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WITH FOCUS ON SYSTEM EFFICIENCY

OPUS10 VERSION 7 UPGRADE INFORMATION

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This document briefly describes the new features in OPUS10 version 7. The first section describes the model improvements while the second section describes the OPUS10 program improvements. In the third section all new and modified input and result fields are listed. Bugs that have been corrected are listed in the last section.

OPUS10 Model improvements

Preventive maintenance together with lateral support

It is now possible to model preventive maintenance (PM) together with lateral support group. The calculation will take the regularity in the demand from PM item replacements into account. This will result in an improvement of MoE compared to the case when all demand comes from corrective maintenance. A similar technique as for ordinary stock positions is used where the total pipe line distribution is based on a mix of a random component from corrective maintenance and a regular component (Bernoulli distribution) coming from PM.

Optimization against ROS

There is now an option to optimize against risk of shortage, ROS. The default optimization target is still NBO, Expected Number of Backorder, which is also the recommended choice. Optimization of NBO is equivalent to optimization against WT and MDT and in most scenarios also equivalent to optimization against A (availability). Optimization against ROS will in general prioritize local stock in favour of central stock when compared to the standard NBO optimisation. Trade-offs between cheap/expensive items and between high/low demand items will also be somewhat different. ROS optimization is activated in a new field OPROS in the input table **ControlParameters**. Due to technical reasons the ROS optimisation will always start from the average pipe line (NRSC). This means that high values on ROS for any item are never considered in the optimisation.

Additional initial stock

There is now a new stock parameter AINST, Additional Initial Stock Size, for discardable items that shows any additional initial purchase recommended. AINST is based on two different modelling features:

1. A higher reorder price compared to the initial price can be specified using REOPF > 1. That means it will be cost-effective to purchase a certain amount of items up front. This has to be balanced against the risk that less items than expected are actually needed during the life cycle.
2. An initial period can be specified in IPBRO. Any additional items above STSIZ needed to cover that period are stored in AINST.

AINST is calculated as the max value over the two.

AINST replaces the earlier stock parameter APCOM. Like APCOM it has an impact only on cost and not on MoE. The cost of AINST is considered as an investment and included in the cost parameter CID rather than CND.

Initial period calculations for discardable items

The model for initial period calculation for discardable items has been modified. In the new model the initial period specified in IPBRO will affect only the initial stock, that is, the new stock parameter AINST. Furthermore there is a new input

field, IPCFL, Initial Period Confidence Level, that specifies the confidence for the initial stock to cover the initial period.

Partial replenishment

It is now possible to freeze the stock level at certain stock positions in replenishment problems. A new column, AREPL, Allow Replenishment, has been added to the input tables StockExist and Item. Possible values are Y(yes) and N(no), and by setting AREPL=N no more items are allowed at that stock position or for that item. The default value per item is AREPL=Y which means that replenishment is allowed. The default value in StockExist is the value for the corresponding item.

Improvements in problemtype LORA

LORA can now be combined with other problem types than INITIAL. LORA-XT is no longer specified as a problem type. Instead a new input field, **LORA-XT**, has been added to **ControlParameters** to specify that the calculation shall be performed as LORA.

Any problem type can be combined with LORA. The most suitable types are INITIAL, REALLOC and REALLOC-REPLEN. ANALYSIS and REPLENISHMENT are less suitable since those problem types specify stock levels at certain locations which considerably restricts the LORA optimisation.

Another important improvement is the possibility to get results per resource and per resource and station. There are two new report tables, **Volumes_Resource** and **Volumnes_ResourceStation**, available in the report generator. The results show cost parameters and also average number of resources in use.

Multiple item replacements in PM tasks

The model for preventive maintenance, PM, has been improved regarding batched replacements (PMRQ > 1). The batch size, PMRQ, is now explicitly handled in the MoE calculation which will result in slightly higher NBO compared to the previous model. A consequence of this, however, is that it is no longer possible to mix different values on PMRQ for the same item. Note that in corrective maintenance the same item is still assumed to be handled one-by-one.

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Miscellaneous

- Annual down time is now calculated and available in a result column ADT. It is calculated simply as 8760*(1-A). ADT is calculated primarily per system position. Aggregated values are calculated per station, per system and as a total overall value. The total overall value is available also in the result window.

- The reorder safety stock is now calculated and available in a new result column SAFES. It is calculated as STSIZ – ROSIZ – DRT*LEADT and is available only per reorder position.

- A new input field LINDX has been added to the Station table. LINDX is used together with LEVL to control the layout of the organisation plot. While LEVL specifies the vertical order (level), LINDX is used to control the horizontal order within each level. LINDX is entered as an integer number.

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OPUS10 Program improvements

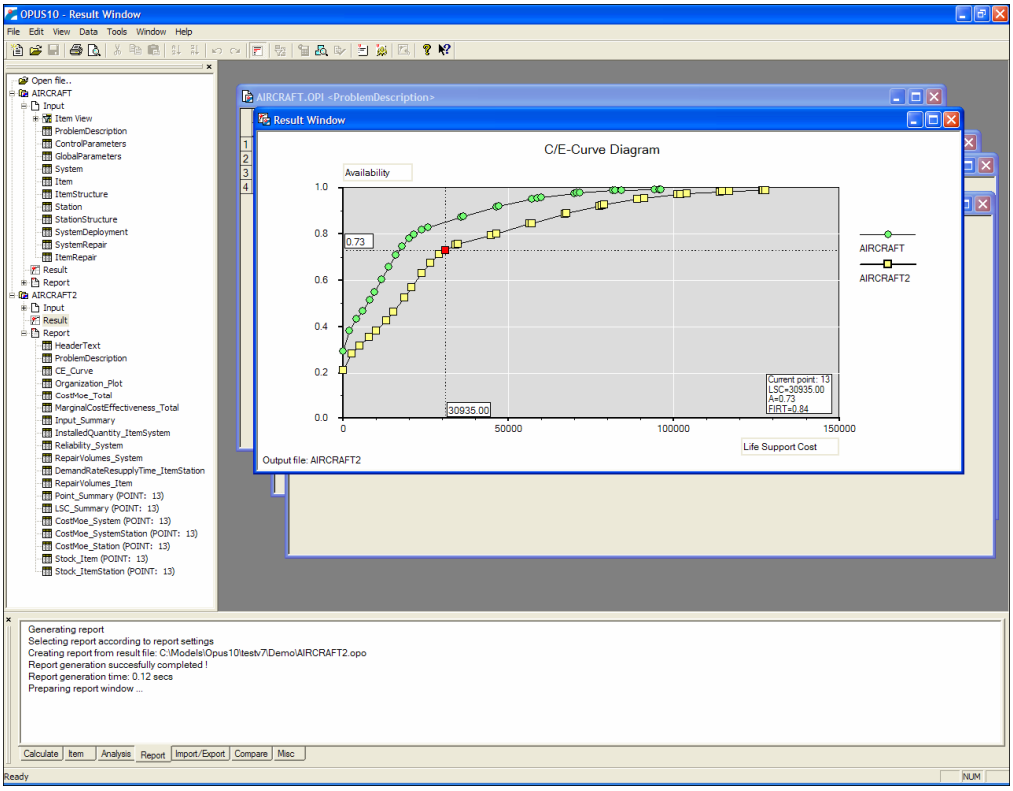

Figure 1, OPUS10 version 7 application window layout

Explorer view

A new view, the explorer view, has been added. It is displayed as a tree showing all open windows and objects within OPUS10. This view makes it a lot easier to navigate between different objects and provides a very good overview. By default it is docked to the left of the application window, but it can be moved or hidden.

Log window

The log window is changed to be more visible and useful. By default it is docked at the bottom of the application window and is never hidden by other windows. That reduces the risk of missing important warning or notes messages. Furthermore the log window is divided into different pages (tabs), one for each type of operation. That means e g that any calculation messages remain also after the report generation.

Item view and analysis view

The Item and analysis views are extended to also show redundancies. They are presented at the bottom of the tree and are marked with letter R. There are also new commands available to expand all nodes, either one level or completely.

Result window

The result window is modified in several ways and provides a powerful tool to get an overview of the results and to compare different cases. Examples on improvements:

- Zoom by the mouse

- Interactive change of MoE and Cost
- Tool tips per point showing total MoE and cost
- Coloured markers
- Improved presentation of long file names
- Display difference between two points
- Pop-up menus

Report settings

Interactive changes of the report layout and presentation are now stored in the report settings and will remain if a new report is generated.

Table Setup settings have been extended to allow changes of column header text, column width and numeric precision. The Table Setup dialogue has been improved to show table names in alphabetic order.

Editor and report

A sorting facility has been added in the editor and in the report tables. Any column can be sorted simply by double-clicking the header or by using the command Data::Sort.

The NOTE columns included in all input tables now has support for multi-line data. A line shift is inserted by entering Shift+Enter. The row height is automatically adjusted to show all lines.

It is now possible to adjust the font size used in the editor and in the report. This is done in the Tools::Options dialogue in the tab General.

Compatibility issues

Although the C/E-curves produced by the two versions are more or less identical from an overall point of view the selected solution points might not be exactly the same. The reasons for this are changes and improvements in the optimisation procedure that affect the internal point selection.

In the new version the model for discardable items during an initial period has been modified. This will affect the results and the stock strategies recommended by the model. The largest differences are on the cost side, but there are also some changes in the MoE-calculation.

An automatic data conversion is carried out each time a datafile saved in the previous version is opened in the new version. The modified input tables are converted to the new format and all floating point fields are changed to double precision.

Overall program settings are stored in the registry. Any old settings different from the default values are not automatically transferred to the new version but must be entered again.

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