General overview

Introduction

The OSCAM (Operating and Support Cost Analysis Model) family provides time evolutionary whole life costing models for a variety of US Navy weapon system platform types. The OSCAM Ship v8 simulation model represents the operating and support activities for a class of ships through life.

The simulation is controlled via a powerful user interface that allows selection and editing of data, running the simulation, analysis of results and a number of analysis tools, including risk analysis. The business processes are documented through interactive influence diagrams that are accessible via every input and output in the model. These diagrams ensure that OSCAM is not a black box and that the analyst understands and can have confidence in the outputs generated by the model.

OSCAM Ship v8 is designed to be flexible so that it can be used to represent a wide range of Navy platforms. It is supported by VAMOSC-based data for in-service and historical platforms so that it is possible to develop a cost estimate for a new platform class by using an existing class as a baseline or using an analogy based on a variety of ship classes. OSCAM Ship v8 also provides a number of choices on the level of detail that is required to populate a data record. This allows OSCAM to be used early on in the development process and then to grow as the program matures to include a more detailed representation of the platform operations and support.

OSCAM Ship v8 represents a major enhancement on earlier versions of the model. The business processes represented by the simulation have been reviewed from first principals, and the user interface has been re-written to make it more intuitive and flexible. The enhancement incorporates lessons learned and feedback from OSCAM users and includes new options into OSCAM where previously work-arounds were found to be required.

A suite of tools is provided as part of the standard installations:

- OSCAM Ship v8 – the main tool that is used for developing input data, performing simulations and analysis of results.
- OSCAM Ship v8 PCT – Parametric Costing Tool that can be used to develop and OSCAM data record based on ship type and characteristics using regression analysis of existing ship classes.
- OSCAM Ship v8 DMT – Data Management Tool that allows platform level data for operational and intermediate level maintenance to be built up using a work breakdown structure of systems and sub-systems.
- OSCAM Ship v7 to v8 Conversion Tool – converts an OSCAM Ship v6 or v7 input data record into a format that can be loaded into OSCAM Ship v8.

OSCAM Ship v7 to v8 User Help

OSCAM Ship v8 will be available to anyone who currently has access to OSCAM Navy Suite v7. A guide is available to help OSCAM Ship v7 users migrate to v8.

Downloads

OSCAM Ship v8 and historic data (derived from VAMOSC data) is available for download. A username and password is required for the download, which is provided on successful completion of the training course. Any patches and updates for OSCAM Ship v8 will also be available here.

Tutorials

A series of automated tutorials have been created designed to provide a taste of the functionality to those who have not yet attended the training course, as well as a "how to..." reminder for those that have.
Six tutorials demonstrate worked examples, whilst a further two tutorials focus on data inputs and features that are new to OSCAM Ship v8. There is also a tutorial demonstrating a Conversion Tool which is available for converting OSCAM Ship v6 & v7 data records into Ship v8 data records.

OSCAM Tutorials

Introduction

This series of automated tutorials has been designed to complement the OSCAM Ship training courses. The tutorials walk through examples of using OSCAM Ship and aim to provide a taste of the functionality to those who have not yet attended the training course, as well as a "how to..." reminder for those that have.

The links provided below use your web browser to play a "movie" of the selected tutorial.

Progress through the tutorials may be controlled using the drop-down buttons which can be found at the top right of the viewing screen.

Each tutorial runs for approximately 15 minutes.

Tutorial 1 – DDG 51 Flight 3 Study
Modelling the cost of a program extension in OSCAM Ship. The following features are covered:

- Changing the program start year
- Setting regular introductions
- Levelling reduction
- Crew reduction
- Throughputs
- TY$ tool

Tutorial 2 – LHD 1 Class Future O&S Cost Study
An approach to modelling projected O&S costs for the remainder of a program underway, in OSCAM Ship. The following features are covered:

- Changing the program start year
- Cost deferral reporting
- Entering new ships
- Aggregation

Tutorial 3 – Submarine Deployment Study
Modelling the cost of an existing SSN submarine performing normal deployment cycles in OSCAM Ship. The following features are covered:

- Using the deployed options in operations
- Setting deployments on the operational profile
- Looking at non-cost outputs
- Using the delta tool

Tutorial 4 – LSD 49 Maintenance Refinement Study
Refining the current maintenance policy in OSCAM Ship. The following features are covered:

- Deleting avails on the operational profile
- Adding continuous maintenance
- Delta tool
- Non-cost outputs

Tutorial 5 – Future FFG Class Study
Modelling future O&S costs for five FFG(X) ships, in OSCAM Ship. The following features are covered:

- Simplified depot maintenance
- Using table inputs for sw maintenance
- Using shift-key graphs

Tutorial 6 – CG47 Cost Reduction Study
Evaluating cost reduction strategies for the CG47, in OSCAM Ship. The following features are covered:

- Working with the profile chart
- Uncertainty tool
- Delta tool

For existing OSCAM Ship v7 users there are three additional tutorials, focusing on changes and new features added in OSCAM Ship v8:

Ship v8 tutorial for Ship v7 users: User interface changes
Demonstrating the changes to the user interface in OSCAM Ship v8. The following features are covered:

- New input tables
- F1 Help diagrams
- Undo / Redo functionality
- Uncertainty tool additions

Ship v8 tutorial for Ship v7 users: Input data changes
Demonstrating the changes made to the inputs used in OSCAM Ship v8. The following features are covered:

- New inputs
- Relocated inputs
- Capacity increases
- New input methods

OSCAM v7 to v8 Conversion Tool Tour
Demonstration of the conversion tool designed to upgrade OSCAM Ship v7 data files for use in OSCAM Ship v8. The following features are covered:

- Converting v7 data files to v8
- Opening and using converted files in Ship v8
- Source ID conventions used

Downloads

Downloading OSCAM Navy Suite

To download OSCAM Navy Suite you will require a username and password, which are provided upon completion of the training course.

Training courses are held periodically at the Washington Navy Yard, and offer a comprehensive overview of OSCAM Ship, including the Data Management Tool and Parametric Costing Tool. The course covers the methodology used in developing the model, advice on sourcing data and extensive hand-on experience in using the tools.

Follow the steps below to download the model and data.

Step 1: Complete OSCAM Training Courses

If you are interested in attending an OSCAM Navy Suite training course, please complete one of our training registration forms. Once processed, we will contact you to confirm the date of the next course. Training is limited to those either employed by the US Government, or contractors sponsored by the US Government.

Register for Training

If you have already taken the training and are a Registered User, go to Step 2 below.

Step 2: Download Model

Once you have a username and password, click below to download the OSCAM Navy Suite, which will be in the form of a zipped file. Once downloaded (approximately 60MB), extract the files to your hard drive and double click the "Startup.exe" file.
Note, you will need to install Powersim Runtime from the menu in order for the model to run correctly. This is included in the download.

Download OSCAM Navy Suite Model

Step 3: Download Historic Databases

The OSCAM Navy Suite Historic Databases (derived from VAMOSC data) may be downloaded in zip file format.

When the zip file has been downloaded, extract the contents of the zip file to your hard disk. Move these files to an appropriate directory below the OSCAM Navy Suite models.

Download OSCAM Navy Suite VAMOSC Datasets

User Guides

The updated OSCAM Sys Historical Dataset Guide can be downloaded in PDF format. The guide contains information on the different inputs to the model and insight into how the datasets are produced. Updates reflect changes in methodology utilized in developing the FY08 Datasets.

Download OSCAM Sys v7.0 Historical Datasets Guide

Changes from OSCAM Ship Version 7

OSCAM Ship Version 8 has been created after an extensive review of the underlying business processes for operating and supporting a class of ships. The user interface has also undergone improvements. A summary of the main changes is shown below.

OSCAM Ship Version 7 Data Records

Due to the extensive changes in the business processes and the input data that is used by OSCAM to build a cost estimate, it is not possible to load an OSCAM Ship v7 data record directly into OSCAM Ship v8. A Conversion tool has been provided that will convert Ship v6 and v7 data records into a format that can be loaded into OSCAM Ship v8.

Primary and Detailed Data

The database architecture has been significantly improved and there are no longer separate databases for Primary and Detailed data, instead all of the data for a scenario is held within the same data record. Many sectors have radio buttons and/or check boxes that allow the user to select the level of detail that they wish to use.

Ship Introductions

Ship introductions are now entered in a table that includes copy and paste functionality. The maximum number of ships in a class has been raised from 30 to 60 ships. A new Regular Introductions form provides a quick way of defining ships that are introduced at regular intervals.

Ship Life and Disposal

Inputs for the lifespan of a ship are now easily accessible, along with the weight and disposal costs which are now all found on the Program Profile form.

OpTempo – Underway vs Deployment Mode

Alternative options have been added for the way that fuel use is calculated. Underway Mode is the original method of specifying the proportion of time spent Steaming Underway, Steaming Not Underway and Cold Iron. This option has been enhanced compared with Ship v7.

In Deployment Mode the ship operational profile can be divided into Deployed and Non-Deployed time, which can have different measures of days per month Steaming Underway, Steaming Not Underway and Cold Iron. Deployed periods can be represented on the Operational Profile chart.

OpTempo Impacts

Changes in operational intensity can now be more widely reflected in operating and support costs. Additional input options have been added to Ordnance costs and O/I Maintenance actions and costs, and Unscheduled Depot Actions that allows these to be specified in terms of cost (or actions) per Hour Underway.

Personnel Categories and Grades

OSCAM Ship v8 has a dedicated Personnel sector. In addition to Officer and Enlisted crew there are now Warrant Officer, Civilian Mariner Class 1, Civilian Mariner Class 2, and Contractor. There is also the option to use a table of grades for each personnel category.

Crews per Ship

OSCAM Ship v8 has a new input that represents the number of crews per ship. Salary, training and indirect costs are incurred for all crews, but supply costs are only incurred for the onboard crew.

Other Unit Level Personnel

In addition to crew, OSCAM Ship v8 allows other unit level personnel to represented. This can be expressed as an annual cost or in terms of number of personnel, by category, and pay rates. Training and indirect costs can also be incurred for other unit level personnel.

Personnel Training

OSCAM Ship v8 has a dedicated sector for training. This includes annual costs per person by category for crew and other unit level personnel. It is also possible to include annual training costs for the program as a flat annual cost or via a table that allows different costs to be allocated each year.

O/I Level Maintenance - Categories

The available categories for O/I Level Maintenance have been simplified. The I-Level Ashore and I-Level Afloat options in v7 have been amalgamated into a single I-Level option for v8. This has been done to match the level of data that is generally available.

For the detailed representation of O-Level and I-Level Maintenance, the tabs within each maintenance level have been changed such that the Unscheduled and Scheduled tabs are amalgamated into a single Maintenance Actions tab. This matches the way in which VAMOSC captures the data.

O/I Level Maintenance – Simplified vs Detailed

The Simplified option allows maintenance costs to be specified in one or more of the following formats: $K/Ship/Year, $K/Month IFT (In Fleet Time), $K/Steaming Hour Underway. This allows cost estimates for maintenance actions to be developed earlier in the life a program without having to determine detailed data on action rates, issue costs, etc.

The Detailed representation is similar to Ship v7 and uses action rates to drive labor effort and costs.

O/I Level Maintenance – Factors

OSCAM Ship v7 had a graphical aging factor on action rates in the Detailed data record. In Ship v8 the Primary data record has aging factors on action rates and an aging factor on parts costs. There are also factors that allow the ship deployed status to impact action rates. The factors apply to both Simplified and Detailed options.

Overhaul Profiles Chart

The Overhaul Profiles chart that was used in Ship v7 has been improved and made more flexible, with the addition of Deployed periods. The resulting chart is now called the Operational Profile Chart and is found in the Program Profile sector.

Unscheduled Depot Maintenance

Unscheduled Depot Maintenance now has Simplified and Detailed options. The simplified option allows OpTempo impacts to be included.

Scheduled Depot Maintenance – Simplified vs Moderate vs Detailed

A Simplified representation of Scheduled Depot Maintenance is available. This applies an average annual cost for each ship and a percentage of a ship's life that it is in Scheduled Depot Maintenance. Moderate representation can be used for each Availability type and allows high level costs to be specified for repair, modernization and refuelling. Detailed representation is similar to the format used for OSCAM Ship v7 but has been made more intuitive.

Scheduled Depot Maintenance – Government and Contractor Depots

For Availability type a choice can be made of whether it is undertaken at a Government or Contractor depot, or a mixture of the two.

Continuous Depot Maintenance

Continuous Depot Maintenance is new to OSCAM Ship v8. It allows the representation of depot maintenance that is undertaken outside of a depot when a ship is alongside. It does not reduce Materially Available Vessel Days.

Indirect Sector

The Indirect sector is new to OSCAM Ship v8. It allows a representation of indirect support costs and indirect personnel costs.

Other Sector

The Other Sector has been expanded to add more options for representing Software Maintenance and ETS costs. Each can be represented as a mixture of program costs, cost per ship or using a table that allows different costs to be specified for each year. ETS costs now differentiate between Government and Contractor.

Throughput Data

An inflation appropriation can now be associated with each Throughput item. This allows Throughput data to be updated automatically when the Cost Base Year is changed and also allows it to be included in the calculation of Then Year $ results.

Annual Profile Tables

Annual cost profiles have been created for Training, Installation Support, Personnel Support, ETS and Software Maintenance costs. These are areas where Throughput profiles have often been used. These profiles are now available in the appropriate sectors, and the cost impacts shown in the relevant parts of the results tree.

Undo and Re-do Functionality

It is now possible to undo previous data changes. An undo button is used to undo the last change. Previous changes can be selected from a pull-down list. Alternatively, double-clicking on an input will show the traditional dialog to select values from Primary or Reference data records, to which an extra tab has been added to allow previous data values to be selected. Data tables also have a list of undo items.

A re-do button and pull-down has also been added to reverse undo actions. The list of undo and re-do actions is cleared when a new data record is loaded.

Simulation Runs – Powersim Mode

Use of the Powersim simulation package with OSCAM is now optional and does not need to be installed on the host PC in order to be able to use OSCAM Ship v8. Powersim is not started automatically with OSCAM (improving start-up times) and will only be loaded if a non-Warp Speed simulation run is selected.

Simulation Runs – Auto Run Length

The required length of a simulation run is automatically calculated based on the year of the last ship introduction and the ship lifetime (plus 1 year). This can be manually overridden to allow for shorter runs that do not cover the whole of the program lifetime, or if Throughput costs are required to extend beyond the retirement of the last ship.

Results Screen – Cost Breakdown Structure

The cost breakdown structure has been organized using the CAIG 2005 structure and numbering. Some of the output lines have changed to reflect the business processes that are represented in OSCAM Ship v8.

Results Screen – Name Tab Functions

The results tabs at the bottom of the results table now display a popup menu when right-clicking the mouse on them. This allows quick access to view/change the results description, delete a results set, and to specify whether or not that results set is displayed on the graph.

Uncertainty Tool Changes

The Uncertainty Tool has been extended to allow more than 20 inputs to be selected. It also now allows a variety of probability distributions to be used. To help in the selection of a probability distribution a graphical display will show the shape of the distribution for the selected parameter values. The input data for an Uncertainty run is now saved as part of the input data record rather than the workspace.

Saving Results

Results that are saved via the option in the File menu now retain more decimal places. This allows more accurate calculations to be applied in Excel when exporting the results.

When Copying and Pasting the results from the OSCAM results tree into Excel, the pasted data will use the displayed number of decimal places and the displayed layout.

Default Data File Locations

The default OSCAM Databases directory structure is no longer placed in the Program Files directory. The installation process now places the Databases directory structure in the users My Documents directory (in Windows 2000 or XP) or Document directory (in Windows Vista). The top level directory is called 'OSCAM' with a sub-directory called 'Ship v8 Databases'. Note that these locations may be changed during the installation process.

OSCAM Ship Version 7 Data Records

Due to the extensive changes in the business processes and the input data that is used by OSCAM to build a cost estimate, it is not possible to load an OSCAM Ship v7 data record directly into OSCAM Ship v8. A Conversion tool has been provided that will convert Ship v6 and v7 data records into a format that can be loaded into OSCAM Ship v8.

Conversion Tool

The OSCAM Ship v7 to v8 Conversion Tool converts data records that were created using OSCAM Ship Version 7 (or Version 6) into records that can be used by OSCAM Ship Version 8. The Conversion Tool can be used with any Ship v7 Primary Data Record that is held in a .USE or a .HIS file.

Types of Conversion

There are some differences between Ship v7 and Ship v8 in the logic for the business processes represented by the models and there are some additional inputs in Ship v8 that do not appear in Ship v7. When looking at a converted data record in OSCAM Ship v8 the source text against the input (where used) will identify the type of conversion approach that was used. This will be one of the following:

Conversion Type	Description	Source ID
Direct v7 Copy	*Copying input values where a direct equivalent exists in the v7 data record.*	The original source text (or record name where no source text was previously recorded) will be used for inputs that are directly copied without changes.
Derived from v7	*Performing a mathematical operation on one or more v7 inputs.*	A '*' followed by the record name will be used for inputs that require a mathematical operation or assumption to be made.
Default Value	*Using a default value, usually 0, where an input is new in OSCAM Ship v8.*	'New in v8' will be used for inputs that have no equivalent in OSCAM Ship v7.

In most cases a converted data record should generate similar results in OSCAM Ship v8 to the results generated for the original data record using OSCAM Ship v7. Due to the logic changes the results are unlikely to be identical. In some cases the Conversion tool must make assumptions on the nature of the data that is being converted, so it is always advisable to review the data record that has been created in order to check the assumptions.

The online help in OSCAM Ship v8, accessed via the Help => Help Topics menu item, includes documentation on the conversion of each input in the model.

Accessing the Conversion Tool

The Ship V7 to V8 Converter can be accessed via the Start menu via the OSCAM Ship V8 and Tools menu folders. The Ship V7 to V8 Converter has a wizard that will take you through the process of converting OSCAM Ship v7 data records.

Primary and Detailed Data

Significant changes have been made to the way that OSCAM Ship deals with Primary and Detailed data. There are no longer separate databases for Primary and Detailed data, instead all of the data for a scenario is held within the same data record.

Levels of Detail

Three common options for the level of detail are:

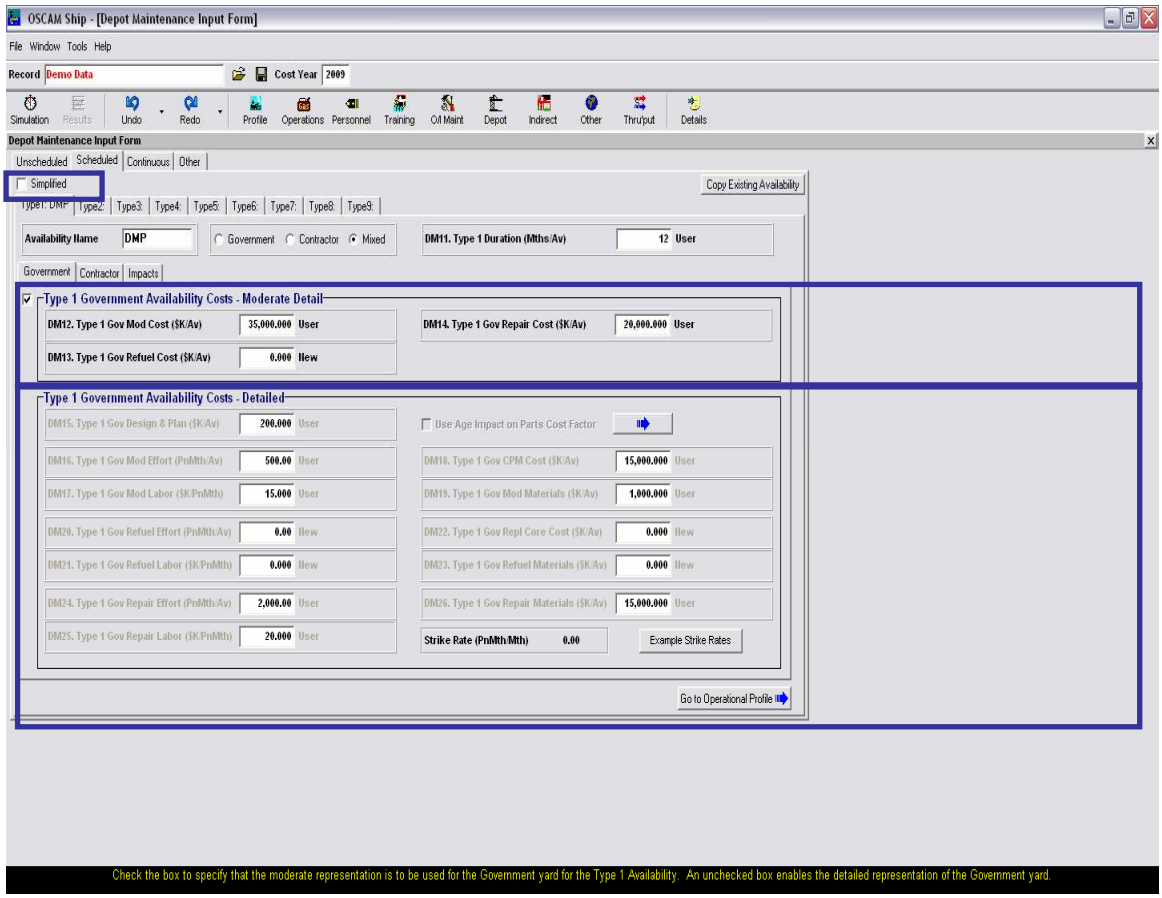
- Simplified
- Moderate Detail
- Detailed

Many sectors have radio buttons and/or check boxes that allow the user to select the level of detail that they wish to use. Inputs that are not applicable to the selected level of detail will be grayed-out or hidden.

In many cases the Simplified option allows for a less detailed representation than was required for OSCAM Ship v7. This should allow OSCAM Ship to be used earlier in the acquisition process, or for a certain level of representation to be specified for a sector when the main focus of the study is another aspect of the operating and support process.

In a number of sectors there are alternative ways of specifying input data (e.g. Cost per Ship, Cost per Month In Fleet Time, Cost per Steaming Hour). The analyst can select to use one or a mixture of these input types, leaving 0 values in the others that are not required.

The depot sector – with the option to choose between simplified, moderate and detailed inputs



Ship Introductions

Changes have been made to the program profile user-interface, in order to improve and simplify the introduction of ships.

Increased ship numbers

The maximum number of ships in a class has been raised from 30 to 60 ships.

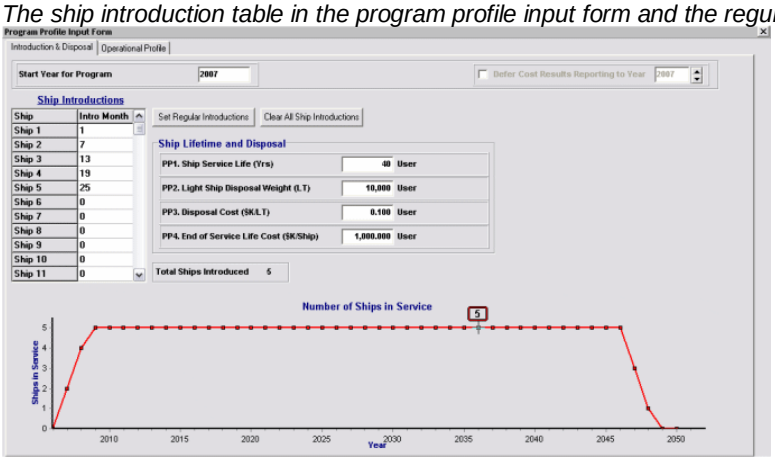
Tabular introduction profile

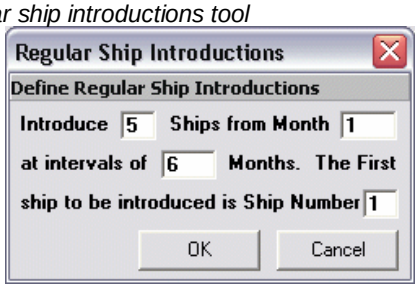
Ship introductions are now entered in a table that includes copy and paste functionality. Data can be copied from any other cell(s) in the table or from other programs (such as Microsoft Excel).

Regular introductions tool

A new Regular Introductions form provides a quick way of defining ships that are introduced at regular intervals. Simply enter the number of ships to be introduced, the month the first ship is to be introduced and the number of months between each ship introduction.

The ship introduction table in the program profile input form and the regular ship introductions tool





Ship Life and Disposal

As part of the review of OSCAM Ship, some inputs have changed location in order to make them more accessible, and more logically grouped. In the Program Profile, there is now a 'Ship Lifetime and Disposal' section drawing together ship lifespan, weight and disposal inputs.

Relocated inputs

Input	Original Location
Ship Service Life	Platform Lifetime & Overhaul Profile chart
Light Ship Disposal Weight	Operations Sector
Disposal Cost	Operations sector
End of Service Life Cost	New input (default value 0)

The 'Ship Lifetime and Disposal' input section in the Program Profile sector

OpTempo – Underway vs. Deployment Mode

Actual fuel costs are dependent on fuel usage which is generated through operational activity.

Operational Activity Options

Two options are provided for specifying operational activity:

- **The Underway Option**

  This allows the percentage of time to be specified for a ship Steaming Underway, Steaming Not Underway and Cold Iron. A speed categories table can be used for Steaming Underway.

- **The Deployment Option**

  Deployed and Non-Deployed periods can be specified with different operational tempos. The Deployed periods are specified on the Operational Profile.

Radio buttons are used to specify whether the Underway Option or Deployment Option is to be used.

Underway Option

Tabular inputs

In underway mode, there are now two alternative options for entering the % of IFT Steaming Underway and Average Fuel Use Underway:

1. As in OSCAM Ship v7, the values are entered via input boxes.
2. An new tabular option has been added allowing more detailed representation where percentage of time and fuel use are specified for different speed ranges.

A check box is used to specify whether the Simplified (edit boxes) or Detailed (table) option is used. When the Detailed option is used the values in the edit boxes will be grayed-out and calculated from the data in the table.

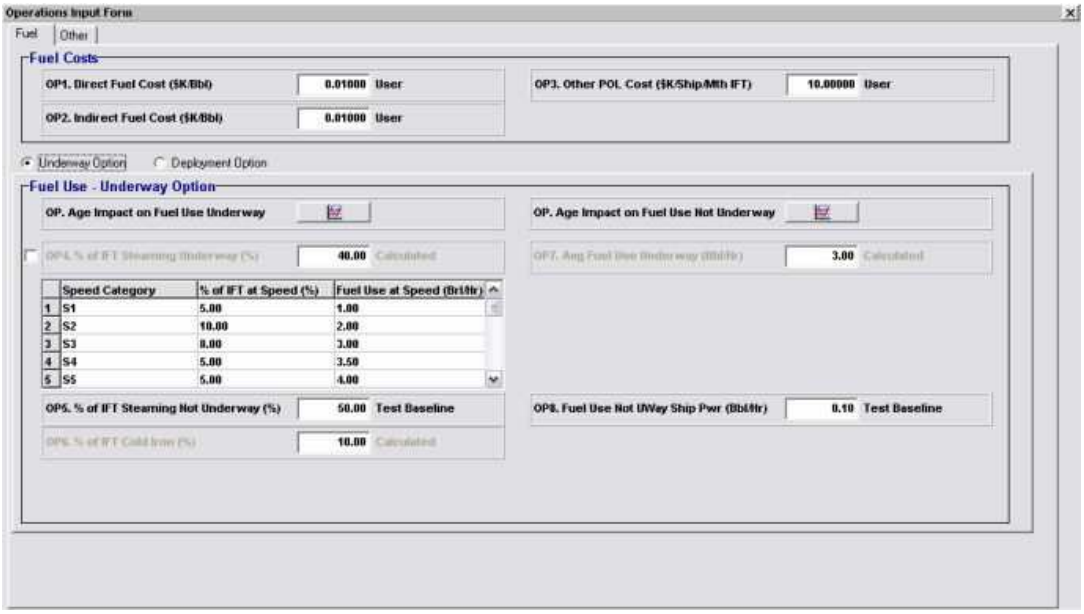
Calculated values

The inputs for % of IFT Steaming Underway and % of IFT Steaming Not Underway are entered by the user. The % of IFT Cold Iron is automatically calculated so that the three percentages add up to 100%. Validation checks are incorporated to ensure that the sum of the percentages does not exceed 100%.

Aging curves

Fuel usage can be impacted by ship aging. Aging curves to be defined to represent this.

The underway option in the Operations sector


Operations Input Form
Fuel
Other
Fuel Costs
OP1. Direct Fuel Cost ($K/Bbl) 0.01000 User
OP2. Indirect Fuel Cost ($K/Bbl) 0.01000 User
OP3. Other POL Cost ($K/Ship/Mth IFT) 10.00000 User
Underway Option
Deployment Option
Fuel Use - Underway Option
OP. Age Impact on Fuel Use Underway
OP. Age Impact on Fuel Use Not Underway
40.00 Calculated
3.00 Calculated
Speed Category
% of IFT at Speed (%)
Fuel Use at Speed (Bbl/Hr)
1 S1 5.00 1.00
2 S2 10.00 2.00
3 S3 8.00 3.00
4 S4 5.00 3.50
5 S5 5.00 4.00
OP5. % of IFT Steaming Not Underway (%) 50.00 Test Baseline
OP8. Fuel Use Not UWay Ship Pwr (Bbl/Hr) 0.10 Test Baseline
10.00 Calculated

Deployed Option

Deployed & Non-Deployed

When using the Deployment Option, separate data can be specified for when the ship is Deployed and Not Deployed. This option is used in conjunction with the **Operational Profile** to specify the occurrence of the Deployment periods.

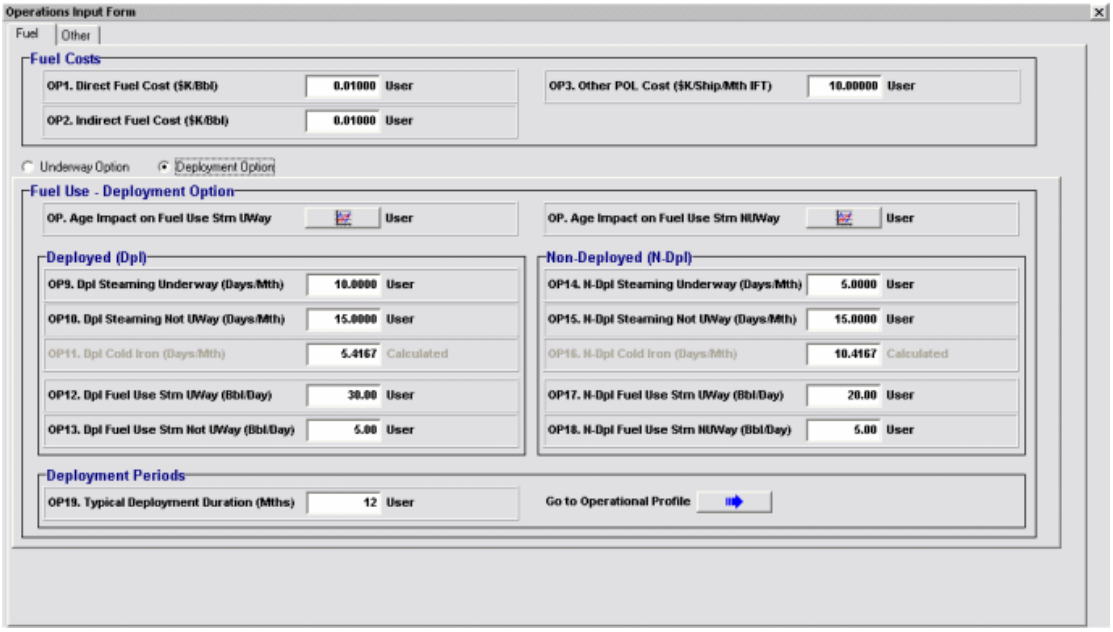
Calculated values

The inputs for Steaming Underway and Steaming Not Underway are entered by the user as days per month. The number of days Cold Iron is automatically calculated. The number of days spent Cold Iron is calculated with validation checks built in to ensure the days spent Steaming Underway, Steaming Not Underway and Cold Iron do not sum to more than 30.4167 (1-month).

Aging curves

Fuel usage can be impacted by ship aging. The buttons bring up forms that allow an aging curve to be defined. Note that these aging curves are different from those specified for the Underway Option, and so will need to be specified if the option setting is changed.

The deployment option in the Operations sector



OpTempo Impacts

Reflecting Operational Intensity

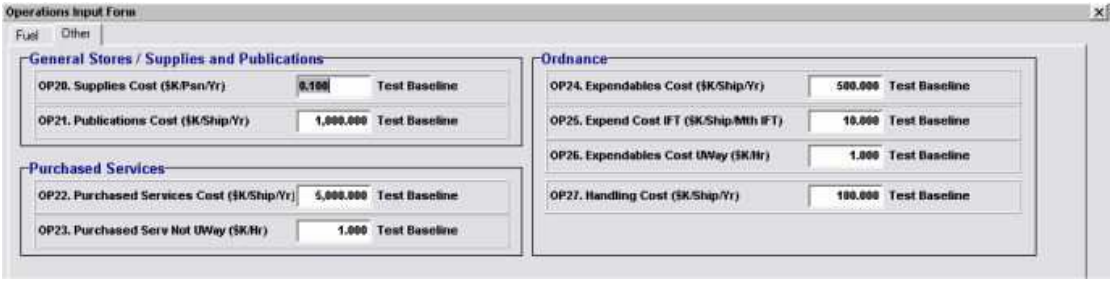
Changes in operational intensity can now be more widely reflected in operating and support costs. Ordnance costs, for example, now allow three different ways of specifying costs by operational activity:

1. Per Year: $K/Ship/Yr (flat line regardless of activity)
2. Per Month: $K/Mth IFT (only incurred when not in availability)
3. Per Hour: $K/Hr Underway (only incurred when Steaming Underway)

A single input or combination of the three can be used to define the ordnance costs.

Additional input options have also been added to O/I Maintenance actions & costs, and to Unscheduled Depot Actions that allows these to be specified in terms of cost (or actions) per Hour Underway.

Expansion of inputs on the Ordnance sector to reflect Op Tempo



Personnel Categories and Grades

Additional Personnel Types

OSCAM Ship v8 has a dedicated Personnel sector. In addition to Officer and Enlisted crew there are now also:

- Warrant Officers
- Civilian Mariners Class 1
- Civilian Mariners Class 2
- Contractors

Personnel Grades

There is an option to use a table of grades for each personnel category. A check box is used to switch between simple (input box) and detailed (grade tables) manning. Inputs or tables are greyed out when they are not selected, and will not be used in the simulation.

The Officer, Warrant Officer and Enlisted personnel tables have pre-defined grades. For Civilian Mariners Class 1 & 2 and Other there are no universally recognized grades so these can be specified by the user.

Personnel grades being applied to determined the number of personnel and their pay

Crews per Ship

The No. of Crews per Ship input allows scenarios of crew rotation to be used where there may be more crews than ships (e.g. an average of 1.2 crews per ship might be used).

Only a single crew will be taken into account for costs such as supplies, but pay and indirect costs will take account of the extra crews. The number of crews per ship can be less than 1, in which case supplies costs and maintenance hours per enlisted crew member, as well as pay and indirect costs, will also be based on the smaller crew.

The size of the crew can be reduced or increased during and after Scheduled Depot Maintenance which will affect all cost and non-cost outputs based on crew numbers.

Other Unit Level Personnel

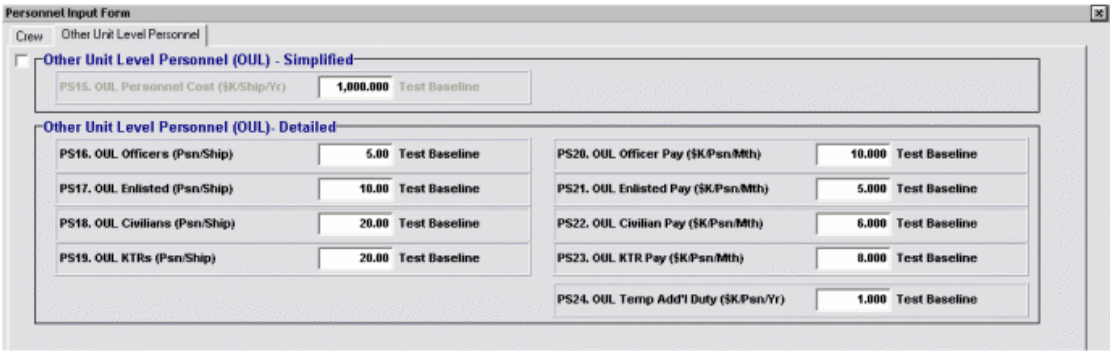
Other Unit Level Personnel is new in OSCAM Ship v8 and enables personnel costs to be attributed to the class for non-crew personnel.

Levels of detail

Other Unit Level Personnel has a Simplified option where a cost per ship per year is specified, or a Detailed option where numbers and pay by type are specified.

The selection of the option has an impact on how Training costs and Indirect costs are calculated since using the Simplified option means that the number of personnel is unknown. Reminders are shown on the Training and Indirect sector forms if the Simplified option for Other Unit Level Personnel is selected.

The Other Unit Level Personnel tab



Personnel Training

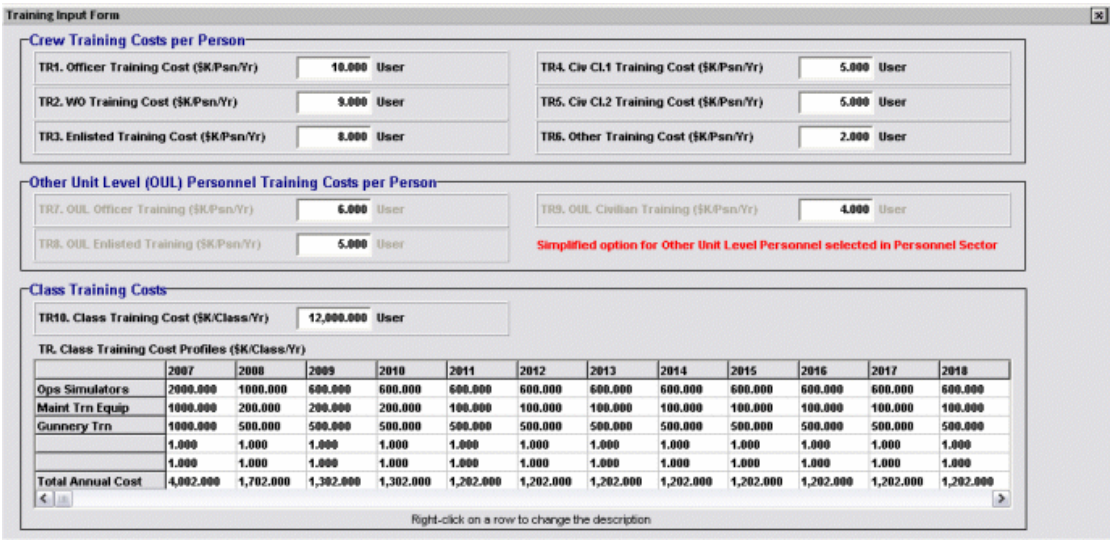
The Training sector is new for OSCAM Ship v8, but includes some inputs that were formerly in the Ship v7 Other sector.

Training Costs

Training costs can be specified by one or a combination of:

- **Training cost per person** — Specified for each personnel type. Other Unit Level Personnel training costs are only incurred if the Detailed option is selected in the Personnel sector.
- **Class training cost** — Specified as a flat cost each year and/or a cost profile over time through tabular inputs.

The dedicated Training sector



O/I Level Maintenance

Maintenance Categories

The available categories for O/I Level Maintenance have been simplified:

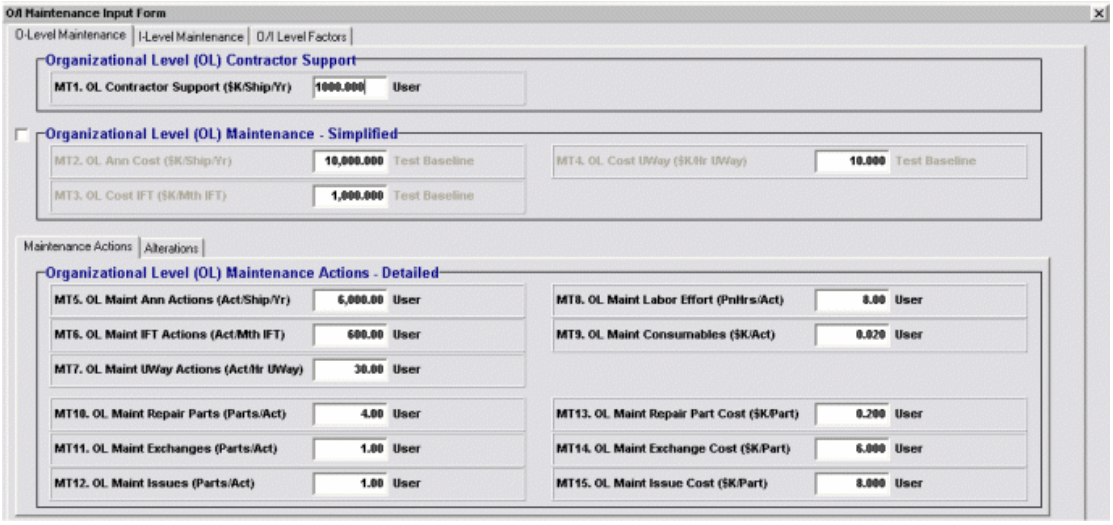
- **Single I-Level option**

  The I-Level Ashore and I-Level Afloat options in v7 have been amalgamated into a single I-Level option for v8. This has been done to match the level of data that is generally available in VAMOSC.

- **Unscheduled and Scheduled Maintenance merged**

  Unscheduled and Scheduled tabs are now amalgamated into a single Maintenance Actions tab for each of O-Level and I-Level Maintenance. This matches the way in which VAMOSC captures the data.

The O-Level Maintenance tab in the O/I Maintenance sector



Simplified Input Options

Each maintenance level now has a Simplified option where maintenance costs can be specified in one or more of the following formats:

- $K/Ship/Year
- $K/Month IFT (In Fleet Time)
- $K/Steaming Hour Underway

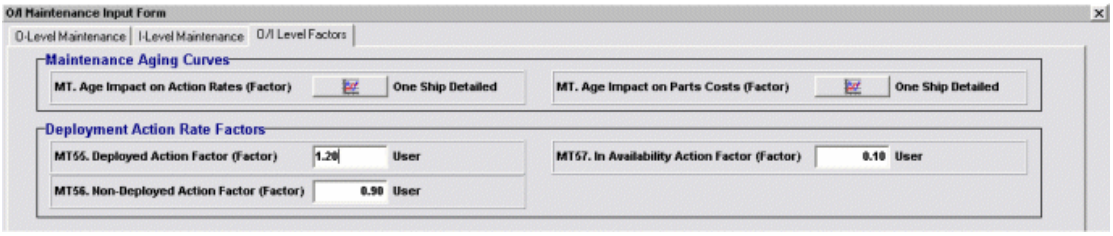
This allows cost estimates for maintenance actions to be developed earlier in the life of a program without having to determine detailed data on action rates, issue costs, etc.

The Detailed option is similar to version 7 and allows the rate of maintenance actions to be specified based on a variety of criteria, and then has effort and costs specified per event. Detailed data is entered separately for Maintenance Actions and Alterations.

Factors

OSCAM Ship v7 had a graphical aging factor on action rates in the Detailed data record. In Ship v8 the Primary data record has an aging factor on action rates and an aging factor on parts costs. There are also factors that allow the ship deployed status to impact action rates. The factors apply to both Simplified and Detailed options.

The O/I Level Factors in the O/I Maintenance sector


O/I Maintenance Input Form
O-Level Maintenance
I-Level Maintenance
O/I Level Factors
Maintenance Aging Curves
MT. Age Impact on Action Rates (Factor)
One Ship Detailed
MT. Age Impact on Parts Costs (Factor)
One Ship Detailed
Deployment Action Rate Factors
MT55. Deployed Action Factor (Factor)
1.20
User
MT56. Non-Deployed Action Factor (Factor)
0.90
User
MT57. In Availability Action Factor (Factor)
0.10
User

Overhaul Profiles Chart

Deployment periods

The Overhaul Profiles chart that was present in Ship v7 has been retained as a concept but made more flexible, with the addition of Deployed periods. The Deployment periods can be defined if the Deployment mode option is selected in the Operations Sector. The resulting chart is now called the Operational Profile Chart and is found in the Program Profile sector. Overhauls are now called Availabilities to match US Navy terminology. Right-clicking on the Availability Templates provides a shortcut to the appropriate tab in the Depot sector that contains data about that Availability type.

Increased Availabilities

The number of Availabilities that can be placed on the chart has been increased from 40 to 100, while 200 Deployment periods can be placed on the chart.

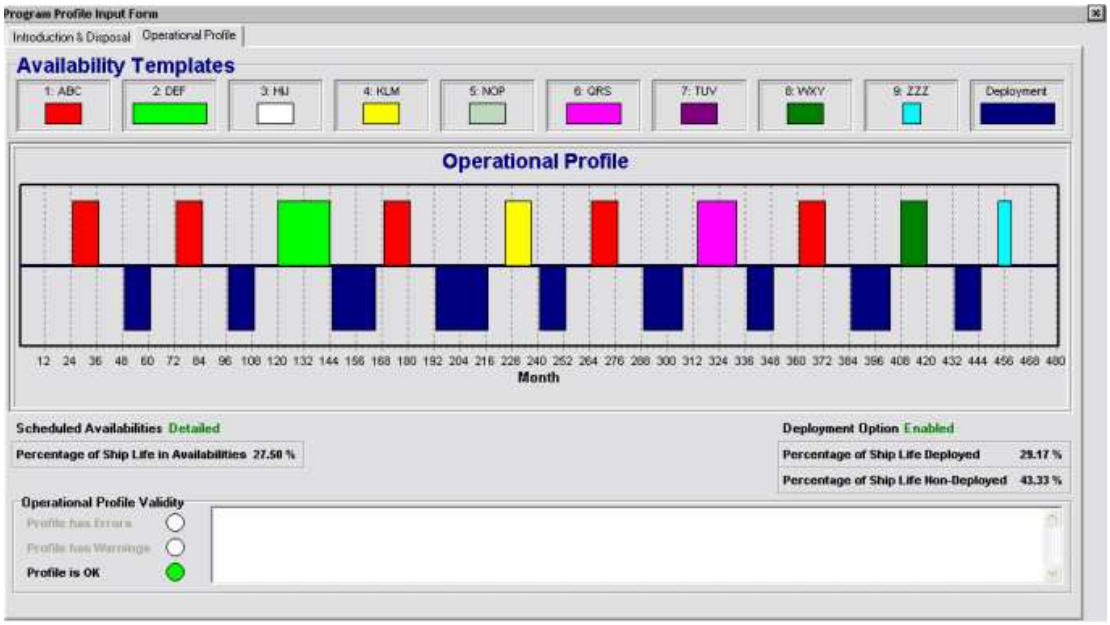
Additional Error Checking

Additional error checking has been added to the chart so that there are error messages if the chart contains invalid data (e.g. overlapping Availability periods) or warnings if data is unlikely to be used (e.g. Availability periods that start after the retirement of a ship).

Ship lifetime input moved

The ship lifetime input has been removed from the Overhaul chart and is now an explicit input on the Program Profile sector form.

The Operational Profile Chart



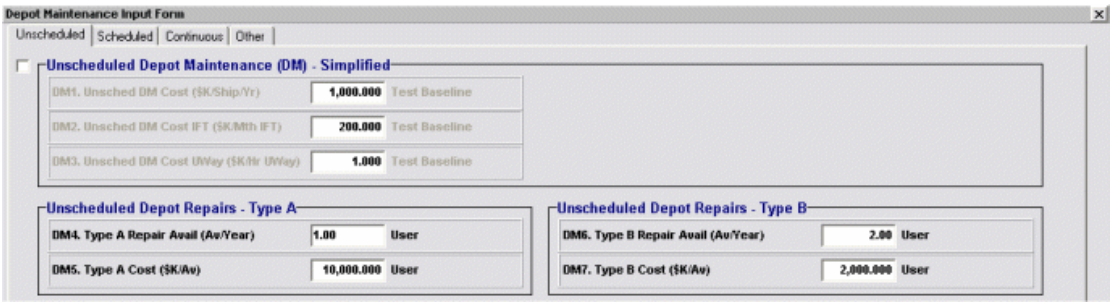
Unscheduled Depot Maintenance

More Levels of Detail

Simplified Option

Unscheduled Depot Maintenance now has Simplified and Detailed options. The simplified option allows OpTempo impacts to be included. The Detailed option uses the same representation as OSCAM Ship v7 with two Unscheduled Depot Maintenance types.

The Unscheduled Depot Maintenance tab



Scheduled Depot Maintenance

More Levels of Detail

Three levels of detail are available for Scheduled Depot Maintenance: Simplified, Moderate and Detailed. The Simplified representation does not use the Availability types in the Operational Profile chart. The Moderate and Detailed options do allow the use of up to 9 Availability types, with the ability to select the level of detail for each Availability type.

Simplified

A Simplified representation of Scheduled Depot Maintenance is now available. This applies an average annual cost for repair and modernization for each ship, and a percentage of a ship's life that it is in Scheduled Depot Maintenance. When the Simplified Scheduled Depot Maintenance is selected, all Availability periods are hidden in the Operational Profile (if any have been defined). These will be displayed again if Simplified mode is de-selected.

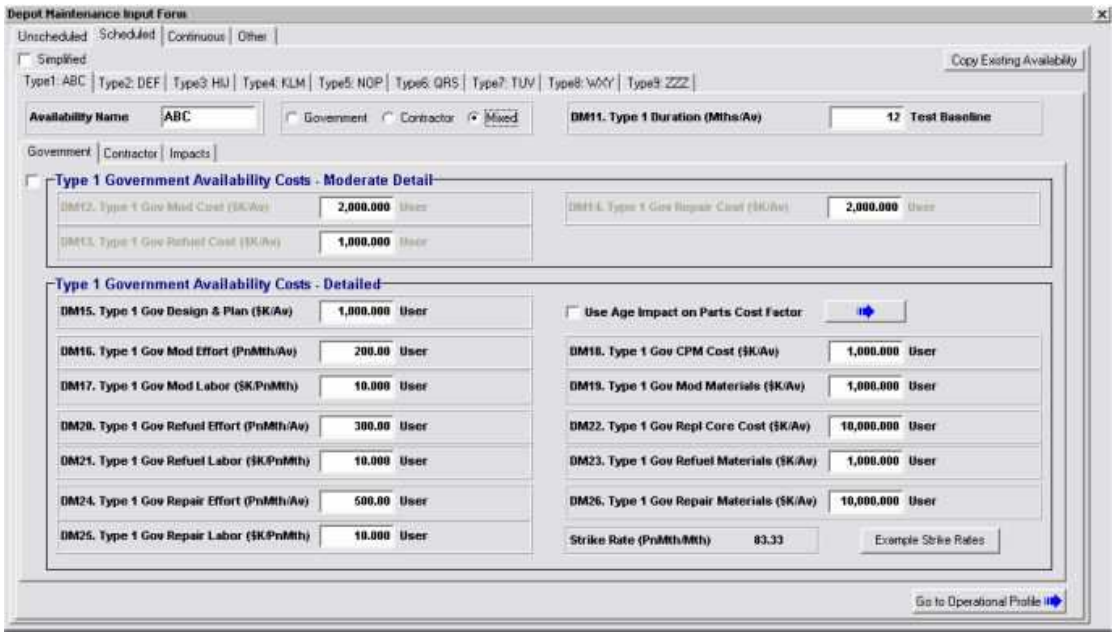
Moderate Detail

The Moderate representation allows high level costs to be specified for repair, modernization and refuelling for the Availability type.

Detailed

The Detailed representation is similar to the format used in OSCAM Ship v7 but has been made more intuitive. The Strike Rate (the maximum amount of labor effort that can be applied per month) is no longer used as an input. This means that the Availability will always be completed in the specified duration and will not be extended due to insufficient Strike Rate. The Strike Rate is still retained as a feedback metric to show the required monthly labor effort that would be required to complete the specified amount of work in the specified duration. An Example Strike Rates button displays historical Strike Rates for different ship classes for a range of Availability types.

The Scheduled Depot Maintenance tab



Government and Contractor Depots

For Moderate and Detailed representation, work can be specified to take place at a Government facility, a Contractor facility, or at both (Mixed location). For Mixed locations it is possible to specify Moderate level at one location and Detailed level at the other. When

converting data files from Ship v7, all information for each Availability Type is placed in the Government tab.

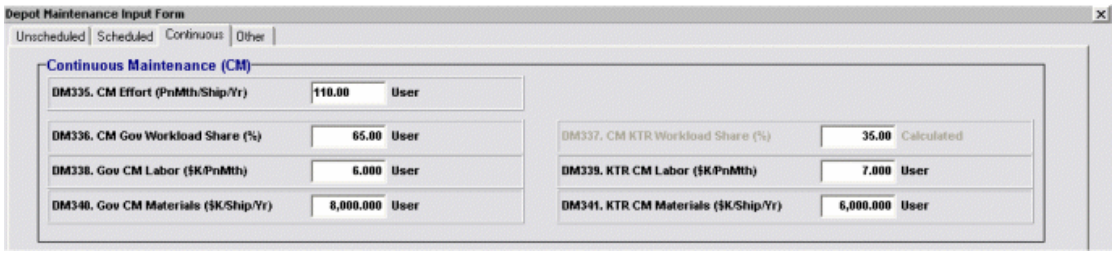
Continuous Depot Maintenance

Continuous Depot Maintenance is new to OSCAM Ship v8. It allows the representation of depot maintenance that is undertaken outside of a depot when a ship is alongside. It does not reduce Materially Available Vessel Days.

Continuous Maintenance inputs

CM Effort is specified for labor in hours per year. This is then divided between Government and Contractor using the Workload Share %. CM Materials costs are then applied for Government and Contractor supplied materials. Note that Government and Contractor materials costs arise regardless of workload share. All costs and labor effort are specified for a full year In Fleet Time. If a ship spends half a year in an Availability then the labor effort and each of the costs for Continuous Maintenance will be halved for the year in the simulation run.

Continuous Depot Maintenance Tab in the Depot Maintenance sector



Indirect Sector

The Indirect sector is new to OSCAM Ship v8. It allows a representation of indirect support costs and indirect personnel costs.

Indirect inputs

The Indirect Sector contains data on Installation Support and Indirect Personnel costs. Each of these has a class cost, ship cost and per person cost as well as a table that allows a profile of costs to be specified over time.

For the per person costs a reminder will be displayed if the Simplified option has been selected for Other Unit Level Personnel. In this case the number of Other Unit Level Personnel is not specified and so cannot be included in the calculation.

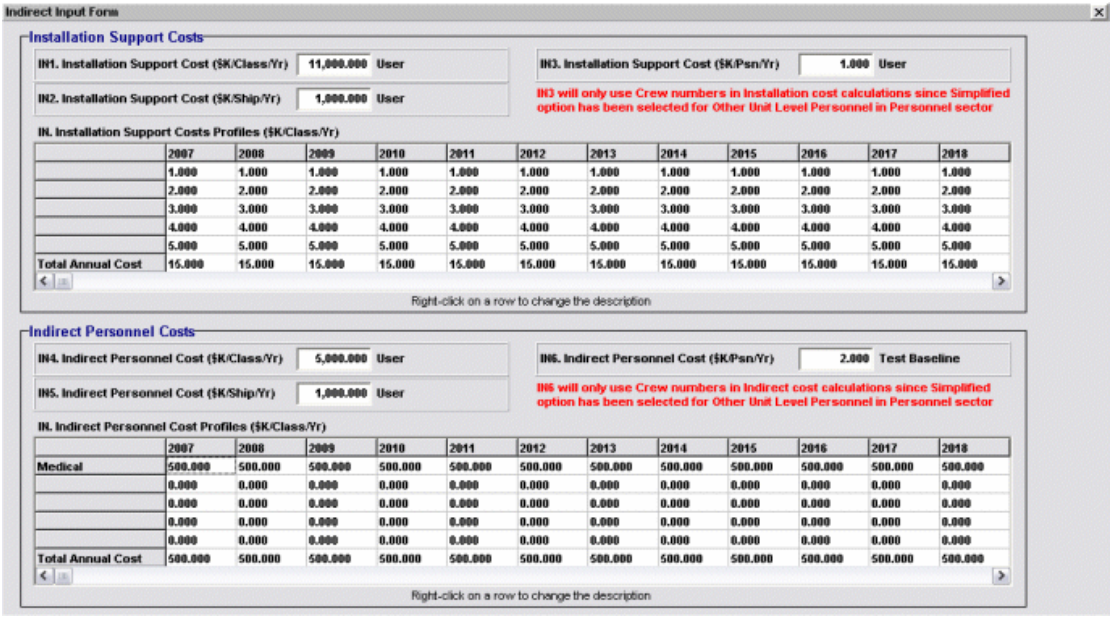
Tabular inputs

The row headers of the profile tables can be specified from a right-click option. The tables allow multi-cell selection with copying and pasting through a right-click option.

Converting Ship v7 files

When converting Ship v7 data file to Ship v8, all inputs are by default set to zero.

The Indirect Sector input form



Other Sector

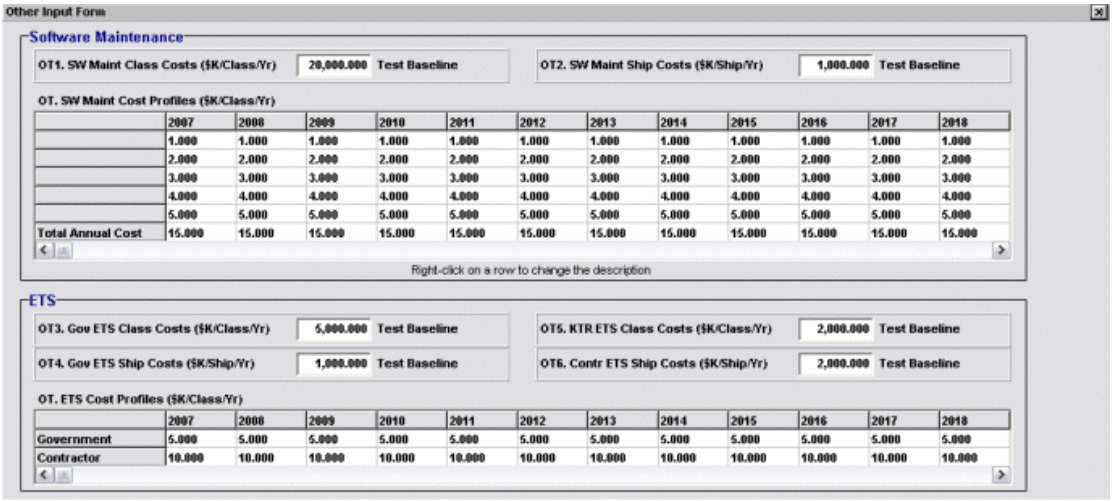
Expanded input types

The Other Sector has been expanded to add more options for representing Software Maintenance and ETS costs. Each can be represented as a mixture of program costs, cost per ship or using a table that allows different costs to be specified for each year. ETS costs now differentiate between Government and Contractor.

Relocated inputs

The OSCAM Ship v7 Other sector contained Other Depot Maintenance which is now found in the OSCAM Ship v8 Depot Maintenance sector, and Training which now has its own sector.

The Other Sector input form



Throughput Data

Appropriation Categories

An inflation appropriation can now be associated with each Throughput item. This allows Throughput data to be updated automatically when the Cost Base Year is changed and also allows it to be included in the calculation of Then Year $ results.

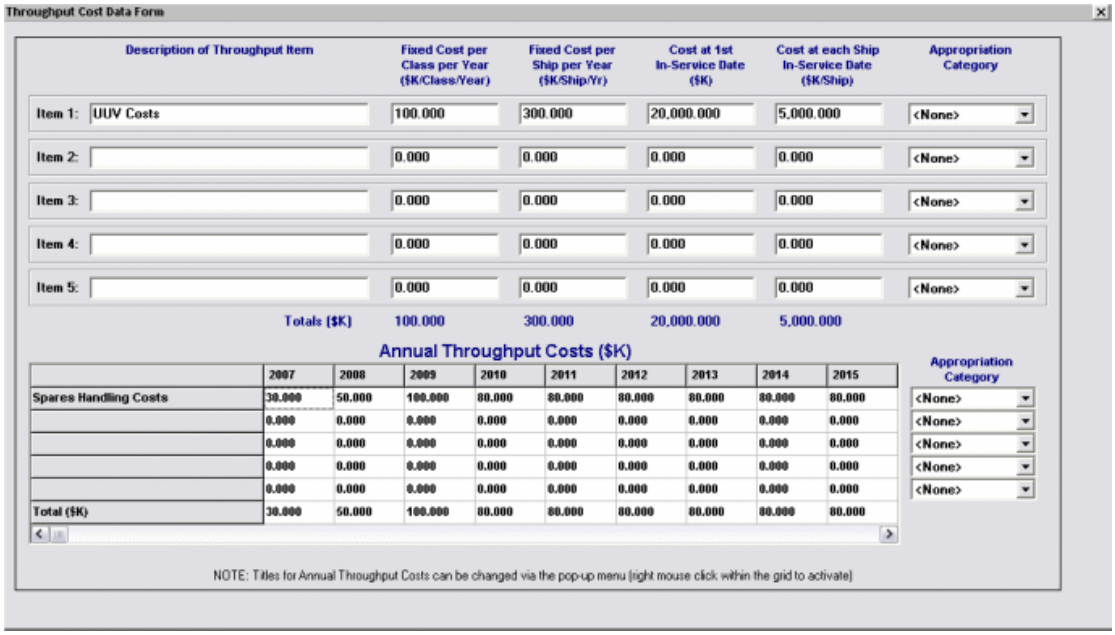
Converting Ship v7 files

Ship v7 Throughput does not have the option to select appropriation categories for data items so all categories are specified as <None> when converted to OSCAM Ship v8. It is recommended that an appropriation category should be identified for each row with data so that changes in Cost Base Year and Then Year $ calculations are able to inflate or deflate the Throughput data.

Impact on Then Year $

Then Year $ can no longer be calculated for results sets that have been created through the Delta or Aggregation tools since Throughput appropriation categories cannot necessarily be matched up when multiple results sets are combined using these tools. If Then Year $ are required for Delta or Aggregation results then the individual results sets should be converted to Then Year $ before utilizing the Delta or Aggregation tools.

The Throughput Costs input form



Annual Profile Tables

Annual cost profiles have been created for Training, Installation Support, Personnel Support, ETS and Software Maintenance costs. These are areas where Throughput profiles were often used in OSCAM Ship v7. These profiles are now available in the appropriate sectors, and the cost impacts shown in the relevant parts of the results tree.

Undo and Re-do Functionality

It is now possible to undo previous data changes. An undo button is used to undo the last change. Previous changes can be selected from a pull-down list. Alternatively, double-clicking on an input will show the traditional dialog to select values from Primary or Reference data records, to which an extra tab has been added to allow previous data values to be selected. Data tables also have a list of undo items.

A re-do button and pull-down has also been added to reverse undo actions. The list of undo and re-do actions is cleared when a new data record is loaded or when the Cost Base Year is changed.

Simulation Runs

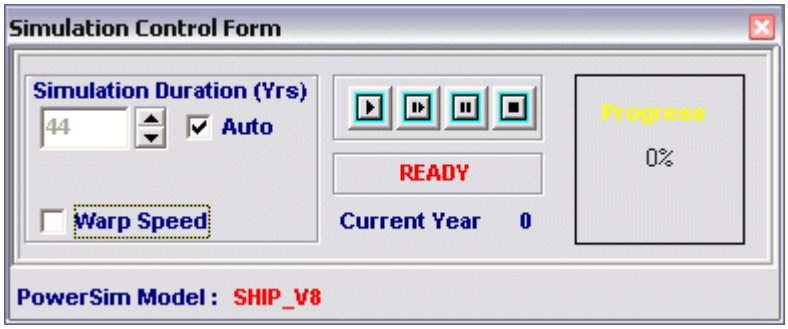
Optional Powersim Mode

Use of the Powersim simulation package with OSCAM is now optional and the software does not need to be installed on the host PC in order to be able to use OSCAM Ship v8. Powersim is not started automatically with OSCAM (improving start-up times) and will only be loaded if a non-Warp Speed simulation run is selected.

Automated Simulation Duration

The required length of a simulation run is automatically calculated based on the year of the last ship introduction and the ship lifetime (plus 1 year). This can be manually overridden to allow for shorter runs that do not cover the whole of the program lifetime, or if Throughput costs are required to extend beyond the retirement of the last ship.

The Simulation Control form



Results Screen

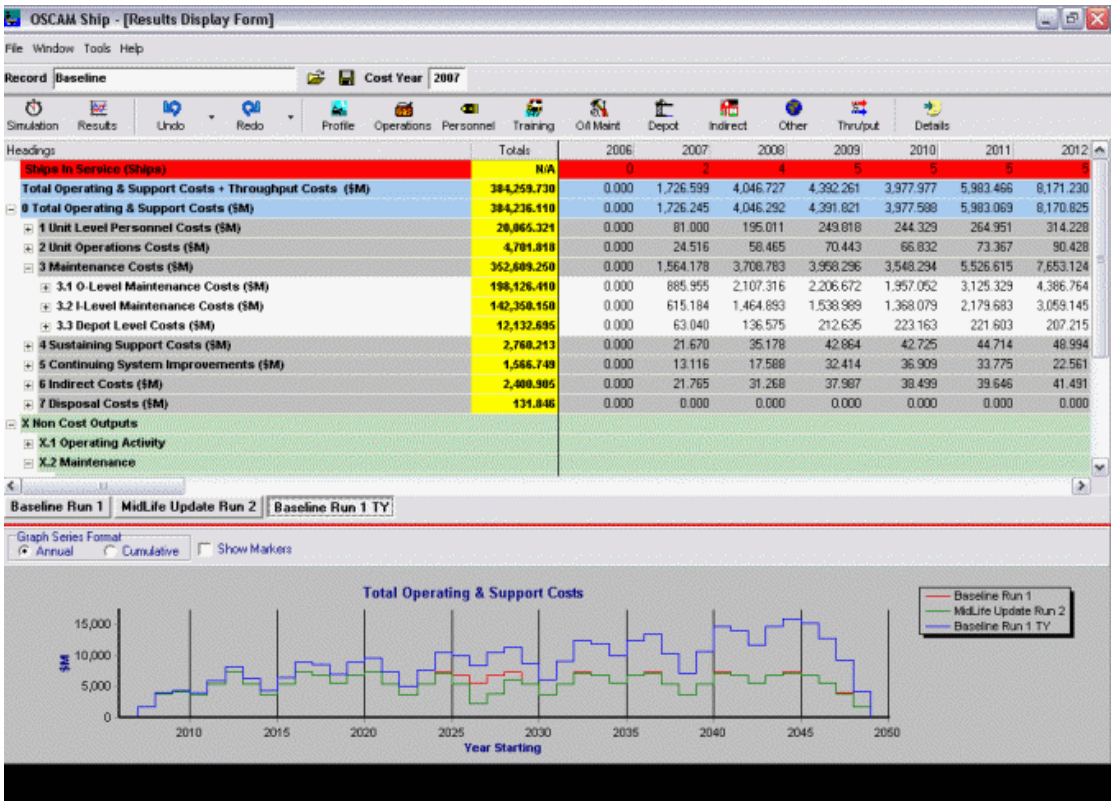
Cost Breakdown Structure

The basic functionality of the results screen has stayed the same as in OSCAM Ship v7. The cost breakdown structure has been organized using the CAIG 2005 structure and numbering. Some of the output lines have changed to reflect the business processes that are represented in OSCAM Ship v8.

Name Tab Functions

The results tabs at the bottom of the results table now display a popup menu when right-clicking the mouse on them. This allows quick access to view/change the results description, delete a results set, and to specify whether or not that results set is displayed on the graph.

The Results Display

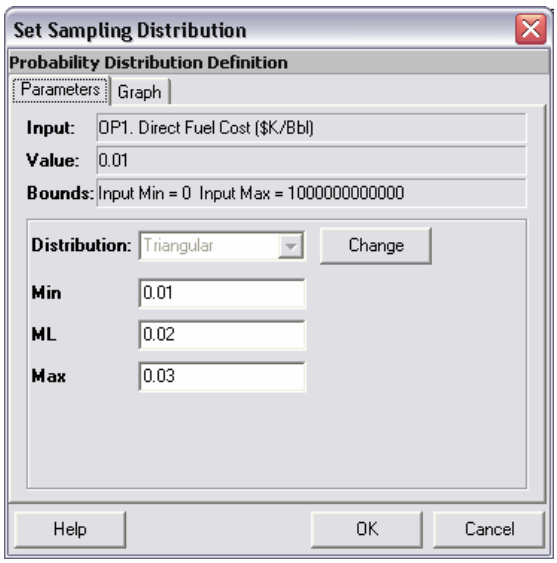


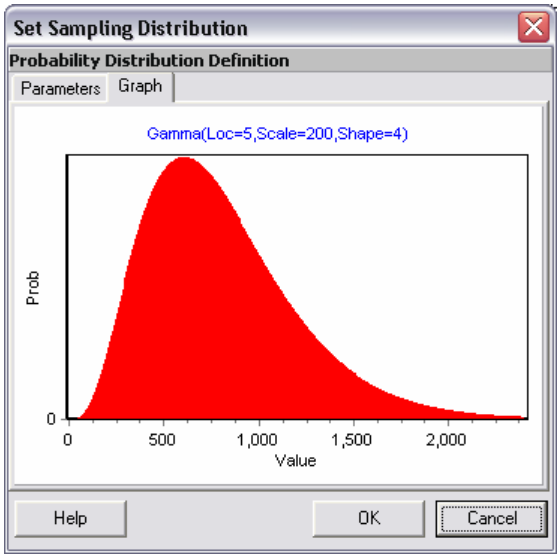
Uncertainty Tool Changes

Alternative Probably Distributions

The Uncertainty Tool has been extended to allow more than 20 inputs to be selected. It also now allows a variety of probability distributions to be used. To help in the selection of a probability distribution a graphical display will show the shape of the distribution for the selected parameter values. The input data for an Uncertainty run is now saved as part of the input data record rather than the workspace.

The probability distributions parameters and graph





Saving Results

More decimal places

Results that are saved via the option in the File menu now retain more decimal places. This allows more accurate calculations to be applied in Excel when exporting the results.

When Copying and Pasting the results from the OSCAM results tree into Excel, the pasted data will use the number of decimal places and layout that is displayed on the Results form.

Default Data File Locations

New default location

The default OSCAM Databases directory structure is no longer placed in the Program Files directory. The installation process now places the Databases directory structure in the users My Documents directory (in Windows 2000 or XP) or Document directory (in Windows Vista). The top level directory is called 'OSCAM' with a sub-directory called 'Ship v8 Databases'. Note that an alternative location may be selected during the installation process.