equipment Job

The only information that can be modified, is:

- Required number
- Planned hours
- Start Day
- Action Sequence number (only if the Job has actions defined)

5.2.10.4 To Delete a Resource Requirement from an Equipment Job

A resource allocated for an Equipment Job or Equipment Job Action can be deleted without restrictions.

Click on the  icon to delete the current Resource Requirement.

5.2.11 Job Actions Details

The Job Actions Details window looks by default as follows:

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During Action's execution, there can be certain parameters that must restrict to certain values. Two such restricted values can be defined for an Action. This is the first restricted value, an optional numeric information.

Unit 1

This is the measurement unit for the first restricted value, an optional alphanumeric information that can take up to 6 characters.

Limit 2

This is the second restricted value, an optional numeric information. See also Limit 1Limit 1.

Unit 2

This is the measurement unit for the second restricted value, an optional alphanumeric information that can take up to 6 characters.

5.2.11.1 To Add a New Action to an Equipment Job

Minimum information required to add an Action to a Job, is:

- Action sequence number
- Equipment identifier
- Action identifier
- Time interval (if the job is time-based)
- Meter interval (if the job is meter-based)
- Planned Hours

Select the Actions tab and click on the  icon to launch the ADD window.

5.2.11.2 To Modify an Action of an Equipment Job


The only information that cannot be modified, is:

- Action identifier
- Action description
- Action Kind
- Action Kind description
- Meter Interval unit

5.2.11.3 To Delete an Action from an Equipment Job

A Job Action cannot be deleted, if:

- It has allocated resources
- It has allocated stock items

Click on the  icon to delete the current Action.

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- o Planned hours

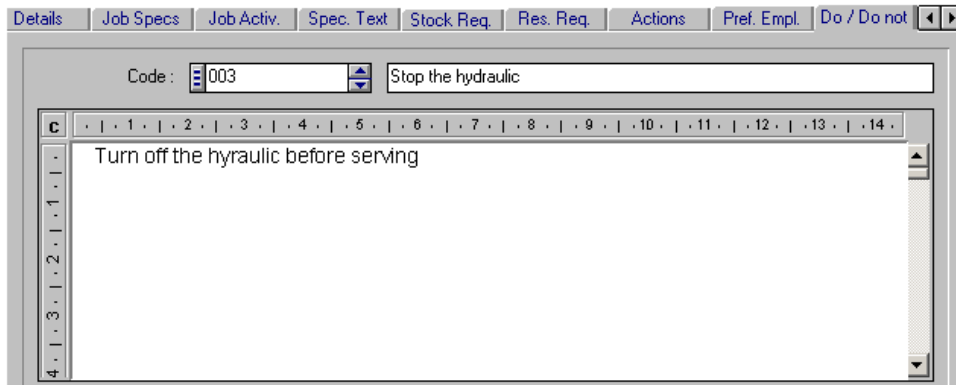
5.2.12.3 To Delete a Preferred Employee from an Equipment Job

A preferred employee for an equipment job can be deleted without restrictions.

Click on the  icon to delete the current Preferred Employee.

5.2.13 Indication and Restriction Details

The Indication and Restriction Details window looks by default as follows:



Detailed Field Descriptions:

Indication/Restriction code

This is the reference code of the to do codification, a mandatory information. The reference code of to do codification should be unique at the level of equipment job. The reference code of to do codification should exist in the directory of Do/Do Not codification.

Description

This is the description of the to do codification, a read-only information automatically managed by the system.

Indication/Restriction text

This OLE multi-line enables the user to provide supplementary information about the indication/restriction. The interface consists of the drawing layout, where the user can write text and / or append pictures, drawings, spreadsheets and any other form of OLE information.

5.2.13.1 To Add a New Indication/Restriction to an Equipment Job


Minimum information required to add a indication/restriction to an equipment job, is:

- o Codification Code

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Select the Do / Do Not tab and click on the  icon to launch the ADD window.


5.2.13.2 To Modify an Indication/Restriction of an Equipment Job

The only information that can be modified, is:

- o Indication/Restriction text

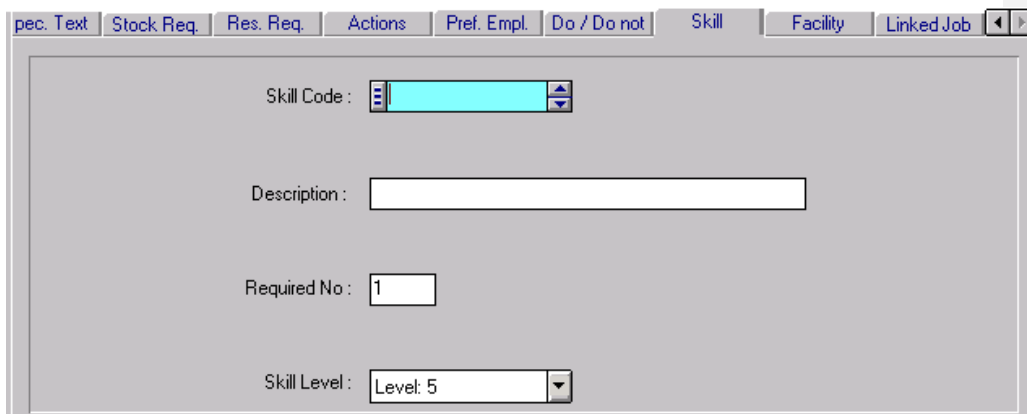
5.2.13.3 To Delete an Indication/Restriction from an Equipment Job

A job indication / restriction defined for an equipment job can be deleted without restrictions.

Click on the  icon to delete the current Job Indication/Restriction.

5.2.14 Skill Requirement Details

The Skill Requirement Details window looks by default as follows:



Detailed Field Descriptions:

Skill Code

This is the reference code of the skill, a mandatory information. It must exist in the directory of Skills and shall be unique at the level of equipment job.

A selector trigger button (or F2 key) linking to Skill Selector is available.

Right-mouse click (or F7 key) will activate the Skill Details window for the current code.

Description

This is the description of the skill, read-only information automatically managed by the system.

Required No

This is the required number of workers having the skill to accomplish the job, a mandatory strictly positive integer value.

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Skill Level

This is the level of proficiency required for the skill, a mandatory integer value in the interval [1 - 10].


5.2.14.1 To Add a New Skill Requirement to an Equipment Job

Minimum information required to add a skill requirement to an equipment job, is:

- Skill
- Required Number
- Level

The default values proposed by the system are:

- Required Number = 1
- Level = 5

Select the Skill Requirement tab and click on the  icon to launch the ADD window.


5.2.14.2 To Modify a Skill Requirement under an Equipment Job

The only information that can be modified, is:

- Required number
- Level

5.2.14.3 To Delete a Skill Requirement from an Equipment Job

A skill requirement can be deleted without restrictions.

Click on the  icon to delete the current Skill Requirement.

5.2.15 Facility Requirement Details

The Facility Requirement Details display the facility requirement and allow facility requirement definition through the following information.

The Facility Requirement Details window looks by default as follows:

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pec. Text	Stock Req.	Res. Req.	Actions	Pref. Empl.	Do / Do not	Skill	Facility	Linked Job
<div> Facility : <input type="text" value="F1"/> <input type="button" value="F2"/> <input type="text" value="Facility 1"/> </div> <div> Planned Time : <input type="text" value="2.000"/> Time Unit : <input type="text" value="1-DAY"/> </div> <div> Rate : <input type="text" value="150.00"/> Planned Cost : <input type="text" value="300.00"/> Start Day : <input type="text" value="1"/> </div> <div> Total Time : <input type="text" value="0.000"/> Used Times : <input type="text" value="0"/> Planned : <input type="text" value="1-PLANNED"/> </div>								

Detailed Field Descriptions:

Facility

This is the reference code of the generic facility, a mandatory information. The facility reference code should be unique at the level of job. The facility reference code should exist in the directory of Maintenance Facilities.

A selector trigger button (or F2 key) linking to Facility Selector is available.

Right-mouse click (or F7 key) will activate the Facility Directory window for the current code.

Description

This is the description of the generic facility, read-only information automatically managed by the system.

Planned Time

This is the number of time units planned to use the facility for the job, mandatory positive numeric information.

Time Unit

This is the unit of measure for the time planned to work by the facility against the equipment job. It is mandatory integer information that can take the following values: 0-HOUR, 1-DAY or 2-WEEK

Rate

This is the cost of use of facility per time unit, mandatory positive information. It is used to compute the cost of facility usage against the job.

Planned Cost

This is the planned cost of use of facility, read-only information automatically computed by the system as the product between the planned time and the rate.

Start Day

This is the first day on which the facility is needed (if the job extends on more than one day), mandatory information.

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Total Time

This is total time in terms of hours that the facility has been used against the equipment job. This is a read-only information automatically updated by system upon archival of associated work order (provided the option 'Update Facility Requirement')

Used Times

This is the.

Planned

This flag indicates if the facility requirement is '0 – Not Planned' or '1 – Planned'. System proposes the '1 – Planned' as default.

5.2.15.1 To Add a New Facility Requirement to an Equipment Job

Minimum information required to add a facility requirement to an equipment job is:

- Facility
- Planned Time
- Rate
- Time Unit
- Start Day

The system will propose the rate and the time unit of the generic facility as default values for the facility requirement rate and time unit.

The system computes the cost of the facility requirement and updates the standard facility cost of the equipment job with the cost of the newly defined facility requirement.

Select the Facility Requirement tab and click on the  icon to launch the ADD window.

5.2.15.2 To Modify a Facility Requirement under an Equipment job


The only information that can be modified, is:

- Planned Time
- Rate
- Time Unit
- Start Day

Whenever the Planned Time or the Rate is modified the system updates the cost of the facility requirement and the standard facility cost of the equipment job with the modified facility requirement cost.

5.2.15.3 To Delete a Facility Requirement from an Equipment Job

The facility requirements can be deleted from an equipment job without restrictions.

Click on the  icon to delete the current Facility Requirement.

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His job chart shows:

P1	Week 12	Week 13	Week 14
	J1 ₀	J1 ₁	

Subsequently, planner P2 creates a plan on the same job J1 on the equipment E1 for the week 12 and 14.

If P2 checks the CLASH box option (selected), his job chart will be:

P2	Week 12	Week 13	Week 14

If P2 uncheck the CLASH box option (unselect), his job chart will be:

P2	Week 12	Week 13	Week 14
			J1 ₂

In neither case can a job be planned two twice for the same period.

Association of an equipment and job with its planner is maintained only until the plan jobs are released to Work-in-Progress. Once the plan jobs are released to WIP, an equipment job is free to be planned by any planner.

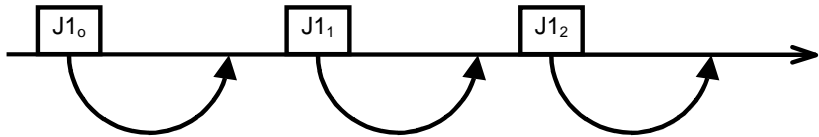
Auto Re-planning of Jobs

There are situations where planned jobs will need to be re-planned due a job occurrence is moved.

In such situations, you have the option to re-plan the jobs, by selecting or clearing the corresponding **Auto Replan Jobs** option, thus making the plan more dynamic.

EXAMPLE:

If the first job J1₀ is delayed in the plan, then the subsequent jobs J1₁ and J1₂, already specified in the plan, will be shifted accordingly.



This applies to all plans with the option Auto Replan Job selected.

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The formula used to compute the priority of job is:

$$9 - (\text{EquipmentPriorityWeight} * (9 - \text{EquipmentPriority}) + \text{JobPriorityWeight} * (9 - \text{JobPriority}) + \text{LaborHourPriorityWeight} * \text{LaborHourPriority} + \text{MissedPriorityWeight} * \text{MissedPriority}) / (\text{EquipmentPriorityWeight} + \text{JobPriorityWeight} + \text{LaborHourPriorityWeight} + \text{MissedPriorityWeight})$$

Effect of Work Orders on Planning

Existing incomplete Work Orders have an effect on planning of jobs. It is so because the Last Occurrence Date of job in 'Job Guidelines' is based on the Work Orders that have been completed and for which feedback has been completed (Archival Status). However, for a job there could be Work Orders, who are either not yet over, or for which feedback is yet to come. The system takes into account such Work Orders, by estimating their completion dates. The highest of the completion dates (from Work Orders and Job Guidelines) is taken as the Last Occurrence Date of a job for its next planning.

Effect of Existing Plans on a New Plan

COSWIN provides the facility to plan for several future periods, while retaining current plan data. Thus, you may generate plans 1, 2 and 3 for periods A, B and C and maintain them simultaneously.

In view of this feature, the system has to take into account all existing plan jobs when generating a new plan. Therefore, while generating a plan, the system determines the highest date up to which a job is already planned. All new occurrences of a job are computed by taking this highest date as the Last Occurrence Date of the job.

Backlog Job Adjustment

Jobs, which are due earlier than the plan start date (after considering Work Orders and planned jobs), are 'Backlog Jobs'. These jobs have been missed in the past and therefore must be taken up in the current plan. To ensure their early execution, all Backlog jobs are scheduled on the first day of the plan period.

Two Types of Planning

System allows the following two types of plans:

- **Theoretical** - Planning for 'Simulation'
- **Practical** - Planning for 'Release' (Job release to WIP)

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Delete all unwanted previous Plans. If there are 'Simulation' or 'Release' Plans which are no longer required, these should be deleted. As each 'Release' type plan has to scan existing plans, time would be wasted unnecessarily if such plans exist when generating a new plan.

5.3.2 Create a Job Plan

The Planning module is used to create a sequence of maintenance jobs that will be due in a user-defined period of time. It uses the jobs already defined in Job guidelines along with their Last occurrence date and periodicity data. In a given plan, a job may occur once or several times depending upon the plan period, job periodicity, behaviour and its last occurrence.

Using Search Criteria, the user can define lower and upper limits on several important fields to generate plans suiting his/her specific requirements. Thus, only the equipment and jobs, which meet the Search Criteria, are considered for planning. The user can define Search Criteria on the following fields:

- Zone
- Function
- Cost Centre
- System
- Equipment / Group
- Job Identifier
- Job Type
- Job Class
- Job Priority
- Resource
- Job Supervisor

Facility is provided to include wild card characters (*) and (?) in lower and upper limits to make the search definition flexible and powerful. Pick list facility is also available for Zone, Equipment/Group, Job Type and Resource fields to 'mark' and select specific values of these fields for which a plan is to be generated. This facility allows the user to search on specific Zones, Equipment, Job Types and/or Resources as against search for a range of values provided by lower and upper limits.

Select from COSWIN menu *Maintenance / Planning / Plan Jobs* to launch the Plan Jobs module:

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Eqpt/Group Code

Enter the lower and upper limits of the Equipment identifiers (up to 16 alphanumeric characters).

A selector trigger button (or F2 key) linking to Equipment Selector is available.

Job ID

Enter the lower and upper limits of the Job identifiers (up to 16 alphanumeric characters).

A selector trigger button (or F2 key) linking to Equipment Jobs Selector is available.

Job type

Enter the lower and upper limits of the Job type identifiers (up to 6 alphanumeric characters).

A selector trigger button (or F2 key) linking to Job Type Selector is available.

Job class

Enter the lower and upper limits of the Job class identifiers (up to 6 alphanumeric characters).

A selector trigger button (or F2 key) linking to Job Class Selector is available.

Job priority

Enter lower and upper limits of the Job priority (one digit).

Resource

Enter the lower and upper limits of the Resource identifiers (up to 10 alphanumeric characters).

A selector trigger button (or F2 key) linking to Resource Selector is available.

Supervisor

Enter the lower and upper limits of the Job supervisor identifiers (up to 6 alphanumeric characters).

A selector trigger button (or F2 key) linking to Supervisor Selector is available.

Weight Factors

The default priority weights are displayed and you can enter new values, which should be used for the current plan run. However these weights are not saved. Weights can be between 0 and 9, 9 being the highest. All four weights cannot be zeros.

Job Priority

Enter Job priority weight (one digit: 0...9).

Equipment Priority

Enter Equipment priority weight (one digit: 0...9).

Number of Times Missed

Enter Times Missed weight (one digit: 0...9).


Labour Hours/Duration

Enter Labour Hrs/Duration weight (one digit: 0...9).

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After specifying the selection criteria, user can click on the non-standard  button to start planning process.

Once the planning starts, a pop-up form is displayed indicating the number of Equipment/Jobs scanned and number of plan jobs created. Even at this stage, the plan creation process can be aborted by pressing the Abort button.

Once the plan is created successfully, the identifier of the newly created plan will appear under the Plan No field. User may use the right-mouse click (or F7 key) to activate the Release Jobs module to review the newly created plan.

5.3.3 Compute Resource Availability

The purpose of this module is to compute the resource availability information, for different phases of the resource status:

- ❑ Wrench Hours phase: computes wrench hours for each resource, based on employees calendars
- ❑ Work In Progress load phase: computes WIP committed hours, based on pending resources for work orders
- ❑ Free Hours phase: computes free hours for each resource, based on wrench and WIP hours using the PM jobs factor
- ❑ Plan Load phase: computes the plan hours and sets accordingly the resource availability flags for the involved plan jobs

Select from COSWIN menu *Maintenance / Planning / Resource Availability / Availability Computation* to launch the Compute Resource Availability module.

The Compute Resource Availability window looks by default as follows:

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Detailed Field Descriptions:

Period - DWY

Enter here the start and finish dates (Day/Week/Year format) of the period for which resource computation should be run. By default, the proposed start date is the current date and the proposed end date is the seventh day from period start, thus setting a period of one week automatically.

The ending date of the plan period cannot be greater than 75 days from the current date if not specified otherwise through Parameters at installation. This restriction holds for the plan period of all four phases.

Period - DMY

This information display the period limits in Day/Month/Year format, automatically generated by the system, not accessible to the user.

Phase 1 - Compute Wrench Hours

Execute

This checkbox indicates whether or not to compute wrench hours. This flag is marked by default.

Wrench (From ...To ...)

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These are the start and finish dates (Day/Week/Year format) of the period for which wrench hours computation should be run. The plan period dates are proposed by default.

Phase 2 - Compute WIP Load

Execute

This checkbox indicates whether or not to compute WIP load. This flag is marked by default.

WIP (from ...To ...)

These are the start and finish dates (Day/Week/Year format) of the period for which WIP load computation should be run. The plan period dates are proposed by default.

Consider Backlog Jobs

This checkbox indicates whether or not to consider backlog WIP jobs for WIP load computation. This flag is marked by default.

Phase 3 - Compute Free Hours

Execute

This checkbox indicates whether or not to compute free hours. This flag is marked by default.

Free (From ...To ...)

These are the start and finish dates (Day/Week/Year format) of the period for which free hours computation should be run. The plan period dates are proposed by default.

Modify PM Jobs Factor

This checkbox denotes whether to modify the PM jobs factor of all the resources at the time of computing free hours. This enables the user to increase or decrease the PM job factor of one or more resources selectively and see the effect on the release flag, without using the resource module.

Resource Code

It is a read-only field. It shows the resource that is currently being processed during the free hour computation phase.

Factor

This information displays the PM job factor of the resource that is currently being processed during the free hour computation phase.

Phase 4 - Compute Plan Load

Execute

This checkbox indicates whether or not to compute plan load. This flag is marked by default.

Plan (From ...To ...)

These are the start and finish dates (Day/Week/Year format) of the period for which plan load computation should be run. The plan period dates are proposed by default.

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Consider Backlog Jobs

This checkbox specifies whether to consider backlog planned jobs while computing plan load. This flag is marked by default.

Consider Simulation Plans

This checkbox specifies whether to consider one or more simulation (theoretical) plans while computing plan load. This flag is unchecked by default.

Plan Factor

The user can indicate here the percentages by which job duration can be extended for resource availability computation purposes. The user has to key in values, which result in the extension of the job duration by at least one day.

The job duration should be in ascending order starting from the first row.

If simulation plans are to be considered, a pick list is displayed showing all the simulation type plans whose plan period overlaps with the user defined plan period. The user can then pick one or more plans.

Job duration 1

Enter first job duration level, an integer between 0 and 999.

%Ext. perm 1

Enter first percentage by which the job duration can be extended, an integer between 0 and 999.

Job duration 2

Enter second job duration level, an integer between 0 and 999.

%Ext. perm 2

Enter second percentage by which the job duration can be extended, an integer between 0 and 999.

Job duration 3

Enter third job duration level, an integer between 0 and 999.

%Ext. perm 3

Enter third percentage by which the job duration can be extended, an integer between 0 and 999.

Job duration 4

Enter fourth job duration level, an integer between 0 and 999.

%Ext. perm 4

Enter fourth percentage by which the job duration can be extended, an integer between 0 and 999.

Job duration 5

Enter fifth job duration level, an integer between 0 and 999.

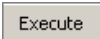
%Ext. perm 5

Enter fifth percentage by which the job duration can be extended, an integer between 0 and 999.

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Click on the non-standard  button to activate the computation. The system then executes the Resource Computation phases for which the indicator is checked. A window is displayed for each of these phases indicating the status of execution. The user can abort the process at any time by pressing (ESC) key or the Abort button.

The four status pop-up associated with each of the phases is briefly described below.

Phase I (Compute Wrench Hours) status window indicates the total number of resources and the number of resources processed.

Phase II (Compute WIP Load) status window indicates the total number of times the Work Orders should be scanned and the current run number.

Phase III (Compute Free Hours) status window indicates the total number of resources and the number of resources processed.

Phase IV (Compute Plan Load) status window indicates the current job priority, current job date, jobs processed, jobs flagged 'Yes', jobs flagged 'No' and jobs skipped. The current job priority field can have a value between '0' and '9'. The system first processes all planned jobs with priority '0', then priority '3' and so on up to '9'.

At the end of the process, the system displays a message informing the completion of the process.

5.3.4 Display Daily Resource Availability

This option allows you to review the summary results of Resource Availability Computation run. The function of Resource Availability Computation module is to compute Wrench Hours, Work Load Hours committed to WIP Jobs, Work Load due to Planned Jobs and to flag Plan Jobs which can be carried out considering availability of resources.

Using this module, you can review the Wrench Hours, WIP Load, Free Hours, Plan Job Hours and Total Plan Job Hours for any resource. Comparison and ratio analysis of these hour fields representing resource availability and resource requirements will help you in resource management, job prioritisation and short/long term planning of maintenance personnel requirements of different trades/skills.

Select from COSWIN menu *Maintenance / Planning / Resource Availability / Resource Display (day)* to launch the Daily Resource Availability Display module.

The Daily Resource Availability window looks by default as follows:

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	indicated on Employee Calendar.
WIP Hrs	It is the total hours of workload arising from the Work Orders in WIP module. These hours are computed based on remaining hours for each trade for all those Work Orders which are 'Not Started' or 'In Progress'.
Free Hrs	It is the total free hours available for planned jobs, after making provision for WIP hours. Free Hours = PM Jobs Factor * (Wrench Hours - WIP Hours). Zero or negative free hours indicate complete or over booking of the resource for current WIP jobs. You can increase or decrease free hours by changing PM Job factor.
Plan Hrs	It is part of the planned jobs load (jobs in plan file) which have been assigned to the resource. Plan Hours will always be less than or equal to Free Hours. This represents workload for plan jobs flagged as 'Y' in Resource Availability run.
Total Hrs	It is the total planned jobs load (jobs in plan file) for the resource. This represents total workload for the resource, including plan jobs flagged as 'Y' and 'N' in resource availability run.

5.3.5 Display Weekly Resource Availability

This option allows you to review the summary results of Resource Availability Computation run. The function of Resource Availability Computation module is to compute Wrench Hours, workload Hours committed to WIP Jobs, workload due to Planned Jobs and to flag Plan Jobs, which can be carried out considering availability of resources.

Using this module, you can review the Wrench Hours, WIP Load, Free Hours, Plan Job Hours and Total Plan Job Hours for any resource. Comparison and ratio analysis of these hour fields representing resource availability and resource requirements will help you in resource management, job prioritisation and short/long term planning of maintenance personnel requirements of different trades/skills.

For a given resource you can see the availability data for a week from a given day, week and year.

Select from COSWIN menu *Maintenance / Planning / Resource Availability / Resource Display (week)* to launch the Weekly Resource Availability Display module.

The Weekly Resource Availability window looks by default as follows:

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Here you have to introduce the ratio divisor, which is any Hour field (from A to E). By default, system displays E - Total Plan Hours. You can get ratio between any other hour fields by changing ratio field indicators.

Date - DMY

This is the starting date (displayed as day/month/year) for the given combination of day, week, year. This is a display-only field, automatically managed by the system.

PM Job factor

The Preventive Maintenance Job Factor defines in percentage the position of Wrench Hours which would be available for PM Jobs for the resource. This is a display-only information, automatically managed by the system.

Number of Employees

This data field displays the number of employees working under this resource code. This is a display-only information, automatically managed by the system.

5.3.6 Compute Stock Availability

The process of Compute Stock Availability can be broadly classified into five stages, based on the main function they perform, as:

1. Setting up Item expected free quantity
2. Plan selection based on user-defined options
3. Selection of jobs
4. Item expected quantity computation
5. Stock availability check for a particular job

Setting up Item expected free quantity

Before the process of stock availability check can commence, it is necessary to estimate the free quantity for stock items, which are available for plan jobs. This is achieved by updating the following fields in the item record type as

Item free qty for stock balancing = Current Item free quantity

Last date of balanced quantity update = Current date

Plan Selection based on user-defined options

The user, on specifying a balancing period, effectively limits the total number of plans which may be taken up for stock balancing. Only those plans, which have one or more jobs falling in the specified Stock Balancing Period, are considered for Stock Balancing. The number of plans to be considered during a balancing period is restricted to 25.

Selection of Jobs

Planned jobs are accessed in the order of scheduled date and priority. A job must meet the following criteria before it is taken up for Stock Balancing:

- o Scheduled date of the job must fall within the Balancing Period
- o It must have one or more items falling between the limits provided by the user

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- o Release flag of the job must be set to 'Y' and Resource availability flag checked according to parameter specification.

Item expected quantity computation

A particular job, after having its job stock shortlist, undergoes the expected quantity computation.

Final Item free quantity for stock balancing =

Current Item free quantity for stock balancing +

Expected Receipts against pending Purchase orders

If pending Purchase Orders are not taken into account, then the expected receipts against pending Purchase Orders is 0.

This estimated quantity is updated on to the Item free quantity available for stock balancing along with the current balancing date which denotes the exact quantity of Stock Items available for a job scheduled on that particular date. This procedure is performed for all the items shortlist for a particular job.

Stock availability check for a particular job

The estimated Item free quantity for stock balancing is now considered as the maximum quantity available for those items on that particular date. The current job is checked for stock availability of each of the shortlist items as shown below:

If the current item free quantity for balancing is greater than or equal to the quantity of item required for performing the current job, stock of that particular item for that particular job is considered to be available (that is 'Y'), or else not available.

A similar process is carried out to check the availability of all the items for that particular job. If each of the items reports 'Y' then the job is considered feasible and its stock availability is marked 'Y' else if there is a shortfall in any of the items then the job's stock availability is marked 'N'. In case of an unsuccessful job, care is taken to reverse all the prior allocation made on different items for that particular job so that the subsequent jobs have that amount available for allocation.

This procedure is performed until all the jobs scheduled on a particular day among different plans are exhausted and then the procedure is repeated for the subsequent days until the end of the balancing period.

Select from COSWIN menu *Maintenance / Planning / Stock Availability* to launch the Compute Stock Availability module.

The Compute Stock Availability window looks by default as follows:

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Item Category

The user may enter or select the starting and ending Category codes from where the items may be considered for Stock Availability. If left blank, the first and/or last categories are assumed by default and are also displayed to the user.

A selector trigger button (or F2 key) linking to Item Category Selector is available.

ABC Class

The user can consider items from a specific class or a set of classes. The starting and ending class codes from where the items will be considered should be entered in these fields. If left blank, 'A' and 'C' class are assumed by default.

Pending Purchase Orders

The user can consider taking into account all the pending deliveries for the items, based on the pending Purchase orders. This quantity is included in the expected stock in the system. If you wish to include them, check this option, otherwise un-check it. By default, this checkbox is checked.

Backlog Jobs

The user may consider including all the jobs prior to the starting date (Backlog jobs) during the current balancing period and compute stock availability by selecting this option. If he does not wish to include the backlog jobs, he can uncheck the box. By default, this checkbox is checked.

Generate Purchase Request

This option specifies whether to automatically generate Purchase Requests after running Stock Availability, starting from the list of missing items.

Considering jobs in X state

If this option is selected, the planned jobs in X state ("waiting") will also be considered while computing the purchase request. This information is available only when the Generate Purchase Request option is selected.

Planner ID

Enter the lower and upper limits of the Planner Identifiers (up to 6 alphanumeric characters) for which the purchase request will be computed. If left blank, the first and last Plan Identifiers are assumed by default and are also displayed to the user. This information is available only when the Generate Purchase Request option is selected.

A selector trigger button (or F2 key) linking to Planner ID Selector is available.

Plan No

Enter valid lower and upper limits for plan numbers for which the purchase request will be computed. If left blank, system automatically fills in the first and last plan numbers. This information is available only when the Generate Purchase Request option is selected.

A selector trigger button (or F2 key) linking to Plan ID Selector is available.

Considering qty. in request

This checkbox specifies whether or not to consider the quantity in Request when calculating Total Item Quantity. This information is available only when the Generate Purchase Request option is selected. By default, its status is checked.

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Considering qty. in order

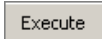
This checkbox specifies whether or not to consider the quantity in Order when calculating Total Item Quantity. This information is available only when the Generate Purchase Request option is selected. By default, its status is checked.

Considering reserved qty

This checkbox specifies whether or not to consider the reserved quantity when calculating Total Item Quantity. This information is available only when the Generate Purchase Request option is selected. By default, its status is checked.

Considering qty. under inspection

This check box specifies whether or not to consider the quantity under Inspection when calculating Total Item Quantity. This information is available only when the Generate Purchase Request option is selected. By default, its status is checked.

Click on the non-standard  button to execute the Stock Availability computation.

If the Generate Purchase Request option is selected, after performing the Stock Availability computation, the user can make a Purchase Request, starting from the list of missing items.

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5.4 CONSULTING THE PLAN AND RELEASING JOB

The result of JOB PLANNING is a list of recommended jobs. You can visualise and print the recommended jobs in several different ways.

- Plan Summary:** Allows to review the summary of various plans generated by each planner.
- Job chart:** Allows to see/print the graphical chart of the jobs recommended by the all the plans on one period as a whole.
- Job releasing:** Allows to list the jobs of a particular plan. Also allows to modify the data and the release flag.

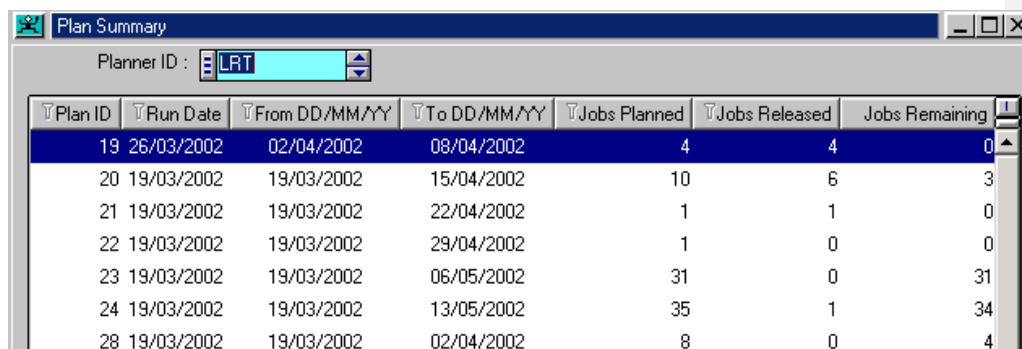
5.4.1 Plan Summary

Plan Summary module is used to review the summary of various plans generated by each planner. This summary includes information like the plan numbers, plan period, number of jobs planned and number of jobs released for each plan. In addition to this, using this module you can delete complete plans, which are no longer required.

Since COSWIN allows creation of multiple plans for each planner and you can have multiple planners, this module serves as the central controlling point to review status of various plans and removal of old and/or redundant plan data.

Select from COSWIN menu *Maintenance / Planning / Plan Summary* to launch the Plan Summary module:

The Plan Summary window looks by default as follows:



Plan ID	Run Date	From DD/MM/YY	To DD/MM/YY	Jobs Planned	Jobs Released	Jobs Remaining
19	26/03/2002	02/04/2002	08/04/2002	4	4	0
20	19/03/2002	19/03/2002	15/04/2002	10	6	3
21	19/03/2002	19/03/2002	22/04/2002	1	1	0
22	19/03/2002	19/03/2002	29/04/2002	1	0	0
23	19/03/2002	19/03/2002	06/05/2002	31	0	31
24	19/03/2002	19/03/2002	13/05/2002	35	1	34
28	19/03/2002	19/03/2002	02/04/2002	8	0	4

Detailed Field Descriptions:

Planner ID

Enter or select the Planner Identifier (an alphanumeric field, up to 6 characters), whose plans you want to review.

A selector trigger button (or F2 key) linking to Planner ID Selector is available.

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5.4.1.2 To Release Jobs from Plan Summary

Double click on any of the displayed plans in the plans list will activate the Release Job module for the selected plan.

5.4.2 Releasing Jobs

Release Jobs module is used to review the jobs in a plan and to release jobs from a plan into Work in Progress.

Select from COSWIN menu *Maintenance / Planning / Release Jobs* to launch the Release Jobs module.

The Release Job Details window looks by default as follows:

The screenshot shows the 'Release Jobs' window with the following details:

- Planner ID:** SD
- Plan ID:** 30013
- Plan Type:** 1
- Plan Period:** 13/05/2002 to 20/05/2002
- Action From:** 13/05/2002
- To:** 13/05/2002
- Checkboxes:**
 - ☒ Allocate Employees
 - ☒ Check Skills
 - ☒ Reserve Items
 - ☒ Auto generate Work Permit
 - ☐ Skip Subcontracted Jobs
 - ☐ Use Project Code
- Project Code:** (empty field)
- More:** (tab selected)
- Table:**

Job ID	Description	Eqpt/Group Code	WO ID	Due DD MM YY	Release	Rel	Pty	Eqpt Lvl	
REPAIR	Repair Job	AFCALB17/GTDR01		13/05/2002	Y			7	2 CH
- Equipment Description:** string

Detailed Field Descriptions:

Planner ID

Enter the abbreviated name of the planner as used when generating the plan (up to 6 alphanumeric characters).

A selector trigger button (or F2 key) linking to Planner ID Selector is available.

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Plan ID

Enter a valid plan number (integer number up to 99999) for the plan that you want to review. System automatically proposes the first plan number.

A selector trigger button (or F2 key) linking to Plan List Selector is available.

Plan Type

System displays the type of the plan.

0 - Theoretical plan whose jobs planned cannot be released and their details cannot be modified.

1 - Practical plan whose jobs planned can be released into WIP and their details can be modified before release.

Plan Period

Displays the limit dates of the period for which the plan was generated.

Action From...To

These are the lower and upper limits (in day/week/year format) of the period for which you want to view or release plan jobs. System automatically fills in the plan period. You can modify the plan period to view jobs for a specific period, which is a part of the plan period.

Planned Jobs List

The plan jobs are displayed in the order of their scheduled date and priority. A Release Flag associated with each plan job indicates whether a job can be released to Work in Progress or has to wait for the completion of earlier occurrences of this job.

Allocate Employees

This flag, when checked, automatically allocates employees to the released work orders. The default status of this flag is established in COSWIN Configuration's Maintenance / Work Order / Parameters. The system allocates employees to the work order based on:

- o The resource requirements of the planned job
- o The preferred employee of the equipment job
- o The available roster list
- o The planned shifts of the planned job released in Work in Progress.

The system allocates the job's preferred employees to the work order whenever possible (employees are available in the shift and not overloaded).

Check Skills

This flag, when checked, automatically checks the skills of the employees allocated to released work orders. The default status of this flag is established in COSWIN Configuration's Maintenance / Work Order / Parameters.

For each allocated employee the system will check (on request) the employee skills against the equipment job skill requirements and flags them as REJECTED when none of its skills matches any of the equipment job skill requirements.

Reserve Items

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	N	Y
	X	Y
Priority	Total Priority of Plan Job.	
Eqpt Lvl	Level of the equipment in the equipment structure.	
R	Resource Availability Flag. This flag is set by Resource Availability module. Y indicates that all the resources required for the job will be available on the scheduled date, considering current WIP jobs and other planned jobs. N indicates that the job cannot be taken up, as not all the resources required will be available. BLANK indicates that either 'Resource Computation' has not been executed on this job.	
S	Stock Availability Flag. This flag is set by Stock Availability module. Y indicates that all the stocked spare items required for the job will be available on the scheduled date of the plan job, considering the requirements of current WIP jobs and other planned jobs. N indicates that the job cannot be taken up, as not all the required spare items will be available. BLANK indicates that either 'Stock Availability' has not been executed on this job.	
E	Equipment Status Flag. It indicates the status of the Equipment or plant on the scheduled job date. It can be one of the following values: P: Peak Production day N: Normal Production day S: Shutdown day H: Holiday W: Weekly-off The legend (P/N/S/H/W) can be modified to suit different languages, by changing a parameter record.	
C	Contract Job Flag. C indicates the job is a contract job. BLANK indicates the job is not a contract job.	
Schedule Date	The initial scheduled day-week-year of the plan-job.	
Type	Job Type.	
Shift	Shift for which job is scheduled.	
Down Time	Down time (if any) involved in the job.	

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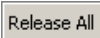
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Equipment description

This field displays accordingly the description of the equipment for the current plan-job.

5.4.2.1 Release Plan Jobs to Work in Progress

Click on the non-standard  button to release the currently selected plan job into Work in Progress. Or, click on the non-standard  button to release all plan jobs with Release Flag as 'Y' into Work in Progress.

The released plan jobs are deleted from plan file. As a job is released to WIP, next occurrence of the same job in the plan file (if any) is flagged as 'N'.

This prevents another occurrence of the same job being raised as a Work Order till the current Work Order is completed.

Each Work Order is assigned with a system generated running serial number and is referred to as Work Order Number or WO ID. Work Order type of all these Work Orders is set to 'P - Planned', indicating these are planned Work Orders.

Facility is also provided to Release a part of the plan, by specifying a range of dates indicating the period for which jobs should be released. This facility allows you to plan for a long period and then release jobs progressively. For example, you can plan for the next four weeks and then at the end of each week you can release jobs for the next week.

5.4.2.2 Effect of Work Order Completion on Plan job

Whenever a work order completes and is archived to History, the Plan Job file is updated as follows:

- Next Job Release Flag is set to 'Y'
- Plan job that are not relevant will be deleted.
- When a plan job is released to WIP, the next occurrence of the same job in plan file (if any) is set to 'N'. This is to prevent another Work Order being created till current Work Order is completed. Therefore with the completion of a Work Order, Release Flag is set to 'Y'.

In addition, if a Works Order is completed much later than its scheduled date, plan file is updated to delete such job occurrences which are not relevant due to the delayed execution.

Consider the following example of a weekly job J1 on equipment E1, which has been planned for the next four weeks as given below:

Due D-Wk-Yr	1-10-97	1-11-97	1-12-97	1-13-97
Release Flag	Y	X	X	X

When the jobs are released to WIP, job J1 scheduled on 1-10-97 is released as Work Order and the updated plan-file would appear as given below:

Due D-Wk-Yr	1-11-97	1-12-97	1-13-97
Release Flag	N	X	X

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Now, in the case the Work Order scheduled on 1-10-97 is delayed and is completed on 4-12-97, the occurrences of the job J1 as on 1-11-97 and 1-12-97 are no longer valid and therefore are deleted from plan-file. The updated plan-file would appear as given below:

Due D-Wk-Yr 1-13-97

Release Flag Y

5.4.2.3 Release Job Details

You can modify certain details of a plan before releasing it into Work in Progress. This helps in customising a plan to your specific requirements. For example, you may decide to advance (or delay) certain jobs depending upon your production requirements and other considerations. You may also completely turn-off a job by setting its release flag to 'N'.

You can modify only 'Release' type plans (Plan Type = 1 - Practical) and modification can only be done in Release Job Details window.

Double click on any of the plan jobs in the plan job list of Release Job module will activate the Release Job Details window:

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However, flexibility is provided to modify these flag values to meet special requirements. For example, you may like to cut multiple Work Orders for several weeks and send these to your overseas plant. Following modifications can be made in the Release Flag setting:

<u>From</u>	<u>To</u>	<u>Remarks</u>
Y	N	You can prevent a job being released to WIP by changing 'Y' to 'N'.
N	Y	You can force a plan job to status 'Y' so that it can be released to WIP.
X	Y	You can force a plan job to status 'Y' so that it can be released to WIP.

When modifying the Release Flag of a plan job from 'X' to 'Y', all the other plan jobs, prior to the modified job whose Release Flag are also 'X', will have their Release Flags automatically set to 'Y'.

EXAMPLE:

Consider a weekly job J1 on Equipment E1:

<u>Equipment</u>	<u>Job</u>	<u>Scheduled</u> (D-Wk-Y)	<u>Flag</u>
E1	J1	1-10-97	Y
E1	J1	1-11-97	X
E1	J1	1-12-97	X
E1	J1	1-13-97	X

If you modify the Release Flag of the Job occurrence 1-13-97 to 'Y', then the Release Flag of other job occurrences prior to it, viz. 1-12-97 and 1-11-97, are also set to 'Y'.

This is to maintain logical consistency in plan-jobs data.

Due D/Wk/Yr

You can advance or delay the execution of a job by modifying its scheduled date (day/week/year). You are only allowed to modify the Date/Shift of those jobs whose Release Flags setting are 'Y'.

Since the plan jobs are displayed in the order of date and priority, each time the date (or priority) is modified, the Planned jobs list window display is refreshed. Therefore, as you keep modifying the dates of jobs, the Planned jobs list window display also keeps adjusting to new sequence of jobs.

Note: The same facility to modify plan job schedule date is available in Job Chart Details module. It displays the job occurrences of all jobs on an equipment (and sub-equipment) in a graphical manner.

Shift ID

Enter shift for which job is scheduled, a positive integer 2 characters number.

To modify this field, the Release Flag should be set to 'Y'.

Priority

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Priority of a Plan job is computed by the system and is based on several factors (like Job priority, Equipment priority, Number of times missed, etc.). You can increase (or decrease) the priority of a plan job to ensure that all the manpower and spares resources are first allocated to this job. Zero is considered as the highest priority and nine is the lowest.

Each time priority is modified, the current screen display is refreshed and the sequence of jobs is changed to reflect the new order of jobs.

You are only allowed to modify the priority of those Plan jobs which have Release Flag setting as 'Y'.

Auto Replan Jobs

This information specifies whether to automatically update plan jobs when the current job is re-planned.

Clash

This information specifies whether planned jobs generated by other planners should be taken into account or not when updating planned jobs. The information is accessible to the user only when Auto Re-plan Job flag is set.

Old occurrences

This information specifies the action to be performed by the system upon the delayed planned jobs, during the synchronisation of planned jobs. The available actions are:

- Delete** The system will delete the delayed jobs.
- Move** The system will move the delayed jobs to future dates, according to the equipment job's periodicity.

This information is accessible to the user only when Auto Re-plan Job flag is set.

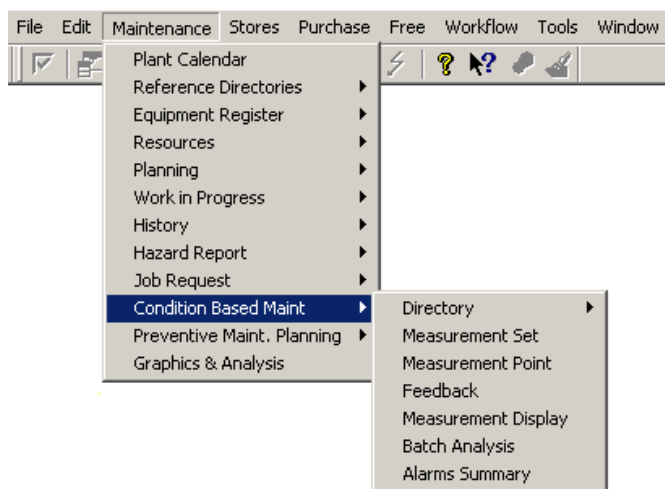
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Reference: <u>756/PMP/8029e/A756/PMP/8029e/A756/PMP/8029e/A756/PMP/8029e/-</u> KSC Version: <u>2.12.12.12.0</u>	MAINTENANCE MANAGEMENT SYSTEM <u>COSWIN WORKCOSWIN WORK</u>	Page: 168 Date: <u>21 August 200221 August 200221 August 200221 August 20023 June 2002</u>

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6. CONDITION BASED MAINTENANCE

The purpose of condition-based maintenance is to define the conditions and the measurement process over the maintained equipment. It also defines the conditions to raise alarms in case of abnormal behaviour of equipment occurs and the actions to be taken when the alarms occur.



The measurement data on various equipment is obtained as feedback in COSWIN CBM system. This feedback data is verified against the specifications defined for a measurement point. The specifications for a measurement point indicate the permissible range of a feedback data value for a safe operation of the equipment. An occurrence of a feedback data which does not meet the criteria defined by the specifications indicates the abnormal functioning of an equipment and is referred to as an alarm.

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6.1 MEASUREMENT SETS DIRECTORY

Condition Based Maintenance is carried out on the equipment by monitoring measurement parameters at regular intervals of time. These parameters, reflecting the performance of equipment, can be, for example: temperature, pressure, vibrations etc. In COSWIN, these parameters are represented by a *Set*. Each set has a unique set code, set description and the unit of the parameter being measured. A set can be linked to any number of equipment to carry out the measurements.

The **Measurement Set Directory** allows the user to maintain a directory of sets. These sets are referenced in the Measurement Set module for linking to equipment.

Select from COSWIN menu *Maintenance / Condition Based Maint / Directory / Set* to launch the Measurement Set Details module.

The Measurement Set Details window looks by default as follows:

Detailed Field Descriptions:

Set Code

This is the Set identifier, a mandatory information of maximum 10 alphanumeric characters. It must be unique among all Measurement Sets.

A selector trigger button (or F2 key) linking to Measurement Set Selector is available.

Set Description 1

This is the first explanatory description, a mandatory information of maximum 40 alphanumeric characters.

Set Description 2

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This is the second explanatory description, an optional information of maximum 40 alphanumeric characters.


Unit of measurement

This is the Set's Unit of measurement identifier, a mandatory information of maximum 6 alphanumeric characters.

6.1.1 To Add a New Measurement Set

Minimum information required to add a Measurement Set, is:

- The Measurement Set identifier
- The Measurement Set first description
- The Set's measurement Unit

Click on the  icon to launch the ADD window.


6.1.2 To Modify a Measurement Set

The information that can be modified, is:

- The Measurement Set first description
- The Measurement Set second description
- The Set's measurement Unit, only if the set is not defined against any measurement point

6.1.3 To Delete a Measurement Set

A Measurement Set cannot be deleted if it has been linked to an equipment.

Click on the  icon to delete the current Measurement Set.

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Measurement Unit

This is the Measurement Unit identifier, for the measured parameter, a mandatory information of maximum 6 alphanumeric characters.

Time Unit

This is the unit of time for the norm. It is a mandatory information and it can be one of the following:

- Minutes
- Hours
- Days
- Weeks

Norm Values in More Tab:

The purpose of this window is to define a set of Norm values that will be seen as a curve of ideal behaviour of the equipment for which the set is defined. The Norm values must be provided in ascending order.

Norm List Box

Time This is the time elapsed from the start of the operation until the time of measurement


Measurement This is the ideal value of the measured parameter

Double click on any of the displayed norms values will activate the Norms Value Details window.

6.2.1 To Add a New Measurement Norms

Minimum information required to add a Norm, is:

- Norm measurement unit
- Norm time unit

Click on the  icon to launch the ADD window.


6.2.2 To Modify a Measurement Norms

The Norm information can be modified only if the Norm is not being used by a measurement point, in which case the only information that can be modified, is:

- Norm measurement unit
- Norm time unit

6.2.3 To Delete a Measurement Norms

A Norm cannot be deleted if it has already been defined against any measurement point.

Click on the  icon to delete the current Measurement Norms.

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6.2.4 Norm Value Details

The purpose of this window is to provide details for a Norm value belonging or to be added to a set of Norm values, set that will be seen as a curve of ideal behaviour of the equipment for which the set is defined.

The Norm Value Details window looks by default as follows:

Detailed Field Descriptions:

Time

This is the time elapsed from the start of the operation until the time of measurement, a mandatory positive numeric information, greater than 0.


Measurement

This is the ideal value of the measured parameter, an optional numeric information (positive or negative). If not specified, COSWIN automatically assumes the value 0.

6.2.4.1 To Add a New Norm Value

Minimum information required to add a Norm value, is:

- o The Norm elapsed Time

Click on the  icon to launch the ADD window.

6.2.4.2 To Modify a Norm Value

The only information that can be modified, is:

- o The Norm ideal value

6.2.4.3 To Delete a Norm Value

There are no restrictions on deleting Norm values.

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Reference: <u>756/PMP/8029e/A756/PMP/8029e/A756/PMP/8029e/A756/PMP/8029e/-</u> KSC Version: <u>2.12-12-12-0</u>	MAINTENANCE MANAGEMENT SYSTEM <u>COSWIN WORKCOSWIN WORK</u>	Page: 174 Date: <u>21 August 200221 August 200221 August 200223 June 2002</u>

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Click on the  icon to delete the current Norm values.

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6.3 MEASUREMENT JOBS DIRECTORY

The module is used to manage the measurement jobs used in condition Based Maintenance process. The measurement jobs are used for retrieving the actual values of equipment parameters.

The entire Condition Based Maintenance process relies on the feedback data of the measured parameters. Measurements on equipment must be carried out periodically to ensure regular feedback. The task of carrying out measurements can be looked upon as a job occurrence at regular intervals.

Select from COSWIN menu *Maintenance / Condition Based Maint / Directory / Measurement Jobs* to launch the Measurement Job Details module.

The Measurement Job Details window looks by default as follows:

Detailed Field Descriptions:

Measurement Job ID

This is the identifier of the Measurement Job, a mandatory information of maximum 10 alphanumeric characters. It must be unique among all Measurement Jobs.

A selector trigger button (or F2 key) linking to Measurement Jobs Selector is available.

Description

This is the Measurement Job Description, a mandatory information of maximum 40 alphanumeric characters.

Interval

Keppel Steria Consortium (KSC)		C756
Reference: <u>756/PMP/8029e/A756/PMP/8029e/A756/PMP/8029e/A756/PMP/8029e/-</u> KSC Version: <u>2.12-12-12-0</u>	MAINTENANCE MANAGEMENT SYSTEM <u>COSWIN WORKCOSWIN WORK</u>	Page: 176 Date: <u>21 August 200221 August 200221 August 200221 August 20023 June 2002</u>

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This is the time Interval between two occurrences of the Measurement Job, an optional positive numeric information of maximum 4 alphanumeric characters. COSWIN automatically proposes the value 1.

Interval unit

This is the interval's measurement unit, an optional information. It must be one of the following:

- Minutes
- Hours
- Days
- Weeks

COSWIN automatically proposes the first selection (minutes)


Measurement Activities

This information specifies job activity remarks. It is an optional information. The interface consists of the drawing layout, where the user can write text and / or append pictures, drawings, spreadsheets and any other form of OLE information.

6.3.1 To Add a New Measurement Job

Minimum information required to add a Measurement Job, is:

- The Measurement Job identifier
- The Measurement Job description

Click on the  icon to launch the ADD window.


6.3.2 To Modify a Measurement Job

The information that can be modified, is:

- The Measurement Job description
- The Measurement Job interval, if the job is not used, yet, for a Measurement Point
- The interval unit, if the job is not used, yet, for a Measurement Point having a planned job linked to it
- The Measurement Job Activities

6.3.3 To Delete a Measurement Job

A Measurement Job cannot be deleted, if it is actually used by a Measurement Point.

Click on the  icon to delete the current Measurement Job.

Keppel Steria Consortium (KSC)		C756
Reference: <u>756/PMP/8029e/A756/PMP/8029e/A756/PMP/8029e/A756/PMP/8029e/-</u> KSC Version: <u>2.12.12.12-0</u>	MAINTENANCE MANAGEMENT SYSTEM <u>COSWIN WORKCOSWIN WORK</u>	Page: 179 Date: <u>21 August 200221 August 200221 August 200221 August 20023 June 2002</u>

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Set Code

This is the Set identifier, for the current equipment, a mandatory information of maximum 10 alphanumeric characters. It must be unique for the given equipment.

A selector trigger button (or F2 key) linking to Measurement Set Selector is available.

Right-mouse click (or F7 key) will activate the Measurement Set Details window for the current code.

Description

This is the Measurement Set Description identifier, a read-only information automatically managed by the system.

Calendar based

This check box specifies whether the Working Time should be allocated based on Equipment Calendar (if checked) or not.

Working Time/day

This is the time that must be allocated per day for the work on the Set's measurement job for the current equipment. It is non-null, optional positive integer. COSWIN proposes a default value of 1.

Time unit

This is the measurement unit of the Working Time, an optional information, automatically proposed by COSWIN as "minutes". It must be one of the following:

- Minutes
- Hours

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6.5 MEASUREMENT POINT

The module is used to manage the measurement points and their readings for existing equipment measurement set.

A *Measurement Point* represents a physical location on equipment where measurement is carried out to check the normal behaviour of equipment. The guidelines for the measurements and the criteria indicating the validity of a measurement are defined at individual measurement points. Subsequently, the feedback is accepted and the analysis is carried out against individual measurement points. Alarm situations, indicating abnormal behaviour of equipment, are raised at measurement points.

Feedback details (a number of readings in a time interval) can be added for each measurement point. These real readings are used to check if an alarm should be raised for the given point. When adding or modifying the measurement point readings, an analysis process is started. The analysis of measurement data can be of different types depending on the parameter being measured and the equipment on which measurement is done. The process analyses if the actual real readings violate the expected behaviour of the measurement point.

There are three ways to analyze and check for normal behaviour of an equipment parameter:

- Parameter range - the parameter values must fit a fixed interval defined by the user
- Deviation from a norm - the reading values are compared to the values of a measurement norm and a defined percentage of deviation must be respected
- Deviation from the last reading - the deviation from the last reading must be in a defined percentage

A measurement point can have the following profiles (combinations of the analysis types):

1. *Upper and Lower Limit*: Compares measured data against absolute upper and lower limits
2. *Comp against a Norm*: Compare measured data against a set of data representing the ideal operation known as norm readings
3. *Comp against Previous Value*: Compare measured data against the parameter previous values
4. *Combination of 1 and 2*: It is a combination of analysis types 1 and 2
5. *Combination of 1 and 3*: It is a combination of analysis types 1 and 3
6. *Combination of 2 and 3*: It is a combination of analysis types 2 and 3
7. *Combination of 1, 2 and 3*: It is a combination of analysis types 1, 2 and 3

The following *measurement actions* can be performed when an alarm is triggered (the analysis process detects an abnormal situation):

0. No action to be taken
1. Make the measurement job due to reconfirm the reading

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This is the description of the set, a read-only information automatically managed by the system once the set is defined.

Point Set List Box

Point Code	The identifier of the Measurement Point
Description	The description of the Measurement Point
Profile	The identifier of the Measurement Point's Profile
Meas. Job	The identifier of the Measurement Job attached to the Measurement Point
Job	The identifier of the maintenance planned Job attached to the Measurement Point

The Point Details window looks by default as follows:

The screenshot shows a software window titled "Point" with a "Close" button. The window contains several sections for configuring a measurement point:

- Top Section:**
 - Point Code: (dropdown arrow)
 - Profile: (dropdown arrow)
 - Description:
 - Measurement Job: (dropdown arrow) | Desc:
 - Interval: Mins
 - Alarm: (dropdown arrow)
 - Data Input:
 - Next Read:
 - Last Read:
- Details Tab:**
 - Job ID: (dropdown arrow) | Repair Job:
 - Link to Job: | When Alarm: (dropdown arrow)
 - Plot Type: (dropdown arrow) | Units:
 - Title:
- Parameter Range:**
 - Low Limit: | High Limit:
- Deviation from Last Reading:**
 - %Dev.:
 - Rev.Fact.:
- Deviation from Norm:**
 - Norm:
 - %Dev.:
 - Rev.Fact.:
 - Start Date:
 - Time:

The purpose of this window is to provide details for a measurement point, and / or to add measurement points for equipment.

Detailed Field Descriptions:

Point Code

Keppel Steria Consortium (KSC)		C756
Reference: 756/PMP/8029e/A756/PMP/8029e/A756/PMP/8029e/A756/PMP/8029e/- KSC Version: 2.12-12-12-0	MAINTENANCE MANAGEMENT SYSTEM COSWIN WORKCOSWIN WORK	Page: 184 Date: 21 August 200221 August 200221 August 200221 August 20023 June 2002

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This is the identifier of the measurement Point, to be added to the equipment, a mandatory information of maximum 6 alphanumeric characters. It must be unique among all Point identifiers defined for an equipment-set combination.

Profile

This is the profile identifier applied to analyse the measured feedback data, a mandatory information.

The analysis of measurement data can be of different types depending on the parameter being measured and the equipment on which measurement is done.

There are seven profile codes and they are defined as follows:

1. *Upper and Lower Limit* - Compare measured data against absolute upper and lower limits.
2. *Comp. Against a Norm* – Compare measured data against a set of data representing the ideal operations known as Norms Values.
3. *Comp. Against Previous Value* - Compare measured data against its own previous values.
4. *Combination of profile 1 and 2.*
5. *Combination of profile 1 and 3.*
6. *Combination of profile 2 and 3.*
7. *Combination of profile 1, 2 and 3.*

Description

This is the Point description, an optional information of maximum 40 alphanumeric characters.

Measurement Job

This is the Measurement Job identifier, a mandatory information of maximum 10 alphanumeric characters. It must exist in the directory of Measurement Jobs.

A selector trigger button (or F2 key) linking to Measurement Jobs Selector is available.

Right-mouse click (or F7 key) will activate the Measurement Job Details window for the current code.

Measurement Job description

This is the description of the Measurement Job, a read-only information automatically managed by the system once the measurement job is specified.

Interval

This is the interval of the measurement, an optional positive numeric information. COSWIN will propose the interval defined in the measurement job as the default.

Interval unit

This is the interval measurement Unit identifier, a read-only information automatically managed by the system.

Alarm

This is the identifier for the measurement action to be taken once an alarm is set. This action must be correlated with the corresponding profile code. It is a mandatory information and must be one of the followings:

Keppel Steria Consortium (KSC)		C756
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This is the highest permissible value for comparing with the measured Parameter data in analysis, an optional numeric information. This information is accessible to the user only if the Profile code is one of the following: 1, 4, 5 or 7.

Sign of %Deviation from last read

This is the sign of the deviation from the last reading, either '+' or '-' explicitly if the deviation to be allowed is either in the positive or negative side. If not specified, it is assumed that deviation is allowed on both sides and the symbol '±' is prefixed to the value entered. This information is accessible to the user only if the Profile code is one of the following: 3, 5, 6 or 7.

Value of %Deviation from last read

This is the absolute value of the percentage of the deviation allowed in the analysis of the measured parameter data against its immediate previous value to raise an alarm for that measurement point, an optional positive numeric information. The value can never exceed 999 on both sides.

The actual percentage value is computed from the sign (see above) and the absolute percentage value. This information is accessible to the user only if the Profile code is one of the following: 3, 5, 6 or 7.

Revision Factor (Rev. Fact.)

This information indicates the values by which the interval of the measurement job is to be reduced when an alarm occurs, a mandatory positive integer.

The values could be 1 to 9, by which it would mean a reduction in the Interval of Job by a factor of 1/2 to 1/9. This information is accessible to the user only if the Profile code is one of the following: 3, 5, 6 or 7.

Norm

This is the Norm identifier, a mandatory information. It must exist in the directory of the Measurement Norms. The norm code entered is valid for the point only if its time unit is the same as that of the specified measurement job, and the measurement unit is the same as that of the measurement set. This information is accessible to the user only if the Profile code is one of the following: 2, 4, 6 or 7.

A selector trigger button (or F2 key) linking to Measurement Norms Selector is available.

Right-mouse click (or F7 key) will activate the Measurement Norms Details window for the current code.

Norm %Deviation sign

This is the sign of the deviation of the Norm, either '+' or '-' explicitly if the deviation to be allowed is either in the positive or negative side. If not specified, it is assumed that deviation is allowed on both sides and the symbol '±' is prefixed to the value entered. This information is accessible to the user only if the Profile code is one of the following: 2, 4, 6 or 7.

Norm %Deviation value

This is the absolute value of the percentage of the deviation allowed in the analysis of the measured parameter data against the standard norms data to raise an alarm for that measurement point, an optional positive numeric information. The value can never exceed 999 on both sides.

Keppel Steria Consortium (KSC)		C756
Reference: 756/PMP/8029e/A756/PMP/8029e/A756/PMP/8029e/A756/PMP/8029e/- KSC Version: 2.12-12-12-0	MAINTENANCE MANAGEMENT SYSTEM COSWIN WORKCOSWIN WORK	Page: 191 Date: 21 August 200221 August 200221 August 200221 August 20023 June 2002

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"0" - No Alarm

"1" - Expected Alarm

"2" - Actual Alarm

Error

This information indicates any errors encountered in data, during the analysis process, a read-only information automatically managed by the system. It can be one of the following:

- 0 - No error encountered
- 1 - Insufficient Norm
- 2 - Missing Reading
- 3 - No start date given

Action

This is the identifier of the Action to be taken when an alarm occurs, a read-only information automatically managed by the system. It can be one of the following:

- 0 - No Action
- 1 - Reduce Interval of the measurement job
- 2 - Create a Job occurrence
- 3 - Create Work Order for Maintenance

6.5.4.1 To Add a New Feedback

Minimum information required to add Feedback details, is:

- o The feedback date

6.5.4.2 To Modify a Feedback

If there is a current alarm for the point and it is caused by the displayed feedback data, then the feedback details cannot be modified. Otherwise, the information that can be modified is:

- o The feedback date
- o The feedback time
- o The feedback reading value

6.5.4.3 To Delete a Feedback

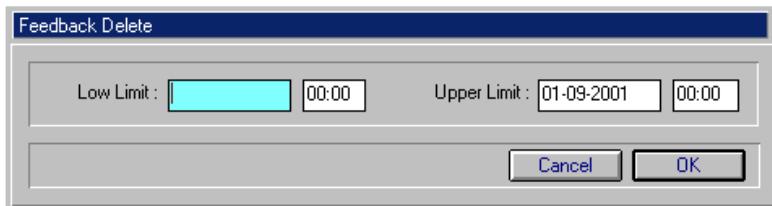
A Feedback details record cannot be deleted if there is a current alarm for the point and the displayed feedback data have caused the alarm.

Under the Feedback tab, click on the  icon and the following window will appears:

Keppel Steria Consortium (KSC)		C756
Reference: <u>756/PMP/8029e/A756/PMP/8029e/A756/PMP/8029e/A756/PMP/8029e/-</u> KSC Version: <u>2.12.12.12.0</u>	MAINTENANCE MANAGEMENT SYSTEM <u>COSWIN WORKCOSWIN WORK</u>	Page: 192 Date: <u>21 August 200221 August 200221 August 200223 June 2002</u>

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The dialog box titled "Feedback Delete" contains two input fields for date limits. The "Low Limit" field is currently empty, and the "Upper Limit" field contains the date "01-09-2001". Both fields have a time component set to "00:00". At the bottom right of the dialog are "Cancel" and "OK" buttons.

This window will perform a batch deletion for the feedback readings specified between two limits:

Date Limits

These are the lower and upper limits of the dates between which the Feedback Details / Readings are to be deleted (optional information).

Time Limits

These are the lower and upper limits of the actual moments of the limit days between which the Feedback Details / Readings are to be deleted (optional information).

Specify the limits to delete and click on the  to execute.

Keppel Steria Consortium (KSC)		C756
Reference: <u>756/PMP/8029e/A756/PMP/8029e/A756/PMP/8029e/A756/PMP/8029e/-</u> KSC Version: <u>2.12-12-12-0</u>	MAINTENANCE MANAGEMENT SYSTEM <u>COSWIN WORKCOSWIN WORK</u>	Page: 194 Date: <u>21 August 200221 August 200221 August 200221 August 20023 June 2002</u>

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This is the identifier of the Set, for which measurement feedback reading information is displayed, a mandatory information. It must be among the measurement sets defined for the equipment.

A selector trigger button (or F2 key) linking to Measurement Set Selector is available.

Right-mouse click (or F7 key) will activate the Measurement Set Details window for the current code.

Description

This is the Set description identifier, a read-only information automatically managed by the system.

Feedback List Box

Point	This is the identifier of the measurement point.
Profile	This is the identifier of the profile of the current measurement point.
Reading Date	The date of the Measurement.
Reading Time	The time of the Measurement.
Value	The actual measurement reading value.
Unit	This is the Set's unit of measurement.
Alarm	This is the Alarm set (if any), for this measurement point. It can be one of the following: " " - No analysis done yet "0" - No Alarm "1" - Expected Alarm "2" - Actual Alarm
Err	This column indicates abnormality in data, if analysis has been carried out. It can be one of the following: 0 - No error encountered 1 - Insufficient Norm 2 - Missing Reading 3 - No start date given

The Add, Modify and Delete operations in this window are the same as that for the **Feedback Reading** window. Refers to the **Feedback Reading** section for details.

6.6.1 Feedback Readings

Feedback module accepts the readings of measurements carried out at a point for a parameter set of an equipment. The measurement feedback data is accepted as a measurement, point wise.

Keppel Steria Consortium (KSC)		C756
Reference: <u>756/PMP/8029e/A756/PMP/8029e/A756/PMP/8029e/A756/PMP/8029e/-</u> KSC Version: <u>2.12.12.12.0</u>	MAINTENANCE MANAGEMENT SYSTEM <u>COSWIN WORKCOSWIN WORK</u>	Page: 195 Date: <u>21 August 200221 August 200221 August 200221 August 20023 June 2002</u>

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The purpose of this window is to provide details on the feedback made against the readings of the measurements.

The Feedback Readings window looks by default as follows:

Detailed Field Descriptions:

Point Code

This is the identifier of the measurement Point, a mandatory information. It must exist in the directory of Measurement Points.

Description

This is the description of the measurement Point, a read-only information automatically provided by the system once the measurement point is specified.

Date

This is the date of the Measurement, a mandatory information.

Time

This is the Time of the Measurement, an optional information.

Reading

This is the actual measurement Reading Value, an optional numeric information. COSWIN automatically proposes the 0 value.

Alarm

This is the Alarm set (if any), for this measurement point, a read-only information automatically managed by the system. It can be one of the following:

- " " - No analysis done yet
- "0" - No Alarm
- "1" - Expected Alarm

Keppel Steria Consortium (KSC)		C756
Reference: 756/PMP/8029e/A756/PMP/8029e/A756/PMP/8029e/A756/PMP/8029e/- KSC Version: 2.12-12-12-0	MAINTENANCE MANAGEMENT SYSTEM COSWIN WORKCOSWIN WORK	Page: 196 Date: 21 August 200221 August 200221 August 200221 August 20023 June 2002

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"2" - Actual Alarm

Error

This information indicates abnormality in data, if analysis has been carried out, a read-only information automatically managed by the system. It can be one of the following:

- 0 - No error encountered
- 1 - Insufficient Norm
- 2 - Missing Reading
- 3 - No start date given

Action


This is the identifier of the Action to be done when alarm occurs, a read-only information automatically managed by the system. It can be one of the following:

- 0 - No Action
- 1 - Reduce Interval of the measurement job
- 2 - Create a Job occurrence
- 3 - Create Work Order for Maintenance

6.6.1.1 To Add a New Feedback Reading

Minimum information required to add Feedback Readings for a measurement point, is:

- o The Measurement Point identifier
- o The date of the Measurement


Click on the  icon to launch the ADD window.

6.6.1.2 To Modify a Feedback Reading

If there is a current alarm for the point and the displayed feedback data have caused the alarm, the Feedback Reading details cannot be modified. Otherwise the only information that can be modified is:

- o The date of the Measurement
- o The time of the Measurement
- o The Measurement's actual reading value

6.6.1.3 To Delete a Feedback Reading

Click on the  icon and the following window will appears:

Keppel Steria Consortium (KSC)		C756
Reference: <u>756/PMP/8029e/A756/PMP/8029e/A756/PMP/8029e/A756/PMP/8029e/-</u> KSC Version: <u>2.12.12.12.0</u>	MAINTENANCE MANAGEMENT SYSTEM <u>COSWIN WORKCOSWIN WORK</u>	Page: 197 Date: <u>21 August 200224</u> <u>August 200221 August 20023</u> <u>June 2002</u>

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This window will perform a batch deletion for the feedback readings specified between two limits:

Date Limits

These are the lower and upper limits of the dates between which the Feedback Details / Readings are to be deleted (optional information).

Time Limits

These are the lower and upper limits of the actual moments of the limit days between which the Feedback Details / Readings are to be deleted (optional information).

Specify the limits to delete and click on the  to execute.

In the batch deletion process, feedback data later than the last rectified date will not be deleted. If the rectified date does not exist but failure date exists, feedback data from the failure date will not be deleted. If both the rectified and failure date do not exist for the point all feedback data within the specified period will be deleted.

Keppel Steria Consortium (KSC)		C756
Reference: <u>756/PMP/8029e/A756/PMP/8029e/A756/PMP/8029e/A756/PMP/8029e/-</u> KSC Version: <u>2.12.12.12-0</u>	MAINTENANCE MANAGEMENT SYSTEM <u>COSWIN WORKCOSWIN WORK</u>	Page: 198 Date: <u>21 August 200221 August 200221 August 200221 August 20023 June 2002</u>

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6.7 MEASUREMENT DISPLAY

The measured parameters on various equipments are obtained as feedback against various points in COSWIN Condition Based Maintenance system. This feedback data is analysed to detect possible cases of alarms indicating a deviation from the normal functioning of an equipment.

The *Measurement Display* module lists the different measurement points defined against an equipment-set combination with details indicating status of alarm situations. Option is provided to view the feedback details against a measurement point.

Select from COSWIN menu *Maintenance / Condition Based Maint / Measurement Display* to launch the Measurement Display module.

The Measurement Display window looks by default as follows:

Detailed Field Descriptions:

Eqpt Code

Keppel Steria Consortium (KSC)		C756
Reference: 756/PMP/8029e/A756/PMP/8029e/A756/PMP/8029e/A756/PMP/8029e/- KSC Version: 2.12-12-12-0	MAINTENANCE MANAGEMENT SYSTEM COSWIN WORKCOSWIN WORK	Page: 199 Date: 21 August 200224 August 200221 August 20023 June 2002

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This is the identifier of the Equipment, for which measurement point information is displayed, a mandatory information. It must exist in the directory of Equipments. A selector trigger button (or F2 key) linking to Equipment Selector is available.

Sub-Equipment

This flag, if checked, indicates the displayed information concerns the equipment and all its sub-equipment instances belonging to its structure.

Description

This is the description of the equipment, a read-only information automatically provided by the system once the equipment is specified.

Set Code

This is the identifier of the Set, for the current Equipment and for which measurement point information is displayed, a mandatory information. It must exist in the directory of Measurement Sets.

A selector trigger button (or F2 key) linking to Measurement Set Selector is available.

Right-mouse click (or F7 key) will activate the Measurement Set Details window for the current code.

Measurement List Box

Point	This is the identifier of the measurement point
Profile	This is the identifier of the profile of the current measurement point
Meas. Job Int. Unit	These are the time interval between two occurrences of the measurement job, and its measurement unit
Alarm	This is the status of the alarm for a measurement point (0-No Alarm, 1-Expected Alarm, 2-Actual Alarm)
Err	This is the type of error in data encountered during the analysis (0-No error encountered, 1-Insufficient norm, 2-Missing reading, 3-No start date given)
%Error	This is the value of the actual deviation of a measurement in percentage
Failure Date	This is the date of the feedback data for which an alarm has occurred
Failure Time	This is the time of the feedback data which caused an alarm
Act	This is the code for the action taken when an alarm occurs (0-No Action, 1-Reduce Interval of the measurement job, 2-Create a Job occurrence, 3-Create Work Order for Maintenance)

Current Equipment

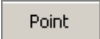
This is the identifier of the Equipment's current sub-equipment, if the measurement point current information concerns an equipment's sub-equipment; otherwise it is the description of the equipment. It is a read-only information automatically managed by the system.

Keppel Steria Consortium (KSC)		C756
Reference: <u>756/PMP/8029e/A756/PMP/8029e/A756/PMP/8029e/A756/PMP/8029e/-</u> KSC Version: <u>2.12.12.12.0</u>	MAINTENANCE MANAGEMENT SYSTEM <u>COSWIN WORKCOSWIN WORK</u>	Page: 200 Date: <u>21 August 200224 August 200221 August 20023 June 2002</u>

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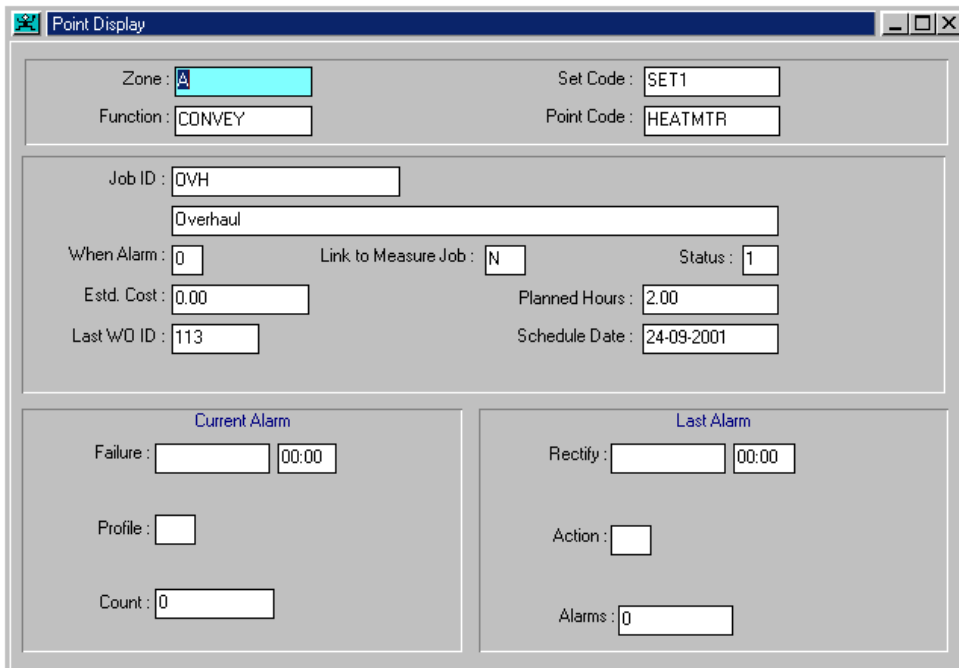
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6.7.1 To View Point Details

Click on the non-standard  button to activate the Point Display module.

The purpose of this window is to provide Measurement Point details for a point defined against an equipment (or sub-equipment)-set combination. The information display are read-only.

The Point Display window looks by default as follows:



The screenshot shows the 'Point Display' window with the following fields:

- Zone:
- Function:
- Set Code:
- Point Code:
- Job ID:
- Overhaul:
- When Alarm:
- Link to Measure Job:
- Status:
- Estd. Cost:
- Planned Hours:
- Last W/D ID:
- Schedule Date:
- Current Alarm:
 - Failure:
 - Profile:
 - Count:
- Last Alarm:
 - Rectify:
 - Action:
 - Alarms:

Detailed Field Descriptions:

Zone

This is the identifier of the Zone of the equipment for which the current measurement point is defined.

Right-mouse click (or F7 key) will activate the Zone Details window for the current code.

Set

This is the identifier of the Set defined against the current measurement point.

Right-mouse click (or F7 key) will activate the Measurement Set Details window for the current code.

Function

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This is the identifier of the Function of the equipment for which the current measurement point is defined.

Right-mouse click (or F7 key) will activate the Function Details window for the current code.

Point

This is the identifier of the current Measurement Point.

Job ID

This is the identifier of the planned Job defined against the current measurement point.

Right-mouse click (or F7 key) will activate the Jobs Directory window for the current code.

Job description

This is the description of the planned Job defined against the current measurement point.

When Alarm

This is the code of the action to be taken when an alarm occurs for the current measurement point.

Link to Measure Job

This information specifies whether the planned job is a measurement job ("Y") or a maintenance job ("N"). It is a read-only information automatically managed by the system.

Status

This is the Status of the last Work Order created upon the planned maintenance Job, a read-only information automatically managed by the system (0-not started, 1-in progress, 2-finished, 3-archivable).

Estimated Cost

This information represents the total cost (total of the labour cost and material cost) incurred against the work order.

Planned Hours

This information specifies the total number of resource hours that will be required to execute the job.

Last Work Order ID

This is the identifier of the last Work Order created upon the planned maintenance Job.

Right-mouse click (or F7 key) will activate the Work Order Details window for the current code.

Schedule Date

This is the measurement's last Work Order Schedule Date.

Failure date

This information represents the actual date on which the failure causing the alarm occurred (displayed only if the current measurement point has an alarm).

Failure time

This information represents the actual time at which the failure causing the alarm occurred (displayed only if the current measurement point has an alarm).

Profile

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Time	This is the specific moment of the day when the measurement was carried out.
Value	The measured value.
Alarm Flag	This flag specifies the validity of the measured data (0-No alarm situation, 1-Reading carried on expected alarm situation., 2-Reading carried on actual alarm situation).
Err	This is the status of error situation caused during the analysis of a feedback data (0-No error,1-No equivalent norm present, 2-Equivalent norm obtained by interpolating, 3-Date and time of measurement lies outside the working range of the equipment).
Act	This is the action to be taken in case of an alarm situation against a reading (0-no action, 1-reduce interval of the measurement job, 2-create a Job occurrence, 3-create Work Order).

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6.8 MEASUREMENT BATCH ANALYSIS

Using the *BATCH ANALYSIS* module the user can analyse the data for various combinations of equipment-sets and measurement points for different periods. The analysis process essentially validates the measurement data to check for alarms. An alarm is a condition when data representing a measured parameter on an equipment do not satisfy the criteria which indicate a normal smooth operation of the equipment. The analysis option also forecasts a likely moment of equipment failure based on the trend of a set of data.

The users have the provision to specify criteria for carrying out analysis on his data.

The Analysis process consists of two phases:

- Validation on feedback to detect alarms.
- Action taken on an equipment in case of an alarm situation

The above two processes depend on the specifications defined in the measurement point module.

Phase I - Detection of Alarm situations

Every measurement point is represented by a particular profile code. COSWIN provides 7 profiles for analysis. They are as follows:

1. *Upper and Lower Limit* - Compare measured data against absolute upper and lower limits.
2. *Compare Against a Norm* – Compare measured data against a set of data representing the ideal operations known as Norms Values.
3. *Compare Against Previous Value* - Compare measured data against its own previous values.
4. *Combination of profile 1 and 2.*
5. *Combination of profile 1 and 3.*
6. *Combination of profile 2 and 3.*
7. *Combination of profile 1, 2 and 3.*

Profile Code 1 – Upper and Lower Limit

For this profile, the validation is carried out by comparing each instance of feedback data against a set of absolute upper and lower limits. If an instance of feedback data violates the defined parameter, then a flag is updated against the feedback data, indicating the occurrence of an alarm.

This is done only if the measurement point does not currently have an alarm triggered. The date and time of the feedback data are updated as the failure date and time.

In the case when a current alarm is set against a measurement point then this occurrence is set as the current alarm if the date and time of this feedback data is earlier than the existing failure date and time.

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No instance of feedback data is considered to be set as a current alarm, if it is earlier than the date and time at which the equipment was last rectified. This rectified date can be specified in the **Alarms Summary** module.

Profile Code 2 – Compare Against a Norm

When a measurement point is defined with a profile code 2, the feedback data is compared against an ideal set of data called the norm. The norm represents the ideal data for an equipment. The norm data can be defined or modified through the **Measurement Norms Directory** module and can be defined against an equipment in the **Measurement Point** module. Each occurrence of feedback is compared against its corresponding value in the set of data representing the norms.

As in the case of profile code 1, the individual feedback occurrence is marked for the alarm condition. In this profile, the individual feedback data is also marked for errors if a corresponding norm data does not exist. In case of inconsistent feedback data, the intermediate values, i.e., the instance at which the measurement should actually have been carried out, are obtained by interpolating the existing data for the analysis period. Some graphics interpolation techniques are employed here to obtain near accurate values.

In the case of this profile, feedback data not falling in the daily operating period of an equipment is not considered for analysis. The daily operation period of an equipment is represented by the Start Time information of the measurement point and the Working Time/Day information defined in the **Measurement Set** module.

All rules for setting a current alarm are same as in the earlier profile code.

Profile Code 3 – Compare Against Previous Value

When measurement points are defined with this profile, each instance of the measured data is compared against the previous instance of data. If the deviation is greater than the permissible deviation defined by you, then an alarm is raised against this feedback. All rules for setting current alarm discussed for earlier profile codes are applicable here. As in the case of profile code 2, the missing readings are obtained by interpolation and then compared against the previous reading.

When measurement point is defined with a combination of more than one profile, the analysis is carried out successively for each profile taken.

Computation of Expected Date of Failure: A set of data though not violating the range of permissible values can indicate the likely occurrence of an alarm in the future. Thus, what is called a trend of a set of data can be obtained, which can be extrapolated to compute the likely moment of failure.

This process is done by the analysis option when a measurement point with profile code 1 does not have an alarm condition in the specified analysis period.

Phase II - Action on Alarms

There are two different types of jobs against a Measurement Point.

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- ❑ A measurement job defined in Measurement Job Directory. Definition of this job is compulsory.
- ❑ A job linked to job guidelines module that can either be a Measurement job or a Maintenance job. This job is optional.

Measurement Job of Measurement Directory

You can define three types of actions for this job in the Measurement Point module:

Increase Frequency: The frequency of the measurement job is increased by reducing the interval. The interval is reduced by a factor specified by you in the Measurement Point module. This action will be reflected the next time you take a Plan Job Report in the Measurement Point module.

Create a Job Occurrence: When the action is set to this case, an occurrence of the Measurement Job is scheduled for the day on which the alarm is noticed.

Do Nothing: No action is taken on the Measurement Job in this case.

Job linked to the Job Guidelines and behaving as a Measurement Job

Two actions are possible on this job in case of an alarm situation:

Increase Frequency: As in the case of the Measurement Job the frequency of this job can also be increased in case of an alarm. The interval of the job is reduced by the specified factor.

Create a Work Order: In this case, a work order is generated against this job, thus scheduling an occurrence of the job. The Work Order is scheduled for the date on which the alarm was noticed.

Job linked to the Job Guidelines and behaving as a Maintenance Job

This job can only be a breakdown job with a behaviour code 0. The only action possible on this job is a creation of a Work Order:

Create Work Order automatically: In this case, the Work Order against the job is created when an alarm condition is raised. The work order is scheduled for the date and time at which the alarm was noticed.

Create Work Order manually: This case arises when the measurement job has the action of **1. Create Job Occurrence**. Such a situation indicates that a measurement job needs to be done to confirm the earlier readings taken and then a Work Order has to be created for the maintenance job if the new reading has an alarm condition too. Once the analysis process encounters such a situation, it takes the necessary action to enable creation of the Work Order manually through the **Alarms Summary** module.

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The Batch Analysis window looks by default as follows:

The screenshot shows a window titled "Batch Analysis". It contains two main columns: "Lower Limit" and "Upper Limit".

Lower Limit:

- Period: A text box with a cyan background containing "00:00".
- Zone: A selector button (square with three horizontal lines) followed by a text box.
- Function: A selector button (square with three horizontal lines) followed by a text box.
- Eqpt Code: A text box.
- Set Code: A text box.
- Point Code: A text box.

Upper Limit:

- Period: A text box containing "08/05/2002" and a time text box containing "16:03".
- Zone: A selector button followed by a text box.
- Function: A selector button followed by a text box.
- Eqpt Code: A text box.
- Set Code: A text box.
- Point Code: A text box.

Detailed Field Descriptions:

Analysis Period

Enter the date and time lower and upper limits of the period to be analysed.

Zone

Enter the lower and upper limits of the identifiers of the equipment Zone, for which CBM analysis is to be performed (up to 6 alphanumeric characters).

A selector trigger button (or F2 key) linking to Zone Selector is available.

Function

Enter the lower and upper limits of the identifiers of the equipment Function, for which CBM analysis is to be performed (up to 10 alphanumeric characters).

A selector trigger button (or F2 key) linking to Function Selector is available.

Eqpt Code

Enter the lower and upper limits of the identifiers of the Equipment instances, for which CBM analysis is to be performed (up to 16 alphanumeric characters).

A selector trigger button (or F2 key) linking to Equipment Selector is available.

Set Code

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Enter the lower and upper limits of the identifiers of the Measurement Sets, for which CBM analysis is to be performed (up to 10 alphanumeric characters).
A selector trigger button (or F2 key) linking to Measurement Set Selector is available.

Point

Enter the lower and upper limits of the identifiers of the Points for which CBM analysis is to be performed (up to 6 alphanumeric characters).

Click on the non-standard  button to perform the Batch Analysis process.

As a result, the following information is displayed:

- Total number of equipment scanned
- Number of sets scanned
- Number of points scanned
- Number of points selected for analysis
- Total number of measurement points having an alarm condition

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6.9 ALARMS SUMMARY

Alarm Summary module lists the various measurement points at which an alarm is raised, displays the details of the alarm and lets you take an action or reset the alarm indicating a normal operation of the equipment. Optionally you can view all the measurement points irrespective of the status of the alarm.

The Alarm Summary window looks by default as follows:

Eqpt Code	Set Code	Point	TP	TAI	TE	TAc	% Error	Failure Date	Failure Time	Zone
/EQPT-STD	SET-SS	pt-ss	1	0			0.0		00:00	NEL
EQPT	MSET	POINT1	1	2		3	50.0	18/03/2002	00:00	NEL

☐ Only alarm points
 Order of display: By equipment

Equipment Description:

Double click on any of the displayed points will activate the **Point Details** window on the selected point. Refers to the section on **Measurement Display** for screen and field details on **Point Details**.

Detailed Field Descriptions:

Alarm List Box

Eqpt Code	This is the identifier of the equipment against whose set the current measurement point is being defined.
Set	This is the identifier of the set defined against the above

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Rectify date

Date : 06-09-2001

Time : 22:21

Cancel OK

6.9.2 To Reset Alarm Occurred on a Measurement Point

Click on the non-standard **Rst. Alarm** button to reset the alarm for a measurement point having an alarm by specifying a rectification date on it.

Rectify date

Date : 06-09-2001

Time : 22:21

Cancel OK

6.9.3 To Create Manual Work Order for Alarm

This button performs a Work Order creation against the selected measurement point's launched alarm, if the following conditions are met simultaneously:

- The selected measurement point must have launched an alarm
- There is not a Work Order already created for the selected measurement point alarm
- The measurement point's action to be done, when an alarm occurs, must have been of type "3-Manually create a work order for the job linked to job guidelines to carry out maintenance".

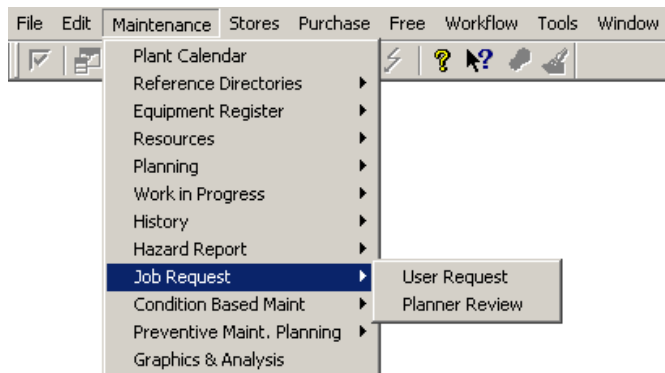
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7. JOB REQUESTS

Job requests serve as a link between the requestor departments (e.g.: production department) and the maintenance department. A demand is created in the **User Request** module, the maintenance department provider is informed of the request and decides the necessary operation in the **Planner Review** module. The requestor can also view the progress of the follow-up work from the request, number and status of the WO from the **User Request** module.



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7.1 CREATE USER REQUEST

Path: Maintenance / Job requests/ User request

This module specifies the details for a request for job to be done on equipment, like details of the equipment on which the job has to be carried out, the job ID, the target date and date of sanction of the request.

Also, this module also performs the following activities:

- ❑ Raise new job requests. User can provide a problem report to help the planner decide on the maintenance job to be done.
- ❑ View the requests raised and their status.
- ❑ Modify an already raised request, if no action has been taken against the request.
- ❑ Delete a request if no action has been taken on it and if it becomes irrelevant.

Select from COSWIN menu *Maintenance / Job Request / User Request* to launch the User Request module.

The User Request window looks by default as follows:

Detailed Field Descriptions:

Job Request No

This is a 10-character, mandatory data field. It is the request reference number for the job. Press the TAB key and system will automatically assign a unique Job Request No with prefix defined in COSWIN Configuration's Maintenance / Job Request.

A selector trigger button (or F2 key) linking to User Request Selector is available.

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Status

This is the request's status, a read-only information automatically managed by the system. The possible values are:

- 1 – Request Raised
- ~~2 – Planner Reviewed~~
- 3 – Ready to Release
- 4 – To be Released to Plan
- 5 – To be Released to Work In Progress
- 6 – Closed by Planner
- 7 – Request closed due to equipment under warranty

Date

This is the date on which the request was made, a read-only information automatically managed by the system.

Time

This is the time at which the request was made, a read-only information automatically managed by the system.

Request By

This is a 6-character, mandatory data field. It is the identifier of the person requesting the job.

A selector trigger button (or F2 key) linking to Request By Selector is available.

Right-mouse click (or F7 key) will activate the Request By Details window for the current code.

Requester Name

This is the name of the requester, a read-only information automatically provided by the system once the Request By is specified.

Phone

This is the phone number of the person who requested the job, an optional information of maximum 15 alphanumeric characters.

Source Equipment/Group

This is the equipment / group for which the request was raised, an optional information. The entered value must exist in the directory of Equipments.

The Cost Centre, Zone and Function of the selected equipment will be extracted and proposed as default values for the corresponding fields in the window.

A selector trigger button (or F2 key) linking to Equipment Selector is available.

Equipment/Group Description

This is the equipment description, a read-only information automatically provided by the system once the equipment is specified.

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Job ID

This is the job that is to be performed against the equipment in response to the request. It is an optional information, of maximum 16 alphanumeric characters. A job identifier can be entered only if the equipment is specified and the job ID must have already been defined against the equipment in the database.

A selector trigger button (or F2 key) linking to Equipment Jobs Selector is available.

Right-mouse click (or F7 key) will activate the Job Guidelines Details window for the current code.

Target Date

This is the target date by which you need the request to be completed, an optional information.

Supervisor

This is the supervisor in charge of the request, an optional information of maximum 6 alphanumeric characters.

A selector trigger button (or F2 key) linking to Supervisor Selector is available.

Right-mouse click (or F7 key) will activate the Supervisor Details window for the current code.

Cost Centre

This is the cost centre to which all costs for this request will be charged to, an optional information of maximum 16 alphanumeric characters. It must exist in the directory of Cost Centres.

A selector trigger button (or F2 key) linking to Cost Centre Selector is available.

Right-mouse click (or F7 key) will activate the Maintenance Cost Centre Details window for the current code.

Zone

This is the zone in which the job is requested, an optional information of maximum 10 alphanumeric characters. It must exist in the directory of Zones.

A selector trigger button (or F2 key) linking to Zones Selector is available.

Right-mouse click (or F7 key) will activate the Zone Details window for the current code.

Function

This is the function for which the job is requested, an optional information of maximum 10 alphanumeric characters. It must exist in the directory of Functions.

A selector trigger button (or F2 key) linking to Function Selector is available.

Right-mouse click (or F7 key) will activate the Function Details window for the current code.

Priority

This is the priority code of work order, an optional information. The provided value must exist in the directory of Priorities of Work.

A selector trigger button (or F2 key) linking to Priority Selector is available.

Right-mouse click (or F7 key) will activate the Priority Details window for the current code.

Priority Description

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This is the description of the priority code of work order, a read-only information automatically provided by the system once the priority is specified.

Under the Problem Tab:

This field captures the detailed description on the problem encountered on the machine.

The interface consists of the drawing layout, where the user can write text and/or append pictures, drawings, spreadsheets and any other form of OLE information.

MORE TAB:

This tab displays the follow-up actions being performed on the current request.

<div> <div>Problem</div> <div>More</div> <div>Fault Rep.</div> </div>	
WD Eqp/Group : <input type="text" value="AFCALB17/GTAC01"/> <input type="text" value="AC-DC Converter"/>	
Source WD ID : <input type="text" value=""/> Combined To : <input type="text" value="JBRQ232265"/> Schedule Date : <input type="text" value="13/05/2002"/> Completion Date : <input type="text" value="14/05/2002"/> WD ID : <input type="text" value="13720"/> WD Status : <input type="text" value="1"/> <input type="text" value="In Progress"/>	<div>Sanction</div> From : <input type="text" value="08/05/2002"/> <input type="text" value="11:52"/> To : <input type="text" value="10/05/2002"/> <input type="text" value="11:52"/> Note : <input type="text" value=""/> Down Time : <input type="text" value="13.00"/> Visa : <input type="text" value="Sup"/>
<div>Entity</div> Request : <input type="text" value="ECS"/> <input type="text" value="Environmental Control System"/> Action : <input type="text" value="AFC"/> <input type="text" value="Automatic Fare Collection System"/>	

Source Wo ID

This is the work order that creates the current user request. It is a read-only information automatically managed by the system.

Combined To

This field displays the User Request ID that the current request has been combined into. This is a read-only information automatically managed by the system. It is to be updated by planner in Planner Review module.

Schedule Date

This is a read-only information automatically managed by the system. It is to be updated by planner in Planner Review module.

Completion Date

This is a read-only information automatically managed by the system. It is to be updated by planner in Planner Review module.

Work Order ID

This is a read-only information automatically managed by the system. It is to be updated by planner in Planner Review module.

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Work Order Status

This is a read-only information automatically managed by the system. It is to be updated by planner in Planner Review module.

From Date

This is the start date from which the request was sanctioned. It is an optional field.

From Time

This is the start time from which the request was sanctioned. It is an optional field.

To Date

This is the end date up to which the request is sanctioned. It is an optional field.

To Time

This is the end time up to which the request is sanctioned. It is an optional field.

Note 1

This is the first field for any general remarks / notes about the job request. It is an optional information of maximum 30 alphanumeric characters.

Note 2

This is the second field for any general remarks / notes about the job request. It is an optional information of maximum 30 alphanumeric characters.

Down Time

Specify the expected down time if the equipment for jobs being executed is off-line. Down time is always specified in hours. This is an optional numeric data.

Visa

This is the name of the person who authorises the job request. This is a read-only information automatically managed by the system. It is to be updated by planner in Planner Review module.

Request Authority

This is the authority entity from which the user request is raised. It is an optional information.

Request Authority Description

This is the description of the request authority entity. It is a read-only information automatically managed by system.

Action Authority

This is the authority entity that performs the necessary action on the user request. It is an optional information.

Action Authority Description

This is the description of the action authority entity. It is a read-only information automatically managed by system.

FAULT REPAIR TAB:

This tab allows user to attach fault reports to the request.

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This is the Cause description for the current Defect, a read-only information automatically managed by the system.

A :

This is the Action description for the current Defect, a read-only information automatically managed by the system.


7.1.1 To Add a New User Request

Minimum information required to add a user request:

- Request identifier
- Requester ID

For a requestor who does not know the equipment code of the faulty machine and or any associated job guidelines, he just requires to do the following:

1. Tab through the Job Request field and COSWIN will automatically issue a request code using the prefix defined in COSWIN Configuration.
2. Specify the requestor name at the Required By field.
3. He may enter the equipment code. If he has specified a wrong code, the planner can still rectify it during Planner Review stage.
4. Describe the problem of the machine at the Problem field (OLE field).
5. Save the request.

Click on the  icon to launch the ADD window.

7.1.2 To Modify an User Request

A request can be modified only if its status is less than 4, i.e. the request has not been released to Plan / WIP or closed by the planner yet.

7.1.3 To Delete an User Request

There is no restriction in deleting a job request.

The details corresponding to the request reference number are deleted along with its associated problem report.

Click on the  icon to delete the current User Request.

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7.2 REVIEW JOB REQUEST BY PLANNER

Path: Maintenance / Job Request / Planner Review

Planner reviews the User Requests through the Planner Review module and decides the appropriate actions for each request.

In Planner Review module, provision is available for maintenance personnel to review the user requests, assign jobs to a request or a combination of requests, and release the job either to plan or directly to work in progress.

The following operations can be performed in the module:

- Review User Requests
- Combine Requests / Raise jobs for the request
- Release jobs to Plan / Work in Progress
- Batch delete of Job Requests which have already been released or closed by the planner

Select from COSWIN menu *Maintenance / Job Request / Planner Review* to launch the Planner Review module.

The Planner Review window looks by default as follows:

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Planner Review

Job Request No: **JBRQ-1** Request By: **C1** COM Snr Mgr

Source Eqt/Group: **AFCALB17/GTAC01** AC-DC Converter

WO Eqt/Group: **AFCALB17/GTAC01** AC-DC Converter

Job ID: **SERVICE** Service job

Cost Centre: **2714300** Zone: **NEL** Function: **AFC/TICKET**

Priority Code:

Details | **Problem** | **Fault Tree** | **Fault Report** | **Action/Request**

Phone: Date: **09/05/2002** Time: **11:52**

Supervisor: Status: **5** Target Date: **09/05/2002** Source WO:

Combined To: **JBRQ232265**

Schedule Date: **13/05/2002**

Completion Date: **14/05/2002**

Release Flag: **Not released**

WO ID: **13720**

Status: **1** In Progress

☐ Skip Subcontracted Jobs ☒ Check Skills

☒ Auto generate Work Permit ☒ Allocate Employees

Sanction

From: **08/05/2002** **11:52**

To: **10/05/2002** **11:52**

Note:

Down Time: **13.00**

Visa: **Sup**

Detailed Field Descriptions:

Job Request No

This is the reference number of the user request. It must exist in the directory of User Requests.

A selector trigger button (or F2 key) linking to User Request Selector is available.

Request By

This is a 6-character, mandatory data field. It is the identifier of the person requesting the job.

A selector trigger button (or F2 key) linking to Request By Selector is available.

Right-mouse click (or F7 key) will activate the Request By Details window for the current code.

Requester Name

This is the entire name of the requester, a read-only information automatically managed by the system.

Source Eqt/Group

This is the identifier of the (source) equipment originally specified in the User Request. It is a read-only information that cannot be modified by the planner.

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2 - Planner Reviewed Request – When a request of status 1 has been reviewed by the planner, it is assigned this status.

3 - *Request Ready for Release* – a request is provided this status when the following data is available:

Job Request No

Request By

Target Date

Equipment

Job ID

4 - *Released to Plan* – a request is assigned this status when it is released to planning

5 - *Released to WIP* – a request is assigned this status when it is released to WIP

6 - *Closed by Planner* – the planner has closed this request.

7 - *Request closed due to equipment under warranty* – The request is closed when warranty action is being performed on the faulty equipment of the request.

Target Date

This is the target date by which the request needs to be completed.

Source WO

This is the work order from which the request is created. It is a read-only information automatically managed by the system.

Combined To

This is the reference of the job request to which the current one is combined into. This is a read-only information automatically managed by the system.

Schedule Date

This is the planned date of the job if the request is to be released into planning or the start date for the WO if to be released into work in progress. This date cannot be less than current date.

Completion Date

This is the finish date for the work order if released to work in progress. It is a read-only information automatically managed by the system.

Release Flag

While reviewing the job request, you should enter the release option and the schedule date for the request. Four choices are available for the release option:

Not Released (default option at job request creation)

0 - *Release in Plan* (the request will be released in plan, with a plan number greater than 30001)

1 - *Release in WO* (the request will be released directly in work order)

2 - *Closed by Planner* (in this case, the request will be deleted from the requests list)

WO ID

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Here, you can enter any general remarks / notes about the job request. It is an optional information of maximum 30 alphanumeric characters.

Note 2

Here, you can enter any general remarks / notes about the job request. It is an optional information of maximum 30 alphanumeric characters.

Down Time

Specify the expected down time if the equipment for jobs being executed is off-line. Down time is always specified in hours. It is an optional numeric information.

Visa

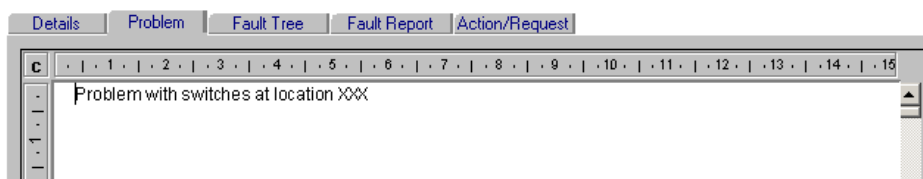
This is the name of the person who authorises the job request, an optional information of maximum 10 alphanumeric characters.

Under Problem Report Tab:

The details in this field are captured during creation of User Request.

It is the detailed description on the problem encountered on the machine.

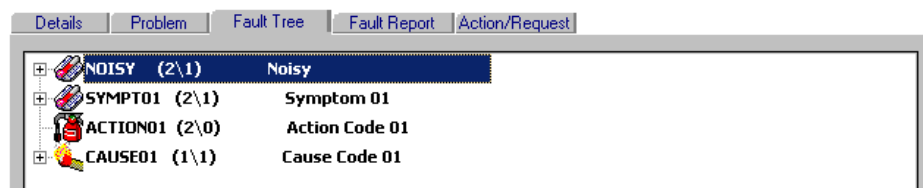
The details stated in this tab will be copied to work order's feedback note when a work order is released against the job request.



The interface consists of the drawing layout, which can contents write text and / or pictures, drawings, spreadsheets and any other form of OLE information.

Under Fault Tree Tab:

This tab displays the tree of defect for the job request's faulty equipment. The information displayed is read-only and cannot be modified.



The tree presents the hierarchy of equipment defects respecting the following categorization levels in order: Symptom / Defect / Cause / Repair Action.

Under Fault Report Tab:

This tab displays the fault report specified during User Request creation. The information displayed is read-only and cannot be modified.

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Problem										
Symptom	Defect	Cause	Action	Date	Time	Day	Week	Year	Duration	TWO ID
ISCS/05	AMS-03	ISCS/02	ACTION	15/05/2002	14:30	3	20	2002		

S: Fail to Function	D: DG fails
C: Short Circuit	A: Action desc

Under Action/Request Tab:

Details		Problem		Fault Tree		Fault Report		Action/Request	
Request Entity :	CAS	Communications & Systems							
Action Entity :	INF	Infrastructure							

c	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15

Requesting Entity

This is the company entity that is requesting the job, an optional information. The provided value of authority must exist in the directory of Company Entities.

A selector trigger button (or F2 key) linking to Company Entities Selector is available.

Right-mouse click (or F7 key) will activate the Company Entities Details window for the current code.

Requesting Entity Description

This is the description of the Requesting Entity, a read-only information automatically provided by the system once the Requesting Entity is specified.

Action Entity

This is the company entity that is supposed to perform the work, an optional information. The provided value of authority must exist in the directory of Company Entities.

A selector trigger button (or F2 key) linking to Company Entities Selector is available.

Right-mouse click (or F7 key) will activate the Company Entities Details window for the current code.

Action Entity Description

This is the description of the Action Entity, a read-only information automatically provided by the system once the Action Entity is specified.

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Transfer Reason

This is the reason of job request transfer to other company entity.

The interface consists of the drawing layout, where the user can write text and/or append pictures, drawings, spreadsheets and any other form of OLE information.

7.2.1 To Review/Modify the User Request

The planner can check, correct and update the information for the user request. The following data can be modified:

- Equipment code - if the code was not defined the planner can enter any equipment code. If an equipment code was already assigned during User Request phase, then the planner can only change it to an equipment within the same structure
- Requested job
- Cost centre, zone and function
- Requestor identifier and name
- Request date and phone
- Requesting and actioning entity
- Job supervisor, target date, schedule date, shutdown time, notes and problems
- Release options

The release options are the following:

- Not released
- 0 - Released in plan (a plan will be created)
- 1 - Released in Work in Progress (a work order will be generated directly for the user request)
- 2- Closed by planner (the request is no longer modifiable)

7.2.2 To Assign a Job to the User Request

Below are the various scenarios when assigning job code to a User Request:

The Job ID Already Exists for the Current Equipment

Click on the Job ID selector (or press F2 Key) to select from the list of existing jobs already defined for the current equipment.

The Job ID Exists for another Equipment

Type the required job Id then system will offer to connect the job code to the current equipment.

The Job ID does not Exist and You Want to Create It

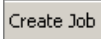
Keppel Steria Consortium (KSC)		C756
Reference: <u>756/PMP/8029e/A756/PMP/8029e/A756/PMP/8029e/A756/PMP/8029e/-</u> KSC Version: <u>2.12-12-12-0</u>	MAINTENANCE MANAGEMENT SYSTEM <u>COSWIN WORKCOSWIN WORK</u>	Page: 231 Date: <u>21 August 200221 August 200221 August 200221 August 2002</u> <u>20023 June 2002</u>

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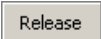
- Type the required job code then TAB, system offers to create the equipment job guideline in the database
- If the answer is Yes, the Job Guideline screen opens:
- Fill in the fields as a creation. Once validated return to the Job Request window, this job is selected automatically:

The Job Id does not Exist And You do not Want To Create One

- Click on the non-standard  button.
- COSWIN opens a Job Guideline screen for the equipment, fill in the remaining fields except the job ID. Upon saving a new job with job ID = UNPLxxxxxxx is created. RELEASE JOB REQUEST

After the request is reviewed, the request may either be released into a **plan** or directly into **Work in Progress**.

7.2.3 Releasing Job Requests into Plan

- To release the Job Requests into plan, all these requests must have their Release Flag set to '**0 - Release in Plan**' and saved.
- From the Planner Review module, click on the non-standard  button and the Release Job Request window appears:

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- c) If YES is selected, a Work Order will be created immediately.
- d) If NO is selected, Work Order can still be created from the request at later stage using the non-standard button in the Planner Review module.
- e) When a work order is released from a job request, the request will progress to status '5 - Released to WIP' and updated with the ID of the released Work Order.

7.2.5 Detailed Field Descriptions for Release Ranges

When the non-standard button of the Planner Review module is clicked, the following window is activated, prompting user for the criteria for selecting the requests to release either into plan or WIP depending on the Release Flag set in the individual Request.

Planner ID

Indicates the abbreviated name of the planner. This is a mandatory information of maximum 7 alphanumeric characters.

A selector trigger button (or F2 key) linking to Planner ID Selector is available.

Planned Shift

This field allows the planner to specify the work order planned shifts from a pick-list of shifts. A selector trigger button (or F2 key) linking to Shifts Selector is available.

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A selector trigger button (or F2 key) linking to Company Entity Selector is available.

Requesting Entity

Enter the lower and upper limits of the requesting authority, if the pick list checkbox is unmarked. Otherwise, select the desired authorities from the available Authority pick list.

A selector trigger button (or F2 key) linking to Company Entity Selector is available.

After specifying the release criteria, click on the non-standard button and the selected requests will be released accordingly.

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7.2.6 Paging from Job Requests

MMS allows the relevant staff to be paged for a particular maintenance action.

In COSWIN, paging is linked to the Job Request Module. The Maintenance planner shall modify the Job Request in Planner Review Module. This will allow the Maintenance Planner to amend the Problem Report, the Job Request priority or the Actioning Authority when necessary.

Step 1: Planner makes the necessary changes on the Job Request regarding the WO equipment if necessary and the Job in the Planner Review module.

Step 2: Planner shall ensure that there is the Actioning authority defined in the Action/Request By tab of the Job Request and the Pager number and Message for the action authority is defined in the Company Hierarchy module. The pager number and pager message shall be defined in the Commercial telex field and the Technical telex field of the Contacts tab in the Company Entity screen respectively.

Step 3: The Planner will have to change the Priority Code to a pre-defined code of "PAGING".

Once the Job Request is saved, paging is triggered.

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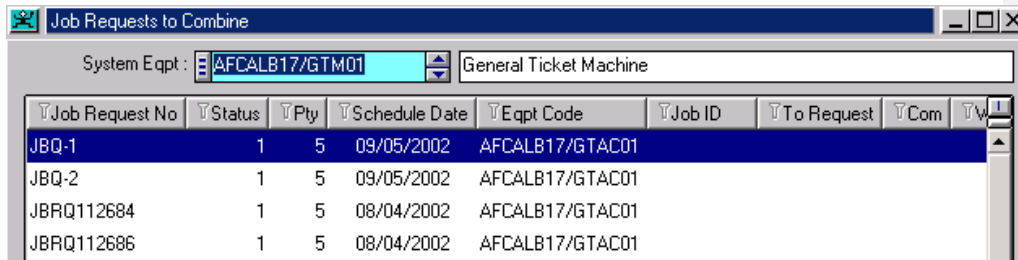
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7.3 COMBINE JOB REQUESTS

COSWIN provides an option to combine job requests from the equipment in the same structure into a job request on the system equipment of this structure.

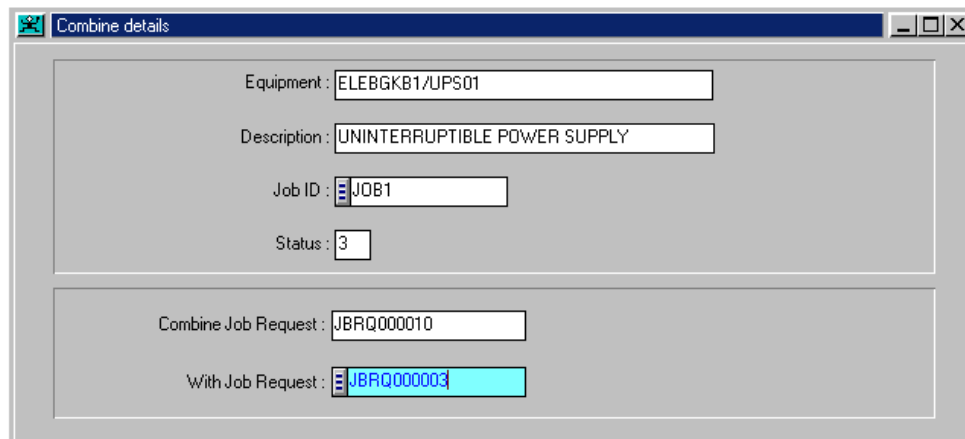
- From the Planner Review module, select the Job request to combine.
- Click on the non-standard  button and COSWIN will display a list of job requests existing for all equipment in the **same structure**. The **System** equipment code is displayed in the equipment code field:



The screenshot shows a window titled 'Job Requests to Combine'. At the top, 'System Eqpt' is set to 'AFCALB17/GTM01' and 'General Ticket Machine'. Below is a table with columns: Job Request No, Status, Qty, Schedule Date, Eqpt Code, Job ID, To Request, Com, and Ty.

Job Request No	Status	Qty	Schedule Date	Eqpt Code	Job ID	To Request	Com	Ty
JBQ-1	1	5	09/05/2002	AFCALB17/GTAC01				
JBQ-2	1	5	09/05/2002	AFCALB17/GTAC01				
JBRQ112684	1	5	08/04/2002	AFCALB17/GTAC01				
JBRQ112686	1	5	08/04/2002	AFCALB17/GTAC01				

- Double-clicking on the job request to combine and the following detail window appears:



The screenshot shows a 'Combine details' window. It contains the following fields:

- Equipment: ELEBGKB1/UPS01
- Description: UNINTERRUPTIBLE POWER SUPPLY
- Job ID: JOB1
- Status: 3
- Combine Job Request: JBRQ000010
- With Job Request: JBRQ000003

- The list of existing job requests related to the system equipment of the current request is available in the selector on the **With Job Request** field.
- Select the job request with which you want to combine the current job request, and save.
- COSWIN displays on the combined request, the request number with which it is combined.

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NOTE:

- You cannot combine a request to a request that has already combined with others.
- When a Job request is combined, you can no longer modify the **Release Flag** field. You can release a plan or a WO on a request to which it is combined. The WO number will nevertheless be displayed in the combined job request.

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7.4 CANCEL/CLOSE JOB REQUESTS

While the job request is at status 1, the requestor can still delete the request. But once the request's status is greater than 2, it can only be closed by the planner.

To cancel/close a request, set the Release Flag of the request to '2 – Closed by Planner'. Upon saving the record, the status of the request becomes '6 – Closed by Planner'.


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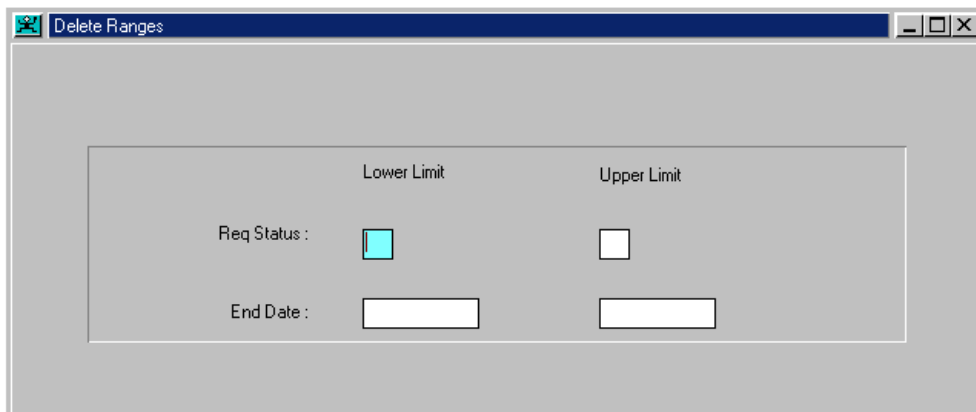
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7.5 DELETE JOB REQUESTS

It is possible to delete obsolete job requests from archived WO or cancelled job requests.

From the Planner Review module, click on the non-standard  button and the Delete Range prompt will appear:




The 'Delete Ranges' dialog box contains two columns: 'Lower Limit' and 'Upper Limit'. Under 'Lower Limit', there is a 'Req Status' label with a dropdown menu showing '4' and an 'End Date' label with a text box. Under 'Upper Limit', there is an empty dropdown menu and an empty 'End Date' text box.

Request Status refers to the status of the requests to be deleted.

End Date refers to the target date of the requests to be deleted.

Define the upper and lower limits of selection criteria. **Only Job requests at status 4, 5, 6 can be deleted.**

Click on the non-standard  button again to confirm deletion and COSWIN will display the number of job requests deleted.

NOTE: Job requests linked to work orders are deleted during the archive process.

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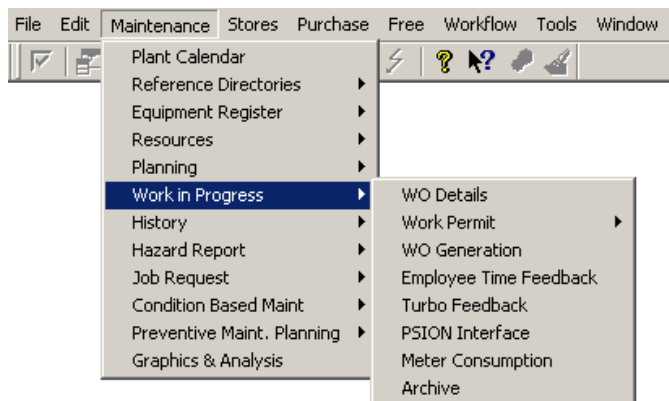
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8. WORK IN PROGRESS

The purpose of Work in Progress is to provide the user with the facilities to:

- ❑ Define work orders and to provide different kind of feedback on work orders (employee time, resource, stock and facility usage and defects)
- ❑ Manage the several types of feedback against the work order (employee, material, defects, meters)
- ❑ Manage follow-up request or work order
- ❑ Manage feedback on consumption on the meters used in maintenance activities
- ❑ Provide Turbo Feedback for WO requiring minimum feedback
- ❑ Generate and print work orders
- ❑ Archive the completed work orders



Work Order is a written specification to perform a maintenance job on specific equipment. The ultimate purpose of a work order is to operate upon an equipment in a way or another (mainly repairing).

Work orders in the system have been categorised as follows

- ❑ Planned - work orders created by planning and release modules. These are work orders that have been planned in advance and therefore do not cause disruption to production activities.
- ❑ Unplanned - work orders created in Work Order Details Module for breakdown/corrective maintenance.
- ❑ Other - work order performed for project maintenance jobs.

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Each work order has a life cycle described by its status. There are four stages of broadly defined transitions through which the status of a work order progresses:

0 – NOT STARTED: the work order under this status has been generated but the work has not started.

1 – IN PROGRESS: the work to accomplish the job has been initiated against the work order but has not been completed.

2 – FINISHED but awaiting feedback: the work is completed against the work order but feedback to the system is not yet over.

3 – ARCHIVABLE: the work has completed and necessary feedback to the system has been provided. The work order is now ready to be posted to the History module.

Work order status can change status in any of the following ways:

FROM Current Status	TO New Status
Not Started	In Progress
	Finished
	Archivable
In Progress	Finished
	Archivable
Finished	Archivable
Archivable	Finished

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8.1 PROVIDE FEEDBACK ON WORK ORDER

Feedback is the action of entering data resulting from the work performed to accomplish the tasks of the work order. Accurate and timely feedback helps in evolving an efficient preventive maintenance system. Work order feedback module is used to provide feedback in detail on each work order.

Feedback cannot be given for a work order in 0 – NOT STARTED status. In order to give feedback to the work order, the status must be changed to 1 – IN PROGRESS, 2 – FINISHED. Also, most feedback cannot be given if the work order is already in 3 – ARCHIVABLE state. However, the work order status can be changed from 3 – ARCHIVABLE to 2 – FINISHED and then give any remaining feedback.

It is possible to restrict users to provide feedback to certain status of work order using COSWIN Configuration program.

Most of the fields can be modified irrespective of the state the work order is progressed to. Though, the equipment, job description and job type can only be modified for work orders made on unplanned jobs.

Launch the Work Order Details & Feedback module from COSWIN menu *Maintenance / Work In Progress / Work Order Details*.

The Work Order Details & Feedback window looks by default as follows:

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A selector trigger button (or F2 key) linking to Status List Selector is available.

Status description

This is the work order user status description, a read-only information automatically managed by the system once the WO Status is specified.

Schedule date

This is the date when the work against the work order is to begin, a mandatory information.

The schedule date should not be earlier than one year from the work order creation or feedback date.

Eqpt Code

This is the equipment/group identifier for which the work order is generated, a mandatory information. It must exist in the directory of Equipment or Groups of equipment. This field can only be modified if the work order is of Unplanned type.

A selector trigger button (or F2 key) linking to Equipment Selector is available.

Eqpt description

This is the description of the equipment selected for the work order, a read-only information automatically provided by the system once the equipment identifier is assigned.

Job ID

This is the work order job identifier, i.e. the code of the maintenance job that is to be accomplished. It is a mandatory information of maximum 16 alphanumeric characters. This field can only be modified if the work order is of Unplanned type.

A selector trigger button (or F2 key) linking to either Equipment Job Selector or Category Job Selector (depending on the Job Selection Criteria radio button) is available.

Right-mouse click (or F7 key) will activate the Job Guidelines Details window for the current code.

Job description

This is the job description, a mandatory information of maximum 40 alphanumeric characters. This field is accessible and can be modified if the work order is of Unplanned.

Eqp. / Catg. Radio button (Job selection criteria)

This radio button represents the source of job selection (see paragraph Job). The available options are:

Equipment wise	This selection specifies that work order's job will be selected from the current equipment's list of jobs.
Category wise	This selection specifies that work order's job will be selected from the current equipment's category list of jobs.

Type

This is the job type, a mandatory information of maximum 6 alphanumeric characters. It must exist in the directory of Job Types. Job Types are defined through *COSWIN Configuration's Maintenance / Job / Type*.

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Criticality

This indicates the criticality of the work order. The valid options are: 0-Normal, 1-Major and 3-Critical. System will propose 1-Normal as the default value.

8.1.2 Specifying the Time Duration, Source and CostOthers in the Details tab

The Details tab looks by default as follows:

Depending on the work order's status, the following fields are editable:

	Not Started	In Progress	Finished	Archivable
Target date		✓	✓	
Start date and time		✓	✓	
Finished date and time			✓	
Total Planned Hours		✓	✓	
Previous WO ID		✓	✓	✓
Report By	✓	✓	✓	✓
Report Date and time	✓	✓	✓	✓
Phone		✓	✓	✓
Labour Cost (only for WO with contract jobs)		✓	✓	✓
Material Cost		✓	✓	✓

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(only for WO with contract jobs)				
Miscellaneous Cost		✓	✓	✓
Recovery Cost		✓	✓	✓

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Detailed Field Descriptions:

Target date

This is the date when the work order is supposed to be finished. It is a mandatory information. If not specified, system will propose current date.

Start date

This represents the date when the work against the work order starts. It is an optional information.

If employee time usage feedback has been provided, the default start date proposed by the system is internally computed as the earliest date on which the employee worked against the work order.

If employee time usage feedback has not been provided, but the work order's finish date was already provided, then the start date is computed from the work order finish date and the job duration with the following formula:

Start date = Finish date - job duration + 1

Otherwise, the current date is proposed as work order's start date.

The work order start date cannot be later than current date.

Start time

This represents the time when the work against the work order started. It is an optional information.

If employee time usage feedback has been provided, the default start time is internally computed by the system from the time inputs, otherwise the system proposes the current time as default work order's start time.

Finish date

This represents the date when the work against the work order was completed.

It is only accessible as well as mandatory for work order with system status equal 2 – Finished or 3 – Archivable.

If employee time usage feedback has been provided, the default finish date proposed by the system is internally computed as the latest date on which the employee worked against the work order.

If employee time usage feedback has not been provided, but the work order start date has already been provided, then the finish date is computed from the start date and the job duration with the following formula:

Finish date = Start date + job duration - 1

If the both the work order's start date and finished date are not specified (for work orders progress from status '0 – Not Started' to '2 – Finished' or '3 – Archivable' directly), then the current date is proposed as default finish date and the work order's start date is computed based on the finish date and the job duration.

Finish time

This represents the time when the work against the work order was finished.

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If employee time usage feedback has been provided, the default finish time is internally computed by the system from the time inputs, otherwise the following rules apply to the default value of work order's finish time proposed by the system:

- The work order's finish time is the same as work order's start time when the start date is different from the finish date.
- The work order's finish time is one hour later than the work order's start time when the start date and the finish date are the same.
- In case the start time is not specified, the start time is considered the current time.

Total cumulative units (T. Units)

This represents the cumulative units of the job's meter at the end of work order's execution. The total cumulative units is an read-only information, automatically provided by the system when the work order is progressed to archival status.

The Total cumulative units (TCU) is computed using the following formula:

new TCU = old TCU + (LMRV - PMRV)

where: LMRV is the last meter reading value

PMRV is the previous before last meter reading value

Total planned hours

This information represents the number of resource hours required to accomplish the work order job (from the resources requirement specified for the work order). It is an optional numeric information.

If the work order's job is an existing equipment job, then system will propose the total labour hour of the equipment job as the default value for this information.

Total actual hours

This information represents the actual number of worked hours against the work order. It is an information not accessible to the user, automatically derived by the system from the employee time usage feedback.

Previous WO ID

This is the previous work order identifier, an optional positive numeric integer value. The entered value must exist in the directory of Work Orders. It specifies the identifier of the work order from which the current work order is created.

This field will be automatically updated by system in those work orders created using the non-standard button operation **Create Work Order**. Like in the case of repairable management, a second work order is created from the first work order to move the faulty unit to the repair yard.

In all the other cases, the previous work order has no relevant significance, although it can be assigned when work order is at 1 – In Progress or 2 – Finished status.

A selector trigger button (or F2 key) linking to Work Order Selector is available.

Plan No

This is the plan number under which the work order was released. It is a read-only information automatically updated by the system for work orders generated from Release Jobs Module.

Job Request ID

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This is the Job Request number under which the work order was released. It is read-only information automatically updated by the system for work orders generated in Planner Review Module.

Report by

This is the name of the person who requested for the maintenance job to be carried out. It is an optional information of maximum 13 alphanumeric characters. If the work order is generated from the Planner Review module, then the system automatically assigns the person who raised the job request as the work order's reporting person.

Reporting date

This is the date when the work order is first requested, a mandatory information. If the work order is generated from the Planner Review module, then the system automatically propose the job request's date as work order's reporting date. Otherwise, the system will propose the current date as work order's reporting date.

Reporting time

This is the time when the work order is first requested, an optional information.

If the work order is generated from the Planner Review module, then the system automatically propose the job request's time as work order's reporting time. Otherwise, the system will propose the current time as work order's reporting date.

Reporting phone

This is the phone number from where the work order was reported (see paragraph Report by). It is an optional information of maximum 13 alphanumeric characters.

If the work order is generated from the Planner Review module, then the system automatically propose the job request's phone as work order's reporting phone.

Skip SubContracted Jobs

When checked, system will disable the release of work orders whose jobs are sub-contracted. The default status of this flag is established in COSWIN Configuration's Maintenance / Work Order / Parameters.

Allocate Employees

When checked, system will automatically allocate employees to the work orders. The default status of this flag is established in COSWIN Configuration's Maintenance / Work Order / Parameters. The system allocates employees to the work order based on:

- o The resource requirements of the planned job
- o The preferred employee of the equipment job
- o The available roster list
- o The planned shifts of the planned job released in Work in Progress.

The system allocates the job's preferred employees to the work order whenever possible (employees are available in the shift and not overloaded).

Check Skills

When checked, system will automatically check the skills of the employees allocated against the equipment job skill requirements. The system flags the allocated employee as REJECTED when none of its skills does not match any of the equipment job skill requirements.

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The default status of the check box is established in COSWIN Configuration's Maintenance / Work Order / Parameters.

Actual labour costs (Lab.)

This is the total manpower cost (labour cost) incurred against the work order. It is a positive numeric value automatically computed by the system, on the basis of employee time usage feedback.

The information is accessible to the user only in case of work orders having contract jobs with third parties. For those work orders the user will be allowed to specify the cost of contracted labour hours.

The formula used to compute the value is:

$$CCLH + \sum_E (FR_E + \sum_A (H_A * R_A))$$

Where:

- CCLH is the cost of contracted labour hours
- FR is the fixed rate of the employee E
- H is the number of hours worked by employee E to perform the activity A
- R is the rate under which employee E performed the activity A

Actual material costs (Mat.)

This is the total material cost incurred against the work order. It is a positive numeric value automatically computed by the system, on the basis of stock usage feedback and the issues against work order.

The information is accessible to the user only in case of work orders having contract jobs with third parties. For those work orders, the user will be allowed to specify the cost of materials provided by the sub-contractor.

The formula used to compute the value is:

$$CM + \sum_S (QTY_S * UP_S)$$

Where:

- CM is the cost of materials provided by the sub-contractor
- QTY is the quantity used (issued) of the spare S
- UP is the unit price of the spare S

Actual miscellaneous costs (Misc.)

This information specifies the miscellaneous costs that may have been incurred against the work order. It is an optional positive numeric value. It can be accessed only for work orders with system status not equal to '0 – Not Started'.

Actual recovery costs

This information specifies any other costs as adjustments (recovery costs) that may have been incurred against the work order. It is an optional positive numeric value. It can be accessed only for work orders with system status not equal to '0 – Not Started'.

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For example, if a replaced component has some value as it can be repaired and reused, then certain costs of the component can be specified as recovery.

Actual total costs

This information specifies the total work order costs. It is a read-only information, automatically computed by the system, using the following formula:

Total costs = Labour costs + Material costs +
Miscellaneous costs - Recovery costs


Repairable

This information specifies whether the work order is a repairable one, i.e. the work order is made against a repairable equipment using the non-standard button operation **Create Work Order**. It is not accessible to the user.

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8.1.3 Currency Conversion

Currency conversion may be performed any of the cost fields as follows:

1. Select the desired cost field.
2. Select the gadget icon, , located on the standard toolbar. This shall display the Currency Conversion window.

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3. Select the currency for the **From** and **To** field and the converted figure shall be displayed automatically on the **Result** field.
4. Select **OK** to exit.

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8.1.38.1.4 Specifying the Down Time and Others in the More tab

The More tab looks by default as follows:

Depending on the work order's status, the following fields are editable:

	Not Started	In Progress	Finished	Archival
Meter reading (if the work order job is meter based)				✓
Down time	✓	✓	✓	
Production Loss	✓	✓	✓	
WO Type		✓	✓	✓
Auto Re-plan				✓
Clash (if Auto Re-plan is selected)				✓
Old Occurrences (if Auto Re-plan is selected)				✓
Contract No	✓	✓	✓	
Cost Type	✓	✓	✓	
Safety Involved checkbox	✓	✓		
Project Code	✓	✓	✓	
Equipment Phone	✓	✓	✓	
Actioning Entity	✓	✓	✓	✓

Detailed Field Descriptions:




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Work Permit

This is the identifier of the work permit raised under the work order. It is a read-only information, automatically provided by the system when work permit is created for the work order (using the Create Work Permit operation of the non-standard button )

Meter ID

This is the identifier of meter specified in the work order's job. It is a read-only information, automatically managed by the system.

Reading

This is the meter reading observed at the time of work order completion. This information can be accessed and is mandatory only for work orders made for meter based jobs. It is an optional numeric information.

When the work order progresses to '3 – Archivable' status, the system computes and proposes a default value for the reading based on the meter's forecast. However, user is still able to update it if actual value differs from the computed one.

Meter unit

This is the measurement unit for the meter reading a read-only information automatically provided by the system.

Down time (D/Time)

This is the time interval (in hours) when the equipment was down because of the work against the work order. It is an optional numeric value, accessible to the user when the work order is at '1 – In Progress', '2 – Finished' or '3 – Archivable' status. When work order is first created, system will propose the Down Time specified in the respective Job Guideline.

Production loss (P/Loss)

This is the number of hours the production has stopped because of the work against this work order. This is an optional numeric information, accessible to the user when the work order is at '1 – In Progress', '2 – Finished' or '3 – Archivable' status.

Work order type

This is the work order's type, i.e. the way the work order was created. It is a mandatory information. The available types for the work orders are:

Planned - when they are created in Release Jobs Module and work order's job is not under a maintenance project

Unplanned - when they are created in Work Order Details Module or in Planner Review Module

Other - when they are created in Release Jobs Module and work order's job is under a maintenance project

Auto Replan

This information specifies whether the planned jobs, created in Plan Jobs Module for the work order's job, should be updated or not based on the work order execution.

The option to automatically re-plan the existing planned jobs of the job is available only for work orders created for jobs having the behaviour '1' or '2'.

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The information is accessible to the user when the work order is progressed to '3 – Archivable' status.

Clash

This information specifies whether planned jobs generated by other planners should be taken into account or not during the synchronisation of planned jobs with the current work order. The information is accessible to the user only when Auto Replan is set.

Old occurrences

This information specifies the action to be performed by the system upon the delayed planned jobs, during the synchronisation of planned jobs with the current work order. The available actions are:

- | | |
|---------------|---|
| Delete | The system will delete the delayed jobs |
| Move | The system will move the delayed jobs to future dates, according to the equipment job's periodicity |

This information is accessible to the user only when Auto re-plan is set.

Contract Selection Criteria (Dir. wise / Eqpt. wise)

It represents the source of job contract selection (see paragraph Contract). The available options are:

- | | |
|-----------------------|---|
| Directory wise | This selection specifies that the job contract will be selected from the list of all open contracts |
| Equipment wise | This selection specifies that job contract will be selected from the current job list of open contracts |

Contract

This is the identifier of the job contract under which the work order is to be performed. It is an optional information, accessible to the user when the work order is at '1 - In Progress', '2 – Finished' or '3 – Archivable' system status. The entered value must exist in the directory of Contracts.

A selector trigger button (or F2 key) linking to Contract Selector is available.

Right-mouse click (or F7 key) will activate the Contract Details window for the current code.

Costs type

This is the type of the work order's costs. The available costs types are:

Internal when the work order is performed by the local team

External when the work order is performed by a third party

The following rules are applied to establish the default proposed costs type during work order creation:

The internal costs type is considered first

If the work order's job is already defined for the work order's equipment, then the job's costs type are considered

If a contract is specified for the work order, the system will automatically change the costs type to external

The information is accessible to the user when the work order is at '1 – In Progress', '2 – Finished' or '3 – Archivable' status.

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Safety Involved

This flag specifies if the corrective maintenance covered by the work order involve safety. The system automatically set this flag to false when the work order is created.

Project Code

This is the maintenance project under which the work order's job is performed. It is an optional information of maximum 10 alphanumeric characters. If the work order's job is an existing equipment job, then the equipment job's project is proposed as default value during the work order creation. This field is accessible to the user when the work order is at '1 – In Progress', '2 – Finished' or '3 – Archivable' status.

Eqp Phone

This is the work order's equipment nearest phone number, an optional alphanumeric information of maximum 13 alphanumeric characters. The equipment phone is proposed by the system as default value during work order creation. This field is accessible to the user when the work order is at '1 – In Progress', '2 – Finished' or '3 – Archivable' status.

Eqp Srl. No.

This is the equipment serial number valid at the work order's creation for any work order made for repairable equipment, a read-only field automatically managed by the system.

In order to repair an item, two work orders are to be generated: one for replacing the item with defects, and the other that actually repairs the work order. This serial number keeps track of the item that is replaced.

New Srl. No.

This is the serial number of the item issued from the stock to replace the one with defects, a read-only field automatically managed by the system.

Zone

This is the zone identifier of the work order's equipment, a read-only field automatically read and updated by the system.

Function

This is the function identifier of the work order's equipment, a read-only field automatically read and updated by the system.

PM Job Covered

This is a field to be entered manually as a Yes/No to act as a reminder to close the associated PM job.

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Request Entity

This is the company entity that is requesting the job, an optional information. The provided value of authority must exist in the directory of Company Entities. COSWIN proposes the company entity that owns the equipment of the WO as the default value.

A selector trigger button (or F2 key) linking to Company Entities Selector is available.

Action Entity

This is the company entity that is supposed to perform the work, an optional information. The provided value of authority must exist in the directory of Company Entities. COSWIN proposes the company entity that owns the equipment of the WO as the default value.

A selector trigger button (or F2 key) linking to Company Entities Selector is available.

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If the work orders have work permits associated, only employees covered by approved work permits are allowed to provide time feedback.


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8.1.7.18.1.8.1 To Add a New Employee Feedback

The minimum information required to make an employee feedback from Work Order Details is:

- Employee Number
- Employee Status
- Date Worked

Employee feedback can be added as long as the work order is at NOT STARTED, IN PROGRESS or FINISHED status.

At the Employee tab, click on the  icon on the COSWIN toolbar and the following ADD window appears:

Details	More	Job Activ.	Spe. Text	Notes	Employee	Allocated	Resource	Stock	
Employee					Work Order				
Employee No : <input type="text"/>					WO ID : <input type="text"/>				
Status : <input type="text"/> Shift ID : <input type="text"/>					Status : <input type="text"/>				
Rate Code : <input type="text"/>					Meter Level : <input type="text"/>				
Date Worked :		Hours Worked :		Time ON :		Time OFF :		Hours Planned :	
<input type="text"/>		<input type="text"/>		<input type="text"/>		<input type="text"/>		<input type="text"/>	
Actions									
<input type="button" value="Not Exec. for Res."/> <input type="button" value="All for Resource"/> <input type="button" value="Selected"/>									
Distribute Hours :					Auto Feedback <input type="checkbox"/>				
<input type="button" value="By Duration"/> <input type="button" value="By Number"/>									
Auto Replan <input type="checkbox"/>					Clash <input checked="" type="checkbox"/>				
Old occur. :					<input type="button" value="Move"/> <input type="button" value="Delete"/>				

Detailed Field Descriptions:

Employee No

This is the identifier of the Employee that performs the feedback. This field is mandatory and only accessible during ADD mode. It must be an existing employee.

A selector trigger button (or F2 key) linking to Employee Selector is available.

Right-mouse click (or F7 key) will activate the Employee Details window for the current code.

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8.1.88.1.9 Allocating Employee to the Work Order

User may either let system assigns employees to the work order according to the resource requirement specified and available roster, or manually pick the employee from the Employee Directory to assign to the work order.

The Allocated tab looks by default as follows:

Details	More	Job Activ.	Spe. Text	Notes	Employee	Allocated	Resource	Stock
Employee No	Employee Name	Allocated Date	Allocation	Allocated Hrs	Rejection	TWP Raised		
109889	Lee Gim Chew	26/04/2002	0	1.00	0	0		

It displays the list of employees allocated to the current work order.

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8.1.8.18.1.9.1 To Allocate Employee to a Work Order

Employees can be allocated only to work order at status '0 – NOT STARTED'.

The system allocates employees to the work order based on:

- The manpower requirements of the work order 's equipment job
- The preferred employee of the equipment job
- The available roster list
- The planned shifts of the work order.

The system will allocate the job preferred employees to the work order whenever possible (employees are available in the shift and not overloaded).


Auto Employee Allocation:

To automatically allocate employee to work order, the following must be specified in the Work Order Detail:

- The checkbox option Allocate Employees under the Detail tab must be checked
- The resource requirement for the work order must be defined under the Resource tab.

The system allocates employees to the work order based on:

- The resource requirements of the work order 's equipment job
- The preferred employee of the equipment job
- The available roster list
- The planned shifts of the work order.


Click on the non-standard  button at COSWIN Toolbar. COSWIN will automatically assign employee to the work order based on the currently in-use company roster.

Manual Employee Allocation:

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At the Resource tab, click on the  icon and the following ADD window appears:

Details	More	Job Activ.	Spe. Text	Notes	Employee	Allocated	Resource	Stock
<div> Resource : <input type="text"/> </div> <div> Required No. : <input type="text" value="1"/> Planned Hrs. : <input type="text" value="1.000"/> Start Day : <input type="text" value="1"/> </div> <div> Action </div> <div> Seq.No : <input type="text" value="0"/> Action : <input type="text"/> </div> <div> Description : <input type="text"/> </div>								

Detailed Field Descriptions:

Resource

This is the Resource identifier, a mandatory field and must be an existing resource.

A selector trigger button (or F2 key) linking to Resource Selector is available.

Right-mouse click (or F7 key) will activate the Resource Details window for the current code.

Resource Description

This is the description of the resource, a read-only field automatically managed by the system.

Required No.

This is the number of required resources, a mandatory numeric integer value, greater than zero.

Planned hours

This is the number of planned hours for the resource, a mandatory numeric positive value.

Start day

This is the index of day from which the resource begins its job on the Work Order, counting from the Work Order start date, a mandatory numeric integer positive value.

Sequence No

This is the Action's sequence number, if the Resource is allocated for a Work Order's Action. Otherwise it is zero. It is an optional positive numeric integer field.

Action Code

This is the code of the Action, if the resource was allocated for an Action, otherwise is empty. It is a read-only field automatically managed by the system.

Description

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This is the description of the Action, if the resource was allocated for an Action, otherwise is empty. It is a read-only field automatically managed by the system.

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8.1.9.28.1.10.2 To Modify a Resource Requirement of a Work Order

Resource requirement specified can be modified as long as the work order system status is at 0 – NOT STARTED, 1 – IN PROGRESS or 2 – FINISHED.

Click on the  icon to save the modification made.

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8.1.9.38.1.10.3 To Delete a Resource Requirement from a Work Order

Resource requirement cannot be deleted from a work order if

- It is a planned resource requirement in the equipment job of the work order, or
- An employee with that resource has provided feedback on the work order.

Otherwise, resource used can be deleted as long as the work order status is at 0 – NOT STARTED, 1 – IN PROGRESS or 2 – FINISHED.

Click on the  icon to delete the currently selected Resource Requirement.

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8.1.108.1.11 Specifying Work Order's Stock Requirement

Stock usage specifies the stock items consumed during the execution of an equipment job. A list of the estimated stock to be used is defined for every work order during its release. This list is copied from the work order's equipment job stock requirement list. Stock usage is used to compute the actual material cost of the work order.

Stock usage can be defined:

- For the work order (GLOBAL), not linked to any work order action
- For a work order action (SPECIFIC), linked to a specific work order action and to the work order in the same time

A stock requirement cannot be specified globally to the work order and specifically to one of the work order's Actions at the same time.

The Stock Requirement tab looks by default as follows:

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- o *Error fixed* - that is, during the execution of the Action some problems occurred, but finally they have been solved, possibly with some delays and/or with supplementary allocation of resources and/or items (status 2)
- o *Error not fixed* - that is, during the execution of the Action some unsolved problem occurred that produced the failure of the Action (status 3)

Actions can be generated from a Job (see Job Guidelines Module) or can be generated at Work Order's feedback time. From this point of view, Actions fall into two categories:

- o Planned Actions (coming from the Job)
- o Unplanned Actions (generated at feedback)

Actions are individualised by their kind (or type). Also, they are part of a Work Order. They belong to a Work Order and they have a sequence number within that Work Order; this sequence number specifies the order in which Actions are to be performed, if they are to be in a serial manner.

The Actions tab looks by default as follows:

Spe. Text	Notes	Employee	Allocated	Resource	Stock	Defects	Actions	Sibling WO	
TSeq No	TSub Equipment	TElement	TAction	TDuration	TExec. Stat	TDate	TGen. WO	TPln	TSub
1	CNV-001	Connection	001	2.000	0	08-10-2001	0	0	Main Co


It displays the list of Actions defined for the current work order.

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8.1.12-18.1.13.1 To Add a New Action to the Work Order

Minimum information required to add an action, is:

- o Sub Equipment identifier
- o Action identifier
- o Action duration – for executed actions
- o Action start date

From the Actions tab, click on the  icon and the following ADD window appears:

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Job Activ.	Spe. Text	Notes	Employee	Allocated	Resource	Stock	Defects	Actions
Seq.No :	1	Sub-Eqp. :						
Action :								
Kind :						Duration :	0.000	
<div> <div>Details</div> <div>More</div> <div>Notes</div> </div>								
Elem :		Date :	01-08-2001	Gen. WO :	0			
Exec :	Not Realized	Terminated OK	Error Fixed	Error Not Fixed				

Detailed Field Descriptions:

Seq. No.

This is the sequence number of the Action within the Work Order, a mandatory integer field. The valid value range is from 1 to the number of actions within the Work Order.

Sub Equipment

This is identifier of the equipment / sub-equipment for which the Action is generated, a mandatory field. The entered identifier will always be checked against the equipment existing in the database. It has to be:

- A sub equipment of the work order equipment, if the work order was made for an equipment, or
- An equipment belonging to the work order group, if the work order was made for a group of equipment

A selector trigger button (or F2 key) linking to Equipment Selector is available.

Sub Equipment description

This is the description of the equipment/sub-equipment, a read-only field automatically managed by the system.

Action

This is the identifier of the Action, a mandatory field of maximum 10 alphanumeric characters. It must exist in the directory of Actions and it must be unique within the work order.

A selector trigger button (or F2 key) linking to Actions Selector is available.

Right-mouse click (or F7 key) will activate the Action Details window for the current code.

Action description

This is the description of the Action, a read-only field automatically managed by the system.

Kind

This is the kind of the Action, a read-only field automatically managed by the system.

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Kind description

This is the description of the Action's kind, a read-only field automatically managed by the system.

Duration

This is the duration of the Action, a positive, not null, numeric value. This is a mandatory field for an executed action.

Element

This is the description of the specific element in the equipment upon which the Action is performed, an optional alphanumeric field of maximum 20 alphanumeric characters.

Date

This is the Action's start date, a mandatory field for an executed action (which by default is proposed as the Action's creation date).

Generated Work Order

This is the identifier of the Work Order generated to correct or complete the current Action, if current Action's status was "error fixed" or "error not fixed". This is a read-only field automatically managed by the system.

One or more Actions, being in the status "error fixed" or "error not fixed" and not having, already, generated an Work Order, may be used to generate a new Work Order that will complete their unfinished job.

Execution State

This radio button specifies the status of the Action, and is a mandatory field. An Action can have one of the following states:

- Not Realised** Action is not completed yet
- Terminated OK** Action is completed correctly
- Error Fixed** Action is completed, but some problems occurred during its execution
- Error Not Fixed** Action execution failed, due to some problems

Action Feedback More

The Action Feedback More tab window looks by default as follow:

Details		More		Notes	
Readings					
Limit 1 :	<input type="text" value="0.00"/>	Unit 1 :	<input type="text"/>	Op. Type :	<input type="text"/>
				Device :	<input type="text"/>
Limit 2 :	<input type="text" value="0.00"/>	Unit 2 :	<input type="text"/>	Eq. Stat :	<input type="text"/>

Limit 1

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During Action's execution there can be certain parameters that must restrict to certain values. For an Action there can be defined 2 such restriction values. This is the first restriction value, an optional numeric field.

Unit 1

This is the measurement unit for the first restriction value, an optional alphanumeric field of maximum 6 characters.

Limit 2

This is the second restriction value, an optional numeric field. See Limit 1.

Unit 2

This is the measurement unit for the second restriction value, an optional alphanumeric field of maximum 6 characters.

Operation Type

This is the description of a manual identifier, which in turn explains how to complete the Action on the equipment. It is an optional field of maximum 20 alphanumeric characters.

Device

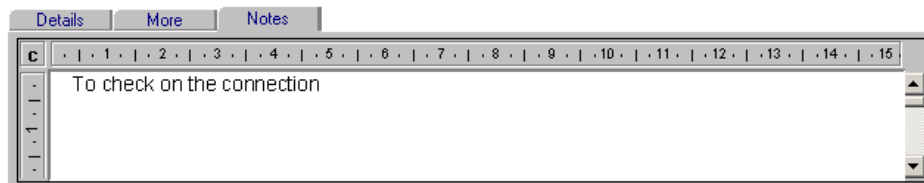
This is the description of a device with which the Action is to be performed, an optional field of maximum 20 alphanumeric characters.

Equipment Status

This is the description of the status in which the equipment is, during the Action's execution upon the equipment. It is an optional field of maximum 20 alphanumeric characters.

Action Feedback Notes

The Action Feedback Notes window provides details/notes/ observations about a Work Order Action.



The interface consists of the drawing layout, where the user can write text and/or append pictures, drawings, spreadsheets and any other form of OLE information.

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8.4.12.28.1.13.2 To Modify an Action of the Work Order

The information that can be modified is:

- Sequence number
- Action identifier
- Action status: from "not realised" to any other state; if the Action has another status, it cannot be modified
- Action duration

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View Employee Feedbacks of the current Action using non-standard  button

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8.1.138.1.14 Creating Follow-up Job Request for the Work Order

The Follow Up looks by default as follows:

Employee	Allocated	Resource	Stock	Defects	Actions	Sibling WO	Follow Up	Facility
Job Request No	YSt	YDate	YReq. by	YTarget Date	YSource Eqpt/Group	YWO Eqpt/Group	YJob ID	
JBRQ000016	1	01-08-2001	J.SMIT	01-08-2001	CNV-001	CNV-001		

It displays all the job requests that are created from the current work order.

At the **Follow Up** tab of the Work Order Details module, click on the non-standard on COSWIN toolbar and the Job Request creation window will appear:

Create JR

User Request Details

Job Req. : JBRQ000017

Stat. : 0

Date : 03-08-2001

Time : 23:12

Req. By :

Phone :

Source Eqpt/Group : 1PL1

Process Line 1

Job ID :

Target Dt. : 03-08-2001

Supv :

Cost Centre : 002

Zone : A

Function : PROCESS

Priority :

Problem

More

Fault Rep.

c

1

2

3

4

5

6

7

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11

12

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14

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1

2

3

4

Note that the equipment code and details like cost center, zone, function will be defaulted to that defined in the work order.

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At the Facility Requirement tab, click on the  icon and the following ADD window appears:

Allocated	Resource	Stock	Defects	Actions	Sibling W/O	Follow Up	Facility	Meters
-----------	----------	-------	---------	---------	-------------	-----------	----------	--------

Facility Code :	<input type="text"/>	
Eqpt Code :	<input type="text"/>	
Status : 0. Request	Sharable : 1. Sharable	Planned : 0. Work in progress
Requested : 0.000	Used : 0.000	Time Unit : 1. Day
Start : 26/03/2002 00:00		
End : 26/03/2002 00:00		
Rate : 1.00	Actual Cost : 0.00	

Detailed Field Descriptions:

Facility Code

This is the reference code of the generic facility, mandatory information that can take up to 10 alphanumeric characters. The facility reference code should exist in the directory of maintenance facilities.

Facility Description

This is the description of the generic facility, read-only information automatically managed by the system.

Eqpt Code

This is the reference code of the actual equipment used, a mandatory information that can take up to 20 alphanumeric characters. The equipment reference code should exist as a facility instance of the generic facility.

Equipment Description

This is the description of the equipment used as facility instance, read-only information automatically managed by the system.

Status

This is the status of the facility usage, mandatory information. The status can have one of the following values: 0 – REQUEST, 1 – APPROVED and 2 – USED.

Sharable

This flag specifies if the facility instance can be used concurrently by several work orders. It is mandatory information.

Planned

This indicates if the facility is a planned facility, with values 0 – Work in Progress implies not a planned facility, and values 1 – Job Released implies is a planned facility.

Requested Time

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This is the number of facility instance time units planned to be used for the work, read-only positive numeric information.

Used Time

This is the number of facility instance time units actually used for the work. It is optional positive numeric information. It has to be entered for the facility usage having the status 2 – USED.

Time Unit

This is the unit of measure for the facility instance time actually used to do the work. It is optional integer information that can take the following values: 0-HOUR, 1-DAY or 2-WEEK. It has to be entered for the facility usage having the status 2 – USED.

Start Date/Time

This is the date and time when the facility instance start to be used, a mandatory information.

End Date/Time

This is the date and time when the facility instance end to be used, an optional information.

Rate

This is the cost of use of facility per time unit, read-only information automatically managed by the system. It is used to compute the actual cost of use of facility to perform the work.

Actual Cost

This is the planned cost of use of facility, read-only information automatically computed by the system as the product between the used time and the rate.

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8.1.14.28.1.15.2 To Modify Facility Requirement of a Work Order

Facility used can be modified as long as the work order system status is at 0 – NOT STARTED, 1 – IN PROGRESS or 2 – FINISHED.

Whenever the Used Time is modified the system updates the cost of the facility usage and the actual facility cost of the work order with the modified facility used cost.

Click on the  icon to save the modification made.

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8.1.14.38.1.15.3 To Delete Facility Requirement from a Work Order

Allocated facility with status 1 – APPROVED and 2 – USED cannot be deleted.

Otherwise, it can be deleted as long as the work order system status is at 0 – NOT STARTED, 1 – IN PROGRESS or 2 – FINISHED.

The system updates the actual facility cost of the work order by subtracting the cost of the deleted facility usage.

Click on the  icon to delete the currently selected facility requirement.

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8.1.158.1.16 Providing feedback for the Equipment's Meter Usage

Meters feedback is used to specify the values of different meters associated to the work order's equipment. Special types of jobs may be defined to perform the meter readings. Meters feedback allows managing the readings made when the job is performed. The readings made through the work order meters feedback are taken into account in planning the jobs relying on them.

The equipment meters are automatically copied into the meter feedback when work orders are released against jobs to be performed on equipment having meters attached. A meter reading is entered when feedback is entered against meters.

The Meter Usage tab looks by default as follows:

Meter ID	Description	Reading Date	Reading Time	Meter Value	Type	Meas. Unit
ECS/ELE/0001	KWH READING		00:00			KWH
LOCO/B05/BATTHR	Locomotive Hour Meter		00:00			HR

Double click on any of the displayed meters in the selector will activate the Meter Usage Details window:

Allocated	Resource	Stock	Defects	Actions	Sibling WO	Follow Up	Facility	Meters
<p>Meter</p> <p>Meter ID : <input type="text" value="RS_KM1"/></p> <p>Description : <input type="text" value="RS KM Run Counter"/></p> <p>Type : <input type="text" value="CN"/></p>								
<p>Meter Reading</p> <p>Date : <input type="text" value=""/></p> <p>Time : <input type="text" value="00:00"/></p> <p>Value : <input type="text" value=""/></p> <p>Unit of Measurement : <input type="text" value="KM"/></p>								

Detailed Field Descriptions:

Meter

This is the meter on which feedback is made, mandatory read-only information. It exists in the directory of meters and is unique among the meters on which feedback is made.

Meter Description

This is the description of the meter, read-only information managed by the system.

Type

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This is the meter type, read-only information automatically managed by the system.

Date

This is the date when the reading was taken, optional information. A null value signal a feedback not performed.

Time

This is the time when the reading was taken, optional information. A default value of 0 is proposed by system.

Value

This is the value of the meter when reading was taken, optional information. A null value signal a feedback not performed.

Unit of Measurement

This is the meter unit of measurement, read-only information automatically managed by the system.

Meter feedback can be performed as long as the work order system status is at 0 – NOT STARTED, 1 – IN PROGRESS or 2 - FINISHED and either Date or/and Value are not entered yet. Once meter feedback has been specified, it cannot be modified.

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8.1.168.1.17 Creating Follow up Work Order

The primary purpose of "Create WO" window is to help generating the repair Work Order for a repairable equipment, i.e. a sub equipment which actually needs two Work Orders:

- The first to replace the sub equipment that doesn't work with a good one, in order to avoid the malfunctioning of the parent equipment
- The second, i.e. the one generated with Create WO option from Work Order Details toolbox, performs the repairing activity for the damaged sub equipment

In a more general manner, any Work Order that needs additional work to be performed after can be the source of generating another Work Order.

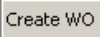
The follow up Work Order is also known as the Child Work Order. Please note that closing the Parent (or the first) Work Order will not automatically close the Child Work Order.

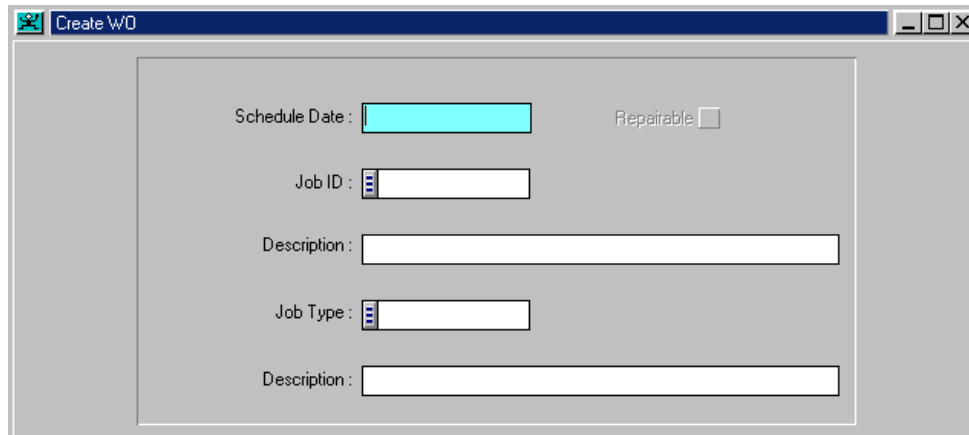
Another use of this window is to generate a Work Order for one or many of a Work Order's Actions that met problems during their execution (Actions with status "error fixed" or "error not fixed"- see 1.3 Action Feedback Details).

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Click the non-standard  button and the following screen will be displayed:



Detailed Field Descriptions:

Schedule Date

This is the Work Order schedule date, a mandatory field .

Reparable

This check box specifies whether the Work Order to be generated is for repairable equipment or not. It is enabled only if the previous Work Order, on whom this Work Order is to be created, falls under first up-mentioned category, otherwise is a read-only field automatically managed by the system.

Job ID

This is the Job identifier the Work Order is to be created for, an optional field that can take up to 10 alphanumeric characters.

If it is not edited, an unplanned job will be created.

A selector trigger button (or F2 key) linking to Equipment Jobs Selector is available.

Right-mouse click (or F7 key) will activate the Jobs Directory window for the current code.

Job description

This is the Job description, a field that can take up to 40 alphanumeric characters.

If the Job identifier is not provided, it is a mandatory field. Otherwise, it is read-only and automatically managed by the system.

Job Type

This is Work Order's Job Type identifier, a field that can take up to 6 alphanumeric characters.

If the Job identifier is provided, the field is read-only and automatically managed by the system.

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Otherwise, it is a mandatory field. The entered job type will always be checked against the directory of job types.

A selector trigger button (or F2 key) linking to Equipment Jobs Selector is available.

Job Type description

This is the description of the Job Type, a read-only field automatically managed by the system.


Enter the details and click the  icon. A follow-up work order will be created.

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8.1.178.1.18 Creating Work Permit for the Work Order

The following conditions must apply when generating a work permit request from work order module:

- It must be an unplanned work order
- The status of the work order must be 0-NOT STARTED
- Employee must have been allocated to the work order

Click the non-standard  button on COSWIN toolbar and the Work Permit Request will be generated.

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Resource

This is the employee's Resource (trade) identifier. It is a read-only field automatically managed by the system.

A selector trigger button (or F2 key) linking to Resource Selector is available.

Right-mouse click (or F7 key) will activate the Resource Details window for the current code.

Supervisor

This is the employee's supervisor identifier. It is a read-only field automatically managed by the system.

A selector trigger button (or F2 key) linking to Supervisor Selector is available.

Right-mouse click (or F7 key) will activate the Supervisor Details window for the current code.

Current Update Date

This is the date of current employee's feedback, a mandatory field.

It is proposed by default as the current date and cannot be greater than the current date.

Last Update Date

This is the date of the last employee's feedback, a read-only field automatically managed by the system.

Employee Feedback List Box


Double click on any of the displayed feedbacks will activate the Employee Feedback Details window.


WO ID	This is the identifier of the Work Order against which the employee has worked.
Date Worked	The date on which the employee performed the Work Order job.
From Time	The time when the employee started his work.
To Time	The time when the employee finished his work.
Worked Hours	This is the number of hours worked by the employee on the specified date.
Rate ID	This is the rate of the employee at which the labour cost will be computed.
Planned Hours	Number of hours planned to be worked by the employee for the Work Order.
Shift ID	This is the shift in which the employee worked on the Work Order.
Empl Status	This is the status of the work of the employee on the Work Order.
WO Status	The user status of the Work Order from the moment the feedback was made.
Total Hours	The cumulative hours the employee has worked against the

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Select the Action to be associated with the feedback and confirm by clicking on the  icon.

Note: This non-standard  button is only enabled when the work order has actions defined.

After the employee time feedback has been added, you may click on this button to view which action being associated to the feedback.

8.2.2 To Modify an Employee Time Feedback

There is no restriction while modifying an employee feedback, except for the action selection criterion, which cannot be changed.

If an employee worked more than once on a work order, only the last instance of his feedback can be modified.

8.2.3 To Delete an Employee Time Feedback

Once the feedback is added, it cannot be deleted.

8.2.4 Employee Time Feedback Details

The purpose of this detail module is to provide time feedback details against an Work Order. The Employee Time Feedback Details window looks by default as follows:

Detailed Field Descriptions:

Employee Number

This is the identifier of the Employee that performs the feedback. It is a read-only field automatically managed by the system.

Employee Status

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This is the status of the employee's work on the Job, a mandatory field, consisting of one alphanumeric character. This field has similar significance with the Work Order status and can be any of the user-defined states corresponding to not started, in progress or Finished system states.

A selector trigger button (or F2 key) linking to Status Selector is available.

Shift ID

This is the employee's shift identifier, an optional numeric integer value, which can range from 0 to 99.

Rate Code

This is the rate of the employee at which the labour cost will be computed. See also Employee Details - Costing Rates.

WO ID

This is the identifier of the Work Order against which the feedback is made a numeric integer value. This field is mandatory and only accessible during ADD mode. When selecting a work order for this field, it must be an existing work order and cannot be already in archivable status.

A selector trigger button (or F2 key) linking to Work Order Selector is available.

Right-mouse click (or F7 key) will activate the Work Order Details window for the current code.

WO Status

This is the Work Order user status (one alphanumeric character), a mandatory field.

A selector trigger button (or F2 key) linking to Status Selector is available.

Meter Level

This is the level of the meter from the moment of the completion of the Work Order, a positive numeric field.

This field is editable only for a Work Order made for a meter-based job and when the Work Order is passed in archival state. It is computed by the system according to the meter forecast and the user can modify it to put the actual value.

Otherwise, it is not used.

Date Worked

This field specifies the date on which the employee performed the job, a mandatory field.

Hours Planned

This is the number of hours planned for the employee's job, an optional positive numeric field.

Hours Worked

This is the number of hours worked by the employee on the specified date, an optional numeric value.

Negative values can be entered here to correct an erroneous feedback previously made, provided that the Hours to Date are still positive.

Hours to Date

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This field specifies the cumulative hours worked by the employee against the Work Order, a read-only field automatically managed by the system. It represents the sum of hours worked by the given employee for the given work order and has to be a positive value.

Time ON

This is the time at which the employee started his work on the Job, an optional field ranging from 00:00 to 24:00.

Time OFF

This is the time at which the employee finished his work on the Job, an optional field ranging from 00:00 to 24:00.

Proposed action selection

This radio button specifies, if the work order has actions, what Actions are selected, when accessing Actions for Work Order selector

Not Exec. for Res. Actions with status "not realised", having no allocated resource, or having this employee's resource among its resources.

All for Resource Actions having no allocated resources, or having this employee's resource among its resources.

Selected Actions already selected by a previous feedback; this is the choice available in VIEW and MODIFY modes.

If not making feedback for actions, or if the frame is not in ADD mode, this radio button is read-only.

Distribute Hours

This radio button specifies, if the work order has Actions, how to distribute the worked hours between the selected actions

By Duration The hours worked for each action will be calculated with the formula:

$$\text{Employee Worked Hours} * \text{Action Duration} / \text{Sum Of Duration Of All Selected Actions}$$

By Number The hours worked for each action will be calculated with the formula:

$$\text{Employee Worked Hours} / \text{Number Of Selected Actions}$$

Auto Feedback

If the work order has Actions, this checkbox specifies that Auto Feedback is to be made against the selected Actions (see also 1.3 Action Feedback Details).

Auto Replan

This information specifies whether the planned jobs, created in Plan Jobs Module for the work order's job, should be updated or not based on the work order execution.

The option to automatically re-plan the existing planned jobs of the job is available only for work orders created for jobs having the behaviour '1' or '2'.

The information is accessible to the user when the work order is progressed to archival status.

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8.3 TURBO FEEDBACK

Work Orders in a Maintenance System can be broadly categorised into two categories:

- o Work Orders for which detail feedback is essential
- o Work Orders for which minimum, but essential feedback will be sufficient. A large number of the Work Orders in a Maintenance System may fall into this category.

Feedback on Work Orders falling in the first category can be provided using Work Order Details Module.

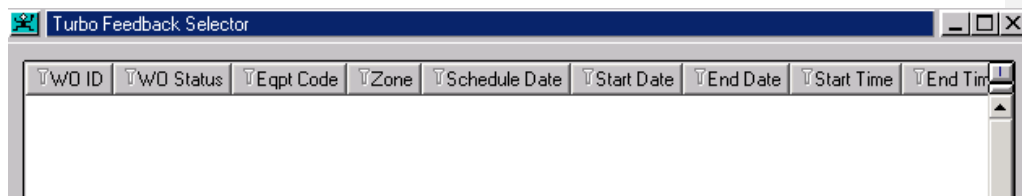
Turbo Feedback Module can be used to provide feedback on Work Orders which fall into the second category.

Turbo Feedback module can be used effectively to provide quick feedback on Work Orders by filling the Actual dates/costs with the planned values.

The purpose of this component is to provide substantial feedback without really entering much data, by establishing some default vital settings for Work Orders that are to support Turbo Feedback.

Select from COSWIN menu *Maintenance / Work in Progress / Turbo Feedback* to launch the Turbo Feedback module.

The Turbo Feedback Selector window looks by default as follows:



Detailed Field Descriptions:

Turbo Feedback List Box

WO ID	This is the identifier of a Work Order for which turbo feedback is provided.
WO Status	This is the Work Order user status which has been set using the Default options (in Turbo Feedback Defaults).
Eqpt Code	This is the identifier of the equipment for which the Work Order is generated.
Zone	This is the identifier of the zone to which the equipment work order belongs.

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Schedule Date	This is the Work Order's schedule date.
Start Date	This is the Work Order starting date.
Start Time	This is the Work Order starting time.
End Date	This is the Work Order finish date.
Fin Time	This is the Work Order finish time.
Job Class	This is the identifier of the Work Order's job class.

8.3.1 Define Default Settings for Turbo Feedback

The Turbo Feedback Default module establishes some vital default settings for Work Orders that are to use to update the work order during Turbo Feedback.

Click on the non-standard **Defaults** button and the Turbo Feedback Default definition screen will be activated:

Detailed Field Descriptions:

WO Status

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This is the user status for the Work Orders that are to support turbo feedback, a mandatory field, consisting of one alphanumeric character. Its system status must be '2 – Finished' or '3 – Archivable'.

A selector trigger button (or F2 key) linking to WO Status Selector is available.

Job Class

This is the identifier of the Job Class to which Work Orders, that are to support feedback, belong. It is a mandatory field and must exist in the directory of Job Class.

A selector trigger button (or F2 key) linking to Job Class Selector is available.

Shift ID

This is the identifier of the shift in which the Work Orders were performed, a mandatory positive integer.

Start Date

This is the date of starting the work for the Work Orders, a mandatory field.

Start Time

This is the time of starting the work for the Work Orders, an optional field.

Finish Date

This is the date of finishing the work for the Work Orders, a mandatory field. It can be neither earlier than start date, nor later than current date.

Finish Time

This is the time of finishing the work for the Work Orders, an optional field.

History Flag

This field specifies if history details will be maintained for the Work Orders, and is used to override history flag in the Work Order. This is an optional "Y" / "N" field.

Employee Feedback

This check box, if checked, specifies that the planned employee time is taken as the actual employee feedback time for the Work Order.

Down Time

This check box, if checked, specifies that the planned down time is assumed to be the actual down time for the Work Order.

Production Loss

This check box, if checked, specifies that the planned production loss time is assumed to be the actual production loss time for the Work Order.

Labour Actual Cost

This check box, if checked, specifies that the planned labour cost from job guidelines is assumed to be the actual labour cost for the Work Order.

Material Cost

This check box, if checked, specifies that the planned material cost is assumed to be the actual material cost for the Work Order.

Resource

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This check box, if checked, specifies that the planned resource requirement is assumed to be the actual resource usage for the Work Order.

Auto Replan

This information specifies whether the planned jobs, created in Plan Jobs Module for the work order's job, should be updated or not based on the work order execution.

The option to automatically re-plan the existing planned jobs of the job is available only for work orders created for jobs having the behaviour '1' or '2'.

The information is accessible to the user when the work order is progressed to archival status.

Clash

This information specifies whether planned jobs generated by other planners should be taken into account or not during the synchronisation of planned jobs with the current work order. The information is accessible to the user only when Auto re-plan is set.

Old occurrences

This information specifies the action to be performed by the system upon the delayed planned jobs, during the synchronisation of planned jobs with the current work order. The available actions are:

- Delete** The system will delete the delayed jobs
- Move** The system will move the delayed jobs to future dates, according to the equipment job's periodicity

The information is accessible to the user only when Auto re-plan is set.

8.3.2 To Select Work Orders for Turbo Feedback

To select work orders for turbo feedback, click the non-standard  button and the work order selector will appear:


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TWO ID	TEqpt/Group Code	TJob ID	TWO Status	TJob Description	TZone	TFunction	TPriority
83	EMU011TRN/XXXXXXXX	TRAIN/RS5KA	1	5K Km PM Task A	NEL	TRAIN/BD	
84	EMU011TRN/XXXXXXXX	TRAIN/RS5KB	2	5K Km PM Task B	NEL	TRAIN/BD	
85	EMU011TRN/XXXXXXXX	TRAIN/RS20K	1	20K Km PM Task	NEL	TRAIN/BD	
107	EMU108CAR/XXXXXXXX	UPLN000034	3	TEST	NEL	TRAIN/BD	
120	EQPT	TAS	3	TEST FOR TAS	NEL	AFC/TICKET HIGH	
125	EQPT	METER	2	Test meter	NEL	AFC/TICKET	
132	AFCBGKB1/GTAC13	UPLN000064	2	TEST	NEL	AFC/TICKET	
134	AFCBGKB1/GTAC16	UPLN000066	2	Test	NEL	AFC/TICKET	
135	EMU101CAR/XXXXXXXX	UPLN000067	0	Test	NEL	TRAIN/BD	
136	EQPT	TAS	3	TEST FOR TAS	NEL	AFC/TICKET HIGH	
137	EQPT	UPLN000068	3	TEST IPTW	NEL	AFC/TICKET	
138	EQPT	UPLN000069	0	Iptw	NEL	AFC/TICKET	
139	EQPT	UPLN000070	0	Test PTW	NEL	AFC/TICKET	
140	EQPT	UPLN000071	0	Test	NEL	AFC/TICKET	
141	EQPT	UPLN000072	0	TEST	NEL	AFC/TICKET	
142	EQPT	UPLN000073	0	Test	NEL	AFC/TICKET	
143	EQPT	UPLN000074	1	Test	NEL	AFC/TICKET	

Note: Only work orders with status not equal to 'Archival' can be selected for turbo feedback.

Pick the work orders to be updated and confirm by clicking on the  icon. The selected work orders will be added to the Turbo Feedback selector:

TWO ID	TWO Status	TEqpt Code	TZone	TSchedule Date	TStart Date	TEnd Date	TStart Time	TEnd Time
138	3	EQPT	NEL	25/03/2002	25/03/2002	25/03/2002	00:00	00:00

8.3.3 To Turbo Feedback on the Selected Work Orders

At the Turbo Feedback selector window with the work orders to be updated already picked, click on the non-standard **Feedback** button and all the selected work orders will be updated with the values specified in the Turbo Feedback Defaults.

Double click on any of the displayed work orders in the Turbo Feedback Selector will activate the Turbo Feedback Detail window:

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The Turbo Feedback Details provide setting details of the turbo feedback for the currently selected work order. User may use this module to modify the feedback setting for a particular work order.

Detailed Field Descriptions:

WO ID

This is the identifier of the Work Order, for which turbo feedback is provided, a mandatory integer numeric field. It must exist in the database and it must be unique.

You can select the WO Reference from the Work Orders Selector by pressing **F2** key or the selector button.

Pressing **F7** key or the mouse right button activates the Work Order Details window for the current code.

Eqpt Code

This is the identifier of the equipment for which Work Order was generated, a read-only field automatically managed by the system.

Zone

This is the equipment's Zone identifier, a read-only field automatically managed by the system.

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Due date

This is the Work Order's schedule date, a read-only field automatically managed by the system.

WO Status

This is the Work Order user status, a mandatory, one alphanumeric character, field, which can be set only to an user status corresponding to archival or completed system status.

You can select the WO Status from the WO Status List by pressing **F2** key or the selector button.

Job Class

This is the Work Order's Job Class identifier, a mandatory field, which can take up to 6 alphanumeric characters.

You can select the Job Class from the Job Classes Selector by pressing **F2** key or the selector button.

Start Date

This is the Work Order's start date, a mandatory field, which cannot be later than current date.

Start Time

This is the Work Order's start time, a mandatory field.

Finish Date

This is the Work Order's finish date, a mandatory field, which cannot be later than current date or earlier than start date.

Finish Time

This is the Work Order's finish time, a mandatory field.

Auto Replan

This information specifies whether the planned jobs, created in Plan Jobs Module for the work order's job, should be updated or not based on the work order execution.

The option to automatically re-plan the existing planned jobs of the job is available only for work orders created for jobs having the behaviour '1' or '2'.

The information is accessible to the user when the work order is progressed to archival status.

Clash

This information specifies whether planned jobs generated by other planners should be taken into account or not during the synchronisation of planned jobs with the current work order. The information is accessible to the user only when Auto re-plan is set.

Old occurrences

This information specifies the action to be performed by the system upon the delayed planned jobs, during the synchronisation of planned jobs with the current work order. The available actions are:

Delete	The system will delete the delayed jobs
---------------	---

Move	The system will move the delayed jobs to future
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dates, according to the equipment job's periodicity


The information is accessible to the user only when Auto re-plan is set.

8.3.3.1 To Add a New Work Order for Turbo Feedback

The following fields are proposed by default by the system, based on the values provided by the user in Turbo Feedback Defaults:


- Work Order Status
- Job Class
- Start Date
- Start Time
- Finish Date
- Finish Time

The user, who has to provide the work order identifier, can modify them.


Click on the  icon to launch the ADD window.

8.3.3.2 To Modify the Feedback Details of Work Order

Except for the work order identifier and the equipment-related information, all the data can be modified.

Click on the  icon to save the modification.

8.3.3.3 To Remove a Work Order from Turbo Feedback

Click on the  icon to delete the current work order will be removed from Turbo Feedback Selector.

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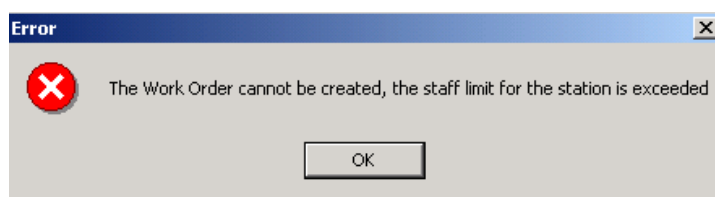
8.4 LIMITATION ON CREATION OF WORK ORDER

COSWIN does not allow adding a new WO if the number of employee already allocated on WO for that station (based on Character 4, 5 and 6 of the Equipment Code), for that day (schedule date) and WO status = 0 - Created or 1 – In Progress, is higher than the pre-defined limit.

The limit on the number of employee allocated to a station can be modified at the Resource Editor and the limit if changed affects all stations.

For example, if the limit is set to be 5 and there are 3 employees allocated for WO 1.

The system allows user to allocate any number of employees for WO 2 for the same station but when the user tries to create WO 3 for the same station, the system prompts him the following error:



This error is prompted only at the creation of WO 3 because, the total number of allocated employees from WO 1 & 2 have exceeded the pre-defined limit of 5.

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Meter ID

This is the identifier of the selected meter for which reading feedback is to be made, a read-only field automatically managed by the system.

Meter Type (Total / Increment)

The meter type is the way in which the meter is to be re-evaluated (a read-only field automatically managed by the system).

Total	In absolute values
Increment	In incremental values

Date

This is the date when the meter reading was taken, a mandatory field. The date must lie between the last reading date and current date.

Time

This is the time when the meter reading was taken, an optional field given in hh:mm format.

Value

This is the latest observed meter reading, a mandatory numeric field whose value must be:

At least equal to the previous reading's value for cumulative total meters, or any positive number for cumulative increment meters.

Units


This is the measurement unit for the meter's readings, a read-only field automatically managed by the system.

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8.4.18.5.1 To Add a New Consumption Feedback

Minimum information required to ADD a meter reading is:

- Reading Date
- Reading Value

Click on the  icon to launch the ADD window.

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8.4.28.5.2 To Modify Consumption Feedback


Only the reading from the last consumption feedback can be modified.

The information that can be modified is:

- Reading Date
- Reading Time
- Reading Value

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8.4.48.5.4 To View Meter Details

Click on the non-standard  button to activate the Meter Details module for the currently selected meter.

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8.58.6 WORK ORDER GENERATION (SEARCH AND PRINT)

To ease the job of maintenance personnel, the Work Orders are generally printed on a standard fixed format giving details and instructions on the job to be carried out. These are then handed out to the concerned maintenance personnel.

Work Order Generation allows you to select Work Orders based on certain criteria and subsequently print these in a batch.

The main window in Work Order Printing module works in a filtering manner. It provides constraints as selection criteria for the Work Orders to be printed.

Select from COSWIN menu *Maintenance / Work In Progress / WO Generation* to launch the Work Order Generation module.

The Work Order Generation window looks by default as follows:

The screenshot shows the 'Work Order Printing' window. It has a title bar with a standard Windows icon and window controls. The main area is divided into sections for inputting search criteria. At the top, there are fields for 'Date/Shift' (with a date picker set to 09/05/2002 and a text field for 15/05/2002), 'Zone' (a dropdown menu), and 'Function' (a dropdown menu). To the right of these are 'WO Start' (13241), 'Search Max' (5000), and 'Select Max' (5000). Below these fields are two tabs: 'Details' and 'More'. The 'Details' tab is selected, showing a list of filters: 'System Eqpt' (dropdown), 'Eqpt/Group Code' (dropdown), 'Eqpt Type' (dropdown with an asterisk), 'Resource' (checkbox and dropdown), 'Planner ID/Supervisor' (two dropdowns), 'Job Type/WO Type' (checkbox and dropdown with 'All' selected), 'WO Status User/System' (checkbox and dropdown), 'Job Class' (checkbox and dropdown), 'Job ID' (dropdown), and 'Priority' (checkbox and dropdown). Each dropdown menu has a small icon indicating it can be expanded.

Detailed Field Descriptions:

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Eqpt/Group Code

Enter the lower and upper limits to select work orders belonging to specific equipment (up to 16 alphanumeric characters).

A selector trigger button (or F2 key) linking to Equipment Selector is available.

Eqpt Type

Enter the type of equipment. Options available are '*' for all, 'Geographical', 'Technical'.

Resource

Enter the lower and upper limits to select work orders using the specific resources (up to 10 alphanumeric characters), if the pick list checkbox is unmarked. Otherwise, select the desired resources from the available Resources pick list.

A selector trigger button (or F2 key) linking to Resource Selector is available.

Planner ID

Enter the lower and upper limits to select work orders belonging to specific planners (up to 6 alphanumeric characters).

A selector trigger button (or F2 key) linking to Planner ID Selector is available.

Supervisor

Enter the lower and upper limits to select work orders belonging to specific supervisors (up to 6 alphanumeric characters).

A selector trigger button (or F2 key) linking to Supervisor Selector is available.

Job Type

Enter the lower and upper limits to select work orders having the specific job types (up to 6 alphanumeric characters), if the pick list checkbox is unmarked. Otherwise, select the desired job types from the available Job Types pick list.

A selector trigger button (or F2 key) linking to Job Type Selector is available.

WO Type

Select from the combo-boxes the lower and upper limits for the Work Order type (All, Planned, Unplanned, Others).

WO Status (User)

Enter the lower and upper limits to select work orders having the specific user states (one alphanumeric character), if the pick list checkbox is unmarked. Otherwise, select the desired states from the available Job Types pick list.

A selector trigger button (or F2 key) linking to Status Selector is available.

WO Status (System)

Enter lower and upper limits to select work orders having the specific system states (a number between 0 and 3).

Job Class

Enter the lower and upper limits to select work orders on jobs belonging to given classes (up to 6 alphanumeric characters), if the pick list checkbox is unmarked. Otherwise, select the desired job classes from the available Job Class pick list.

A selector trigger button (or F2 key) linking to Job Class Selector is available.

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A selector trigger button (or F2 key) linking to Plan Selector is available.


Job Request

Enter the lower and upper limits to select work orders generated on specific job requests (up to 10 alphanumeric characters).

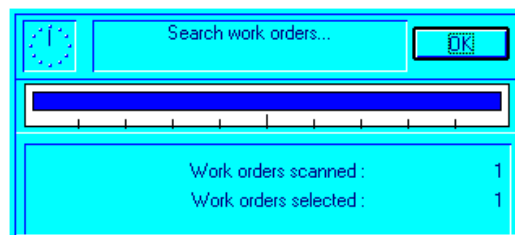
A selector trigger button (or F2 key) linking to Job Request Selector is available.


WO Cost Type

Select from the combo-boxes the lower and upper limits for the Work Order contract types (All, Internal, External).


Fill the necessary selection criteria and click on the non-standard button  to activate the searching process.

Once the search complete, the system will return the search results.



You may click on the special button  on COSWIN toolbar to display the selected WO:

WO ID	Schedule Date	WO Status	Eqpt/Group Code	Eqpt Lvl	Job ID	Pty	#	WO Type
13082	07/05/2002	0	EMU101CAR/XXXXXXXXXX	2	MJGL-001	5	0	U
13080	07/05/2002	0	EMU104CAR/XXXXXXXXXX	2	SERVICE	2	0	P
13062	07/05/2002	0	/EQPT-STD	1	OVERHAUL	5	0	U

To print the selected work orders, you may click on the  icon and select any one of the available reports to print.

NOTE: It is also possible to unselect any work order from printing by clicking onto its respective row entry on the screen.

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8.68.7 ARCHIVAL OF WORK ORDER

Archive module transfers work orders from Work-in-Progress to History. Only work orders having 3 - ARCHIVABLE status can be transferred.

During the archiving process, the following are carried out:

- ❑ Transfers archivable status Work Orders from Work In Progress to History files
- ❑ Posts Work Order costs and other details to Analysis records at annual and to-date levels
- ❑ Optionally, it updates Manpower requirements and Stock requirements for the Job definition (Job Guidelines). The system adds resources and stock items in the Job definition which are consumed on a Work Order but are not defined in the Manpower / Stock requirements for the Job
- ❑ Optionally builds minimum spares list for an equipment

The Archive module provides constraints as selection criteria for the Work Orders to be archived. Only those Work Orders with archivable status and which meet the Search Criteria can be archived.

Only the Work Orders for equipment with History flag set to **Yes** are transferred to History file. If the History flag is set to **No** and the Work Order satisfies the user defined Search Criteria, then it is deleted from Work In Progress file without being transferred to History file. The History flag for an equipment can be set using the Equipment Topographical Details module. This flag enables the user to maintain History data only for the required equipment.

The following data are transferred to History:

- Work Order basic details
- Start/Finish dates
- Cost details
- Down Time/Production Loss
- Feedback Notes
- Actions Feedback
- Resource Usage
- Stock Usage
- Employee Usage
- Defects details

Defects data, though copied to History, is still retained as part of Equipment Register details. This is done to enable Equipment-wise or Category-wise defects analysis for a user-defined period. You may finally remove defects data from Equipment Register using Batch-delete option in Defects module of Equipment Register.

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The user must set up analysis records for the appropriate period, before initiating the archiving process to accumulate maintenance statistics at various levels. Choosing Analysis Control option in the Maintenance Parameters menu can set up analysis records. However, it is not mandatory to set up analysis records.

Analysis data both at annual level and to-date level is maintained for the following entities:

- o Zone
- o Function
- o Cost Centre
- o Budget Centre
- o Equipment/Group
- o Sub Contractor

The following details are maintained at annual and to-date level, by type (internal, external), with break up for Planned, Unplanned and Other kinds of Work Orders:

- o Actual Labour Cost
- o Actual Material Cost (i.e. Material Cost - Recovery Cost)
- o Actual Miscellaneous Cost
- o Number of Work Orders
- o Down Time (in Hours)
- o Production Loss (in Hours)
- o Planned Hours
- o Actual Hours

The above analysis data is added to the respective yearly record based on Work Order finish date. Since you can have analysis records for more than one-year period, you can archive and generate accurate analysis data for Work Orders of previous financial year(s), as well as current financial year.

The following details are updated in the sub contractor record for Work Orders executed by sub contractors:

- o Number of Breakdown Jobs
- o Number of Preventive Maintenance Jobs
- o Number of Man Hours spent on Preventive Maintenance Jobs
- o Number of Man Hours spent on Breakdown Maintenance Jobs

The system maintains a count for each Job definition, which indicates the number of times the job has been carried out on the Equipment. Archiving process increments this counter as the Work Order is transferred from Work In Progress to History.

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Archiving process must be carried out at regular intervals. It is best to run archiving once five hundred to a thousand Work Orders with archival status are accumulated in Work In Progress file. This will enhance the speed of Work In Progress, Plan Jobs and Release Jobs processes. This will also ensure that data displayed by Cost displays are up to date.

If analysis data is required, ensure that analysis records are created before archiving, otherwise Work Orders will be archived to History, but analysis data will not be created.

Select from COSWIN menu *Maintenance / Work In Progress / Archive* to launch the Archive Work Order module.

The Archive Work Order window looks by default as follows:

Detailed Field Descriptions:

Date

Enter the archive start date (by default archive start date is the first date of the current financial year).

Shift

Enter lower and upper limits of the shift identifier (optional integer numeric value).

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Zone

Enter the lower and upper limits to select work orders belonging to specific zones (up to 10 alphanumeric characters), if the pick list checkbox is unmarked. Otherwise, select the desired zones from the available Zones pick list.

A selector trigger button (or F2 key) linking to Zone Selector is available.

Function

Enter the lower and upper limits to archive Work Orders belonging to a specific range of functions (up to 10 alphanumeric characters).

A selector trigger button (or F2 key) linking to Function Selector is available.

Start WO ID

Enter upper-limit of the Work Order identifier, from which the archiving process begins (a mandatory numeric integer value).

Search Max

This is the maximum number of Work Orders to be searched, a mandatory field (enter a numeric integer value, by default 5000).

Select Max

This is the maximum number of Work Orders to be archived, a mandatory field (enter a numeric integer value, by default 5000).

Under the Details tab:

System Eqpt

Enter the lower and upper limits to archive Work Orders belonging to a specific range of system equipment (up to 16 alphanumeric characters).

A selector trigger button (or F2 key) linking to Equipment Selector is available.

Eqpt/Group Code

Enter the lower and upper limits of the equipment/group identifiers whose Work Orders will be archived (up to 16 alphanumeric characters).

A selector trigger button (or F2 key) linking to Equipment Selector is available.

Eqpt Type

Enter the type of equipment. Options available are '*' for all, 'Geographical', 'Technical'.

Resource

Enter the lower and upper limits to archive Work Orders using specific resources (up to 10 alphanumeric characters), if the pick list checkbox is unmarked. Otherwise, select the desired resources from the available Resources pick list.

A selector trigger button (or F2 key) linking to Resource Selector is available.

Planner ID

Enter the lower and upper limits of the planner identifiers who generated the Work Orders (up to 6 alphanumeric characters).

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A selector trigger button (or F2 key) linking to Planner ID Selector is available.

Supervisor

Enter the lower and upper limits to archive Work Orders belonging to a specific range of supervisors (up to 6 alphanumeric characters).

A selector trigger button (or F2 key) linking to Supervisor Selector is available.

Job Type

Enter the lower and upper limits to archive Work Orders having specific job types (up to 6 alphanumeric characters), if the pick list checkbox is unmarked. Otherwise, select the desired job types from the available Job Types pick list.

A selector trigger button (or F2 key) linking to Job Type Selector is available.

WO Type

Select from the combo-boxes the lower and upper limits for the Work Order type (All, Planned, Unplanned, Others).

Job Class

Enter lexically lower and upper limits to archive Work Orders on jobs belonging to specific classes (up to 6 alphanumeric characters), if the pick list checkbox is unmarked. Otherwise, select the desired job classes from the available Job Classes pick list.

A selector trigger button (or F2 key) linking to Job Class Selector is available.

Job ID

Enter lexically lower and upper limits to archive Work Orders belonging to a specific range of Jobs (up to 16 alphanumeric characters).

A selector trigger button (or F2 key) linking to Job ID Selector is available.

Priority Code

Enter the lower and upper limits to select work orders of specific priority code (up to 10 alphanumeric characters), if the pick list checkbox is unmarked. Otherwise, select the desired states from the available Priority pick list.

A selector trigger button (or F2 key) linking to Priority Selector is available.

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Under the More tab:

Details
More
Options

From

To

Cost Centre :

Contract No :

Project Code :

Plan ID :

Job Request :

WO Cost Type :

Cost Centre

Enter the lower and upper limits to archive Work Orders belonging to a specific range of cost centres (up to 16 alphanumeric characters).

A selector trigger button (or F2 key) linking to Cost Centre Selector is available.

Contract No

Enter lower and upper limits to archive Work Orders (generated on a contract basis) belonging to a specific range of contracts (up to 10 alphanumeric characters).

A selector trigger button (or F2 key) linking to Contract Selector is available.

Project Code

Enter lexically lower and upper limits to archive Work Orders belonging to a specific range of projects (up to 10 alphanumeric characters).

Plan ID

Enter lower and upper limits to archive Work Orders generated on specific plan numbers (up to 5 numeric characters).

Job Request

Enter lower and upper limits to archive Work Orders generated on specific job requests (up to 10 alphanumeric characters).

A selector trigger button (or F2 key) linking to Job Request Selector is available.

WO Cost Type

Select from the combo-boxes the lower and upper limits for the Work Order contract types (All, Internal, External).

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Under the Options tab:

Details
More
Options

Update Manpower Requirements

Update Stock Requirements

Update Skill Requirements

Update Planned Actions

Update Facility Requirements

Build Spare List

Delete Unplanned Jobs

Delete User Requests

Delete Work Permits

Update Manpower Requirements

This check box, if checked, specifies that the Job Resources requirement will be updated for the Job from which Work Order is generated.

A resource which is not defined as part of Manpower requirements and is used while carrying out the Work Order is automatically added by the system in the Manpower requirements of the Job definition with the following values:

- Planned Hours = 0
- Start Day = 1

This feature helps in building Job Guidelines from Work Order feedback. Later, you can modify planned hours to a suitable value based on your experience.

Update Stock Requirements

This check box, if checked, specifies that the Job Stock requirements will be updated, for the Job from which Work Order is generated.

A spare item, which is not defined as part of the stock requirements and is used while carrying out the Work Order, is automatically added by the system to the Stock requirements of the Job definition with the following values:

- Planned Quantity = 0

This feature helps in building Job Guidelines from the Work Order feedback. Later, you can modify the planned quantity to a suitable value based on your experience.

Update Skills Requirements

This check box, if checked, specifies that the Skills Requirements will be updated for the actual job from which work order is generated based on employee feedback made against work order.

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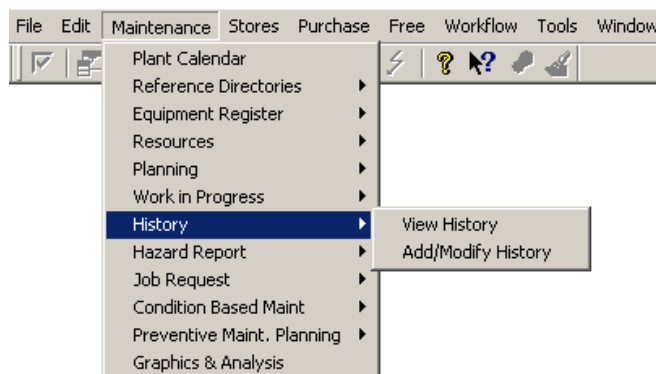
9. WORK ORDER HISTORY

A work order is created and updated with the latest information about the work performed, like the labour hours used, stock used, feedback notes, etc. The work order is passed to the archival status when the job is completed and all information about its execution are known and posted. Archival work orders are moved from the Work in Progress to the History via the archival process.

Archived work orders keep the maintenance history of equipment (the frequency of jobs, the real costs, the stock usage and the manpower usage). Data coming from work orders can be aggregated to obtain the maintenance history for a zone, function or for any other grouping criteria.

The purpose of history is to provide the user the facilities to:

- ☐ Track and consult the maintenance activities performed in the past
- ☐ Analyze the performance of the maintenance activities
- ☐ Create work orders in history



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The View History window looks by default as follows:

The screenshot shows the 'History View' window with the following fields and options:

- Lower Limit:** Date/Shift (text box), Zone (checkbox), Function (text box).
- Upper Limit:** Date/Shift (text box: 09/05/2002), Zone (text box), Function (text box).
- Start WO ID:** 13100
- Search Max:** 5000
- Select Max:** 5000
- Details/More tabs:** Details is selected.
- System Eqpt:** (text box)
- Eqpt/Group Code:** (text box)
- Eqpt Type:** (dropdown menu: x)
- Resource:** (checkbox)
- Supervisor:** (text box)
- Job Type/WO Type:** (checkbox), (dropdown menu: All), (dropdown menu: All)
- WO Status User/System:** (text box)
- Job Class:** (checkbox)
- Job ID:** (text box)
- Serial No:** (text box)
- Priority Code:** (checkbox)

Detailed Field Descriptions:

Date

Enter the History Work Order selection start date lower and upper limits, a mandatory filtering criterion.

Shift

Enter lower and upper limits of the shift identifier (an optional integer numeric value).

Zone

Enter lower and upper limits to view History Work Orders made on equipment from specific zones (up to 10 alphanumeric characters). If the check box is marked, select the desired zones from the available Zones pick list.

Function

Enter lower and upper limits to select Work Orders belonging to specific functions (up to 10 alphanumeric characters).

Start WO ID

Enter upper-limit of the Work Order identifier, from which the searching process begins (a mandatory numeric integer value).

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Search Max

This is the maximum number of Work Orders to be searched, a mandatory field (enter an integer value, by default 5000).

Select Max

This is the maximum number of Work Orders to be viewed, a mandatory field (enter an integer value, by default 5000).

System Eqpt

Enter lower and upper limits to select Work Orders belonging to specific system equipment (up to 16 alphanumeric characters).

Eqpt/Group Code

Enter lower and upper limits to select Work Orders belonging to specific equipment or groups (up to 16 alphanumeric characters).

Eqpt Type

Choose the type of equipment (Geographical or Technical) that Work Orders belong to. By default, an asterisk is proposed implying all types.

Resource

Enter lower and upper limits to select Work Orders using the specific resources (up to 10 alphanumeric characters). If the check box is marked, select the desired resources from the available Resources pick list.

Supervisor

Enter lower and upper limits of the supervisor identifiers to which Work Orders belong (up to 6 alphanumeric characters).

Job Type

Enter lower and upper limits to select Work Orders having specific job types (up to 6 alphanumeric characters). If the check box is marked, select the desired job types from the available Job Types pick list.

WO Type

Select from the combo boxes the lower and upper limits of the Work Order type. Available options are: All, Planned, Unplanned, Others.

WO Status (User/System)

Select from the combo boxes the lower and upper limits of the Work Order Status.

Job Class

Enter lower and upper limits to select Work Orders on jobs belonging to specific classes (up to 6 alphanumeric characters). If the check box is marked, select the desired job classes from the available Job Classes pick list.

Job ID

Enter lower and upper limits to select Work Orders made on specific jobs (up to 16 alphanumeric characters).

Serial No

Enter lower and upper limits of the equipment serial numbers.

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Priority Code

Enter lower and upper limits to select Work Orders belonging to specific priority codes (up to 10 alphanumeric characters). If the check box is marked, select the desired priority codes from the available Priority pick list.

Under the More Tab:

Details
More

Cost Centre :

Contract No :

Project Code :

Plan ID :

Job Request :

WO Cost Type : All

All

The More Tab provides more selection options:

Cost Centre

Enter lower and upper limits to select Work Orders having specific cost centres (up to 16 alphanumeric characters).

Contract No

Enter lower and upper limits to select Work Orders, generated on a contract basis, belonging to specific contracts (up to 10 alphanumeric characters).

Project Code

Enter lower and upper limits to select Work Orders belonging to specific projects (up to 10 alphanumeric characters).

Plan ID

Enter lower and upper limits of the Plan numbers upon which Work Orders were generated (numeric positive integer values).

Job Request

Enter lower and upper limits to select Work Orders generated on specific job requests (up to 10 alphanumeric characters).

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Facility	flag (set if the work order has used facilities)
Employee	Employees flag (set if the work order has employee feedback)
Stock	Stocks flag (set if the work order has stock usage)
Defects	Defects flag (set if the work order has defects feedback)
Feedback Text	Feedback Text flag (set if the work order has notes)
Actions	Actions flag (set if the work order has actions)
Job description	This is the identifier of the Job from which the Work Order was generated

COSWIN provides 8 ways to sort the selected History Work Orders. Click on the non-standard button and the sorting option window appears:

ID	Field name	Order
1	<div></div>	0 Ascending
2	<div></div>	0 Ascending
3	<div></div>	0 Ascending
4	<div></div>	0 Ascending
5	<div></div>	0 Ascending
6	<div></div>	0 Ascending
7	<div></div>	0 Ascending
8	<div></div>	0 Ascending

The available fields to sort on are:


- 0 – Equipment
- 1 – Finished date
- 2 – WO Number
- 3 – Zone
- 4 – Job Type
- 5 – Supervisor
- 6 – Total Cost
- 7 – Function

It is also possible to sort the field in either Ascending or Descending order using the Order field provided.

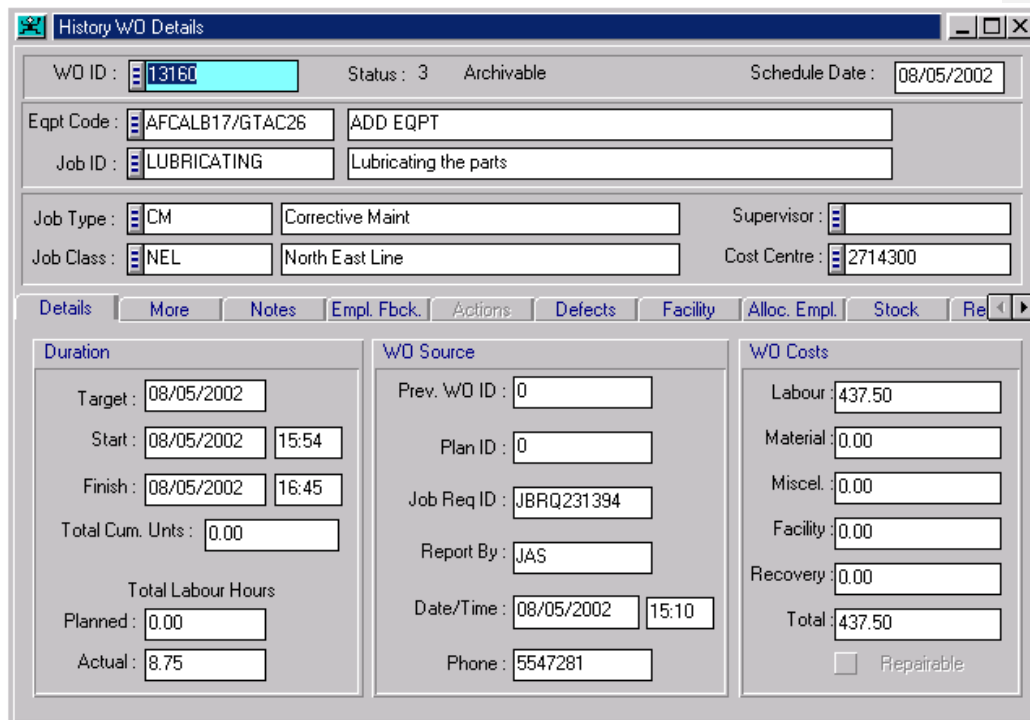
Keppel Steria Consortium (KSC)		C756
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To execute the sort, click on the non-standard  button again. Once the sort process completed, close the sort option window and the selected History Work Orders will appear in the specified sorting sequence.

Double click on any of the work orders listed in the selector and the following history detail will be displayed:



The screenshot shows the 'History WO Details' window with the following data:

History WO Details	
WO ID : 13160	Status : 3 Archivable Schedule Date : 08/05/2002
Eqpt Code : AFCALB17/GTAC26	ADD EQPT
Job ID : LUBRICATING	Lubricating the parts
Job Type : CM	Corrective Maint Supervisor :
Job Class : NEL	North East Line Cost Centre : 2714300
<div> <div>Details</div> <div>More</div> <div>Notes</div> <div>Empl. Fbck.</div> <div>Actions</div> <div>Defects</div> <div>Facility</div> <div>Alloc. Empl.</div> <div>Stock</div> <div>Re</div> </div>	
Duration Target : 08/05/2002 Start : 08/05/2002 15:54 Finish : 08/05/2002 16:45 Total Cum. Units : 0.00 Total Labour Hours Planned : 0.00 Actual : 8.75	WO Source Prev. WO ID : 0 Plan ID : 0 Job Req ID : JBRQ231394 Report By : JAS Date/Time : 08/05/2002 15:10 Phone : 5547281
WO Costs Labour : 437.50 Material : 0.00 Miscel. : 0.00 Facility : 0.00 Recovery : 0.00 Total : 437.50 <input type="checkbox"/> Repairable	

NOTE:

In the History WO Details, the disabled tabs implied that no feedback data is provided in those tabs.

Detailed Field Descriptions:

WO ID

This is the Work Order identifier, a positive unique integer value. This is a read-only field automatically managed by the system.

You can select the Work Order ID from the History Selector by pressing **F2** key or the selector button.

Status

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This is the Status of the Work Order, which is always a user status for the archival system status.

Schedule Date

This is the date for which the work order was scheduled to start.

Eqpt Code

This is the equipment identifier, for which the Work Order was generated.

You can select the Equipment from the Equipment Selector by pressing **F2** key or the selector button.

Equipment Description

This is the description of the Equipment / Group for which the work order was created.

Job ID

The identifier of the job carried out on the equipment.

You can select the Job from the Equipment Jobs Selector by pressing **F2** key or the selector button.

Pressing **F7** key or the mouse right button activates the Job Guidelines Details for the current code.

Job Description

This is the description of the equipment job.

Job Type

This is the Work Order's Job Type identifier.

You can select the Job Type from the Job Types Selector by pressing **F2** key or the selector button.

Job Type Description

This is the job type's long description.

Supervisor

This is the identifier of the supervisor of the current Work Order.

You can select the Supervisor from the Supervisor Selector by pressing **F2** key or the selector button.

Pressing **F7** key or the mouse right button activates the Supervisor Details for the current code.

Job Class

This is the code of the class in which the job was classified.

You can select the Job Class from the Job Classes Selector by pressing **F2** key or the selector button.

Job Class Description

This is the job class description.

Cost Centre

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This is the identifier of the Cost Centre to which the cost incurred on the Work Order was posted.

You can select the Cost Centre from the Maintenance Cost Centre Selector by pressing **F2** key or the selector button.

Pressing **F7** key or the mouse right button activates the Maintenance Cost Centre Details for the current code.

Under Details Tab:

Target Date

This is the target finish date of the work.

Start Date

This is the start date of the work for the work order.

Start Time

This is the time at which the work order was started.

Finish Date

This is the finish date of the work order.

Finish Time

This is the finish time of the work order.

Total Cumulative Units

This field represents the cumulative units of the meter of the Work Order at the end of execution (only if Work Order's job has a meter defined).

Planned Hours

This field represents the number of hours planned to be worked for this Work Order.

Actual Hours

This field represents the actual worked hours for this Work Order.

Previous WO ID

This is the previous Work Order identifier, an optional positive numeric integer value.

Plan ID

This is the plan number from where the Work Order comes, if the Work Order was generated from a plan. See Plan Jobs Module.

Job Request ID

This is the job request number, only for the Work Orders generated from a job request. See Planner Review Module.

Report By

This is the name of the person who reported the Work Order.

Report Date

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This is the date of the Work Order reporting.

Report Time

This is the time of the Work Order reporting.

Report Phone

This is the phone number from where the Work Order was reported.

Labour Cost

This field specifies the total manpower cost (labour cost) incurred against the WO.

Material Cost

This is the total material cost incurred against the Work Order.

Miscellaneous Cost

This field specifies miscellaneous costs that may have been incurred against the Work Order.

Facility Cost

This is the total facility cost incurred against the Work Order.

Recovery Cost

This field specifies any costs recovered as adjustments (recovery costs).

Total Cost

This field specifies the total Work Order costs, using the following formula:

Total Cost = Labour Cost + Material Cost + Miscellaneous Cost - Recovery Cost

Repairable

This check box, if checked, specifies that this Work Order is a repairable work order for repair LRU.

Under More Tab:

The More Tab of View History WO Details window looks by default as follows:

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Details	More	Notes	Empl. Fbck.	Actions	Defects	Facility	Alloc. Empl.	Stock	Re
Work Permit : <input type="text" value="WP00000277"/> Meter ID : <input type="text"/> Reading : <input type="text" value="0.00"/> <input type="text"/> Down Time : <input type="text" value="0.00"/> Production Loss : <input type="text" value="0.00"/> WO Type : <input type="text" value="U Unplanned"/>		Contract No : <input type="text"/> Cost Type : <input type="text" value="Internal"/> Project Code : <input type="text"/> Eqpt Phone : <input type="text"/> Eqpt Location : <input type="text" value="TEST_ISCS_SGK"/> Entity Request : <input type="text"/> Action : <input type="text"/> Eqpt Serial No : <input type="text"/> New Serial No : <input type="text"/> Zone : <input type="text" value="NEL"/> Function : <input type="text" value="AFC/TICKET"/>							

Detailed Field Descriptions:

Work Permit

This is the identifier of the work permit that has been issued for this Work Order.

Meter ID

This is the identifier of the meter for the Work Order Job.

Reading

This is the meter reading at the end of the Work Order (only if the job is based on a cumulative meter).

Down Time

This is the downtime (in hours) of the equipment because of this Work Order.

Production Loss

Number of hours the production has stopped because of this Work Order.

WO Type

This is the Work Order's type, i.e. the way in which Work Order was created: "planned", "unplanned" or "other".

Contract No

Specifies the contract code if a sub-contractor executed the job.

You can select the Contract from the Contract Selector by pressing **F2** key or the selector button.

Cost Type

Specify the type of the Work Order Cost, i.e. internal or external.

Project Code

Specify the project code if the job was part of a project.

Eqpt Phone

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Details	More	Notes	Empl. Fbck.	Actions	Defects	Facility	Alloc. Empl.	Stock	Re
Employee No	Employee Name	Resource	Actual Hrs	From Date	To Date	Shift ID	Cost Centre		
110422	Esmadee Bin Ismail	SIG-TO	3.000	03/04/2002	03/04/2002	0	2713300		

History Employee List Box

Employee No	This is the identifier of the employee
Employee Name	This is the employee's name
Resource	This is the identifier of the employee's skill
Actual Hours	Indicates the number of hours worked by the employee
From Date	This is the date when the employee's activity, for the Work Order, started
To Date	This is the date when the employee's activity, for the Work Order, ended
Shift ID	This is the shift identifier in which the employee executed his/her Work Order activity
Cost Centre	Current employee's cost centre

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Under Actions Tab:

The Actions Tab of View History WO Details window looks by default as follows:

Details	More	Notes	Empl. Fbck.	Actions	Defects	Facility	Alloc. Empl.	Stock	Re
Seq No	Equipment Code	Element	Action	Action Description	Status	Basic Duration	Date		
1	ELEBGK01/BC01		CLN01	Cleaning Job 1	0	2.000	20-08-2001		

Detailed Field Descriptions:

History Actions List Box

Seq No	This is the sequence number of the Action in the Work Order's list of Actions
Eqpt Code	This is the identifier of the equipment for which the Action was generated
Element	This is the identifier of the sub-equipment's subdivision for which the Action is generated
Action	This is the identifier of the Action
Action Description	This is the description of the Action
Status	This is the execution status of the action: 0-not realised, 1-terminated ok, 2-error fixed, 3-error not fixed
Duration	This is the duration of the Action
Date	This is the action start date
WO Generated	This is the identifier of the Work Order made in order to correct or complete the undone activity of this Action (possibly, along with other Actions too)
Eqpt Status	This is the description of the status in which the equipment is, during the Action's execution upon the equipment
Operation Type	This is the description of a manual identifier, which in turn, explains how to complete such an Action kind
Device	This is the description of the device with which the Action is to be executed
Limit 1	The first restrictive value defined for the action
Unit 1	This is the measurement unit for the first restrictive value
Limit 2	The second restrictive value defined for the action
Unit 2	This is the measurement unit for the second restrictive value
Planned	This flag specifies if the Action was planned from Job

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This is the duration of the Action, a positive, not null, numeric value.

Element

This is the description of the specific element in the equipment upon which the Action activates.

Date

This is the Action's start date.

Generated WO

This is the identifier of the Work Order generated to correct or complete the current Action, if current Action's status is "error-fixed" or "error-not fixed".

Operation Type

This is the description of a manual identifier, which in turn explains how to complete such an Action on the equipment.

Device

This is the description of the device with which the Action is to be executed.

Equipment Status

This is the description of the status in which the equipment is, during the Action's execution upon the equipment.

Limit 1

During Action's execution, there can be certain parameters that must restrict to certain values. For an Action there can be defined 2 such restrictive values.

This is the first restrictive value.

Unit 1

This is the measurement unit for the first restrictive value.

Limit 2

This is the second restrictive value.

Unit 2

This is the measurement unit for the second restrictive value.

Action Notes

This window can be accessed from History Actions Details pressing the Notes Tabs.

The interface consists of the drawing layout, which can contents write text and / or pictures, drawings, spreadsheets and any other form of OLE information.

History Action Employee Feedback

This tab page can be accessed from History Actions Details pressing the Employee Feedback tab button.

Action Employee Feedback List Box

Actual Hours Indicates the number of hours worked by the employee on the action

Employee This is the identifier of the employee

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Is

More

Notes

Empl. Fbck.

Actions

Defects

Facility

Alloc. Empl.

Stock

Resource

◀

▶

Symptom :

NOISY

Noisy

Defect :

RBELT

Rusty Belt

Cause :

wNT

Wear and Tear

Action :

REPL

Replacement

Duration :

0.00

Date :

20-08-2001

Time :

13:13

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Employee Name	This is the name (description) of the allocated employee
Planned Hours	This is the number of hours planned for allocation
Rejection	This specify if the allocated employee was rejected due to lack of skills 0 – Accepted 1 – Rejected 2 – Rejection Cancelled
WP	This specify if the work permit request was raised or not for the allocated employee 0 – Not raised 1 – Raised
Date	This is the date when allocation was performed
Planned	This specify if the allocation was manual or automatic 0 – Manual 1 – Automatic

Under Stock Tab:

The Stock Tab of View History WO Details window looks by default as follows:

Details	More	Notes	Empl. Fbck.	Actions	Defects	Facility	Alloc. Empl.	Stock	Re
Global	Details	By Action							
Item Code	Stock/Non-Stock	Description	Planned Qty	Issued Qty	UOM	Cost	Action		
DEPEQT/ELE/11/20	0	Buzzer, AC 230V	10.00	0.00	PIECE	0.00	0		

Stock Selection Criteria

This radio button specifies that the list of items in the list box, is seen as:

Global	The Work Order's list of items; each item appears once in the list, regardless of the fact that the item is actually allocated for the Work Order itself or distributed on Work Order Action	Default selection if the list is opened from History Work Order Details, and current Work Order has no actions
Details	The Work Order's list of items, where items can appear more than once, depending on their allocation: globally for Work	Default selection if the list is opened from History Work Order Details, and current Work Order has actions

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	needed (if the Job extends on more than one day)
Remaining Hours	The hours planned but not worked
Labour Actual Cost	The actual cost of the labour
Last Date Worked	The date of the last employee feedback for this resource on the Work Order
Sequence No	If resource is allocated for a Work Order's Action, this field specifies the sequence number of the Action in the Work Order's list of Actions; otherwise is null
Total Planned Hours	This is the total number of planned hours for this kind of resource (only in global mode)

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9.2 CREATE/MODIFY HISTORY RECORD

Path: Maintenance / History / Add/Modify History

Using this module, the user can add new (earlier) Work Orders to the history module or modify the feedback notes and add defects feedback on existing History Work Orders. The work order number will be generated by the system.

The work order can be added with minimum inputs to the system. Choice lists have been provided at every stage of input. A work order can be created for an Equipment / Group which has already been defined using Topographical / Grouping modules from Equipment Register.

The Work Order can be made on an existing job definition for the Equipment / Group. This job should have been defined through Job Guidelines.

Select from COSWIN menu *Maintenance / History / Add/Modify History* to launch the Add/Modify History module.

The Add/Modify History Details window looks by default as follows:

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Add History Details			
WO ID : <input type="text" value="63"/>	Status : 3	Archivable	Schedule Date : <input type="text" value="19/03/2002"/>
Eqpt Code : <input type="text" value="EQPT-REP"/>	Desc <input type="text"/>		
Job ID : <input type="text" value="UPLN000044"/>	Repair damaged sn <input type="text"/>		
Job Type : <input type="text" value="CM"/>	Corrective Maint <input type="text"/>	Supervisor : <input type="text"/>	
Job Class : <input type="text" value="NEL"/>	North East Line <input type="text"/>	Cost Centre: <input type="text" value="2714300"/>	
<div> <div>Details</div> <div>More</div> <div>Notes</div> <div>Defects</div> </div>			
Duration Target : <input type="text" value="19/03/2002"/> Start : <input type="text" value="22/03/2002"/> <input type="text" value="16:44"/> Finish : <input type="text" value="22/03/2002"/> <input type="text" value="17:44"/> Total Cum. Units : <input type="text" value="0.00"/> Total Labour Hours Planned : <input type="text" value="0.00"/> Actual : <input type="text" value="0.00"/>		WO Source Plan ID : <input type="text" value="0"/> Job Request : <input type="text"/> Report By : <input type="text"/> Date/Time : <input type="text" value="19/03/2002"/> <input type="text" value="09:37"/> Phone : <input type="text"/>	
		WO Costs Labour : <input type="text" value="0.00"/> Material : <input type="text" value="0.00"/> Miscel : <input type="text" value="0.00"/> Facility : <input type="text" value="0.00"/> Recovery : <input type="text" value="0.00"/> Total : <input type="text" value="0.00"/>	

Detailed Field Descriptions:

WO ID

This is the Work Order identifier, a positive unique integer value (up to 8 numeric characters). This is a read-only field automatically managed by the system.

In ADD mode, it is automatically generated by the system.

Schedule Date

This is the date for which the work order was scheduled, a mandatory information.

If it is left blank, the system proposes by default the current date value.

Eqpt Code

Indicate the Equipment / Group code for which the work order is to be created, a mandatory. The code must exist in the Equipment Register.

A selector trigger button (or F2 key) linking to Equipment Selector is available.

Equipment Description

This is the description of the equipment on which the Work Order was performed, a read-only field automatically managed by the system.

Job ID

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Phone

If the requirement for this work order was intimated by phone, you may specify the phone number. This is an optional information, which can take up to 13 alphanumeric characters.

Labour Cost

This field specifies the total manpower cost (labour cost) incurred against the WO. It is a read-only positive numeric value automatically managed by the system, on the basis of Employee Time Feedback.

The formula used to compute the value is:

$$CCLH + \sum_E (FR_E + \sum_A (H_A * R_A))$$

Where:

- CCLH is the cost of contracted labour hours
- FR is the fixed rate of the employee E
- H is the number of hours worked by employee E to perform the activity A
- R is the rate under which employee E performed the activity A

Material Cost

This is the total material cost incurred against the Work Order. It is a read-only positive numeric value automatically managed by the system, on the basis of Stock usage and Issues against the Work Order.

The formula used to compute the value is:

$$CM + \sum_S (QTY_S * UP_S)$$

Where:

- CM is the cost of materials provided by the sub-contractor
- QTY is the quantity used (issued) of the spare S
- UP is the unit price of the spare S

Miscellaneous Costs

This field specifies miscellaneous costs that may have been incurred against the Work Order. It is a positive numeric value, a read-only information automatically managed by the system.

Recovery Cost

This field specifies any costs as adjustments (recovery costs). It is a positive numeric value, a read-only field automatically managed by the system. For example, if a replaced component has some value as it can be repaired and reused, then certain costs of the component can be specified as recovery.

Total Cost

This field specifies the total Work Order costs. It is a read-only information automatically managed by the system, using the following formula:

Total Cost = Labour Cost + Material Cost + Miscellaneous Cost - Recovery Cost

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This radio button specifies the selection criteria for the Work Order job contract (for Work Orders made based on a contract):

- Directory Wise** Select among all job contracts
- Equipment Wise** Select among equipment's job contracts

Contract

Specify the contract code if the job is executed by a sub-contractor. It is an optional information and must exist in the directory of Contracts.
A selector trigger button (or F2 key) linking to Contracts Selector is available.

Cost Type

This combo box specifies the type of the Work Order Cost, i.e. internal or external. By default, the type of the Work Order Cost is the one established in Job Guidelines for the equipment job.

Project

Specify the project code if the job was part of a project. This is an optional information, which can take up to 10 characters.

Equipment Phone

This is the equipment nearest phone, a read-only information automatically managed by the system.

Request Authority

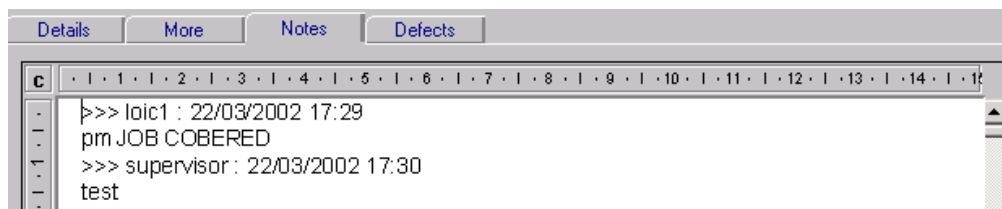
This is the company entity that is requesting the job, an optional information. The provided value of authority must exist in the directory of Company Entities.
A selector trigger button (or F2 key) linking to Company Entities Selector is available.

Action Authority

This is the company entity that is supposed to perform the work, an optional information. The provided value of authority must exist in the directory of Company Entities.
A selector trigger button (or F2 key) linking to Company Entities Selector is available.

Add History Details - Notes Tab

The Notes Tab of Add History Details window looks by default as follows:




This tab specifies any feedback notes pertaining to the work being done on the equipment.
The interface consists of the drawing layout, where the user can write text and / or append pictures, drawings, spreadsheets and any other form of OLE information.

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- o Schedule Date
- o Equipment
- o Job ID
- o Finish Date

Click on the  icon to launch the ADD window.

9.2.2 To Modify a History Work Order

Only the Notes and the Defects of a History Work Order can be modified.

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10. REPAIRABLE EQUIPMENT MANAGEMENT

Repairable Management refers to the breakdown maintenance of the repairable equipment. Repairable equipment is defined as the equipment that has an equivalent stocked item (of repairable type). Repair on such equipment will be a replacement of the entire faulty equipment with its equivalent stocked item from the store.

Tracking of Repairable Equipment by Serial Numbers

Serial numbers are attached to repairable equipment and equivalent repairable stocked items in order to keep track of these maintenance operations. The most recent serial number identifies the current instance of repairable equipment used in production. The past serial numbers reflect the history of the repairable equipment.

Only the replacement date of the most recent serial number can be modified (it represents the date when the repairable equipment start its production activity).

Breakdown Maintenance Process on Repairable Equipment

The breakdown maintenance of the repairable equipment s performed in two steps:

First, the broken equipment (identified by a specific serial number) is replaced with an available one from the stock and the production may be resumed.

Then, the broken equipment is actually repaired (if possible).

The system provides a special mechanism to manage the specific maintenance process of repairable equipment through a pair of work orders:

- The first work order is raised to repair the damaged (sub)equipment. Subsequently, a stock issue of the equipment's equivalent stock item to the work order will trigger a replacement of the damaged equipment with a good one issued. This is to avoid the malfunctioning of the parent equipment.
- The second work order is raised from the first work order, to perform the repairing activity for the damaged (sub)equipment. Its job has always behaviour 0 - JUST IN TIME (breakdown maintenance).

This facility is also applicable for non-repairable equipment (any work order that needs additional work to be performed after can be the source of generating another work order), though there will not be serial numbers associated to the equipment to track its movements.

The repairable equipment serial numbers implied in the maintenance activities are recorded on the repairable work orders. Each work order made for a repairable equipment stores the following two serial numbers:

- Old serial number - the equipment serial number valid at the work order's creation
- New serial number - the serial number of the stocked item issued from the store to replace the one with defects

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When the second work order made against a repairable equipment (the one which performs the repairing job) is progressed into archival state, the user must supply:

- The value of the stocked item
- The status for the repairable item, which at this point can be "available" or "garbage"

Stock Management on the Repairable Stock Items

A stocked item of type 2-REPAIRABLE corresponds to an repairable equipment. Each location of repairable stocked item stores the following additional information:

- A serial number
- A status with the following possible values:
 - 0 – AVAILABLE
 - 1 – TO REPAIR
 - 2 – UNDER REPAIR
 - 3 – GARBAGE

The available quantity in the repairable stocked item is always either 0 or 1.

A new serial number is recorded on the equipment

When a repairable stocked item is issued against a repair work order for a repairable equipment, the serial number reference of the stocked item issued will be recorded as the new serial number of the equipment, and the issue date as the replacement date. The existing attributes of the repairable equipment will also be replaced with the attributes of the stocked item. Only the corresponding attributes will be replaced. If an attribute exists for the stocked item, but does not exist for the repairable equipment, the attribute will be added to the repairable equipment.

A receipt of the damaged equipment (under its equivalent stock item code) back to store will be automatically created by the system following the stock issue for a repair work order. The Delivery Reference Number generated will have a 6 digits serial number instead of the usual 7-digits and the supplier of this receipt record is the company code defined in the COSWIN Configuration's Store / Company parameter. The damaged item will be received into the same location used for the issue. The serial number of the location will be the serial number of the damaged equipment.

The following table presents the maintenance flow for repairable equipment.

	Activity	Results
1	Raise a job request for damaged repairable equipment.	<u>Job request created.</u>
2	Release work order to move damaged repairable equipment to repair yard.	<u>The work order c</u> captures the serial number of damaged equipment.

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10.1 MAINTENANCE GRAPHICS AND ANALYSIS

COSWIN provides a set of analysis reports under the module Maintenance Graphics and Analysis.

In these reports, selection criteria are provided to choose the information upon which analysis is to be done and reported. Analysis can be done upon Zone, Function, Cost Centre, Equipment, Budget, Contract or Subcontract.

The module consists of the following types of reports:

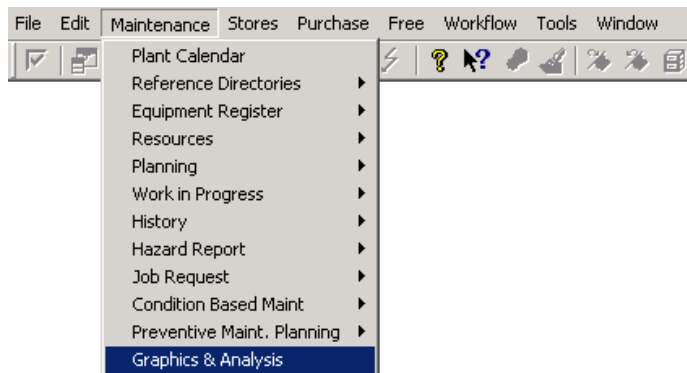
1. **Analysis Reports** - Various Cost Analysis will be reported
2. **Defect/Employee Time Analysis** - Equipment defects and employee time analysis will be reported
3. **Depreciation Report** - Equipment depreciation information will be reported
4. **Plan Jobs Reports** - Plan Jobs information will be reported
5. **CBM Reports** - Measurement activity will be reported
6. **Performance Analysis Graphics** - Maintenance activity will be reported
7. **Budget versus Actual Graphics** - Budget costs information will be reported
8. **Resource Availability** - Resource availability information will be displayed
9. **Resource Req. Vs. Wrench** - Resource time allocation will be displayed
10. **Others** - Other reports may be created and/or linked

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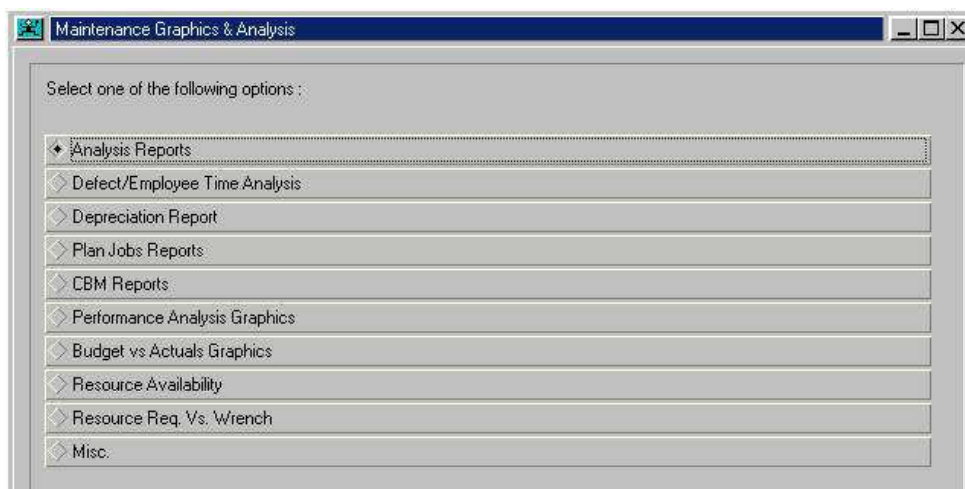
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Select from COSWIN menu *Maintenance / Graphics & Analysis* to launch the Maintenance Graphics and Analysis module.



The Maintenance Graphics & Analysis window looks by default as follows:



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10.2 ANALYSIS REPORTS

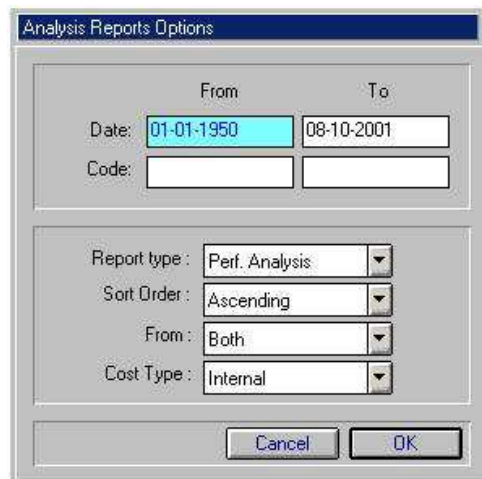
These reports may use data from history work orders and/or work in progress, and generate:

- ❑ Calculation of maintenance costs, down time, production loss, number of work orders, planned and actual hours. The costs may be calculated in "planned, unplanned and other" wise or in "resource, material and miscellaneous" wise.
- ❑ Comparison of costs, production loss and down time by zone, function, cost centre, category, job type, job class or contract.

The following are the detailed reports available under the Analysis Reports type:

ANAL1CI.REP	Resource-Material-Miscellaneous Cost Analysis by Job Class
ANAL1CO.REP	Resource-Material-Miscellaneous Cost Analysis by Contract
ANAL1E.REP	Resource-Material-Miscellaneous Cost Analysis by Equipment
ANAL1FA.REP	Resource-Material-Miscellaneous Cost Analysis by Category
ANAL1FO.REP	Resource-Material-Miscellaneous Cost Analysis by Function
ANAL1SY.REP	Resource-Material-Miscellaneous Cost Analysis by System
ANAL1TI.REP	Resource-Material-Miscellaneous Cost Analysis by Job Type

The Analysis Reports Options window, activated by clicking on the  button, looks by default as follows:



Detailed Field Descriptions:

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Date

Enter lower and upper limits of the dates between which costs analysis is to be reported.

Code

Enter lower and upper limits of the identifiers of the zone, function, cost centre, category, job type, job class or contract for which analysis report is to be done (up to 10 alphanumeric characters).

Report type

This combo box specifies the type of information to be generated in the report. It must be one of the followings:

- ☐ *Performance Analysis* - the report will include calculation of maintenance costs, number of Work Orders, planned and actual worked hours
- ☐ *Planned/Unplanned/Other* - the report will include calculation of maintenance costs for Planned, Unplanned and Other maintenance activity
- ☐ *Res./Mat./Miscellaneous* - the report will include calculation of maintenance costs for Resources, Materials and miscellaneous costs
- ☐ *Operation* - the report will include calculation of maintenance costs, down time and production loss

Sort Order

This information specifies the order in which the zone, function, cost centre, category, job type, job class or contract identifiers' information will be reported. It must be one of the followings:

- ☐ Ascending order
- ☐ Descending order

Data from

This information specifies the source of the costs information. It must be one of the followings:

- ☐ WIP - work in progress cost information will be reported
- ☐ History - history cost information will be reported
- ☐ Both - the sum of the costs from both work in progress and history, will be reported

Cost Type

This information specifies the type of the costs to be reported. It must be one of the followings:

- ☐ Internal costs
- ☐ External costs
- ☐ Total costs

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10.3 DEFECT/EMPLOYEE TIME ANALYSIS REPORTS

Employee Time Analysis

This is the computation of work order labour costs using number of hours worked and the applicable hourly rates. It also generates the standard hours required of each trade for a specific job. This is useful in manpower planning for future jobs

Defect Analysis

This is the computation of defect costs calculated from the cost of work order.


Finding the main causes/symptoms of equipment failure as well as most frequent defects and the corrective actions taken

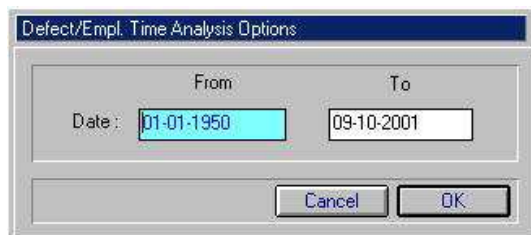
Calculation of the Mean Time Between Failures for an equipment as well as the equipment category.

The following are the detailed reports available under the Defect/Employee Time Analysis type:

ANALCAU.REP	Cause Analysis (Options: Defects)
ANALDEF.REP	Defect Analysis (Options: Defects)
ANALEMP.REP	Analysis of Hour Worked by Employee from WIP (Options: Employee Time)
ANALREM.REP	Action Analysis (Options: Defects)
ANALSYP.REP	Symptom Analysis (Options: Defects)

The Defect/Employee Time Analysis Options window, activated by clicking on the

 button, looks by default as follows:



Detailed Field Descriptions:

Date

Enter lower and upper limits of the defects / employees creation or last updating Date between which the analysis is to be done.

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10.4 DEPRECIATION REPORTS

Equipment depreciation information can be entered through the depreciation module in the equipment register. This information is useful in making decision regarding maintenance related issues:

- ❑ Replacement decisions
- ❑ Calculation of net equipment value after depreciation

The following are the detailed reports available under the Depreciation Report type:

MDEP-01.REP	Equipment Depreciation by Cost Centre
MDEP-02.REP	Equipment Depreciation by Entity

The Depreciation Reports Options window, activated by clicking on the button, looks by default as follows:

Options...

Detailed Field Descriptions:

Zone

Enter lower and upper limits of the identifiers of the Zones, between which Equipment depreciation information is to be printed (up to 6 alphanumeric characters).

Cost Centre

Enter lower and upper limits of the identifiers of the Cost Centres, between which Equipment depreciation information is to be printed (up to 10 alphanumeric characters).

Category

Enter lower and upper limits of the identifiers of the Categories, between which Equipment depreciation information is to be printed (up to 6 alphanumeric characters).

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Equipment level

Enter lower and upper limits of the levels of the Equipment between which depreciation information is to be printed (a positive integer information 0...99).

Equipment code

Enter lower and upper limits of the identifiers of Equipment between which depreciation information is to be printed up to 16 alphanumeric characters.

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10.5 PLAN JOBS REPORTS

The following reports can be generated:

- ☐ Report for a period
- ☐ Missed jobs report
- ☐ Overdue jobs report
- ☐ Backlog jobs report

Each of these reports gives a list of planned jobs along with either Manpower or Stock required to carry out the job.

For planned jobs reports with Manpower requirements a summary report can be generated. This summary shows zone-wise Manpower requirements for each of the trades (resources). It also generates a summary giving the Manpower requirements for all the planned jobs listed in the report.


Similarly, for planned job reports with Stock requirements a summary report can be generated. This report shows the Stock requirements for all the planned jobs listed in the report.

The reports can be generated in one of the following sort orders:

- ☐ Zone-wise, Equipment-wise and Job-wise
- ☐ Zone-wise, Equipment-wise and Date-wise
- ☐ Zone-wise, Date-wise and Equipment-wise

The following are the detailed reports available under the Plan Jobs Report type:

PLANRES.REP	Planned Jobs – Resources
PLANSTK.REP	Planned Jobs – Stock

The Plan Job Reports Options window, activated by clicking on the  button, looks by default as follows:

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Detailed Field Descriptions:

Period

Enter lower and upper limits of the Plan Jobs' creation or last updating date, between which the Plan jobs are selected for the report. COSWIN automatically proposes 01/01/1950 as lower limit and the current date as upper limit.

Zone

Enter lower and upper limits of the identifiers of the Zones, between which Equipment's Plan Jobs are selected for the report (up to 6 alphanumeric characters).

System Equipment

Enter lower and upper limits of the identifiers of the Equipment instances whose Plan Jobs are selected for the report (up to 16 alphanumeric characters).

Times missed

Enter lower and upper limits of the number of times the Plan Jobs were missed, during the planning operation, for the Plan Jobs to be printed (reported). These are optional positive integer information.

Overdue days

Enter lower and upper limits of the time intervals, in days, between Plan Job's planned date (the ideal date when the Job is to be executed) and the Plan Job's actual execution date (the date when the Job is to be actually executed), for the Plan Jobs to be selected for the report. These are optional positive integer information.

Release Flag

This information specifies what kind of Plan Jobs should be selected, from their release flag point of view (the release flag specifies whether a Plan Job may be released or not). It is a mandatory information, and it must be one of the followings:

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- "Y" only (only Plan Jobs that can be released)
- "N" only (only Plan Jobs that cannot be released)
- All

Plan Type

This information specifies the type of Plan Jobs to be selected, for the report. It is a mandatory information, and it must be one of the followings:

- Theoretical
- Practical
- Both

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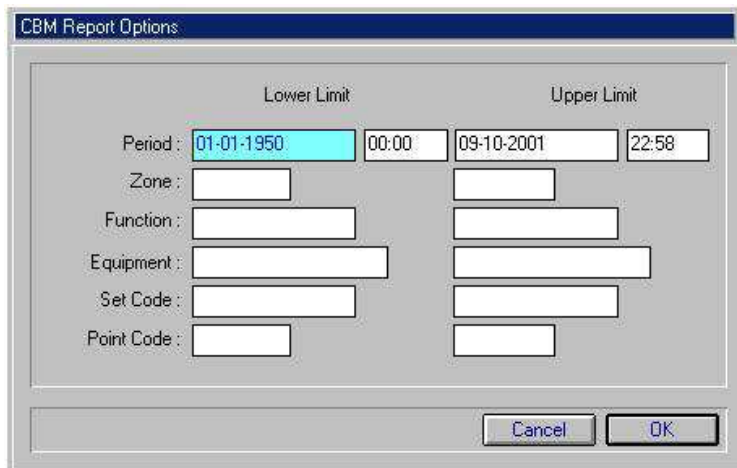
10.6 CONDITION BASED MAINTENANCE (CBM) REPORTS

This report provides a list of planned jobs indicating job due and jobs with missing readings.

The following are the detailed reports available under the CBM Report type:

LSTMCUNI.REP	Measurement Sets List
LSTNORM.REP	CBM Norms List
LSTMESEQ.REP	Equipment Measurement Set
LSTFBPMD.REP	Equipment Measurement Feedback

The CBM Reports Options window, activated by clicking on the  button, looks by default as follows:



Detailed Field Descriptions:

Period

Enter lower and upper limits of the dates between which measurement activity is to be reported.

Time

Enter lower and upper limits of the specific time between which measurement activity is to be reported.

Zone

Enter lower and upper limits of the identifiers of the Zones, between which measurement activity is to be reported (up to 6 alphanumeric characters).

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Function

Enter lower and upper limits of the identifiers of the Functions, between which measurement activity is to be reported (up to 10 alphanumeric characters).

Equipment

Enter lower and upper limits of the identifiers of the Equipment, for which measurement activity is to be reported (up to 16 alphanumeric characters).

Set Code

Enter lower and upper limits of the identifiers of the measurement point Sets, between which measurement activity is to be reported (up to 10 alphanumeric characters).

Point Code

Enter lower and upper limits of the identifiers of the measurement points, between which measurement activity is to be reported (up to 6 alphanumeric characters).

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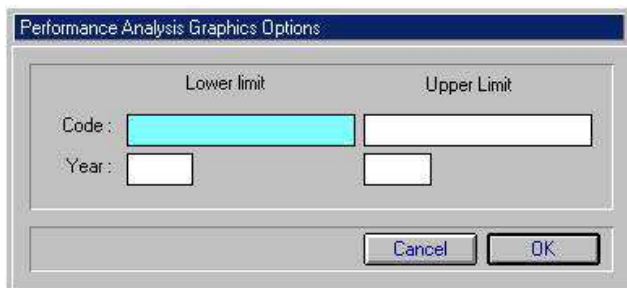
10.7 PERFORMANCE ANALYSIS GRAPHICS REPORTS

The following are the detailed reports available under the Performance Analysis Report type:

GRMENCCC.REP	Graph of Monthly Cost for a Cost Centre
GRMENCCL.REP	Graph of Monthly Cost for a Job Class
GRMENCCO.REP	Graph of Monthly Cost for a Contract
GRMENCEQ.REP	Graph of Monthly Cost for an Equipment
GRMENCFA.REP	Graph of Monthly Cost for a Category
GRMENCFO.REP	Graph of Monthly Cost for a Function
GRMENCPR.REP	Graph of Monthly Cost for a Project
GRMENCSY.REP	Graph of Monthly Cost for a System
GRMENCTY.REP	Graph of Monthly Cost for a Job Type
GRMENCZO.REP	Graph of Monthly Cost for a Zone
GRMENHCC.REP	Graph of Monthly Worked Hours for a Cost Centre
GRMENHCL.REP	Graph of Monthly Worked Hours for a Job Class
GRMENHCO.REP	Graph of Monthly Worked Hours for a Contract
GRMENHEQ.REP	Graph of Monthly Worked Hours for an Equipment
GRMENHFA.REP	Graph of Monthly Worked Hours for a Category
GRMENHFO.REP	Graph of Monthly Worked Hours for a Function
GRMENHPR.REP	Graph of Monthly Worked Hours for a Project
GRMENHSY.REP	Graph of Monthly Worked Hours for a System
GRMENHTY.REP	Graph of Monthly Worked Hours for a Job Type
GRMENHZO.REP	Graph of Monthly Worked Hours for a Zone

The Performance Analysis Reports Options window, activated by clicking on the

 button, looks by default as follows:



The dialog box titled "Performance Analysis Graphics Options" contains two columns: "Lower limit" and "Upper Limit". Under "Lower limit", there are input fields for "Code" (highlighted in cyan) and "Year". Under "Upper Limit", there is an input field for "Code". At the bottom right, there are "Cancel" and "OK" buttons.

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Detailed Field Descriptions:

Code

Enter lower and upper limits of the identifiers of Zone, Function, Cost Centre, Equipment, Budget, Contract or Subcontract, between which the report is generated (up to 17 alphanumeric characters).

Year

Enter lower and upper limits of the dates between which the report's information is being collected.


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Reference: <u>756/PMP/8029e/A756/PMP/8029e/A756/PMP/8029e/A756/PMP/8029e/-</u> KSC Version: <u>2.12-12-12-0</u>	MAINTENANCE MANAGEMENT SYSTEM <u>COSWIN WORKCOSWIN WORK</u>	Page: 374 Date: <u>21 August 200221 August 200221 August 200221 August 2002</u> <u>20023 June 2002</u>

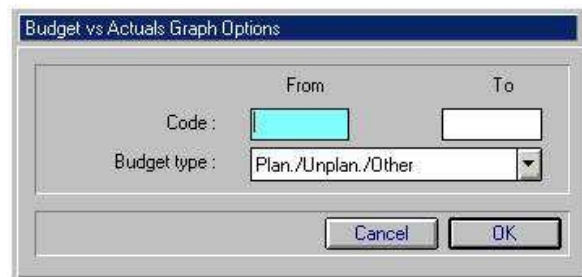
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10.8 BUDGET VERSUS ACTUAL REPORTS

The following are the detailed reports available under the Budget versus Actual Report type:

The Budget versus Actual Reports Options window, activated by clicking on the  button, looks by default as follows:



Detailed Field Descriptions:

Budget Centre

Enter lower and upper limits of the identifiers of the Budget Centres, between which the report is generated (up to 6 alphanumeric characters).

Budget type

This information specifies the Budget Centre targets, for which the report is generated. It is a mandatory information, and it must be one of the followings:

- "Planned / Unplanned / Other" - the report will contain information concerning the Planned, Unplanned and Other Budget Centres
- "Resources/Materials/Miscellaneous" - the report will contain information concerning the Resource's, Materials' and miscellaneous Budget Centres

Keppel Steria Consortium (KSC)		C756
Reference: <u>756/PMP/8029e/A756/PMP/8029e/A756/PMP/8029e/A756/PMP/8029e/-</u> KSC Version: <u>2.12.12.12.0</u>	MAINTENANCE MANAGEMENT SYSTEM <u>COSWIN WORKCOSWIN WORK</u>	Page: 375 Date: <u>21 August 200221 August 200221 August 200221 August 20023 June 2002</u>

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10.9 RESOURCE AVAILABILITY REPORTS

Resource Availability Chart

The purpose of this window is to display a chart containing the resource availability for a specified Resource during a specified period of time. The window is opened by pressing Graphic button from Graphical Resource Availability window.

Chart Layout

This is the graph layout. On the abscise, the time units, for which resource availability is considered, are specified; the ordinate displays the number of hours, for which different resource availability information is considered. The following information concerning the Resource availability is displayed, depending on the selection made in Graphical Resource Availability:

- Wrench hours (red)
- Work in Progress hours (green)
- Free hours (blue)
- Planned hours (yellow)
- Total hours (magenta)

The following are the detailed reports available under the Resource Availability Report type:

The Resource Availability Reports Options window, activated by clicking on the



button, looks by default as follows:

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Detailed Field Descriptions:

X-Axis

This radio-button specifies the information displayed on the abscise of the Resource availability chart.

- Time** The resource availability information is displayed for each period during a specified interval
- Resource** The resource availability information is displayed for each Resource

Period Code

This radio-button specifies the time units, depending on which the resource availability information is displayed.

- Day** The time unit is one day (the resource availability is displayed for each day, beginning from the specified date)
- Week** The time unit is one week (the resource availability is displayed for each week, beginning from the specified date)

Resource

This is the identifier of the Resource, for which the availability information is displayed, an optional information that can take up to 6 alphanumeric characters. It must exist in the database and it must be unique.

You can select the Resource from the Resource selector by pressing **F2** key or the selector button.

Start Date

This is the date beginning from which the availability information is displayed, an optional information, automatically proposed as the current date.

Display Assigned Load Plan Hours

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This information specifies whether the duration of the work assigned to the Resource is to be displayed or not, for the specified Resource and for the specified period of time.

Display Total Load Plan Hours

This information specifies whether the duration of the total work of the Resource is to be displayed or not, for the specified Resource and for the specified period of time.

Display Wrench Hours

This information specifies whether the duration of the already worked period is to be displayed or not, for the specified Resource and for the specified period of time.

Display WIP Hours

This information specifies whether the duration of the work in progress is to be displayed or not, for the specified Resource and for the specified period of time.

Display Free Hours

This information specifies whether the duration of the free time is to be displayed or not, for the specified Resource and for the specified period of time.

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Reference: <u>756/PMP/8029e/A756/PMP/8029e/A756/PMP/8029e/A756/PMP/8029e/-</u> KSC Version: <u>2.12-12-12-0</u>	MAINTENANCE MANAGEMENT SYSTEM <u>COSWIN WORKCOSWIN WORK</u>	Page: 378 Date: <u>21 August 200221 August 200221 August 200221 August 20023 June 2002</u>

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10.10 RESOURCE REQUIREMENT VERSUS WRENCH HOURS REPORTS

Resource Requirement versus Wrench Hours Chart

The purpose of this window is to display the Resources' time allocation. The window is opened by pressing Chart button from Resource Requirement versus Wrench Hours window.


Chart Layout

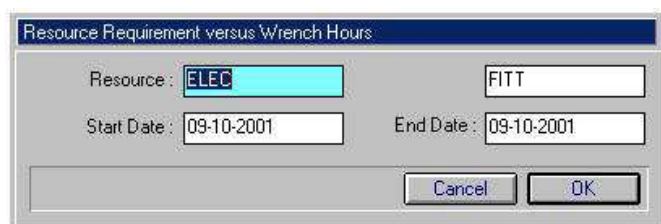
This is the Resources' time allocation chart.

Display Grid

This information specifies the form of the displayed chart: with or without a grid.

The following are the detailed reports available under the Resource Requirement versus Wrench Hours Report type:

The Resource Requirement versus Wrench Hours Reports Options window, activated by clicking on the  button, looks by default as follows:



Detailed Field Descriptions:

Resource

Enter lexically lower-limit of the Resource identifiers, for which the report should be generated, an optional information that can take up to 6 alphanumeric characters.

You can select the Resource from the Resource selector by pressing **F2** key or the selector button.

Date

Keppel Steria Consortium (KSC)		C756
Reference: <u>756/PMP/8029e/A756/PMP/8029e/A756/PMP/8029e/A756/PMP/8029e/-</u> KSC Version: <u>2.12.12.12.0</u>	MAINTENANCE MANAGEMENT SYSTEM <u>COSWIN WORKCOSWIN WORK</u>	Page: 379 Date: <u>21 August 200221 August 200221 August 200223 June 2002</u>

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Enter lower and upper limits of the creation or last updating dates of Resources, between which they are scanned.

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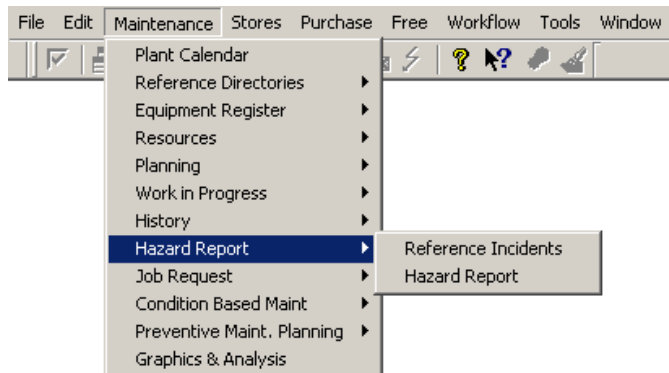
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11. HAZARD MONITORING

The Hazard Monitoring module is used to record the observed incident / accident / safety that occurred on an equipment, as well as their effects, list of recommended actions and followed-up actions.

System also provides configuration module to define the various incident reference codes used in hazard report.



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Incident Causes Details display the following information:

- **Code** – incident cause reference code, a mandatory information of maximum 10 alphanumeric characters. It must be unique among the incident causes.
- **Description** – incident cause short description, a mandatory information of maximum 40 alphanumeric characters.

11.1.1.1 To Add a New Incident Cause

Click on the  icon to launch the ADD window.

Minimum information to add a new Incident cause is

- Code and Description

11.1.1.2 To Modify an Incident Cause

The information that can be modified, is:

- Incident Causes Description

11.1.1.3 To Delete an Incident Cause

The reference incident cause cannot be deleted if it is in use by a hazard report.

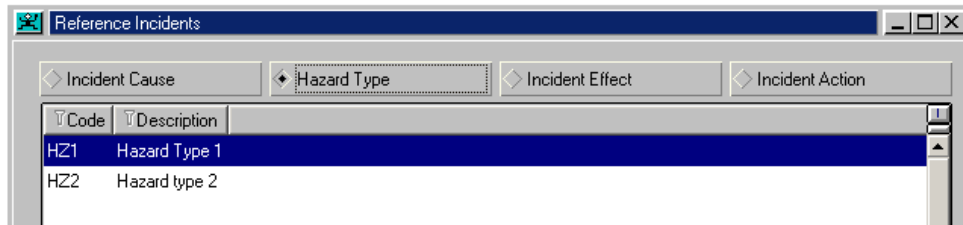
11.1.2 Define Hazard Type

The Reference Hazard Type window looks by default as follows:

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Reference: <u>756/PMP/8029e/A756/PMP/8029e/A756/PMP/8029e/A756/PMP/8029e/-</u> KSC Version: <u>2.12.12.12.0</u>	MAINTENANCE MANAGEMENT SYSTEM <u>COSWIN WORKCOSWIN WORK</u>	Page: 383 Date: <u>21 August 200221 August 200221 August 200221 August 2002</u> <u>20023 June 2002</u>

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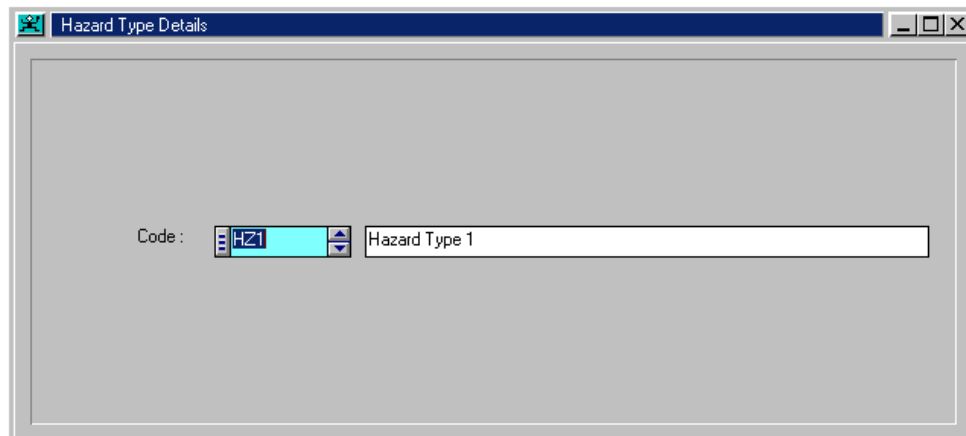
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Hazard Types List Box contains the following columns:

- **Code** is the hazard type reference code
- **Description** is the hazard type short description


Double click on any of the Hazard types displayed in the list box will activate the **Hazard Type Detail** window for the selected code:



Hazard Types Details display the following information:

- **Code** – hazard type reference code, a mandatory information of maximum 10 alphanumeric characters. The code shall be unique among the hazard types.
- **Description** – hazard type short description, a mandatory information of maximum 40 alphanumeric characters.

11.1.2.1 To Add a New Hazard Type

Click on the  icon to launch the ADD window.

Minimum information to add a new Hazard Type is

- Code and Description

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Incident Actions Details display the following information:

- **Code** – action reference code, a mandatory information of maximum 10 alphanumeric characters. It must be unique among the incident actions.
- **Description** – action short description, a mandatory information of maximum 40 alphanumeric characters.
- **Priority** – action default priority code, a mandatory information. It must be an existing priority codes already defined in the database.

11.1.4.1 To Add a New Incident Action

Click on the  icon to launch the ADD window.

Minimum information to add a new Incident Action is

- o Code, Description and Priority

11.1.4.2 To Modify an Incident Action

The information that can be modified, is:

- o Incident Action Description and Priority

11.1.4.3 To Delete an Incident Action

The reference incident action cannot be deleted if a recommended action of a hazard report is based on the incident action.

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11.2 HAZARD REPORTS

The module is used to manage, i.e., create, update and delete the hazard reports, their effects, recommended actions and follow-up. Each hazard report is made for one equipment and stores all the information about the observed incident / accident / safety.

It also keeps the list of recommended actions and follow-up actions.

The hazard report is defined by the following information:

- Auto-generated code and code of equipment on which the incident / accident / safety was observed
- The authority under which the observed equipment is
- Date, location and cause of the incident
- Date and type of hazard report and the date when the report was closed
- Code, name, phone number of person that made the report
- Status of hazard report with the following values: 0 - RAISED, 1 - IN PROGRESS, 2 - CLOSED
- A list of recommended actions to be taken; each action being defined by the action code, the action priority and actioning party (which is a company entity).
- A list of follow-up actions, each of them being defined by the code of either a job request, a work order or a purchase order, the start and finish date of the follow-up action, the status of the follow-up action with the following values: 0 - RAISED, 1 - IN PROGRESS, 2 - CLOSED and the duration of the follow-up action
- A list of reported incident effects, each of them storing the size of the effect. A hazard may have several effects like casualties, injuries, deaths, and damages. Each of these effects has a size (stored as a numerical value); the size measures the effect (it can be persons in case of injuries or deaths, tracks, wagons, signals, etc in case of damages).

When any follow-up action is created its status is 0-RAISED. This corresponds to the following status of the corresponding follow-up transaction:

- Follow-up job request with status 0-USER REQUEST
- Follow-up job work order with system status 0-NOT STARTED, 6-NOT AUTHORIZED
- Follow-up job purchase order with status 0-CREATED

When the follow-up action starts its status is 1-IN PROGRESS. This corresponds to:

- Job request with status 1-PLANNER REVIEWED, 2-READY TO RELEASE
- Work order with system status 1-IN PROGRESS, 2-COMPLETED
- Purchase order with status 1-PARTIALLY RECEIVED

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Code

This is the code of hazard report, a mandatory information of maximum 10 alphanumeric character. It must be unique among the hazard reports.

A selector trigger button (or F2 key) linking to Hazard Report Selector is available.

Status

This is the status of the hazard report, a mandatory information with the following possible values: 0-RAISED, 1-IN PROGRESS, 2-CLOSED.

Close Date

This is the date when the hazard report was closed, manually or automatically. It is a read-only information automatically managed by the system.

Eqpt/Group Code

This is the equipment / group of equipment on which the incident / accident or safety action was observed. The equipment can be either geographical or technical. It is a mandatory information and must exist in the directory of Equipment or Group of Equipment.

A selector trigger button (or F2 key) linking to Equipment Selector is available.

Authority

The equipment of the hazard report is placed under this authority. It is a read-only mandatory information automatically managed by the system.

Type

This is the hazard type, a mandatory information. It must exist in the directory of Hazard Types.

A selector trigger button (or F2 key) linking to Hazard Type Selector is available.

Right-mouse click (or F7 key) will activate the Hazard Type Detail window for the current code.

Cause

This is the cause that led to the reported incident, a mandatory information. It must exist in the directory of Incident Causes.

A selector trigger button (or F2 key) linking to Incident Cause Selector is available.

Cause Description

This is the description of the cause that led to the reported incident, a read-only information automatically managed by the system.

Incident Date

This is the date when the incident / accident / safety action took place.

Incident Time

This is the time when the incident / accident / safety action took place.

Location

This is the location where the reported incident / accident / safety action took place, a mandatory information. System will propose the location of the specified equipment as default.

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11.2.6 Hazard Effect Details

The Hazard Effect Details window looks by default as follows:

Detailed Field Descriptions:

Code

This is the code of the effect, a mandatory information. It must exist in the directory of Hazard Effects and must be unique among the hazard effects of a report.

Description

This is the short description of the effect, a read-only information automatically managed by the system.

Size

This is the size of the effect, a mandatory numerical value.

Measures

This is how the effect is being measured in, a read-only information automatically managed by the system.

11.2.6.1 To Add a New Hazard Effect

Minimum information to add a new hazard effect to a hazard report is:

- Code
- Size

Hazard effects cannot be added to closed hazard reports.

At the Hazard Effect tab, click on the  icon to launch the ADD window.

11.2.6.2 To Modify a Hazard Effect

The only information that can be modified, is:

- Size

Hazard effects cannot be modified on closed hazard reports.


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11.2.6.3 To Delete a Hazard Effect

No restriction exists to delete a hazard effect from a hazard report as long as the report has not been closed.

At the Hazard Effect tab, click on the  icon to delete the current effect.

11.2.7 Recommended Action Details

The Recommended Action Details window looks by default as follows:

Prev. Meas.
Follow Up
Hazard Effect
Rec. Action

Action Code : DESC

Priority Code : Urgent

Actioning Entity : Architectural Building Maint. (Depot)

Detailed Field Descriptions:

Action Code

This is the code of the action to be taken, a mandatory information. It must exist in the directory of Incident Actions and must be unique among the recommended actions of a report.

A selector trigger button (or F2 key) linking to Incident Action Selector is available.

Right-mouse click (or F7 key) will activate the Incident Action Details window for the current code.

Description

This is the short description of the action to be taken, a read-only information automatically managed by the system.

Priority Code

This is the priority code of the action to be taken, a mandatory information. It must exist in the directory of Priorities.

A selector trigger button (or F2 key) linking to Priority Selector is available.

Right-mouse click (or F7 key) will activate the Priority Details window for the current code.

Priority Description

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This is the short description of the priority of the action, a read-only information automatically managed by the system.

Actioning Entity

This is the authority that has to perform the action, a mandatory information. It must exist in the directory of Company Entities.

A selector trigger button (or F2 key) linking to Company Entity Selector is available.

Right-mouse click (or F7 key) will activate the Company Entity Details window for the current code.

Actioning Entity Description

This is the description of the actioning entity, a read-only information automatically managed by the system.


11.2.7.1 To Add a New Recommended Action

Minimum information to add a new recommended action to a hazard report is:

- Code
- Priority
- Actioning Party

When choosing the code of the recommended action the system will propose the priority code of the incident action as the priority of the recommended action.

Recommended actions cannot be added to closed hazard reports.

At the Recommended Action tab, click on the  icon to launch the ADD window.

11.2.7.2 To Modify a Recommended Action


The information that can be modified, is:

- Priority
- Actioning Party

Recommended actions cannot be modified on closed hazard reports.

11.2.7.3 To Delete a Recommended Action

No restriction exists to delete a recommended action from a hazard report as long as the report has not been closed.

At the Recommended Action tab, click on the  icon to delete the current action.

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12. PERMIT TO WORK

This module is used to manually raise requests for work permits, to approve the requests for work permit raised automatically from different modules (Topographical Details, Work Order Details, and Planning), to delete just raised or closed work permits, to modify the details (validity interval) of the work permits, to add individual employee to the work permits raised and to approve individually the employees' work permit raised automatically from different modules and manually from this module.

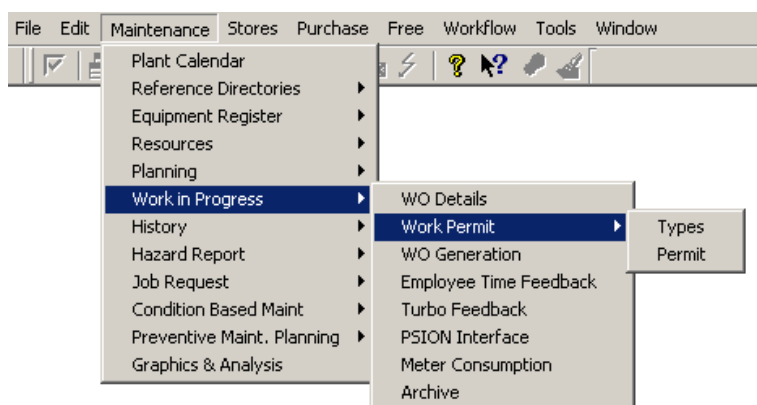
The work permits are always linked to work orders and they cover the work order interval, from schedule date to estimated finish date (schedule date added the work order duration).

A request for work permit is raised when the following conditions are met:

- The work order equipment or equipment job requires work permit presence
- The work order is released
- Employees have been allocated to the work order

The work permit can be granted globally or individually to employee grouped in the work permit. Therefore, the following assertions are always true:

- All individual status are JUST RAISED when the global status is JUST RAISED
- The global status is NOT APPROVED when at least one individual status is NOT APPROVED
- The global status is APPROVED when all individual status are APPROVED
- The global status is CLOSED when all individual status are CLOSED



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12.1 DEFINE WORK PERMIT TYPE

This module is used to manage the different types of work permits (PTW). Work permits types are associated with the equipment (default work permit type to be considered for the work order) and with the equipment job (specific work permit type).

The equipment PTW type is proposed by default as equipment job PTW type when creating an equipment job. The equipment job PTW type may be different from the equipment PTW type. The type of the work permit raised for a work order is taken from the work order equipment job.

Select from COSWIN menu *Maintenance / Work In Progress / Work Permit / Types* to launch the Work Permit Type Details module.

The Work Permit Type Details window looks by default as follows:

Detailed Field Descriptions:

Code

This is the reference code of the work permit type, a mandatory information of maximum 10 alphanumeric characters. The work permit type must be unique among all the work permit types in the database.

Description

This is the technical description of the work permit type, an optional information of maximum 40 alphanumeric characters.

Remarks

This OLE multi-line enables the user to provide supplementary information about the work permit type. The interface consists of the drawing layout, where the user can write text and / or append pictures, drawings, spreadsheets and any other form of OLE information.

Indications tab

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12.1.4 Work Permit Type's Indication Details

The Work Permit Type Indication Details looks by default as follows:


Remarks
Indication


Description :

Detailed Field Descriptions:

Description

This is the description of the indication, a mandatory information of maximum 100 alphanumeric characters.

To add a New Indication, select the indication tab and click on the  icon.

Indications can be modified or deleted without restriction. Click on the  icon to delete the currently selected Indication.

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12.2 DEFINE WORK PERMIT

This module is used for

- ☐ Raising requests for work permits manually.
- ☐ Approving the requests for work permit raised automatically from different modules (Topographical Details, Work Order Details, and Planning).
- ☐ Deleting just raised or closed work permits.
- ☐ Modifying the details (validity interval) of the work permits,
- ☐ Adding individual employee to the work permits raised and
- ☐ Approving individually the employees' work permit raised automatically from different modules and manually from this module.

The work permits are always linked to work orders and they cover the work order interval from schedule date to the estimated finish date (schedule date added the work order duration).

Select from COSWIN menu *Maintenance / Work In Progress / Work Permit / Permit* to launch the Work Permit Details module.

The Work Permit Details window looks by default as follows:

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Reference: 756/PMP/8029e/A756/PMP/8029e/A756/PMP/8029e/A756/PMP/8029e/- KSC Version: 2.12-12-12-0	MAINTENANCE MANAGEMENT SYSTEM COSWIN WORKCOSWIN WORK	Page: 404 Date: 21 August 200221 August 200221 August 20023 June 2002

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This is the description of the work order job, a read only information automatically managed by the system.

Start Date, End Date

These dates represent the beginning and ending dates of the work permit validity interval. They are automatically computed by the system as work order schedule date and work order schedule date delayed with work order duration.

Type

This is the type of work permit requested, a mandatory information. It must exist in the directory of work permit types.

A selector trigger button (or F2 key) linking to Work Permit Type Selector is available.

Right-mouse click (or F7 key) will activate the Work Permit Type Details window for the current code.

Request Date

This is the date when the request for work permit was raised. It is read-only information automatically updated with the system date when new work permits are requested.

Close Date

This is the date when the work permit was closed. It is a read-only information automatically updated with the system date when work permits passed to closed status.

Details tab:

Request Date

This is the date when the request for work permit was raised. It is read-only information automatically updated with the system date when new work permits are requested.

Closed Date

This is the date when the work permit was closed. It is a read-only information automatically updated with the system date when work permits passed to closed status.

Job Request

This is the job request of the work order for which the work permit is raised. It is a read-only information automatically managed by the system.

Plan

This is the plan number of the work order for which the work permit is raised. It is a read only information automatically managed by the system.

Granter

This is the identifier of the person who approved the work permit, a read-only information automatically managed by the system.

Authority

This is the authority to which the work permit is raised. It is actually the authority under which the work order equipment belong to. It is a read only information automatically managed by the system.

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Requester

This is the identifier of the person who requested the work permit, a read-only information automatically managed by the system. It is the planner identifier for specific work permits raised based on a plan or job request, or the user name for work permits raised with Work Permit module.

Requester Authority

This is the authority of the requester. It is a read only information automatically managed by the system. It is the authority under which the requester is placed.

Employee tab:

This tab displays the list of employees requesting for permit to work under a work permit.

The Employee tab of Work Permit Details window looks by default as follows:

Details		Employee						
Employee No	Request Date	Status	Cancelled	Start Date	End Date	Close Date	Granter	Requester
110296	02/03/2002	1	0	06/03/2002	06/03/2002		supervisor	SD
110270	02/03/2002	2	0	06/03/2002	06/03/2002		supervisor	supervis
110422	02/03/2002	2	0	06/03/2002	06/03/2002		supervisor	supervis

Double click on any of the displayed employees details will activate the Work Permit Employee Details window.

Employee List Box

Employee No	This is the identifier of the employee for whom the work permit is raised and granted.
Request Date	This the date when the request for the work permit was raised.
Status	This is the individual work permit status: 0 – Just raised, 1 – Not Approved, 2 – Approved, 3 – Closed
Cancelled flag	This flag denotes if the permit for the employee has been cancelled.
Start Date	This is the beginning of the work permit validity interval.
End Date	This is the end of the work permit validity interval.
Close Date	This is the date when the individual work permit was closed.
Granter	This is the identifier of the person who approved the work permit.
Requester	This is the identifier of the person who requested the work permit.

12.2.1 To Raise a New Work Permit

The following conditions must be met when raising a request for Work Permit:

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- The work order equipment or equipment job requires work permit (with work permit type defined)
- The work order is released into Work In Progress
- Employees are allocated to the work order

Minimum information to add a new work permit to the database is:

- Code
- Start Date
- End Date
- Work order identifier

Work permits are always created with status 0 – Just Raised.

Click on the  icon to launch the ADD window.

12.2.2 To Modify a Work Permit

The only information that can be modified, is:

- Work permit status
- Work permit validity interval

The status cannot be changed from 3 – Close to 2 – Approved or 0 – Just Raised. No modification of validity interval is allowed for closed work permits.

Click on the  icon to save the modification made.

12.2.3 To Delete a Work Permit

Work permits cannot be deleted if they are of 2 - Approved status and their validity interval is not finished. Just raised and closed work permits can be deleted.

Click on the  icon to delete the current work permit.

12.2.4 Work Permit's Employee Details

This module specifies the details on an employee requesting for permit to work.

The Work Permit Employee Details looks by default as follows:

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Details
Employee

☐ Cancelled

Employee No : 110296
Status : 1. Not approved

Start Date : 06/03/2002
Granter : supervisor

End Date : 06/03/2002
Requester : SD

Request Date : 02/03/2002
Close Date :

Detailed Field Descriptions:

Employee No

This is the identifier of the employee for whom the work permit is raised and granted. It is a mandatory information and must exist in the directory of Employees. It is unique among the work permit requested.

A selector trigger button (or F2 key) linking to Employee Selector is available.

Right-mouse click (or F7 key) will activate the Employee Details window for the current code.

Status

This is the identifier of the individual work permit status, a mandatory information. The possible values are 0 – Just raised, 1 – Not Approved, 2 – Approved, 3 – Closed.

Start Date, End Date

These dates represent the beginning and ending dates of the work permit validity interval. They are automatically computed by the system as work order schedule date and work order schedule date delayed with work order duration.

Granter

This is the identifier of the person who approved the work permit, a mandatory read-only information automatically managed by the system.

Requester

This is the identifier of the person who requested the work permit, a mandatory read-only information automatically managed by the system. It is the planner identifier for specific work permits raised based on a plan or job request or the user name for work permits raised with Work Permit module.

Request Date

This is the date when the request for individual work permit was raised. It is a mandatory read-only information automatically initialised with the system date when new individual work permits are requested.

Close Date

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12.3 INTERNET PTW – TO BE COMPLETED

Detailed Field Descriptions:

Code

This is the reference code of the work permit, mandatory information. It must be unique among all the permits in the database.

Type

This is the type of work permit requested, a mandatory information. It must exist in the directory of work permit types.

The Work Permit type description is also displayed.

Description

This is the description of the work permit type. It is read only information automatically managed by the system.

WO ID

This is the identifier of the work order for which the work permit is raised and granted. The work order identifier is accessible only in ADD mode. It must be an existing Work Order identifier in the database.

Job Description

This is the description of the work order job, a read only information automatically managed by the system.

Status

This is the identifier of the work permit status, a read only information automatically managed by the system. The possible values are 0 – Just raised, 1 – Not Approved, 2 – Approved, 3 – Closed.

Authority

This is the authority to which the work permit is raised. It is actually the authority under which the work order equipment is placed. It is a read only information automatically managed by the system.

Authority Description

This is the description of the authority of the Work Permit. It is read only information automatically managed by the system.

Plan

This is the plan number of the work order for which the work permit is raised. It is a read only information automatically managed by the system.

Job Request

This is the job request of the work order for which the work permit is raised. It is a read-only information automatically managed by the system.

Requester

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This is the identifier of the person who requested the work permit, a read-only information automatically managed by the system. It is the planner identifier for specific work permits raised based on a plan or job request, or the user name for work permits raised with Work Permit module.

Requester Authority

This is the authority of the requester. It is a read only information automatically managed by the system. It is the authority under which the requester is placed.

Granter

This is the identifier of the person who approved the work permit, a read-only information automatically managed by the system.

Start Date, End Date

These dates represent the beginning and ending dates of the work permit validity interval. They are automatically computed by the system as work order schedule date and work order schedule date delayed with work order duration.

Request Date

This is the date when the request for work permit was raised. It is read-only information automatically updated with the system date when new work permits are requested.

Close Date

This is the date when the work permit was closed. It is a read-only information automatically updated with the system date when work permits passed to closed status.

Employee tab:

This tab displays the list of employees requesting for permit to work under a work permit.

The Employee tab of Work Permit Details window looks by default as follows:

Details Employee								
Employee No	Request Date	Status	Cancelled	Start Date	End Date	Close Date	Granter	Requ
110296	02/03/2002	1	0	06/03/2002	06/03/2002		supervisor	SD
110270	02/03/2002	2	0	06/03/2002	06/03/2002		supervisor	supervis
110422	02/03/2002	2	0	06/03/2002	06/03/2002		supervisor	supervis

Double click on any of the displayed employees details will activate the Work Permit Employee Details window.

Employee List Box

<u>Employee No</u>	<u>This is the identifier of the employee for whom the work permit is raised and granted.</u>
<u>Name</u>	<u>This is the description of the employee</u>
<u>Status</u>	<u>This is the individual work permit status:</u> <u>0 – Just raised, 1 – Not Approved, 2 – Approved, 3 – Closed</u>
<u>Requester</u>	<u>This is the identifier of the person who requested the work</u>

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	<u>permit.</u>
<u>Grantor</u>	<u>This is the identifier of the person who approved the work permit.</u>
<u>Start Date</u>	<u>This is the beginning of the work permit validity interval.</u>
<u>End Date</u>	<u>This is the end of the work permit validity interval.</u>
<u>Request Date</u>	<u>This the date when the request for the work permit was raised.</u>
<u>Close Date</u>	<u>This is the date when the individual work permit was closed.</u>
<u>Cancelled flag</u>	<u>This flag denotes if the permit for the employee has been cancelled.</u>

An apache web server for Windows 2000 will be required to be running in the Administration Terminal.

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12.3.1 To Raise a New Work Permit

COSWIN shall allow adding of unlimited Work Permits.

Minimum information to add a new work permit to the database is:

- Code
- Start Date
- End Date
- Work order identifier

Selection facility will be available for:

- Work Order
- Work Permit type

Work permits are always created with status 0 – Just Raised. The work order should have the employee already allocated

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13. END OF DOCUMENT

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