AVEVA Hull & Outfitting Release 12.1

User Bulletin

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Contents

Revision History

Date	Description
September 2011	Initial release of 12.1
28/9/2011	Updated
29/9/2011	Added information about ASL, moved Piping Isometrics to Outfitting Design.
04/10/2011	Added section 1.3.1 Projects in Folders with Embedded Spaces. Added section 29.1.3 New Reporting Add-in.
05/10/2011	Added section 29.1.3 AVEVA Global.
18/10/2011	Added reference to Upgrade documentation in chapter 2, release note 9.1 ha been updated with a last bullet point.

1. Introduction

This bulletin describes the new and enhanced functionality available in AVEVA Hull and Outfitting 12.1 as compared to AVEVA Hull and Outfitting 12.0. It gives an overview of the major changes, which are described in full in new and revised User Documentation. Some known issues are also described in this bulletin.

1.1 About AVEVA Hull and Outfitting 12.1

AVEVA Hull and Outfitting 12.1 is a major update from AVEVA Hull and Outfitting 12.0; many of the associated products have also been enhanced.

1.2 About this Bulletin

This manual gives an overview of changes since the previous major release: Hull and Outfitting 12.0. It is aimed primarily at users upgrading from that release; those upgrading from earlier releases should also read the Hull and Outfitting 12.0 User Bulletin, preferably the edition issued with Service Pack 6.

This bulletin also covers many of the associated products supplied on the same DVD-R. These products fall into 3 families – Engineer, Design and Manage – and these groupings within the Marine portfolio are reflected in this document. Those aspects that are common between most of the products are generally covered in the first part of the document.

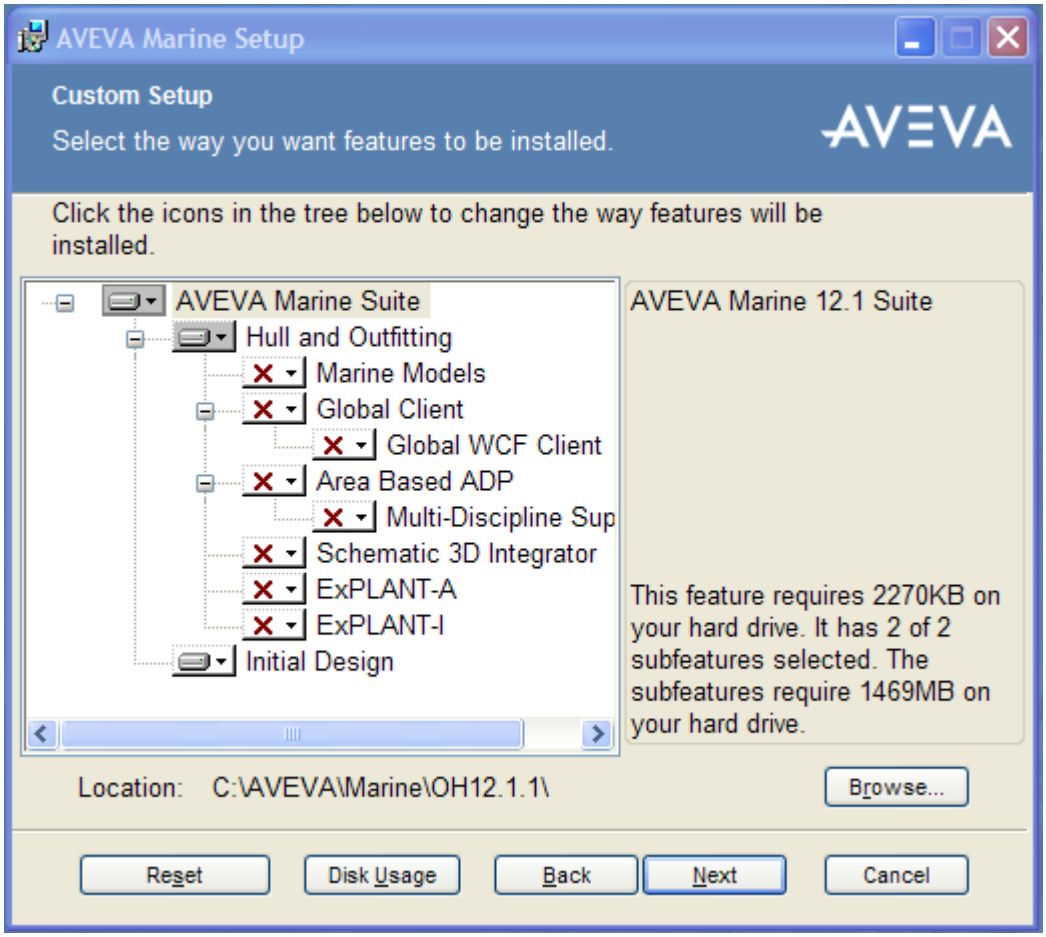
1.3 Software Distribution and Installation

AVEVA Hull & Outfitting 12.1 is supplied on a DVD-R, which self-installs using standard Microsoft installation procedures. The full software suite is usually loaded onto individual PCs running Windows, with the license server and file loaded onto a networked Windows server.

Please note that Hull and Outfitting 12.1 onwards requires Flexman 5 and an appropriate license – it will not work with Flexman 3 or 4. For further details of Flexman License Server releases, please see http://support.aveva.com/services/products/flex/index.asp and http://support.aveva.com/services/products/flex/flex_releases.asp .

The installers use standard Microsoft Installer (MSI) technology, which facilitates silent installations through standard MSI means. They are usually triggered by use of a setup.exe file.

There are fewer separate installers, each corresponding to an AVEVA ‘release’, on the DVD. The Hull & Outfitting/Marine installer now includes options to install many of the associated products, although, for various reasons, some products still use a separate installer.



Using separate installers means that a selection of products can easily be installed together. This includes the AVEVA Global client option, which enables the use of Hull and Outfitting or other Marine products with Global. However, there is a separate installer for Global server, which is usually installed on a separate machine, such as a server, which does not necessarily have Hull and Outfitting installed.

There are options to install batch files and shortcuts on the desktop and/or in the start menu for direct entry to popular modules. In addition, the pml index can be automatically configured. Please note that there is no 'thin client' installation option as this is no longer supported.

Existing installations should be changed, repaired or removed using Add or Remove Programs from the Control Panel. This process will prompt for the original DVD if required. This ensures that a consistent product set, as tested by AVEVA, will be deployed.

Fix releases (patches) will use a standard updating process, which also checks, and if necessary 'heals', the existing installation. There is therefore no prompt for location, as the system already has this information. Fix releases may also be removed using Add or Remove Programs. Fix releases are applied to all products installed together, not to the individual products. The use of the latest fix release is recommended: this includes any previous fixes to products installed together.

Please note: During the installation it is fully possible to change the path in which the Marine product is installed from its suggested default. However, it is required that the installation path does not include folders with spaces in the names.

For full details of the installation options and procedure, and the hardware and software requirements, please refer to the *Marine Software Installation Guide* and *Minimum System Requirements Marine*.

1.3.1 Projects in Folders with Embedded Spaces

AVEVA Hull & Outfitting 12.1 will not fully support projects with spaces in their pathnames. Work is in hand to remove these limitations but no definite release date is yet set.

1.4 Licensing AVEVA Hull and Outfitting Software

Upgrading to Flexman 5 is a pre-requisite for AVEVA 12 series software. It may also be worth stressing that customers do not need to wait for AVEVA 12 but can upgrade at any stage using an existing license file: Flexman 5 is compatible with previous software releases from VANTAGE Marine 11.6 and onwards.

All AVEVA 12 series software requires access to a licensing file provided by the Flexman 5 application, and loaded by the install wizard. The license file can be stored on a networked server with client access, a networked workstation with client access, or on the workstation on which the AVEVA 12 series software is currently loaded.

The reason for storing the license file on a server or shared workstation is that it allows maximum user flexibility, while minimising the number of licenses that must be leased.

1.5 AVEVA Hull and Outfitting 12.1 Test Projects

The table below shows details about the sample project supplied, and where to find the test data.

Project	MDB	Description
MAR	ALL_NO_MDS	MDB for Project Setup with ALL databases except MDS
	ALL_WITH_MDS	MDB for Project Setup with ALL databases including MDS
	ASSYPLANNING	For Assembly Planning Hull and Outfit Users
	CABLEAFT	For Outfit Aft Cable User
	CABLETRAYAFT	For Outfit Aft Cabletray User
	CURVEDHULL	For Curved Hull User
	DBPROMPT	For creating required db elements from DB Prompt
	EQUIPAFT	For Outfit Aft Equipment User
	HADMIN	For Hull Admin User
	HULLNESTING	For Hull Nesting User
	HVACAFT	For Outfit Aft HVAC User
	INITDES	For Initial Design User
	LAYOUTAFT	For Outfit Aft Layout User
	MDSAFT	For Outfit Aft MDS User
	OUTSTEELAFT	For Aft Outfit Steel User
	PIPEAFT	For Outfit Aft Piping User
	PLANARHULL	For Planar Hull User
	PROJADMIN	For Project Admin User
	SCHEMATICS	For Schematics User
	STRUCDESIGN	For Structural Design User
	WELDPLANNING	For Weld Planning User
MAS (Catalogue)	—	

The MDB's can be accessed by the system (FREE) user (SYSTEM/XXXXXX), each has their own 'dedicated' user as well. There will be a full Project Description PDF file with each project which contains the details outlined in the table above, plus the Teams and Users (including passwords) available in the project. This can be found for the Marine (MAR) project at the projects installation location top level, (MARProjectDescription.pdf and MASProjectDescription.pdf).

2. Upgrading from Previous Releases

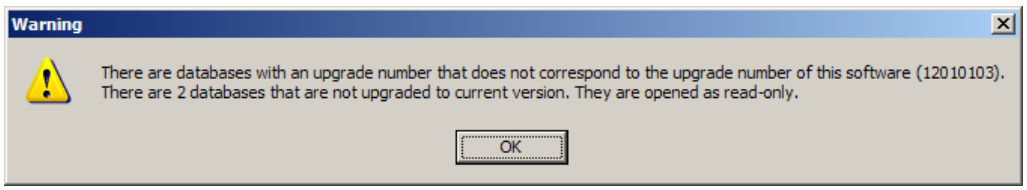
Please note that the full Upgrade documentation is available from the User Documentation index page *Read Me First / Upgrade 12.0 to 12.1*.

2.1 Upgrade Overview

A number of the enhancements made at Hull & Outfitting 12.1 *require* an upgrade to the database. Each of these individual changes is referred to as a Part Upgrade. In general each of these has been designed to be 'optional' from a customer perspective, in that the 12.1 software can work with a database that has not been upgraded and the software will degrade gracefully – that is, the software will continue to work, although some new functions may not be available.

This means that it is possible for customers to continue to work with Foreign DBs, which may be shared with 12.0 or earlier projects and which have not been upgraded, included in their projects. An example would be a Corporate Catalogue DB used for 12.0 and multiple projects.

Databases which have not been upgraded will however be read-only. The following warning will appear when opening an MDB from a project that has not been upgraded:



This warning (or similar) indicates that the project needs to be upgraded to the latest version in order to allow write access.

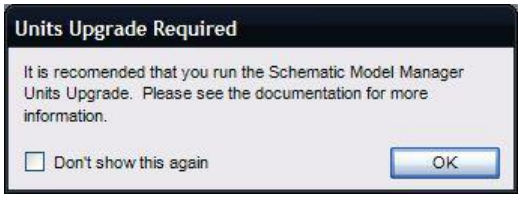
All the Part Upgrades will be run by a new Upgrade Framework, which converts a Hull & Outfitting 12.0 project to 12.1. This is initiated from Admin using the following commands in the Command Pane (or TTY mode):

```
lock
dbupgrade project to latest
unlock
```

This procedure may also be used with Global projects if some additional precautions are taken. A brief summary is given below – further details are given in the *12.0 to 12.1 Upgrade* manual.

Earlier projects should first be upgraded to Hull & Outfitting 12.0.

Schematic Model Manager has its own units handling at Hull and Outfitting 12.0. It also has its own upgrade mechanism, which is separately documented; the software will advise if it is necessary to run this:



2.2 Upgrade Framework

The Upgrade tool is invoked from Admin; it controls the upgrade process and runs each Part Upgrade in the appropriate order. Upgrades relevant to Hull & Outfitting that are covered by this process are:

- UKEYs (now include database number to avoid duplicates)
- Performance of 'finding' database elements (index by type)
- Module Definitions – new TAGS module (and renamed Marine Drafting module)
- Character handling (Unicode representation for names, text etc)
- HULL FEM Data Model
- Compressed HULL Objects
- New Index on Hull Object Type
- Start Value for Name Sequence
- Assembly POS Attribute
- Line widths in Draft (widths of thin, medium and thick lines now stored in system database)

The upgrade tool puts an upgrade number in the databases, indicating the level to which they have been upgraded. This makes it easy to detect, on opening, whether a database has or has not been upgraded. This upgrade number will also be used by the Reconfigure process.

2.3 Database Version Control

The upgrade version number is used to verify that the versions of the database and the software that accesses them are compatible. During application start-up, databases are checked against the software; access may be restricted according to the following table:

	Database Upgrade Version		
	Pre 12.1	**12.1.1**	**Future (e.g. 12.2)**
Software Version	*Max Open Mode*		
Pre 12.1	**R/W**	**X**	**X**
12.1.1	**R**	**R/W**	**X**
Future (e.g. 12.2)	**R**	**R**	**R/W**

This control ensures that AVEVA software that opens a database is compatible with the contents of that database and thereby prevents accidental data corruption. It also ensures that data intended for use with one software version is not modified by a newer, incompatible software version.

X indicates 'no access'; however, versions earlier than 12.1 do not make this check, so cannot detect a database upgraded to 12.1 or later.

2.4 Part Upgrades Outside the Framework

These are independent of other non-framework upgrades; in other words, non-framework upgrades can be applied in any order. However, it will not be possible to backtrack to pre-upgrade sessions.

2.5 Global

Each database must be entirely in either an upgraded or non-upgraded state for Hull & Outfitting to work correctly. Therefore it is essential that all extracts of any database are processed during an upgrade.

The whole project, excluding Foreign databases, should be upgraded at once.

2.6 The Upgrade Process

The upgrade process will be undertaken by System Administrators responsible for the project at all locations. When upgrading multiple projects, many System Administrators will need to co-ordinate. The upgrade process will upgrade one project at a time. Customers will need to give careful consideration to the order of upgrade for the various projects.

The projects will need to be locked for the duration of the upgrade, with all Users out of the system.

The upgrade process will be:-

1. Ensure all users have exited from project
1. Lock project at all locations (upgrade will check for this (see below)
2. Disable Automatic update events if required. (Recommended but not essential)
3. Expunge all users in the system at the local location
4. Flush data from Working extracts – these will not be considered; in Global projects they should be deleted
5. Check project using DICE (Integrity Checker)
6. [If DICE reveals issues, address them, then re-run DICE]
7. *Administrator may want to unlock project while DICE issues are being addressed, but will need to exclude all users and Lock project again before final DICE check*
8. [After clean DICE check]
9. Back-up project at all locations
10. Temporarily relocate all non-Foreign DBs to their master's Primary location
11. Check for No Transient Databases
12. Upgrade the project at each location
13. **Optionally** Merge Sessions
14. **Optionally** Reconfigure for Unicode
15. DICE check project
16. Relocate extracts back to their original locations
17. Perform non-framework upgrades if applicable
18. Unlock the project

2.6.1 Locking the Project

The project as a whole cannot be locked, only individual locations; however, it is possible to lock all online locations from the HUB through Global. To do this run the following command from the HUB:

```
LOCK AT <location>
```

The HUB can be locked without the need for a daemon command using the command:

```
LOCK
```

It is possible to confirm whether locations are locked by evaluating the return result from:

```
QUERY LOCK AT <location>
```

2.7 Extract Hierarchies

It should not be necessary to change the extract hierarchy, nor to consolidate data within extract hierarchies. Therefore the System Administrator should not need to FLUSH, ISSUE, DROP data

between extracts (working extracts are an exception to this – see below). Nor should they need to delete any extract families to leave only Masters. However all extracts will need to be relocated to a single location, although this does not need to be the HUB.

2.7.1 Working Extracts

The upgrade process will need to ensure that all data is up to date at the HUB where pre-scan data checks will need to be made. Working Extracts cannot be propagated as they are specific to a single location. As a result all data MUST be flushed, and claims released from the Working Extract into its parent. This is only true for working extracts; all other extracts do not need to be flushed, or have their claims released, as they will be available at the HUB.

2.7.2 Offline Locations

Global supports Offline locations; therefore we cannot assume that the Hub has a Global connection to that location. Offline locations do not support distributed Extracts but can support stand-alone extract families.

It will not be possible to co-ordinate the upgrade from another location if Offline locations are used. Offline locations are relatively independent, and can be treated as such.

2.8 International Characters (Unicode)

New databases created at Hull & Outfitting 12.1 will by default use the Unicode character set for textual attributes and names – see section 5.1. However, no upgrade is required for older databases: they will be handled according to the project character set as defined in Admin (PROJECT CHARSET or PROJECT MBCHARSET commands). They will also be converted according to this setting if they are reconfigured so it is important that it is set correctly!

In cases where an extended range of characters is needed, Reconfigure may be used to convert a 'legacy' database to a Unicode encoded database.

In the following example legacy DICT databases (used to hold UDA and UDET names) are reconfigured to be Unicode encoded, using Admin 12.1.

```
FROM DB MASTER/DICT
TO FILE /c:\DICT1 /c:\DICT2
RCFCOPY ALL
RECONFIG SESSIONS

FROM FILE /c:\DICT1 /c:\DICT2
TO DB MASTER/DICT
RECONFIG
```

Doing it this way means that no deletion and recreation (or copy) is required for the DB, and therefore neither is re-adding to the MDB structures required. Using RECONFIG SESSIONS in the FROM phase of the reconfigure operation will preserve both the sessions and references.

Summary

Locally Encoded (Legacy) Databases:

- can be opened for read access in both Hull & Outfitting 12.1 and earlier versions
- can be opened for write access in both Hull & Outfitting 12.1 and non-Unicode versions, but the range of characters which may be used is restricted to the set defined by the project settings
- require that the project settings are correct so that characters can be interpreted correctly

- can be reconfigured to a Unicode encoded database

Unicode Encoded Databases:

- cannot be opened for read or write access in versions of Hull & Outfitting prior to 12.1
- can store the full range of Unicode characters available in Hull & Outfitting 12.1

2.9 Units of Measure

2.9.1 Units in Outfitting

Distance and bore units are handled in much the same way as before and should need no conversion. Other attributes will now be converted to and stored in appropriate units. Where a database has stored all quantities of a dimension in the appropriate unit, the new functions can be used without upgrade.

Attributes other than distances and bores have the UNIT field set for the first time; in previous versions of Hull & Outfitting, they were until now stored as values with no specified unit, other than by use and convention - they could change from application to application, and project to project. This approach is not compatible with automated conversion so the storage units must be defined. For compatibility, it is possible to set the units to NUMERIC which will disable Units conversion for that physical dimension. Disabling a specific dimension in this way means that no advantage will be gained from the introduction of that dimension.

Previous versions of Schematic Model Manager had special units support for Angle, Area, Pressure, Temperature, Volume and Weight values that could be included in the ISO15926 format import file. Units UDAs were provided as mandatory UDAs and were attributes on each Diagram element (SCDIAG). The chosen units for these dimensioned quantities could be set in the Project Options form in Schematic Model Manager. In 12.1, the new units capabilities mean that the special units support in Schematic Model Manager is no longer required. Data imported in 12.1 will be stored in the appropriate units consistent with the data read from the ISO15926 import file. The upgrade process for projects moving to 12.1 includes a part upgrade for Schematic Model Manager dimensioned data.

Please note that the CATA database elements MSET, MTYP, ATLI, USEC and UDEF are no longer used; they will be removed from the database in due course.

2.9.2 Units in Hull and Drafting

In AVEVA Marine Hull and Marine Drafting applications the set up for Units differs from the Units setup in Outfitting.

Presentation format for Units in Hull and Drafting can be set to SI or Imperial. SI units are default. The format for SI and Imperial respectively can be further controlled by a set of environment variables and default variables.

For details on the Units usage in Hull and Drafting, please see the following chapters in the AVEVA Marine User Documentation:

1. *Hull Basic Features and Concepts -> Basic Features -> Imperial Units Syntax Description*
2. *Marine Drafting -> Drafting -> User Guide -> Appendices -> Drafting default file keywords -> Unit codes*
3. *Marine Drafting -> Drafting -> User Guide -> Appendices -> Drafting default file keywords -> Unit system*
4. *Hull Initial Design -> Lines – User's Guide -> Technical reference -> Conventions -> Units*

Unit Controlled Dimensions in Hull and Drafting

The dimensions that can be unit controlled in Hull and Marine Drafting are shown in the table below.

Core units are independent of the Unit settings and are the same for Hull and Outfitting data.

Dimension	**Core unit**		
Coordinate	mm		
Linear measure	mm		
Area	mm^2		
Volume	mm^3		
Weight	kg		
Density	kg/ mm^3		
Angle	degree		

Presentation Format for Units in Marine Applications

Within Hull and Marine Drafting specific application functions, values will be presented according to the Hull/Drafting settings.

Attributes in Hull Initial Design are presented according to Initial Design settings.

Within general functions available in Hull Design or Marine Drafting, e.g. Reporter, Attribute addin or Query attribute command, values will be presented according to the Outfitting Units system.

Within common marine applications, such as Space Management and Assembly Planning, all attributes will be presented according to the Outfitting Units system.

Within Outfitting specific functions, presentation of hull attributes will follow the Outfitting Units system.

Input Format for Units in Marine Applications

In Hull and Marine Drafting applications the input format can be SI or Imperial, independent of the Units settings.

Units in Marine – Upgrade and Migration

No upgrade or unit conversion from AVEVA Marine 12.0 to 12.1 is required for Units in Hull and Drafting, since core units have not been changed.

The unit settings, including the default settings, for Hull and Marine Drafting are the same in AVEVA Marine 12.1 as in AVEVA Marine 12.0 (and in Tribon M3).

2.10 Schematics Functions

Projects that are upgraded from Hull and Outfitting 12.0 or earlier need a suitable module definition in order to use the new Engineering functions in the new Tags product (see above).

The data will need some reconfiguring:

- Integrator links world (CYMWRL) has been moved to Reference database
- Shape upgrades in Diagrams – automatic when opening a diagram in write mode

Systems moved to Reference Design database

3. Configuration

3.1 Operating Environment

Hull & Outfitting 12.1 is supported on Windows XP Service Pack 3 (32-bit) and Windows 7 (both 32- and 64-bit versions). Projects are usually installed on a server – both Windows Server 2003 & 2008 R2 are supported.

3.2 PC Hardware Configuration

A minimum of 4 GB of memory is recommended for this release, especially when installed on Windows 7. Hull & Outfitting 12.0 will operate with less, but system performance will be compromised. A screen resolution of *at least* 1280x1024 is recommended, though most users now use either two such screens or a wide-screen (1920x1200) display. For details, please refer to the *Systems Requirements Manual*.

3.3 Microsoft Windows

Desktop

Hull & Outfitting 12.1 is supported for use on Microsoft Windows XP Professional, Service Pack (SP) 3 or on Windows 7 (Business and Enterprise editions) Service Pack 1, with appropriate patches.

A single 32-bit version of the Hull & Outfitting system is available; this is supported on both 32- and 64-bit versions of Windows 7. It is no longer supported on Windows 2000; indeed Microsoft no longer offers support for Windows 2000 or Windows XP SP2.

Please note that User Account Control (UAC) introduces new security restrictions at Windows 7 (and Vista). In particular, this makes it important to ensure that files that need to be written are accessible by users without Administrator privileges.

3.3.1 Microsoft Internet Explorer

Internet Explorer is required for the on-line help system; version 7 or 8 is recommended as version 9 does not currently work correctly.

Hull & Outfitting 12.1 requires Microsoft's .NET Framework 3.5, which is supplied on the DVD and installed if required. It should be noted that installation of version 3.5 brings with it several of the earlier versions, on which it depends.

The updated version of .NET used for Hull & Outfitting 12.0.SP6 onwards may prevent .NET add-ins running if deployed on a network. This will not usually cause an issue as AVEVA recommends a local installation on each machine, but might cause problems for customers running their own add-ins.

.NET security can cause issues when running Hull & Outfitting across the network where the add-in assemblies reside on a different machine to the .NET runtime. The default security level for the local intranet is not set to Full Trust, which means that programs may not be able to access resources on the local machine. To overcome this, the intranet security may be set to Full Trust, though this means that any .NET assembly may run. Alternatively, Full Trust may be given to a specified group of strongly named assemblies.

Trust levels may be set using the Microsoft Code Access Security Policy tool `caspol`. For details, please see http://msdn.microsoft.com/en-us/library/cb6t8dtz(v=VS.90).aspx.

Serialization

Please note that serialized settings (of the user interface configuration) are now saved in the following location on Windows XP:

```
C:\Documents and Settings\<username>\Local Settings\Application Data\Aveva\
```

and on Windows 7:

```
C:\users\<username>\Appdata\Local\AVEVA\
```

3.3.2 Microsoft Office & Fonts

AVEVA Marine 12.1 is supported with Office 2007 and Office 2010. The use of the 32-bit version of Office, including Visio, is recommended on both 32- and 64-bit Windows as issues have been encountered with the 64-bit version.

Excel Interoperability

Import of data into a grid control requires an optional component from Microsoft Office. This is not supplied with Hull & Outfitting but is an installation option for Microsoft Office. Please ensure that ".NET Programmability Support" under Advanced customization of applications" is enabled when Office is installed.

This will install the Microsoft Microsoft.Office.Interop.Excel.dll. If this assembly is not enabled, invoking the Excel import facility will not work.

Screen Font for GUI

The Hull & Outfitting user interface (version 11.6 onwards) requires the use of the Arial Unicode MS font, which is supplied with Microsoft Office (version 2000 onwards) and is usually installed automatically when using Windows XP or later.

For further information, please refer to http://office.microsoft.com/enus/help/HP052558401033.aspx. If this font is not installed, some of the text in the user interface may become illegible.

The layout of some GUI forms may also be adversely affected if the screen font size is not set to the smallest size, which is usually default. This setting is accessed from the Control Panel and is referred to as "Normal" in Windows XP or "Smaller" (100%) in Windows 7.

3.4 Graphics Cards

Due to the rapidly changing availability of hardware-accelerated OpenGL graphics cards, an up-to-date list of supported cards is not included in the documentation released with Hull & Outfitting. The AVEVA Product Support website (accessible from http://www.aveva.com) – IT Configuration section,– contains a list of tested and supported graphics cards.

3.5 Environment Variables

Hull & Outfitting and some of the other products rely on the use of environment variables for various aspects of configuration, notably the location of folders for project databases and user workspace.

4. General System Changes

4.1 Unicode Character Handling

Earlier versions of Hull & Outfitting handled textual data such as element names, textual attributes and file names in a manner specific to the various supported character sets used in supported languages. This applied to most of the input, output and storage. This has now changed; all textual information in Hull & Outfitting is represented as Unicode.

Unicode is a computing industry standard for the consistent encoding, representation and handling of text expressed in most of the world's writing systems. Developed in conjunction with the Universal Character Set standard and published in book form as The Unicode Standard, the latest version of Unicode consists of a repertoire of more than 109,000 characters covering 93 scripts. For more details, please see: http://en.wikipedia.org/wiki/Unicode.

Unicode can be implemented using different character encodings. The Hull & Outfitting Internal Format for string data is Unicode UTF-8 format. This can handle all seven character sets supported in previous versions – and potentially many more.

4.1.1 Restrictions

Hull & Outfitting MS has been tested using the same range of languages as previous releases. No font files are available for any other language; this means that TrueType fonts must be used on drawings and that therefore it is not possible to produce plotfile output.

With that restriction, it is anticipated that many other languages will work, though there are aspects of the Unicode standard that are not yet implemented. Hull & Outfitting currently handles the following correctly:

- Left to Right languages; and therefore **not**, for example, Arabic and Hebrew
- Pre-composed characters; for example, the single character á but not the combiners a + ‘ => á
- Upper and lower casing of characters, where both cases have the same number of bytes

4.1.2 Textual File Handling

By default all sequential text files read by Hull & Outfitting will be expected to be in UTF-8 format with a Byte Order Mark (BOM) present to identify them. Similarly by default all sequential text files written by Hull & Outfitting will be in Unicode UTF-8 format with a BOM present..

A simple command line ‘transcoder’ is also supplied; this may be used in some applications to convert files to a different encoding.

4.1.3 Filenames and PML

The Hull & Outfitting command processor supports Unicode characters. All PML string variables support Unicode values. You can use Unicode characters in PML variable names, PML object form and gadget names, PML method and function names. It is recommended that PML language files should either be UTF-8 format with a BOM present or else strictly ASCII (basic Latin) format. AVEVA application (appware) files are mostly ASCII at present.

Filenames and directory names can also contain foreign Unicode characters, but may cause problems in other systems so it is recommended to keep to ASCII names. This applies to some of the systems to which Hull & Outfitting is interfaced, and even to some of the interfaces where the system makes use of third party software such as output of DXF and DGN. PML Publisher does

not currently fully support Unicode filenames. AVEVA has also encountered problems using files with non-ASCII names in some development tools.

4.1.4 Using Forms and Menus

The default 'system font' used by Forms and Menus (F&M) is *Arial Unicode MS* which contains a large number of the world's alphabets. Internally F&M uses Unicode, but can only display the characters accessible in its current 'system font'. You will be able to copy and paste Unicode characters from and to textual fields of F&M gadgets. This includes entering characters into the Hull & Outfitting command window.

4.1.5 Using TTY Mode

You can enter Unicode characters in Teletype (TTY) mode, but the Console Window can only display the characters which exist in its currently selected font. Console fonts tend to be quite restrictive so you need to select a suitable one. In the UK you will probably be restricted to "Lucida Console" or "Consolas" which will display European characters but not Asian characters etc.

4.1.6 Graphical Output

In general Hull & Outfitting graphical output (2D and 3D) allows only the use of the TrueType fonts set up in the Admin module. This will allow you to display Unicode characters which are known to those fonts. By default you get font 5 = "Arial Unicode MS" which gives a large range of character sets.

Restrictions using Draft and Isodraft 2D Views

For TrueType fonts, the TrueType font selected must have the correct character set(s) present for the language(s) you want to use. Arial Unicode MS has most, but other TrueType fonts typically have a subset. In this case, foreign and mixed language strings will work correctly.

You can of course use fonts specific to a given language for Unicode characters in that language (even if the font name itself is in a foreign character set).

It is recommended that you avoid using Hull & Outfitting (Wigwam) fonts if possible. It is not, in general, possible to have mixed language strings if you use them. They are more complicated to setup, and work more like 12.0, so are limited compared with TrueType. The following restrictions, some of which were documented in previous versions of the Hull & Outfitting Installation Guide, apply:

4.2 Units of Measure

The inclusion of a much wider range of units means that most real attributes now have a default unit (usually in SI units) for storage and input/output. User can also set a default unit, which must be of an appropriate type, for input and output. Input via the command line or GUI also allows the user to specify an alternative unit.

This does mean some unavoidable changes to the command line so user applications using real attributes will need to be reviewed. There are also minor changes to many of the user interface forms. The new functions can also be accessed by the .NET Units interface, as detailed in the *.NET Customization manual.*

Customers who have written or adapted PML applications may need to check these. They are explained in more detail in the *12.0 to 12.1 Upgrade* manual.

Several of the reference manuals have been updated to reflect these changes, including:

Catalogue and Specifications Reference Manual

- *Data Access Routine User Guide*
- *Database Management Reference Manual*
- *Design Reference Manual Creating The Model*
- *Design Reference Manual General Commands*
- *Lexicon Command Reference*
- *Software Customisation Guide*
- *Software Customisation Reference Manual*

4.2.1 Supported Dimensions and Units

In previous versions of Hull & Outfitting, all dimensioned quantities other than distances or bores were output in units stored in the database, irrespective of the current units. For example all masses were assumed to be Kg.

There is a new set of commands to complement and extend the existing units functions. These commands control the units of supported dimensions, and their dependent quantities (e.g. density and pressure). For masses, the command UNITS may be followed by KG MASS, GRAM MASS, POUND MASS, TONNE MASS or TON SHORT/LONG MASS. New DISTANCE options are also provided: 'FOOT DIST' and 'METRE DIST' to output and return values in these common units.

The command which sets the distance units is:

{MM INCH FINCH} DISTANCE

The new commands use the keyword 'UNITS' to define the units to use for the various dimension types. For example:

```
UNITS MM DISTANCE
UNITS POUND MASS
```

The leading UNITS keyword is optional for MM INCH and FINCH DISTANCE but is required for all new options in the commands listed below. The command and functionality of BORE units remains unchanged.

Some units are case-sensitive to adhere more closely to SI conventions; strict adherence is not always possible due to syntax conflicts. This allow a distinction to be made between units such as s(econds) and S(iemens), hours and Henrys, tonnes and Teslas. This does not apply to Imperial units (IN or in, FT or ft are all valid) or to some metric units such as MM, which have been supported in previous releases.

Units that are case sensitive are (m, s, g, t, K, h, Pa, N, V, A, F, Sv, d, J, W, C, S, H, T, W, P, G) – i.e metre, second, gram, tonne, Kelvin, hour, pascal, Newton, volt, ampere, farad, sievert, day, joule, watt, coulomb, Siemens, henry, tesla, watt, poise, gforce. SI prefixes are also case sensitive – for example, m means milli and M mega – except in their full form (e.g. MILLI and MEGA are both accepted).

The table overleaf shows the new units of measure and the options available, as well as the old ones: BORE DIST SQDI CUDI. It gives their name (or description) recognised by the system, the assigned hash-code, the database storage units and the supported standard units for the quantity. For example, attributes of length have a hash code of DIST, are stored in mm and other standard units include inch, cm, ft, metre etc.

Name of Dimension	HashCode /Word	Database units	other specific units	comment
AbsPressure	ABSP	pascal	bar atm PSI torr mmHg inHg	Pressure may be absolute or gauge
Acceleration	ACCL	m/s2	gforce (gravity)	
Angle	ANGL	degree	radian grade arcmin arcsec	
Angular Frequency	ANGF	rpm		
AngularMomentum	ANGM	N.m.s		
Area	SQDI	mm2	acre hectare	
Bore	BORE	mm	in	Range limited to mm and inch (and Finch)
Capacitance	CAPA	farad		
Charge	CHAR	coulomb		
Conductance	COND	siemens		
Content	PCUD	mm-3		
Currency	CURY	USDollar	UKPound Euro	
Current	CURR	ampere		
Density	DENS	kg/m3		
DensityMANDB	MAND	kg/mm3		Densities stored in MANU database
ElectricConductivity	CNDT	Si/m		
ElectricField	EFLD	V/m2		
EMF	EMF	volt		
Energy	ENER	kiloWatthour	joule BTU cal	
EnergyDensity	EDEN	kg/m3		
Force	FORC	newton	poundal dyne kgF lbF	
FoulingFactor	FFAC	m2.K/W		
Frequency	FREQ	hertz	rpm	
GaugePressure	GAGE	pascal	bar atm PSI torr mmHg inHg	Pressure may be absolute or gauge
HeatCapacity	ENTR	J/m		
HeatingValue	HVAL	J/m3		
HeatTransferCoeff	HTRA	W/m2/K		
Impedance	IMPE	ohm		
Inductance	INDU	henry		
Inertia	INER	kg/m2		
KinematicViscosity	KVIS	m2/s		
Length	DIST	millimetre	m in ft cm km mile yard micron thou angstrom	
LinearDensity	PDIS	mm-1		
MagFieldIntensity	MFIN	A/m		
MagFluxDensity	MFXD	tesla		
MagneticFlux	MGFX	weber		
Mass	MASS	kilogram	gram tonne pound oz longTon shortTon cwt	
MassFlow	MFLO	kg/s		
Momentum	MOME	N.s		
Permeability	PMBT	H/m		
Permittivity	PMTT	F/m		
Power	POWE	kiloWatt	hp watt	
Pressure	PRES	pascal		
RadiationDose	RDOS	sievert	radd rem gray	
Radioactivity	RADY	bequerel	curie	
Resistivity	REST	ohm/m		
RotationalStiffness	STFR	N.m/rad		
SpecHeatCapacity	SHCP	N/K		
SpecificEnergy	SENG	J/kg		
Speed	SPEE	m/s		
Stiffness	STIF	N/m		

Name of Dimension	HashCode /Word	Database units	other specific units	comment
SurfaceDensity	PSQD	mm-2		
Temperature	TEMP	degCelsius	degF K degRankine	
TemperatureGradient	TPDI	degC/mm		
ThermalConductivity	TCON	W/m/K		
ThermalResistance	TRES	K/W		
Time	TIME	second	min hr day month week year	
Torque	TORQ	N.m		
UnitMass	UMAS	kg/mm		
ViscosityDynamic	VISC	s/Pa		
Volume	CUDI	mm3	litre ImpGallon USGallon bbl Mbbl MMbbl	
VolumetricFlow	VFLO	m3/s		
None	NONE			numerical real attribute
WORD	WORD			used to assign parameter dimensions etc.
Parameter	UNIPAR			used for parameter attributes

4.2.2 Other UNITS Commands

Three additional forms of the UNITS command for the Fundamental dimensions (i.e. those settable) are supported – UNITS DEFAULT, UNITS NUMERIC, UNITS MKS and UNITS FPS and UNITS CGS.

DEFAULT Units

The default unit of a physical dimension is the database storage unit, which is listed in the table above.

The command `UNITS DEFAULT` formerly set the `DISTANCE` default units to mm; it now sets the units of all the dimensioned attributes to their database storage units. Individual dimensions can be set to their default selectively using the command:

```
UNITS DEFAULT dimension
```

DERIVED Units

The command `UNITS DERIVED dimension` is valid for compound dimensions such as volume, density and pressure. It sets the current units for that dimension to be determined by the current units of its primary dimensions (most often mass and distance).

Volumes, areas, densities, temperature gradients, and numeric densities can all be set to Derived units. Only volumes can be set to specific units.

NUMERIC Units

All attributes that have the UNIT field set for the first time, were stored in previous versions as values with no specified unit. The units that were previously attributed to their values were determined by use and convention and could change from application to application, and project to project. This flexibility can no longer be supported as 'storage units' must be defined. Database storage units have been set to those most commonly used, but this will not be universally compatible. The UNITS NUMERIC command is introduced for compatibility:

```
UNITS NUM/ERIC dimension
```

is used to suspend unit conversions on input and output for attributes of the nominated dimension, that is:

- No conversion from the stored value will be made on output
- No unit qualifying strings will be appended to output values
- Input values with no qualifying unit strings will be stored without conversion in the database
- If input values have a unit qualifying string, a conversion factor will be applied.

This is of particular value to users who wish to continue storing and using attribute values as now, and especially when the values stored are assumed by their system to be in units that are DIFFERENT to those now being assumed by Hull & Outfitting.

The system also supports `UNITS NUMERIC DISTANCE` for completeness.

When a fundamental dimension's unit is NUMERIC, all derived dimensions that use this fundamental dimension will also be treated as NUMERIC. For example, setting NUMERIC MASS will force densities and pressures to be numeric, irrespective of the currently set distance units. Derived units can have their units set to NUMERIC even if their fundamental dimensions have units set.

Weights and Masses

In the past, Hull & Outfitting has not distinguished between weight and mass; this has now changed. Densities (mass/volume) are in Kg per cu metre and the weight of objects derived from this is in Kgf.

Pressures

Pressures are in Force per unit area. Pressure units are supported but whether the pressure is absolute or relative to atmospheric pressure (Gauge Pressure) is a matter for the user to determine when he sets values. No conversion is performed.

4.2.3 Upgrading to use new Units

To take advantage of the new functions, attributes need to be set to the correct dimension. This has been done for the standard attributes. Customers will need it to do it for their UDAs and catalogue and design parameters and properties. Any data imported to a Schematic database using Schematic Model Manager will need to have the 12.1 upgrade applied.

It is not necessary to change all dimensions at the same time. For example, Lengths are already handled correctly. It is expected that angles are stored in Degrees, so they will also be handled correctly, but users will have to identify which UDAs are angles and set their UUNIT to ANGL.

This will be done for a project; the administrator also needs to determine how to handle each of the dimensions used for other attributes – volumes, densities, pressures etc. It is possible to continue as before for any by using the `NUMERIC` option. For details, please refer to the *12.0 to 12.1 Upgrade* manual. The process for each will be:

If all quantities have been stored in the new Database Units

- Set the UUNIT for any UDAs
- Any UDAs used to store the Unit values are no longer required and can be deleted
- Any customer appware managing unit conversion or display can be removed or replaced by standard functions

If all quantities have been stored in the same unit (which is not the new Database Unit)

- Set the UUNIT for any UDAs
- Output a datal file with the dimensions being set to numeric, e.g.
  `UNITS NUMERIC TEMPERATURE`

- Read the datal file back in with the current units set appropriately so that unqualified values are assumed to be in those units: `UNITS DEGF TEMPERATURE`
    - Any UDAs used to store the Unit values are no longer required and can be deleted
    - Any customer appware managing unit conversion or display can be removed or replaced by standard functions

If quantities have been stored in mixed units with a UDA recording the unit for each

- Set the UUNIT for any UDAs
- Set the dimensions to numeric, e.g. `UNITS NUMERIC TEMPERATURE`
- Output a file with the attribute values, with the value from the unit UDA appended
- Check the format of the value plus unit conforms to new input format rules
- If necessary edit the file with a text editor or script to achieve this
- Read the file back in
- Set current units as preferred, e.g. `UNITS DEGF TEMPERATURE`
- Any UDAs used to store the Unit values are no longer required and can be deleted
- Any customer appware managing unit conversion or display can be removed or replaced by standard functions

If quantities have been stored in mixed units with 'custom and practice' being the only record of the unit, which is hopefully rarely the case:

- For the short-term set the dimensions to `NUMERIC`
- Plan to move to more rigorous use of units, probably employing a combination of the techniques above

4.2.4 Units set up for Hull and Drafting

In AVEVA Marine Hull and Marine Drafting applications the set up for Units differs from the Units setup in Outfitting.

Presentation format for Units in Hull and Drafting can be set to SI or Imperial. SI units are default. The format for SI and Imperial respectively can be further controlled by a set of environment variables and default variables.

For details on the Units usage in Hull and Drafting, please see the following chapters in the AVEVA Marine User Documentation:

1. *Hull Basic Features and Concepts -> Basic Features -> Imperial Units Syntax Description*
2. *Marine Drafting -> Drafting -> User Guide -> Appendices -> Drafting default file keywords -> Unit codes*
3. *Marine Drafting -> Drafting -> User Guide -> Appendices -> Drafting default file keywords -> Unit system*
4. *Hull Initial Design -> Lines – User's Guide -> Technical reference -> Conventions -> Units*

Unit Controlled Dimensions in Hull and Drafting

The dimensions that can be unit controlled in Hull and Marine Drafting are shown in the table below.

Core units are independent of the Unit settings and are the same for Hull and Outfitting data.

Dimension	Core unit		
Coordinate	mm		
Linear measure	mm		
Area	mm^2		
Volume	mm^3		
Weight	kg		
Density	kg/ mm^3		
Angle	degree		

Presentation Format for Units in Marine Applications

Within Hull and Marine Drafting specific application functions, values will be presented according to the Hull/Drafting settings.

Attributes in Hull Initial Design are presented according to Initial Design settings.

Within general functions available in Hull Design or Marine Drafting, e.g. Reporter, Attribute addin or Query attribute command, values will be presented according to the Outfitting Units system.

Within common marine applications, such as Space Management and Assembly Planning, all attributes will be presented according to the Outfitting Units system.

Within Outfitting specific functions, presentation of hull attributes will follow the Outfitting Units system.

Input Format for Units in Marine Applications

In Hull and Marine Drafting applications the input format can be SI or Imperial, independent of the Units settings.

Units in Marine – Upgrade and Migration

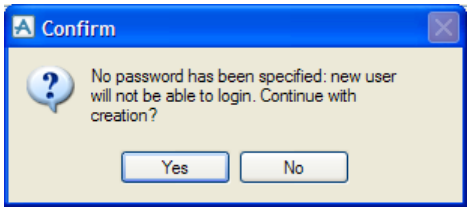
No upgrade or unit conversion from AVEVA Marine 12.0 to 12.1 is required for Units in Hull and Drafting, since core units have not been changed.

The unit settings, including the default settings, for Hull and Marine Drafting are the same in AVEVA Marine 12.1 as in AVEVA Marine 12.0 (and in Tribon M3).

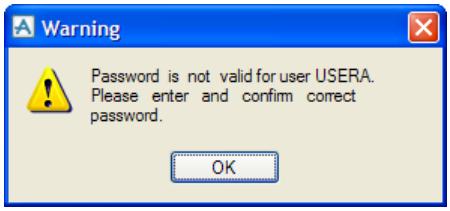
4.3 Enhanced Password Protection

Password protection was made more rigorous at Hull & Outfitting 12.0.SP5. Additional checks have been at this release introduced to trap potential error conditions.

A confirmation dialog, as shown below, warns if a user is created with no password:



A warning is also given, when using the Generate Script dialog, if the password for logging in to the project is not correct. An incorrect password could cause an invalid password error when the script is later executed.



In addition to the `ConfirmID()`, method on the `SESSION` object, an analogous method has been added to the `USER` object. This method also takes a string as argument: the suggested password text with leading '/' character. It returns a boolean value that determines whether the password is correct for the specified user. Example:

```
!u = object USER(|MYUSER|)
if !u.ConfirmID( |/SESAME| ) then $*…
```

4.4 Status Control

A number of small improvements, which affect all constructor modules, have been made to Status Control.

New pseudo-attributes STVMOD and STVUSE have been added to return the status last modification date and user.

PML2 qualified attribute queries are now available for status data, for example:

```
!statusDefinitions[1] = /DesignStatus
!statusValues = !!ce.attribute('STVVAL',
!statusDefinitions)
```

A **new command STM COMMENT** has been added to set the status comment without modifying the status value.

The **Status Change Event Methods** now take an array of objects as their first argument where previously this was a single element reference in a string. The StatusProjectHandler pml object has been modified accordingly and comments show where customised code can be placed. Customised code in the StatusProjectHandler pml object must be updated into the new version. Code for a single object can generally be inserted in the do loops where indicated by comments.

The **StatusData pml object** has also been updated to better handle arrays of objects. It has additional members to hold arrays of data. The previously provided single object members have been maintained and hold the values of the first elements of each equivalent array at the end of each operation, so previously defined calling code will generally work as before. Code using the StatusData pml object will generally continue to work but must be tested, and reviewed to see if it can be made more efficient by using the array members.

For More Information, please refer to the *Status Control User Guide* sections 5.1, 5.2, 8.1, and 8.3.

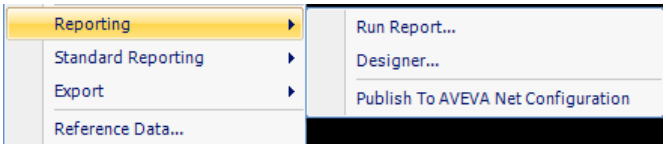
4.5 Report generation

4.5.1 New Reporting Add-in

Hull & Outfitting 12.1 includes a new "Reporting" add-in, based on the reporting tool Xtrareports from DevExpress. This can produce sophisticated formatted reports in a wide variety of formats and can also send the results to AVEVA NET via the Gateway. It is available in Design, Paragon,

Spooler, Draft and Isodraft, as well as in some of the Engineer product modules (Schematic Model Manager, Diagrams and TAGS.)

Running existing reports should be simple. For detailed instructions on designing new reports, please see the new *Report Designer User Guide.* A chapter in that guide gives some further information about running reports – from the Search results grid and from Run Report:



A new PML Reporting API is documented in the *Software Customization Reference Manual.*

4.5.2 'Classic' Reporting

The PML based reporting tool (now known as "Standard Reporting") is still available as before:

The reporting functions are largely unchanged; however, there are some changes due to the implementation of more units handling. The effect is that:

- The units output for quantities other than distance will be the appropriate current working unit; distances will be given in mm unless "inch" is specified
- When Units Conversion is set to "Off", quantities will have their units appended.
  In this case, distances will be in mm with "mm" appended, for example a one inch distance will be shown as. "25.4mm". When Units Conversion is set to "Any/mm" or "Inch", the units are not appended but are show as 25.4 or 1".

Details are available, as before, in the *Reporting Reference Manual.*

The new Report tool is available in Marine Drafting, but in Hull the reports are generated in the traditional way, with specific hull functions.

4.6 GML Performance

There are further improvements to the Geometric Modelling software used in Hull & Outfitting, aimed particularly at speeding up the drawing of data imported using the new Mechanical Equipment Interface.

5. Database changes

5.1 New Database types

5.1.1 Engineering Database

The new ENGI database holds engineering data that does not normally appear on the schematics drawings. It therefore holds more detailed information necessary to fully specify the engineering equipment in a plant. For example, a schematic might show a pump, its name and its major connections – and perhaps a little more. The engineering database will include electrical data (for the motor, loading calculations etc), process data (the process conditions), mechanical data etc.

These data may be owned and controlled by several different discipline engineers. This database will make it easy to produce lists of equipment and other tagged items. Using a separate database makes it simpler for the schematics and the engineering data to be compiled in parallel – and later checked for consistency.

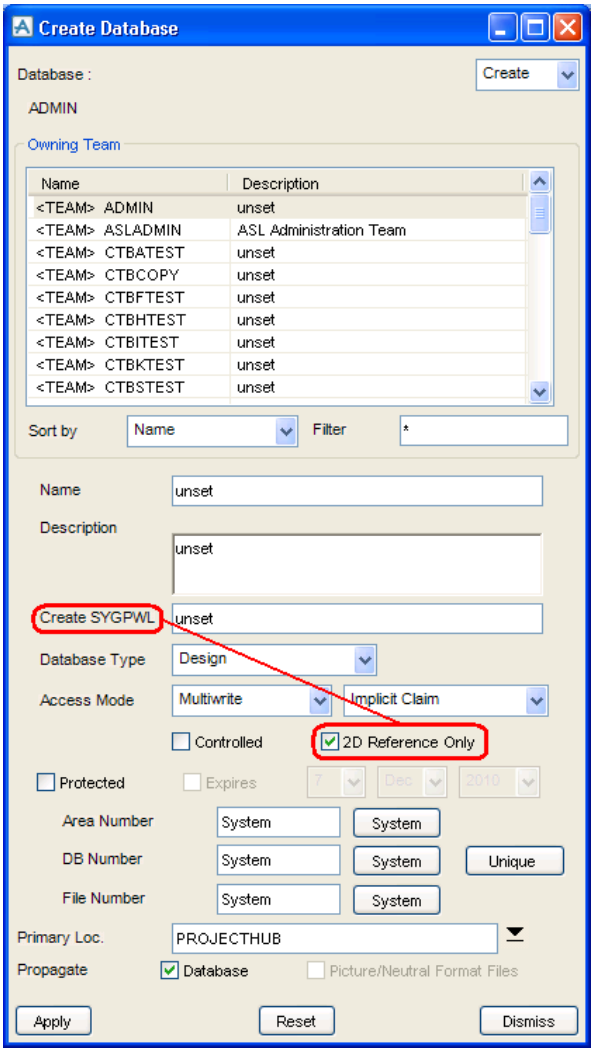
5.1.2 Design Reference Database

This is a restricted Design database, used mainly for administrative purposes – it cannot include any SITE or HULL data. Its main use is for storing information about Systems and Areas for use in Engineering and Schematics applications. It is therefore useful for users who are licensed only for 2D applications.

It is created by setting a flag on the database when it is created; this is the only way to create it and the flag cannot be removed at a later date.

Points to note about Design Reference databases:

- Engineering or Schematics users can use them
- They cannot be the default DB in an MDB
- They cannot include SITEs; this also prevents the creation of elements below SITEs
- They can include Schematic-3D link elements, making link information available in Schematics products when their users do not have access to normal DESI databases



5.2 Access to Databases

The complete list of database types, apart from ‘system’ types, is now:

- Administrative: DICTIONARY, NSEQUENCE
- Parts catalogue and material properties: CATALOGUE, PROPERTIES
- 3D Design and Drafting: DESIGN & DESIGN Reference, DRAFT (PADD), ISODRAFT
- Schematics and Engineering: DESIGN Reference, SCHEMATIC, ENGINEERING

In addition, MANUFACTURING and NSEQUENCE database types are primarily used by the Marine products.

Access to the various types of database depends on the product and module being used as well as a user’s access as determined by his team membership and any Data Access Controls in use. In summary:

- All AVEVA Plant products have full read/write access to the administrative and catalogue data in the DICTIONARY, CATALOGUE, NSEQUENCE and PROPERTIES databases.
- Hull & Outfitting users can read & write 3D databases; those who need to access Schematic or Engineering data also need a Schematic 3D Integrator license. The decision to work in “Integrated” mode is taken when a user enters Hull & Outfitting and applies to the whole session.
- Diagrams users can read & write SCHEMATICS databases; they can read but not write 3D databases. Diagrams users can also read (but not write) the new ENGINEERING database (see below).
- Engineering users can read & write both Schematic and Engineering data; they can also read (but not write) 3D data.

Existing users of Diagrams, Schematic Model Manager and Schematic 3D Integrator will require an updated license file.

5.3 Increase in Number of Databases

A larger number of databases can now be used in a project; the new limit is 250,000. New database numbers from 250,001 to 255,000 are reserved for AVEVA use, as well as those from 7,001 to 8,000.

It is now easier to avoid database number conflicts when databases are shared between projects. These conflicts may be avoided by creating DBRange elements to define the range of database numbers available for use in each of the projects. The database numbers may be between 10,000 and 250,000; these numbers may also be used explicitly in a project that does not use DBRanges.

A DBRange may be created in Admin under the STAT element in the SYSTEM or GLOBAL database and defines the start DBRBEG and end DBREND of a range of numbers.

There is a new “UNIQUE” option for the CREATE DB command to allow the user to create the next database in the defined range for the project; a new pseudo-attribute NXTDBU gives the next database number within the range.

For full details, please refer to the *Administrator User Guide* and *Command Reference Manual*.

5.3.1 Admin GUI

To create a DB Range, a menu in the Settings pull down takes the user to a new form to set values for a DB Range. If no range already exists, this will create an unnamed DB Range and populate it

with the specified values; if more than one range is required for the project, these should be created on the command line.

A **Unique** button for **DB Number** on the Create Database form ensures creation of a database within the project's range: see picture in section 5.1.2.

5.4 Duplicate Names

In general, AVEVA Marine products prevent the use of duplicate names within the current MDB. However, it may be desirable for Engineering or Schematics elements to use the same name as the 3D elements in the Design database. Hull & Outfitting 12.0 allowed name duplication between the DESI and the SCHE databases.

It is now possible to create or rename an element in an Engineering (ENGI) database to have the same name as any element in any Schematic (SCHE), Design (DESI) or Marine Production (MANU) database in the current MDB.

Similarly it is now possible to create or rename an element in any Schematic (SCHE), Design (DESI) or Production (MANU) database to have the same name as any element in any Engineering (ENGI) database in the current MDB.

5.5 Flexibility of Data Organisation

5.5.1 Database Views

Database views provide a way to consolidate data from elements and attributes distributed across databases in an MDB. These views are set up by an administrator using the Database Views Editor and stored in the Lexicon (DICT) database in a 'Database View World' (DBVWWL/D). Users' database views may also be saved a local settings file.

The Editor is currently available in the Lexicon and Tags modules, under **Display > Database Views Editor**.

A Database View uses a table to define a view of the data, which may be derived from a single or multiple elements. There is a row in the Database View table for each element of a particular type that meets the criteria defined by filters. These filters use the same concept as the search grid. If the criteria cannot be expressed using attribute filters, it is also possible to define an expression for evaluation. A row is present in the table only if all the filter criteria are met.

This is a very powerful technique which can be used to derive data structures for a variety of purposes, including the new reporting function. The Excel Import/Export functions also work with Database Views, which are of particular importance in the integration of engineering, schematic and design data.

5.5.2 Distributed Attributes

Distributed attributes enable the definition of objects that have groups of attributes distributed across databases, currently restricted to the DESIgn and new ENGIneering database types. This enables a number of new possibilities:

- Improved concurrency
    - Several users may work in parallel on an object, using different sets of data
    - Simultaneous multi-discipline updates on the same object are possible
    - Claims may be smaller, only claiming the relevant "portions" of an object
- Distribution of an object's attributes across hierarchies and databases
    - Easier distribution using Global

  - Reduced need for Global extracts
- Simplified access control
  - It may be sufficient to use database ownership (by teams)
- Data may be included or excluded by database
- Extensibility of data structures – an alternative to direct use of UDETs and UDAs

  A 'binding' element is used to achieve this: it may bind any number of bound elements, but these bound elements can only bind to one binding element. The attributes defined on the bound elements are then available on the binding element for both querying and manipulation.

Details of the configuration and use of distributed attributes can be found in the *Database Management Reference Manual* and *Lexicon User Guide*.

5.5.3 Handling of Duplicated Names of UDAs and UDETs

UDA keys now take into account database number to remove the possibility of conflicts between UDA names in different databases. In previous versions, this could occur when merging data from different projects or MDBs.

A new command in Lexicon allows a user to reallocate existing UKEY values to the new format for UDAs and UDETs. They can operate on either a selection of UDAs and UDETs or all in the current MDB. The old keys are stored in the attribute OLDKEY for reference. Admin commands allow update of project data to use the new keys.

For details, please refer to the *Lexicon and Admin Command Reference Manuals*.

5.5.4 Top-Level Element Creation in Specific Database

It is now simpler to ensure that top level elements are created in a specific database; a `DB` keyword and name can be added to the `NEW` command:

`NEW` *element_type element_name* `DB` *database_name*

where *element_name* is also optional; *database_name* is a full database name, i.e. *team/database*.

For example, this command will create a new SITE named /MYSITE in the MYTEAM/MYDB database:

```
NEW SITE /MYSITE DB MYTEAM/MYDB
```

5.6 Dynamic Groups

A PML1 collection expression, evaluated whenever the group is used, may now be used to define a selection for a GPSET. The SCOSEL attribute is used to store this selection, for example:

```
SCOSEL ALL EQUI FROM CLAIMLIST
```

More complex dynamic selections are possible, for example:

```
ALL PIPE WHERE (BORE GT 80)
ALL BRAN MEMBERS WHERE (SPREF EQ /MYSPEC) for SITE
/SITE1
```

There is a performance overhead in evaluating more complex selection expressions.

5.7 Database Performance

A number of enhancements have been made to the performance of the Dabacon database. Those noted here are the most visible to users.

Dabacon Buffer

The Dabacon buffer is used for temporary storage of data in local memory and can therefore have a significant effect on performance. Increasing its size is likely to reduce the amount of network I/O, so in generally a larger buffer will improve performance. However if it is larger than the available memory, paging will increase, thus offsetting some of the advantages.

Previous versions of Hull & Outfitting 12 have limited the buffer to between 32,000 and 51,200,000 (integers) with a default of (in general) only 12,800,000. This corresponds to a default of 50 and a maximum of 200 Mbytes; with modern PCs, most customers found it best to use the maximum value, set by use of the BUFFER command in Admin.

These values have been increased at Hull & Outfitting 12.1; it may now be set to between 20 Mbytes and 1 Gbyte.

Default Buffer Size

The default buffer for modules in a new project is now:

Monitor	20 MBytes
Admin, Specon, Propcon, Isodraft, Lexicon DARs, Toolbox	200 Mbytes
Design, Draft, Paragon, Spooler Diagrams, Schematic Model Manager, Tags	500 Mbytes

5.7.1 Specifying the Buffer Size

The Dabacon buffer may be set in Admin for each module *or* by use of an environment variable for all modules.

Buffer Setting for Each Module in a Project

The setting for each program module is usually performed using the **modmac.mac** file during project setup. At a later date, the `ED MOD` command may be used to change its value for one or more modules.

The value may be specified in Mbytes or integers; 256000 integers means the same as 1 MByte.

For example, ED MOD DESIGN 12800000 is the same as ED MOD DESIGN 50 Mbytes

Buffer Setting Per User

The Dabacon value may be set for a particular user by setting the environment variable 'PDMSBUF' before running Hull & Outfitting. This sets the buffer size in **Megabytes** for use by all Hull & Outfitting modules; it will be ignored if its value is greater than 1000. For example, `set PDMSBUF=500` sets it to 500 MByte.

Querying the Amount of Unused Buffer

This may be queried using the command: `Q DABACON AVAIL`.

5.7.2 Dabacon Index Tables

The use of Dabacon index tables has been extended to speed up selection by Hull object type code, element type, UDET or UDA value.

5.8 Units of Measure

This enhancement enables Outfitting to store attribute data in standard units and perform conversions as appropriate. The system handles this automatically dependent on the units and also stores appropriate information with parameterised attributes to enable them to be handled.

A new dynamic UNIPAR attribute has been added to all catalogue elements with PARA attributes – namely SCOM, SPRF, JOIN and FITT – and to all design elements with DESP attributes. It is a hidden (VISI FALSE) integer array attribute (that may not be listed or queried) and holds the set of WORD unit values corresponding to the dimensions of the values in a sibling PARA or DESP attribute.

5.9 Unicode Storage of Name and Text Attributes

Marine Outfitting and Marine Drafting code will handle Unicode strings. Administrators may have chosen to convert all DBs which **do not contain Hull data** to Unicode as part of their upgrade process, or may decide for each DB whether and when to upgrade manually, and perform this upgrade using Reconfigure as in the example above.

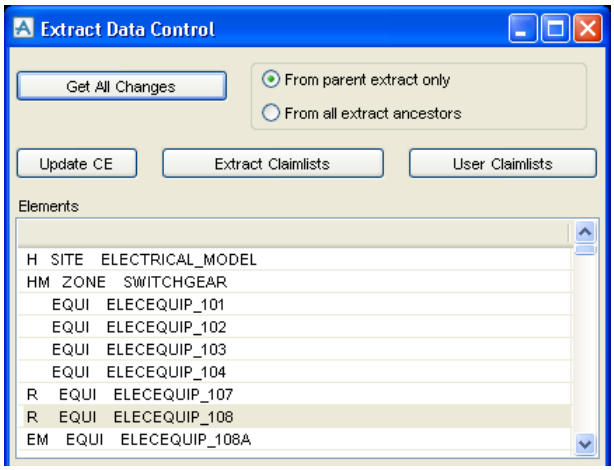
5.10 DRAFT Line-style World Hierarchy

System line-style widths are now stored in the system database, for consistency throughout a project, and are initially set to ISO defaults: Thin=0.25mm, Medium=0.35mm, Thick=0.70mm. See also

5.11 Extract Control – Include Flush Capability

Enhancements have been made to Extract Control in the Design/Engineer modules Design, Diagrams and Schematic Model Manager. When working in an extract database, issuing, flushing or dropping an element that has a referencing Integrator link will automatically include the link object.

The new reference array attribute INCFLU (include flush) returns any Integrator or Status link elements that reference the current element. Flushing, issuing or dropping an element with referencing link objects will act on those link objects even if the element itself is not claimed or modified. The Extract Control form will display an “R” label on such elements.

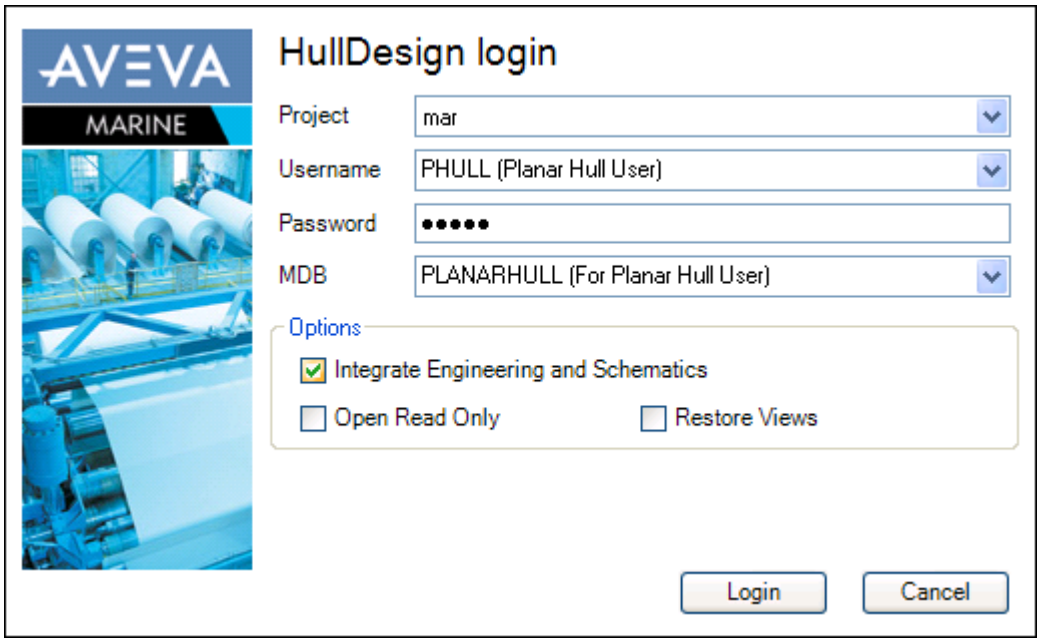


6. User Interface

6.1 Entry to System

Entry to the system has been changed to allow direct entry to any module, without the need to go via Monitor. The login form is presented with the appropriate splash screen. Desktop and Start menu shortcuts are provided for the popular options.

A new checkbox, labelled “Integrated Schematics and Engineering”, determines whether or not the Hull & Outfitting user will also have read access to the SCHEmatic and ENGIneering databases. This option is relevant to customers who also use one of AVEVA’s 2D products, AVEVA Diagrams or AVEVA Engineering. Checking this option allows users to access to these data and is necessary in order to use the Schematic Integrator Addin during the session.



Note: The console window may be suppressed by using a `-noconsole` argument to the start-up script. It may also be controlled using an environment variable: if you wish to run the system with the console hidden, use:

```
set AVEVA_NOCONSOLE=TRUE
```

6.2 Save and Restore Views

This new feature allows a user to take a snapshot of a view and save it to file. The saved view can be reinstated when required, including a new session of Hull & Outfitting. A saved view consists of three elements:

- The current drawlist
- View properties (e.g. view direction)
- A snapshot picture of the view when it was saved

When selecting which view to restore, the snapshot picture is shown to help identify the correct view. Note that this snapshot is just a picture captured at the time the view was saved. Elements in that picture may have been modified or deleted since the picture was saved, so when the view may look different once it is restored. In fact, it is possible that an empty view may appear if all elements in the drawlist have been deleted or moved outside the view area since the original view was saved.

The Save & Restore 3D Views function is accessed via a new icon on the 3D View:

The old numbered saved views are no longer available.

For details, please refer to the *Graphical Model Manipulation Guide*.

6.3 Grid Control

A number of enhancements have been made to the grid control. These include an enhanced column setup form, a new filter on the row filter, an autofit function and an ability to copy a set of grid cells and paste them into another document. In addition, Drag and Drop may be used in the grid for some operations. The Grid Control has also been enhanced to support multi-element and distributed attribute editing using Database Views.

6.4 Toolbar Popup Menu

The popup context menu displayed from the Toolbar area has a new entry **Lock the Toolbars**. This enables users to lock the position of the toolbars to prevent accidental change of layout.

6.5 PML Collections

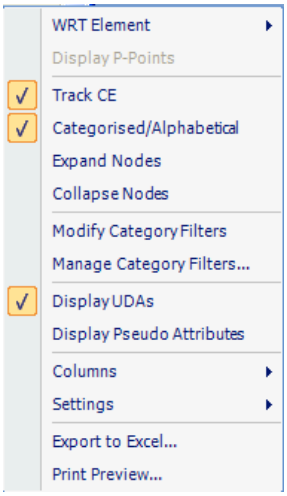
A PML Collection with unlimited scope now collects data from the entire database; in other words, an empty scope now means ALL rather than NONE. [This means that the collection operation will take much longer, so it may be worth checking any PML functions to ensure that this is what is required.]

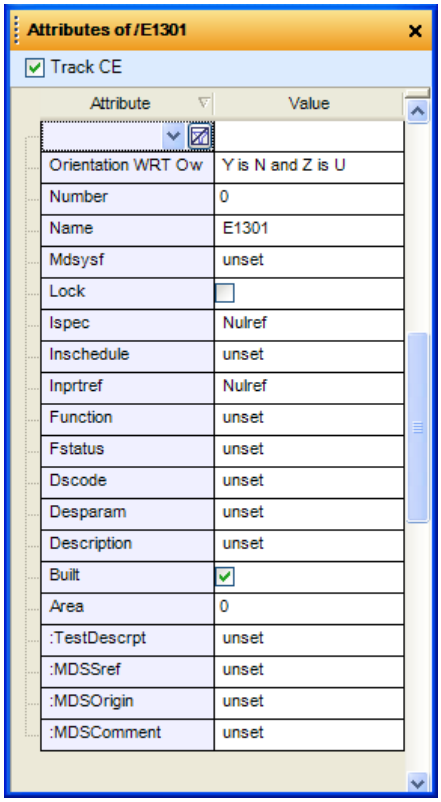
6.6 Attribute Display, Editing and Validation

A new Attributes Utility replaces the previous Query Attributes and Attributes forms; it combines the functions of both and also enables attributes to be edited if access rights permit. Attributes that are not editable are shown with a grey background; feedback is given for inappropriate attribute values. The form displays the attributes of the current database element either in a list or by category: see pictures below.

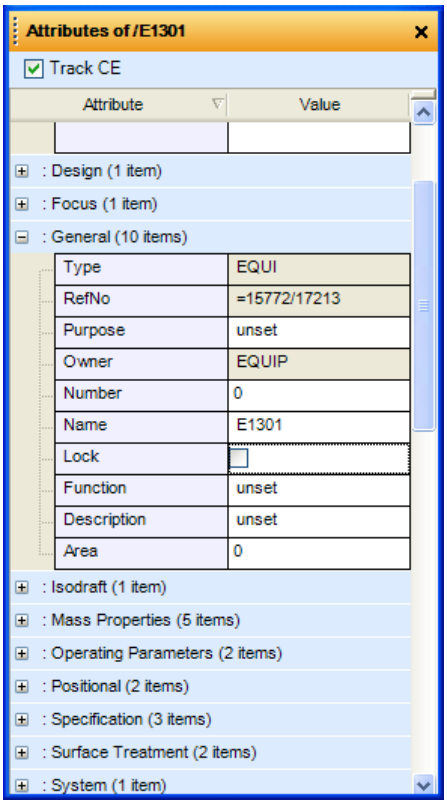
The form allows the user to edit attributes, where appropriate, and is available in all modules. It replaces the old PML Query Attributes form and the old C# Attributes form.

The popup menu provides various new functions such as an ability to set the current element to a reference attribute value. The details vary between modules and are documented in the appropriate manuals.





Attributes displayed in a list



Attributes displayed by Category

6.7 Auto-naming Utility Enhancement

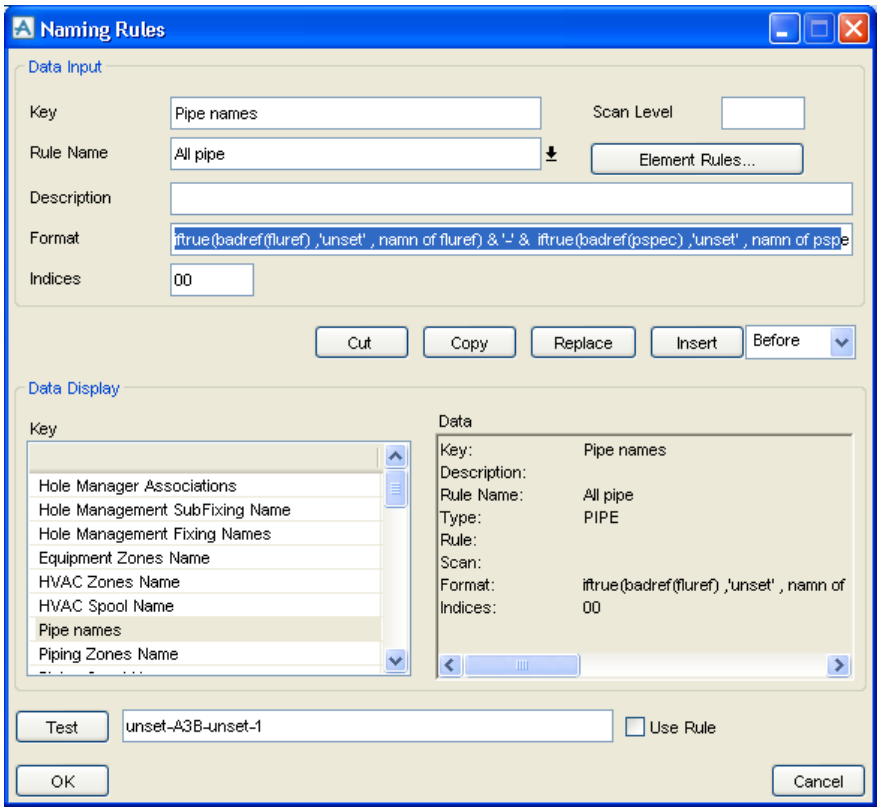
This utility has been enhanced to allow the formulation of a name to use an IFTRUE statement, which is a PML1 facility. For example, if you wish to make up a name based on attributes of a PIPE, you can use the following PML2 autonaming rule:

```
!!ce.fluref.namn & '-' & !!ce.pspec.namn & '-' & !!ce.ispec.namn & '-' & !index
```

However this rule will fail if any of the attributes (FLUREF, PSPE, ISPE) have not been set. You can now use the IFTRUE function in PML1 form to do the same by using the following rule:

```
iftrue(badref(fluref) ,'unset' , namn of fluref) & '-' &
iftrue(badref(pspec) ,'unset' , namn of pspe) & '-' &
iftrue(badref(ispe) ,'unset' , namn of ispe) & '-' & !index
```

Please note that the whole ‘Format’ must be PML 1, concatenated with the ‘&’. It is not possible to mix PML1 and PML2 functions. The result of this rule can be seen below:

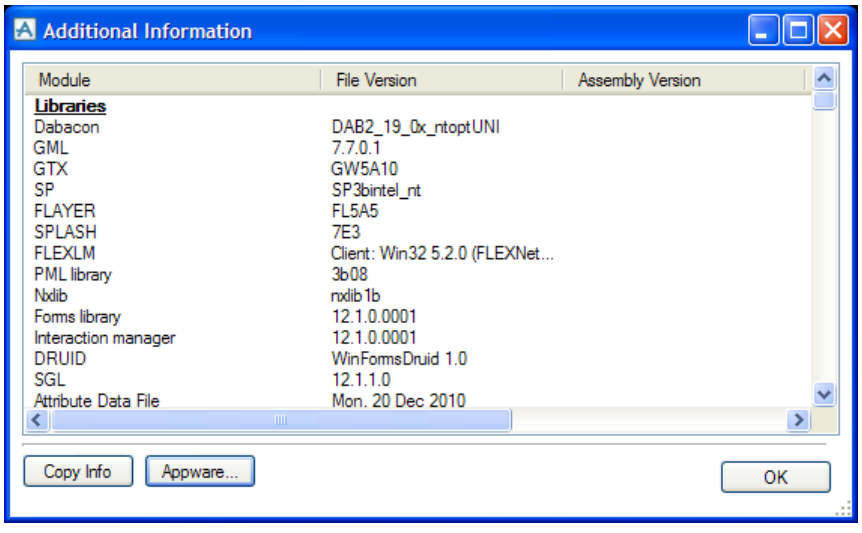


The FLUREF and ISPE have not been set but the PSPE is set to /A3B, so the resultant name is unset-A3B-unset-1.

6.8 Additional Debug Information about PML Applications

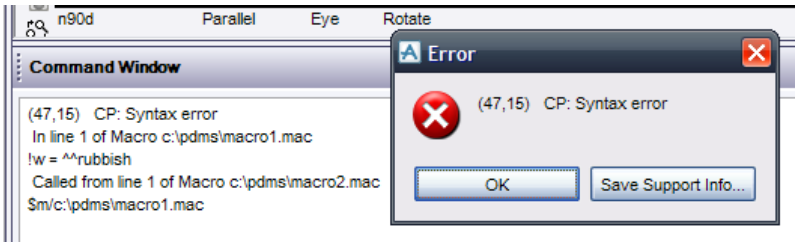
6.8.1 Help About

A new button has been added to the **Help About > Additional Information** dialog, with a new option to scan all Application Appware files to check if they have been changed.



6.8.2 PML Alert

An additional button has been added to the PML alert dialog to allow extra information relevant to the alert to be saved to file. Clicking the **Save Support Info…** button will bring-up a save file dialog and allow the user to save the extended information:



6.9 Infragistics Toolkit

Hull & Outfitting 12.1 uses an updated Infragistics Netadvantage toolkit (version 10.3) for its GUI. The filenames of the Infragistics DLLs no longer include the version number, which will make future upgrades easier.

7. Administration

7.1 GUI Improvements

A number of features have been added to the GUI to improve its ease of use and make it more consistent with other modules. For example:

Import from Excel

Data for Admin elements such as users, teams etc may now be imported reliably from Excel. This has resulted in three changes in behaviour:

- Access Control Assistant (ACA) is no longer hidden during Import and Rollback operations.
- The Export and Import logging dialog no longer has a Cancel button; it is also less responsive to Window operations such as move or resize, while export or import operations are in progress.
- The Export and Import logging dialog "OK" button has been renamed "Dismiss".

For details, please refer to the *Admin User Guide*.

For full details of the various different types of view, please refer to the *Lexicon User Guide.*

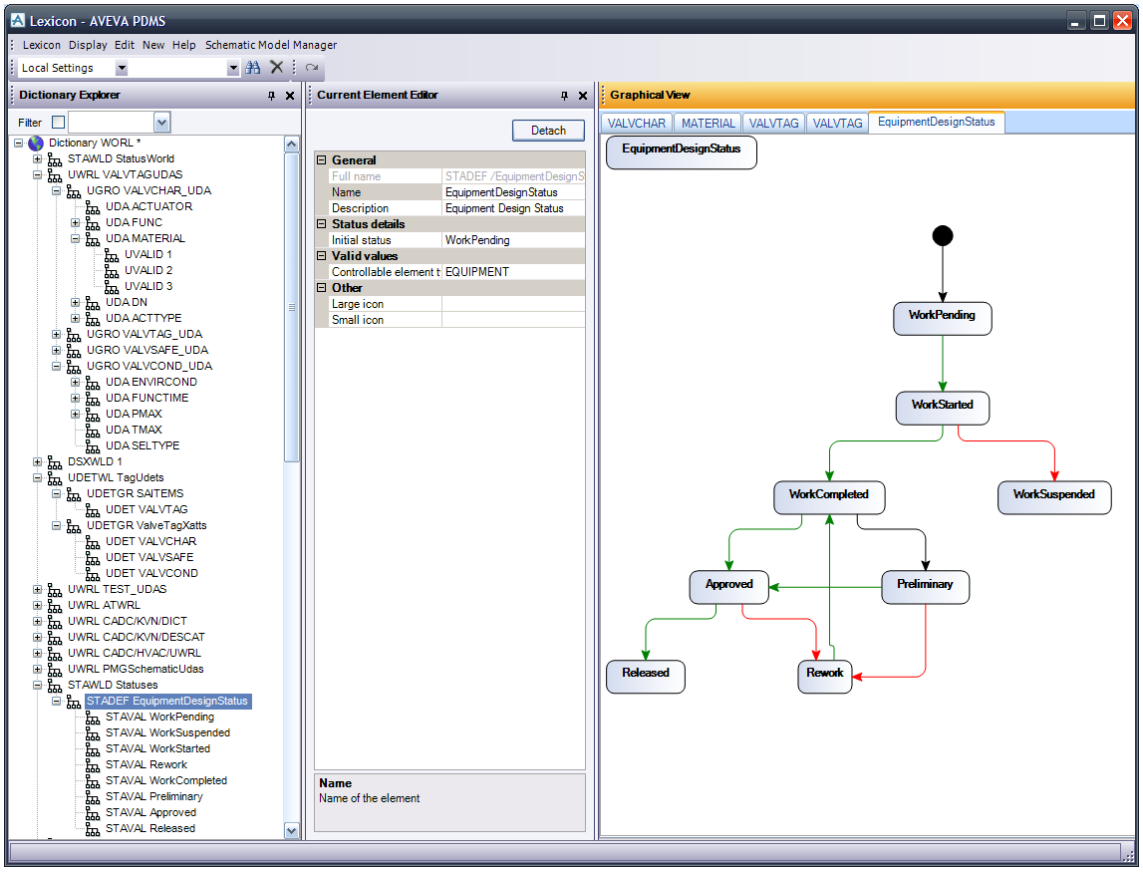
7.2 Lexicon

7.2.1 New Lexicon Graphical View

A new user interface can show a graphic representation of the relationships between Lexicon data entities, using nodes and links, in the style of UML and entity relationship diagrams.

There is a series of graphical views, which are shown on separate tabbed panes in the Lexicon User Interface. There are 4 types of view, showing UDAs, UDETs, status definitions and distributed attributes. Each view tab is opened by selecting the ‘Graphical View’ menu option during a ‘right-click’ on an element of a supported type in the Lexicon explorer.

The picture below shows a screenshot of Lexicon with the new Graphical View on the right, side-by-side with the Dictionary Explorer and Current Element Editor. Individual views are associated with a single database element. To open a view, select the element of interest in the explorer and click the context menu. Each view opens in a separate tab, whose title reflects the name of the element for which it was opened.



7.2.2 UDA Lists of Values

User-Defined Attributes (UDAs) and User System Defined Attributes (USDAs) can have a list of valid values (for text attributes) or a list of valid ranges (for numeric attributes). These lists are checked when setting the UDA to prevent the use of values outside the valid range.

A new logical attribute on UDA and USDA elements determines whether the valid values or ranges (if such exist) are optional. The default behaviour remains that the restrictions remain non-optional. If, however, this attribute is set TRUE and the UDA or USDA definition is re-compiled, it will be possible to override the restriction and set the attribute to a value outside the valid range.

To support this, a new method has been added to PML2 Attribute object and .NET public interface.

The new method `LIMITSVALIDOPTIONAL(ELEMENTTYPE)` complements the existing `LIMITS(ELEMENTTYPE)` and `VALIDVALUES(ELEMENTTYPE)` methods.

The .NET database interface class for attributes, `Aveva.Pdms.Database.DbAttribute` has a new method to determine whether the valid values or range is optional for a particular element type:

```
public abstract bool IsAllowedOptional(DbElementType type);
```

7.2.3 Database Views

A Database View defines a table for viewing manipulating data in the database; these data may be derived from a single element or multiple elements. There is a row in the Database View table for each element that has a particular element type and meets the criteria defined by attribute filters. These Filters are similar in concept to those in the search grid. In addition, if element match criteria cannot be expressed using attribute filters, it is possible to define an expression for evaluation.

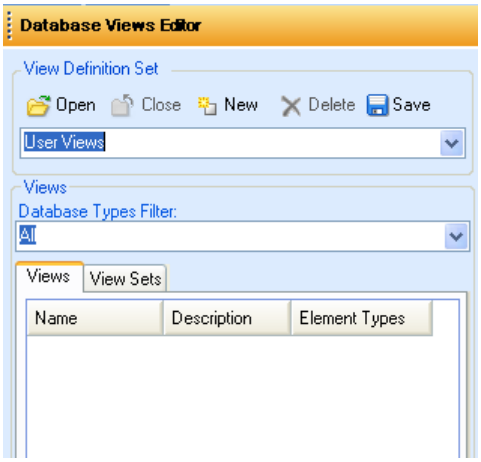
For example, a Database View could be derived from all Equipment elements in the current MDB with a description of ‘Vessel’. The user also specifies the required columns; each can be a

database attribute or an expression run against the equipment element. The user can also specify how to navigate to related elements, such as the owning SITE or ZONE, and derive further columns from that element. This is similar in concept to a saved search except that editable columns may be derived from several elements.

Database Views may be defined and modified in the DICTIONARY database using Lexicon to set up new elements in a new 'Database View World' (DBVWWL/D). Their definition may alternatively be stored as a local settings file (similar to saved searches) or as part of an application. This allows:

- User defined Database Views for reports, ad-hoc working etc.
- Project defined Database Views, shared via Global
- Application defined Database Views for specialist applications

The Editor is currently available in the LEXICON and TAGS modules, under **Display > Database Views Editor**.



Access to the full Editor is gained by selecting **Element Views** from the dropdown list in the View Definition Set area. For details, please refer to the *Tags User Guide*.

Database Views are created automatically to represent element type structures so that users don't have to define them to make element information accessible to the generic reporting tool. This means there is already a Database View for equipment elements with their attributes defined in columns.

7.2.4 General

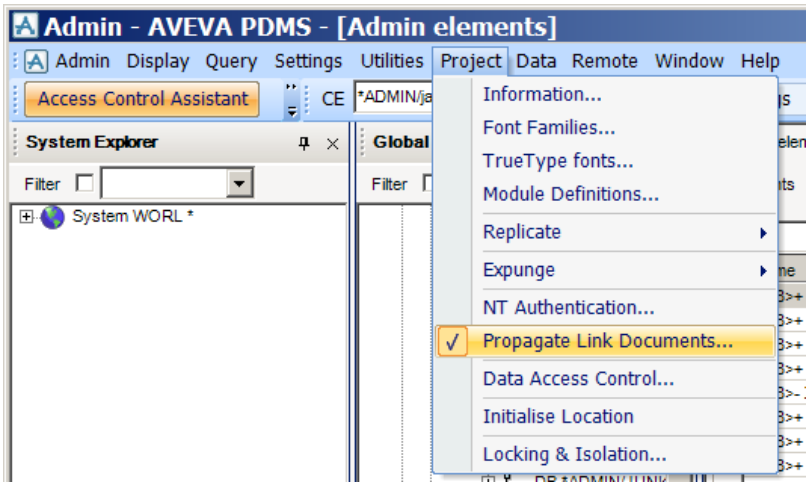
The User Interface has been changed to help with maintenance and improve consistency. In particular the following have changed:

- New menu on the menu bar
- Explorer right click menu (now consistent with other modules)
- Edit Members on the Explorer menu
- New element types, which have changed the contents of the Explorer, Current Element editor and ElementType editor.

7.3 Admin GUI Changes for Global

7.3.1 Global Support for Linked Documents

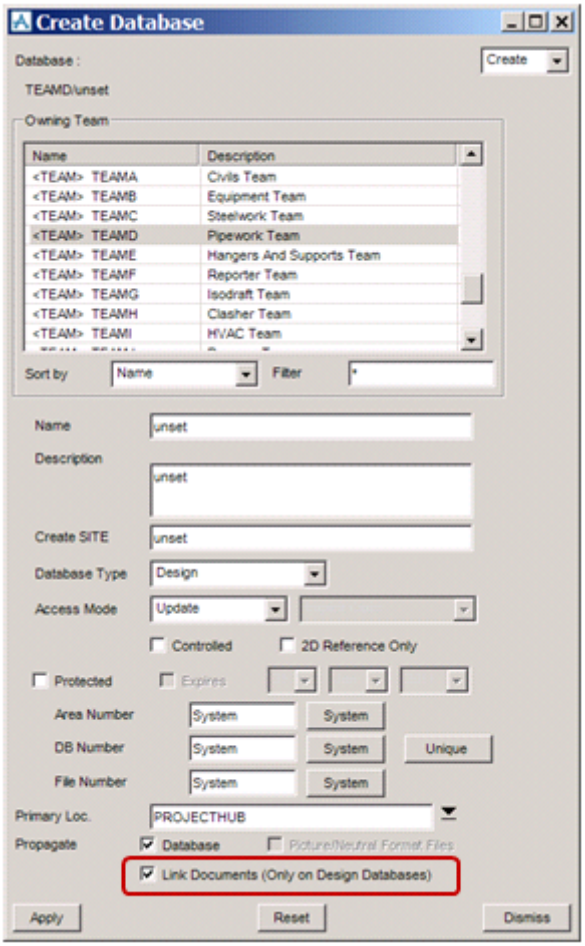
Global has been extended to include support for linked documents by propagating any document marked as *'propagating'* between two locations. By default the propagation of Linked documents is disabled. To enable the propagation of Linked Documents switch on the *'Propagate Link Documents'* setting under the *'Project'* menu in Admin:



Note: *Link Documents are only available in DESI databases*

Link Document Propagation can be enabled on the command line by setting the GLINKP attribute on the GLOCWL (/*GL) element. The default is false indicating that Link propagation is disabled for the project.

To determine which documents require propagation the update process must scan applicable databases. As this has a performance impact on the overall time for updates, the administrator can select which databases to scan. By default all DESI databases will be scanned for Link documents. It is possible to disable Link Documents propagation for a single database via the CREATE/MODIFY Database form by deselecting the Link Documents tick box:



***Note:** The linked Document tickbox is only available for DESI databases; this option is not available for other types of databases.*

The DBLOC element for the Database contains the attribute NOLNKP to determine whether the database should be scanned for link documents. This defaults to False indicating that links will be propagated if enabled. To determine if a Database can support Link Documents the attribute ISLNKD can be queried. The attribute DBLNKP can be queried to determine if the update process will scan this database for link documents.

The Global update process will scan all relevant databases to determine what linked documents to propagate to the remote location. Link Documents are applied to the database through the creation if a `LNDESC` element. The scan will select all link documents that have the `LNKPRP` attribute set to `SEND`. The document is referenced via the `URL` link which must have the format `'file:///<pathname>'`; The file specified by `<pathname>` must exist at both the source and destination locations. Usually this is best achieved using an Environment variable to hide installation differences. Link Documents fully support the use of spaces in path/filenames.

The Update process only propagates documents that are not present at the remote location. It does not support documents that have changed and as a result these will not be propagated over the top of the previous version. However, it is possible to force the propagation of link documents by using the following command in Admin:-

```
SYNCHR <dbname> LINKDOC FORCE
```

Note: There is no UI to support this command

On allocation of a new database, the propagation of all link relevant documents will be forced to the remote location. Recover will force the propagation of all relevant linked documents in the direction of the recover. Therefore if recovering a database back to the primary location then the linked documents will also be recovered back to the primary location.

> **Note:** The originating location of a document referenced by an extract hierarchy may be unclear. For this reason RECOVER and the FORCE option of SYNCHRONISE should be used with caution for extracts.

Progress and State (Success/Failure) of linked document propagation is recorded in the transaction database

Limitations

When creating a new location with allocated databases the linked documents will not be transferred. These will require a forced Synchronisation after the location has been configured and initialised.

Global does not delete linked documents at the remote location when the linked document has been marked with LNKPRP DELE.

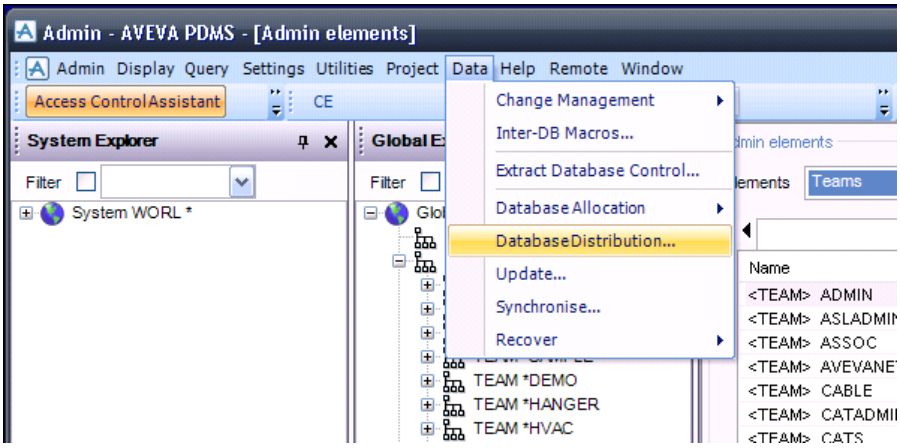
Offline transfer is not supported.

Linked documents propagation does not guarantee consistency between files at different locations. In particular:-

- Linked documents functionality is primarily intended for files which are part of the data model, such as PDF Plotfiles, and certain Marine files;
- Linked documents are not definitely linked to the database which references them. It is therefore difficult to track such documents once the link description is no longer available.
- Likewise linked documents may be referenced multiple times. This will be the norm for extract databases. This makes it difficult to identify the primary location of a document.
- It is possible to reference Linked documents for other data types of documents, such as Word documents and Excel spreadsheets;
- It is possible for users to change documents at the destination location; this will lead to an inconsistency between locations. The update process does not detect this.
- Behaviour for extract hierarchies may not be as expected. For this reason the FORCE option should be used with caution on databases in an extract hierarchy, since it could overwrite the wrong version of the file.
- No documents are deleted when a database is de-allocated. For this reason ALLOCATE will always overwrite any pre-existing files.
- There is a strong likelihood that ‘orphan’ linked documents will be left behind after databases have been merged, backtracked, de-allocated or deleted.

7.3.2 Database Distribution Form

This new form helps visualise where databases are allocated, and which location databases are primary. This form provides additional functionality to change the primary location of a series of databases. It is available from the Data menu in Admin:-



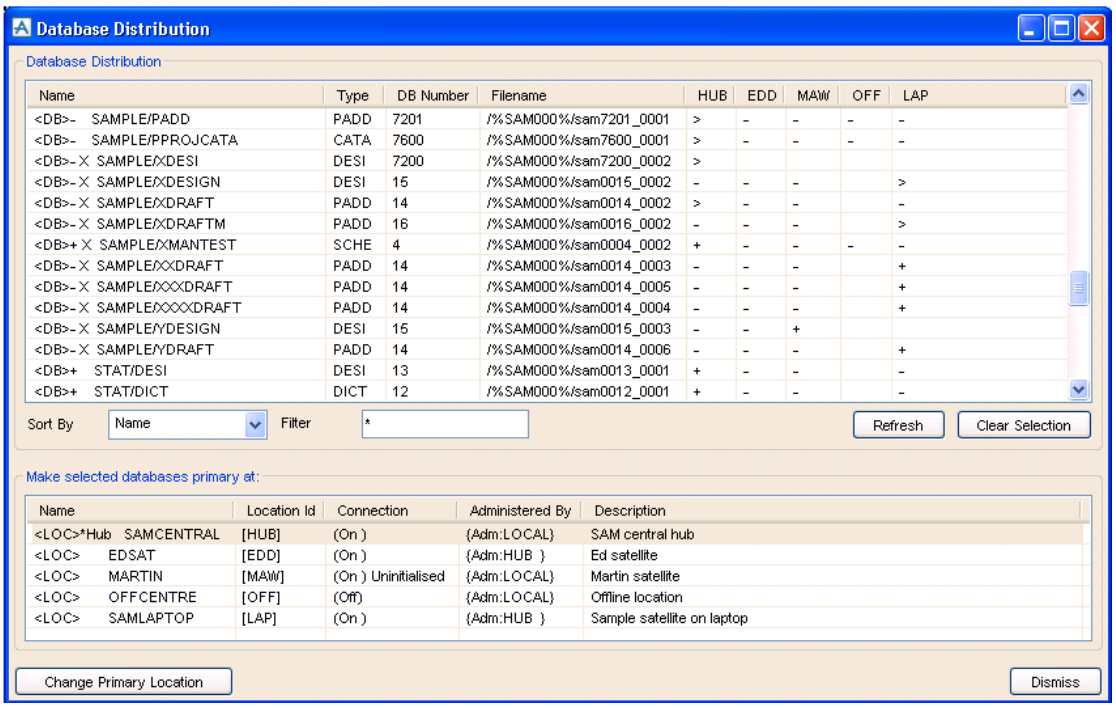
The Data Distribution form lists all Databases in the project and maps it against a matrix of locations. This uses the common symbols of:-

'+' indicates the database is primary at this location

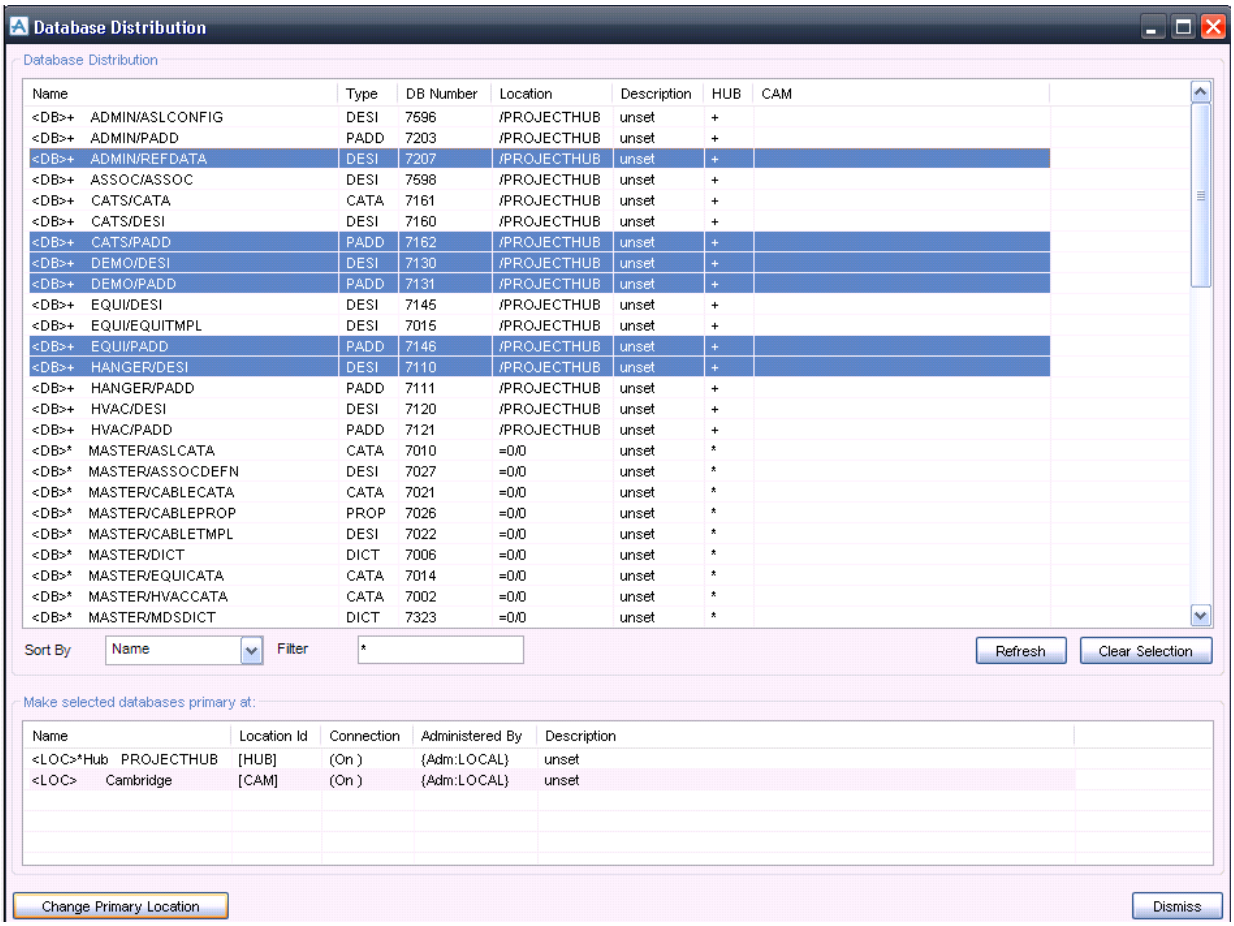
'–' indicates the database is allocated to this location but is primary elsewhere

'>' indicates the database is in transit from this location under a pending transaction

'*' indicates the database is foreign and allocated to this location



By selecting a number of databases and a location, it is possible to change all those databases to be primary to the selected location.



7.3.3 Creation of an Event without Times

The Update event form will now allow the creation of an event without times, to run scripts at the remote location. To do this, create an update event at the current location with the Frequency text box left blank, and the Transfer Scripts text boxes filled in. When an update occurs between A and B, the scripts will be run at B. The arguments will be reversed (B, A).

For details, please refer to the *AVEVA Global User Guide* Section 4.12 Creating Update Events wrt Transfer Scripts.

7.3.4 Remote File Details in Admin

When querying remote file details at different locations to compare them, the results for the different queries are available. Each press of the Apply button appends the results to the list on the right of the form. This means you can choose different locations and see the information for selected databases together in the list.

Press the Clear button to empty the results list. Results can be stored in a file by pressing the Save Report button which will display a file browser for you to save the results into a text file.

For details, please refer to the *AVEVA Global User Guide.*

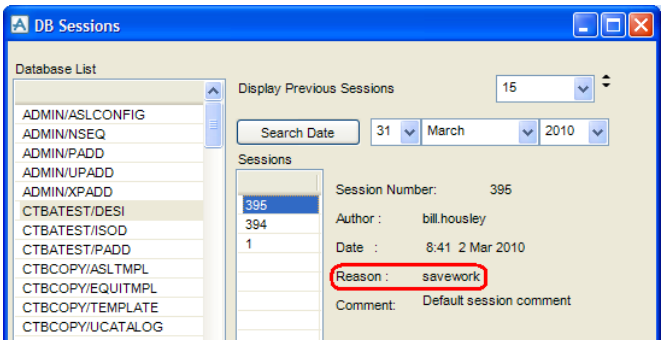
Satellite Commands filter for Transactions

The Transactions form display can now be filtered so that only Global commands are listed. Global commands are defined as those that take place via the Global daemon (i.e. not locally), For example, an Extract claim made when an owning extract database is NOT at the same location.

For details, please refer to the *AVEVA Global User Guide.*

7.3.5 Enhanced User Interface for Sessions

Forms that display details of a database session now also include the reason for that the session. In particular, the DB sessions form, available from **Query > Project > DB Sessions,** shows it thus:



7.4 Engineering (ENGI) Database

The Engineering database type has been added to the list for database creation. Note that the top level database element for Engineering databases is SATWLD.

It has also been added to the module definitions (modmac.mac) and as appropriate in the other admin and global forms for selection, sorting, allocation etc.

7.5 TAGS Module Definition

The new TAGS module has been added to the product modules defined by modmac.mac and therefore available for use.

8. Introduction to New Functionality

This bulletin describes the new and enhanced functionality available in AVEVA Hull and Outfitting 12.1 as compared to 12.0. It gives an overview of the major changes, which are described in full in new and revised User Documentation.

9. AVEVA General Functionality

9.1 Performance Improvements in AVEVA Marine

Description

A number of improvements have been made to speed of functions and usability AVEVA Marine.

- In start-up of AVEVA Marine, the loading of Dll's have been improved to take less time.
  - Many of the Addins will be loaded but they are only notifying the main process that they exists. Data load by an Addin, will take place when needed.
- New indexes are introduced in the database to speed up searching of different Marine objects such as panels, profiles, plate and profile parts, nesting's.
  For example:
  - List Drawings
  - Auto scale of drawing
  - Create Symbolic View
  - Recreate Symbolic View
  - Input Model
  - Schema run
  - Automatic Creation of Planar Parts (PPanparts)
  - Automatic Creation of Curved Parts (CPanparts)
  - Open Nest
  - Part Menu
- Selected forms have changed behaviour to remember more information, for example
  - Planar Hull Statement Wizard
    - Boundary to remember last used point mode
    - Stiffener to remember type, connection and endcut codes
    - Flange to remember type, connection and endcut codes
- The reading of large objects from the database over a high latency network has been improved.

Work in this important area is on-going.

9.2 SetStart Method of NameSeq Object

Description

The NameSeq object that can be used to make user defined name sequences working with data in an NSEQ database has been extended with new methods. Earlier the SetStart method made a name sequence to start over from a specified value. Now it is possible to store a specific start value for a sequence by the SetStart method (which no longer restarts a sequence). By a new ReStart method a name sequence can be restarted from the stored initial value. Name sequences with wraparound, will automatically restart by the initial value when required.

Benefits

Handle wraparounds and name sequence restarts from specified initial value.

Compatibility Constraints

To store an initial value other than zero upgrade of NSEQ dbs is required.

For More Information

Only noted here.

Affected Programs

Curved Hull Design and any customisation using NSEQ dbs.

9.3 BLOCK Creation in Specific Database

Description

There is a new PML function available for creating BLOCKs in specific databases.

```
!!HullNewBlock(!blkName is STRING, !dbName is STRING) is DBREF
```

The parameter *blkName* is the name of the new block and it is mandatory.

The parameter *dbName* is the name of the new block and it is optional (needs to be passed as space, i.e. ‘’).

The function returns the DBREF to the newly created BLOCK element if successful. Otherwise an error message is issued and the function result is undefined.

Example:

```
!blk = !!HullNewBlock('MYBLOCK', 'MYTEAM/MYDB')
```

That statement will create a new block, *MYBLOCK*, in the database *MYTEAM/MYDB*.

```
!blk = !!HullNewBlock('MYBLOCK', '/MYHBLWLD')
```

That statement will create a new block, *MYBLOCK*, under the existing HBLWLD */MYHBLWLD*.

Benefits

The new PML function makes it possible to create Hull Blocks without using DBPrompt.

Compatibility Constraints

None.

For More Information

See User Guide *Hull in Dabacon / Marine Project Setup – Getting Started / Create Initial Data Structures*.

Affected Programs

Hull Design

9.4 Stable Identification of Un-named Hull Elements

Description

When the name of an unnamed element is displayed, it is composed by its type and member position.

TYPE n of …

The n is its numbered position in the list of its owner, only counting elements of the same type. Some types of elements are possibly better identified by the value of an attribute than by its position among its equal type of siblings. For some marine hull type of elements this is just the case.The name of an unnamed element is normally presented in the format:

HSTIFF 3 of HPANEL /ER2-LP32_2

While it onwards instead will be presented in the format

HSTIFF idsp 6003 of HPANEL /ER2-LP32_2

The value 6003 is provided by the TBID attribute for the HSTIFF element. Hull elements with a TBID attribute will be presented in this format.

Command graphs are adjusted so that the same format can be used as input by user to change position in the element hierarchy.

Benefits

More stable identification of unnamed hull elements.

Compatibility Constraints

None.

For More Information

Refer to *Design Reference Manual / How to Use the Syntax Graphs / Standard Syntax Graphs / Design Element Identity <gid>* and User Guide *Hull in Dabacon / General / Identification of Unnamed Elements.*

Affected Programs

This is a core change that affects all programs exploring hull data.

9.5 New Storage Model for Hull Objects

Description

The underlying Hull objects (i.e. OBJHD) are stored in a more efficient way in the database.

Benefits

Performance in terms of read/write I/O; and less space consumed in the database. I/O reductions on up to 40 percent can be achieved.

Compatibility Constraints

None.

For More Information

See the upgrade documentation for details on how to optionally convert object into new storage model.

Affected Programs

HullDesign, HullDrafting

9.6 Hull Specific Design Explorer Configuration

Description

The Design Explorer is configured to expose an additional name for hull part nodes. Beside the name derived from the FLNM attribute hull parts are presented by a second name derived from the PARNAM attribute. If the environment variable MARINE_DESIGN_EXPLORER_PLAIN is assigned any value the additional name presentation is switched off.

Benefits

None.

Compatibility Constraints

None.

For More Information

Only noted here.

Affected Programs

Hull Design, Outfitting Design, Marine Drafting

9.7 Limited Unicode Support in Hull Design

Description

Even if a project is in Unicode mode the same restrictions on allowed characters in the names of objects created using Hull Design still apply.

I.e. only uppercase letters A-Z, digits and the special characters hyphen (-), full stop (.), underscore (_) and plus (+) can be used.

A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P	Q	R	S	T	U	V	W	X	Y	Z	0	1	2	3	4	5	6	7	8	9	-	.	_	+

9.8 Improved Local Language – Unicode Encoding

A major internal change at Hull & Outfitting 12.1 is that the system uses the Unicode standard for text storage and manipulation, rather than the various specific and somewhat proprietary methods that are used in Hull & Outfitting 12.0 and earlier releases. This standard covers all common world languages – and special characters – and will make it much easier to provide support for additional character sets in the future. It makes text handling more robust and makes it much easier to relax some of the previous restrictions, particularly to the use of Asian 16-bit character sets. For example, these may now be viewed in the 3D views. Inputs and outputs may be in Unicode or local standards.

9.9 Units of Measure – Extended Range of Conversions

Hull & Outfitting has always provided conversions for distance and (pipe) bore measurements, to cater for the use of both Metric and Imperial (English) units. This has allowed users to work with feet and inch input & output, but with database storage always in millimetres. Area and volume units have been derived from the length units. Other physical quantities have been handled as purely numeric and have had no conversions applied to them.

Hull & Outfitting 12.1 extends these facilities to a much wider range of measures, and includes built-in definitions and conversion factors for a wide variety of units of measure, with standardised storage and efficient conversion.

These extensions are needed to provide for the much wider range of data now being handled, particularly for plant engineering and schematic data. These data now include Distance, Bore, Area, Volume, Angle, Weight, Temperature, Density, Pressure, Force, Voltage, Current, Impedance, and many others.

Please note that this does mean that the behaviour of some real attributes is different; users' PML applications that check or manipulate these values will need to be reviewed.

9.10 Extract Claims in Hull Applications

Description

Hull object locking (claiming) and releasing in extracts has been improved. When working in extracts, it is no longer a requirement to make explicit extract claims of hull objects before making modifications to them. I.e. when modifying a hull object, e.g. a planar panel, in an extract, the application will implicitly try to claim the object to the extract.

Benefits

Hull user does not need to make explicit extract claims.

Compatibility constraints

None

For more information

Only noted here

Affected programs

Hull Design applications

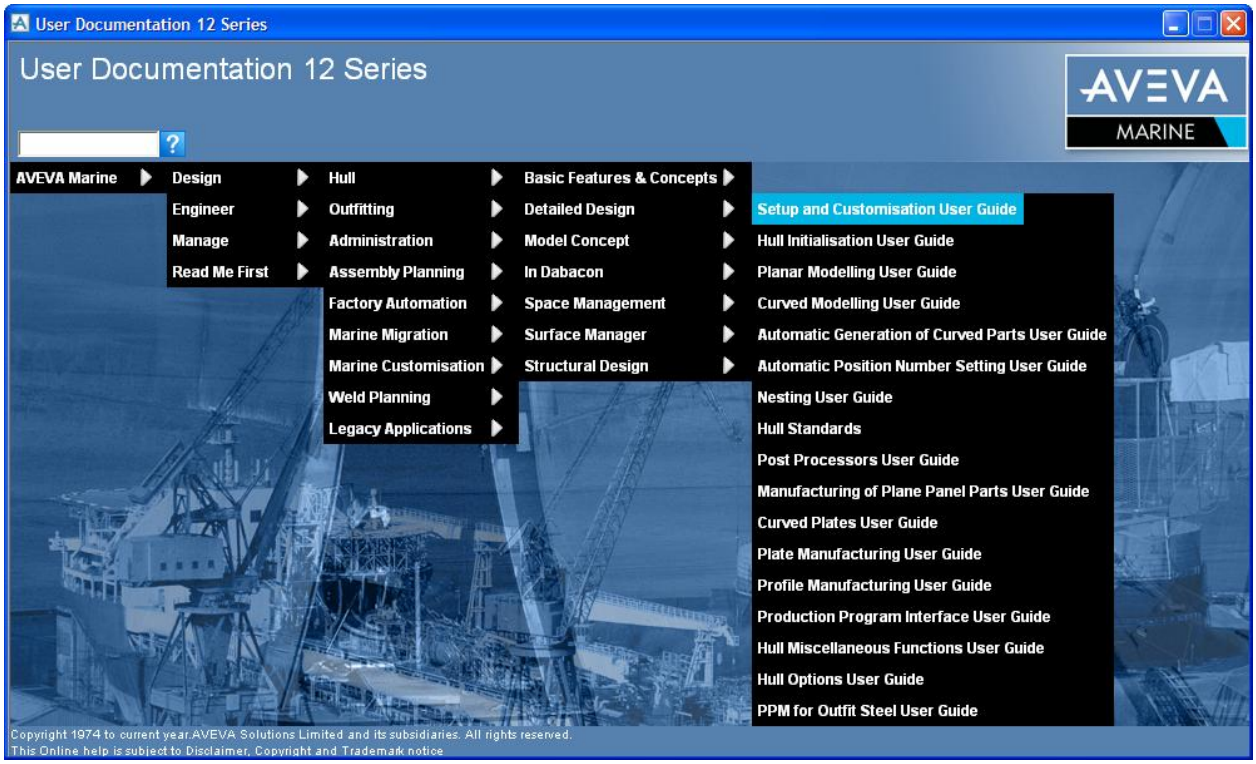
9.11 Documentation

A great many changes have been made to the documentation set for Hull and Outfitting 12.1, with all manuals updated.

Notable improvements to the documentation set include:

- A new 12.0 to 12.1 Upgrade manual
- Manuals for new functions and products: Design Reuse, Space Management, Surface Manager, Report Designer, Tags, Isometric ADP
- Major update for Lexicon manual
- A new section on Event Driven Graphics in the Software Customisation Reference Manual

A new index page gives access to the online help system, which may also be accessed direct from the system using <F1> as usual.



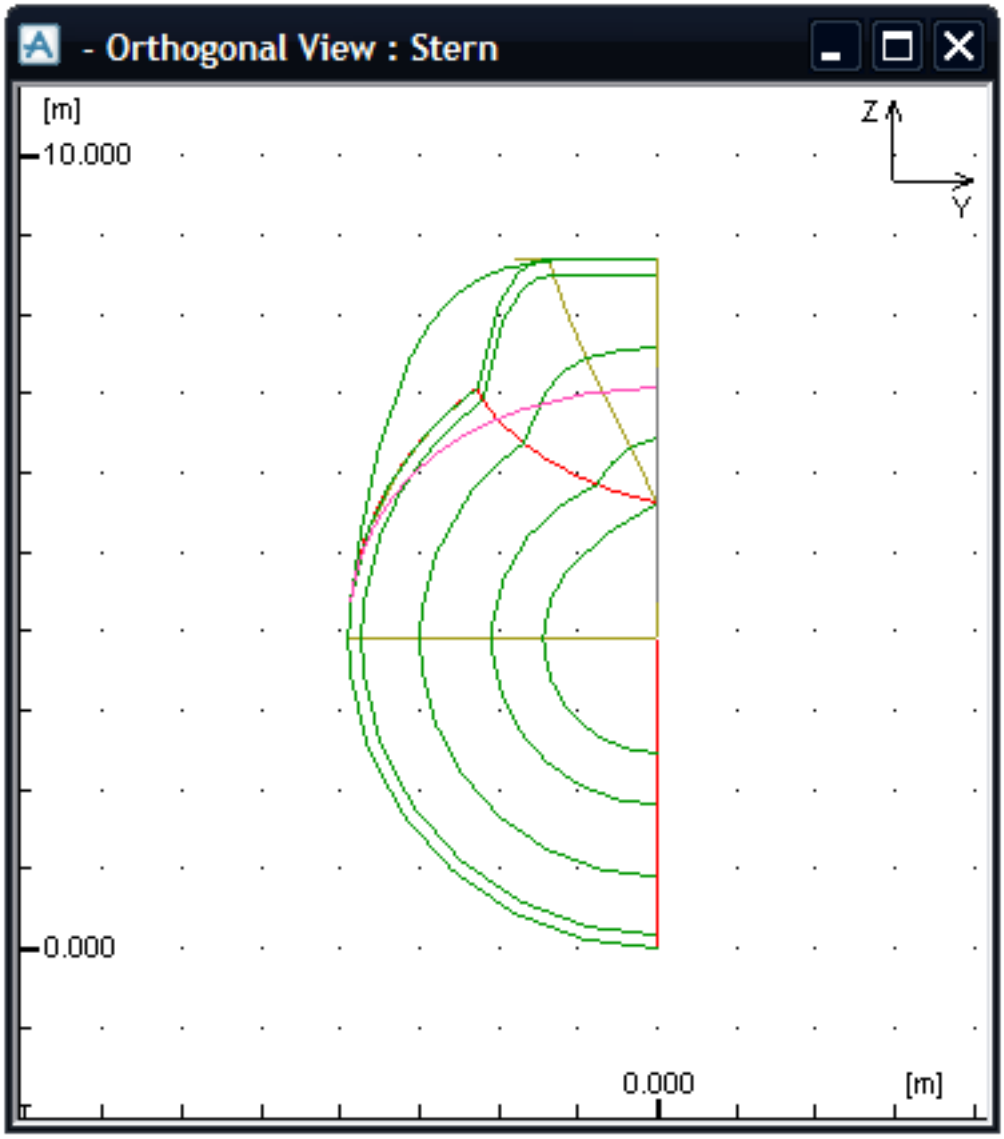
It should be noted that the PDF manuals are no longer supplied separately but may be obtained from the on-line help by clicking Printable version on entry to any manual.

10. AVEVA Initial Design

10.1 Lines - New Grid in PACE

Description

To improve the usability of the grid used in PACE, the way the grid is displayed has changed from a graph paper like grid to a less intrusive intersection point based grid. The rulers have been made more distinct and locked to the sides of the viewport. The coordinate axis are also displayed.



Benefits

A less intrusive grid and more distinct rulers make it easier to work when geometry and grid coincide.

Compatibility Constraints

None

For More Information

Only noted here.

Affected Programs

AVEVA Marine Lines

10.2 Lines - Individual Tuft Size in Views in PACE

Description

It is now possible to have different size of tufts in individual views in PACE.

Benefits

This makes fairing easier when the scale difference is large between individual views.

Compatibility Constraints

None

For More Information

See User Guide *Initial Design / Lines / Screen Based Reference Guide / Patch and Curve Editor / Graphics View Control*.

Affected Programs

AVEVA Marine Lines

10.3 Lines - Macro Editor in PACE

Description

The Lines macro editor is now available in PACE, and can be used in a similar fashion as in Lines. Recording of macros however should be avoided as not all PACE actions will generate corresponding macro commands.

Benefits

There is now a possibility to run macros without interaction, without having to switch to Lines.

Compatibility Constraints

None.

For More Information

Only noted here.

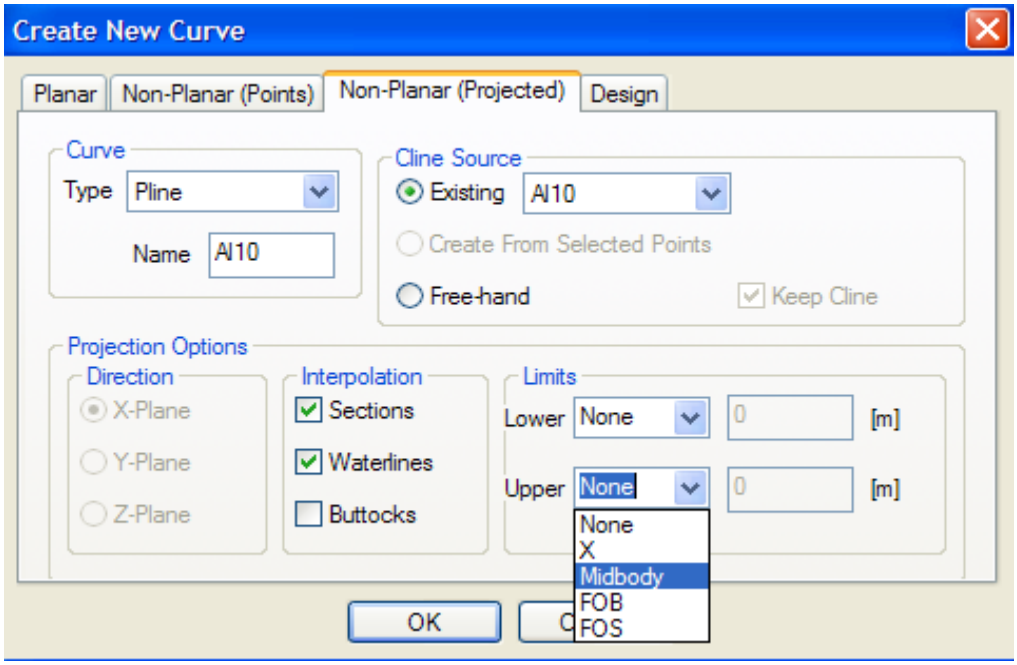
Affected Programs

AVEVA Marine Lines.

10.4 Lines - Clines Project Limits (PMB and Mid Ships)

Description

Cline projection limits have been extended to include a general Midbody limit. In this way, giving e.g. the upper limit as Midbody, a pline would stop at either the FOS, FOB or PMB Aft curve, whichever is the aft most point.



Benefits

The parallel surface limit can be automatically set for curves which has a Cline as source.

Compatibility Constraints

None

For More Information

Only noted her.

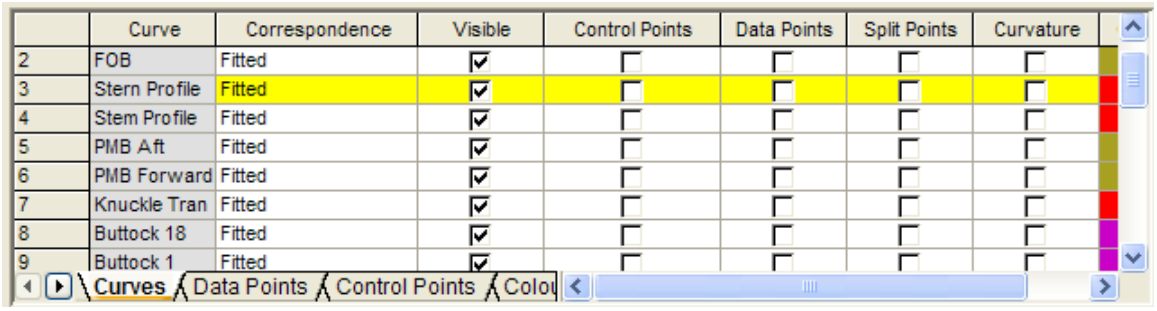
Affected Programs

AVEVA Marine Lines

10.5 Lines - Curve Highlighting

Description

An enhancement to the highlighting of the current curve has been implemented in the curve grid. The currently selected curve from the Curve tree view is now highlighted in the curves grid. Selecting a curve in a graphical view will also scroll into view and highlight the corresponding curve in the curve grid.



Benefits

It is more apparent which curve is currently selected

Compatibility Constraints

None

For More Information

Only noted here.

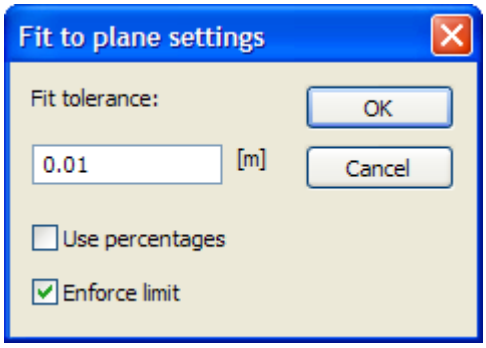
Affected Programs

AVEVA Marine Lines

10.6 Lines - Locking and Fitting to a Plane

Description

Curves can now be fitted and locked to arbitrary planes. Curves lying in the principal planes (for example boundary curves) are already locked and fitted, and as such the items below are not applicable. For both locking and fitting, specification of the plane for the curve can be done in two ways – either using automatically determined points, or manually via selected points.



Benefits

Easier fairing and manipulation of planar curves not lying in a principal plane.

Compatibility Constraints

None

For More Information

Only noted here.

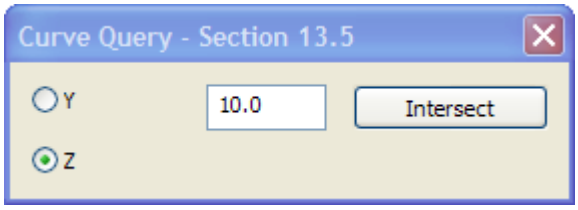
Affected Programs

AVEVA Marine Lines

10.7 Lines - Curve Interrogation

Description

Coordinates and angles at X/Y/Z values can be examined for a curve. The function is activated by the right mouse button and values are shown on the output window.



Benefits

Coordinates can be derived for inserting a point into a curve

Compatibility Constraints

None

For More Information

Only noted here.

Affected Programs

AVEVA Marine Lines

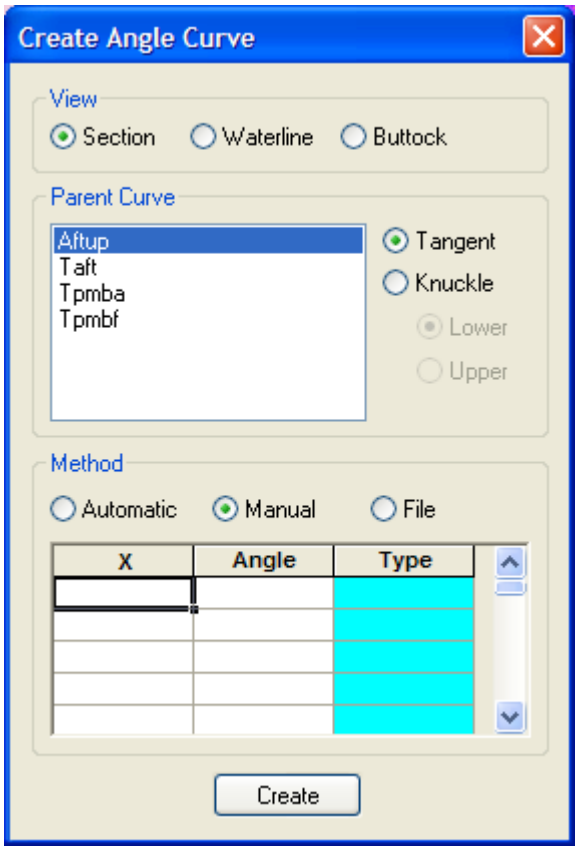
10.8 Lines – Angle Curve Creation/Editing

Description

It is now possible to create and manipulate angle curves in PACE. The angle curves can be set active as other curves and are visually superimposed on the existing orthogonal and oblique views. They can therefore be changed graphically or edited by changing the values in the Data Point grid.

	Curve	Index	Active	Point Type	x [m]	y [m]	z [m]
1	Cline Lxknuck	0	☑	Ordinary	9.0000	50.7008	0.0000
2	Cline Lxknuck	1	☑	Ordinary	10.5000	53.8875	0.0000
3	Cline Lxknuck	2	☑	Ordinary	13.5000	59.4602	0.0000
4	Cline Lxknuck	3	☑	Ordinary	22.0000	71.5827	0.0000

The angle curves can be created by function Curve, Create Angle Curve and the angle coordinates are put by means of the dialog box.



Benefits

The angle curves can more easily be changed in PACE.

Compatibility Constraints

None

For More Information

Only noted here.

Affected Programs

AVEVA Marine Lines

10.9 Lines - User Local View

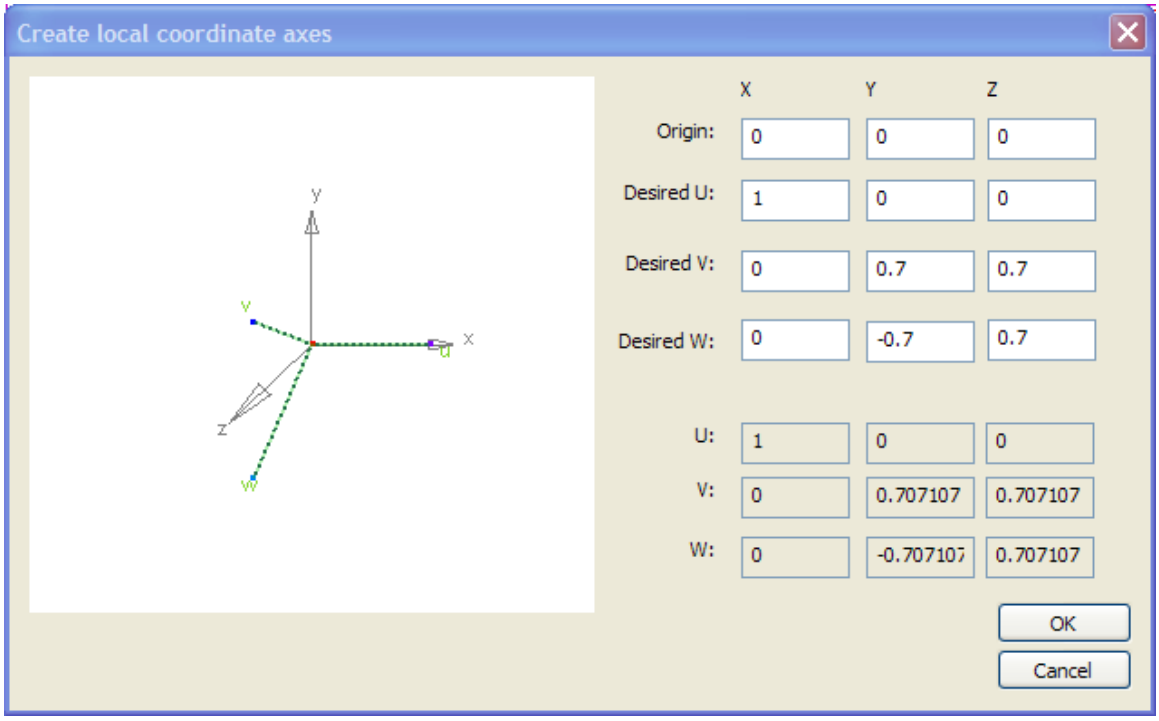
Description

An oblique local view based either on a locked curve or on a user specified coordinate system can be created. The view context menu in an oblique view contains the items “Local (specified axes)…” and “Local (from selected curve)”. The second option is available when a curve locked in an arbitrary plane is selected. The first option is always available.

From selected curve

When available, selecting this option will switch the view to an oblique view with a local coordinate system defined by the plane of the selected curve. The title bar will change to reflect the curve on which the view is based, and the axes it is defined by.

Specified axes



Selecting this option will provide a dialog where an arbitrary Cartesian coordinate system can be specified. The user entered coordinates are normalized and adjusted to ensure the axes are orthogonal. To ensure a right handed system is defined, the z axis may require negation. If the user coordinates can be used to form a system, the resulting system is displayed as edits are made. Clicking ok will switch the view to one defined by the calculated axes.

Benefits

Makes definition and fairing of planar curves easier when they are not located in a principal plane.

Compatibility Constraints

None

For More Information

Only noted here.

Affected Programs

AVEVA Marine Lines

10.10 Corrugated RSOs

Description

Corrugated bulkheads with stools created in Surface & Compartment, using the Corrugation or Stool tab in the Internal Surfaces dialog, now has an extended representation which closes the design loop between Surface & Compartment and Structural Design for these RSOs.

As previous a parametrically defined bulkhead will be stored in the model, but along side it a geometric identical copy will be stored, but instead of the parametric definition it will be defined by using sheer and camber curves. In this new representation the stools and corrugation are individual entities. These new entities will be possible to edit in the same way a knuckled bulkhead is today.

The above allows for creation of corrugated bulkheads with stools in Surface & Compartment, releasing them to design, further editing with Structural Design tools and updating Surface & Compartment with the changes via the “Use Design” function.

Benefits

Enables RSO modelling to be made in a more flexible way

Compatibility Constraints

None

For More Information

Only noted here.

Affected Programs

AVEVA Marine Geometry.

10.11 Compartment Export/Import in XML Format

Description

A new open XML-based format is introduced to support import/export of compartments. The format covers compartment definition and content data as well as category information.

The export and import functionality is accessed through added functionality in the “File – Export” and “File – Import” functions.

Benefits

Open format for describing compartments.

Compatibility Constraints

None.

For More Information

See User Guide *Hull Structural Design* / *Functions Overview* / *Functions in the XML Menu*.

Affected Programs

AVEVA Marine Geometry

10.12 Release of Weights to Calc

Description

The default settings for releasing weight of objects to the Hydrostatics and Hydrodynamics application have been changed. Previously the default was to release the weight. This will now be set to off. As before the setting of this is done in the weight analysis dialog,

Benefits

Ease of use.

Compatibility Constraints

None.

For More Information

Only noted here.

Affected Programs

AVEVA Marine Surface & Compartment

10.13 Axis Setting Reflected in Dialogs

Description

In Hydrostatics/Hydrodynamics it has been possible to set the direction of the x-axis and y-axis to be used in reports. This setting is now also reflected in dialogs in Hydrostatics/Hydrodynamics application.

Benefits

Ease of use.

Compatibility Constraints

None.

For More Information

Only noted here.

Affected Programs

AVEVA Marine Hydrostatics

AVEVA Marine Hydrodynamics

10.14 Sea Water Density

Description

A different sea water density can now be specified for each Loading Condition. The sea water density is entered on the Options page of the Loading Condition dialog.

Benefits

Ease of use.

Compatibility Constraints

None.

For More Information

Only noted here.

Affected Programs

AVEVA Marine Hydrostatics and Hydrodynamics

10.15 Multiple Lightship Weights

Description

Hydrostatics/Hydrodynamics can now handle alternative lightweights. More than one Lightweight module can be created in the General Particulars folder. A combo box for selecting which lightweight to use, has been added to the Loading module dialog. The Deterministic, Loading Sequence and Summary Table modules have also been updated to handle multiple lightweights.

Benefits

Ease of use.

Compatibility Constraints

None.

For More Information

Only noted here.

Affected Programs

AVEVA Marine Hydrostatics and Hydrodynamics

10.16 Oil Outflow

Description

A new Oil Outflow module has been added to the Regulations folder. This calculates the oil outflow performance according to MARPOL Regulation 12A p11 concerning the probability of oil outflow from damaged fuel tanks.

Benefits

Ensures compliance with the statutory regulations.

Compatibility Constraints

None.

For More Information

See User Guide *Initial Design* / *Hydrostatics* / *Major Tasks* / *Regulations* / *Oil Fuel Outflow*.

Affected Programs

AVEVA Marine Hydrostatics

10.17 Inclining Experiment

Description

The Inclining module In Hydrostatics/Hydrodynamics has been corrected and revised according to comments received from users. The calculations and output should now fully comply with statutory requirements.

Benefits

Ensures compliance with the statutory regulations.

Compatibility Constraints

None.

For More Information

Only noted here.

Affected Programs

AVEVA Marine Hydrostatics and Hydrodynamics

10.18 Probabilistic Stability to SOLAS 2009 Rules

Description

The Probabilistic Stability module In Hydrostatics/Hydrodynamics has been updated to include the latest 2009 SOLAS cargo/passenger ship rules. The damage case generation algorithm for multi-zone damage has also been revised to bring it in line with the recommended interpretation of the rules.

The implementation also provides for different damage permeabilities for different loading conditions, as specified in the rules.

Benefits

Ensures compliance with the latest statutory regulations.

Compatibility Constraints

None.

For More Information

See User Guide *Initial Design* / *Hydrostatics* / *Major Tasks* / *Probabilistic Stability*.

Affected Programs

AVEVA Marine Hydrostatics and Hydrodynamics

10.19 Damage Case Summary Table

Description

A summary of damage cases is now included in the loading condition intact condition report. The table is included by default, but there is an option for turning it off.

Benefits

A concise way of reporting damage case results.

Compatibility Constraints

None.

For More Information

See User Guide *Initial Design / Hydrostatics / Operator's Instructions / Calculations / Stability Calculations / Damage Scenarios*.

Affected Programs

AVEVA Marine Hydrostatics and Hydrodynamics

10.20 MODU Wind Heeling Moments

Description

The IMO Mobile Offshore Drilling Unit method of calculating the wind force and moment on the structure, has been implemented. To use this feature, all exposed above and under water elements, must be defined as compartments and assigned to a special category with an identifier, **SL**, and name, **Sail**. The program assumes that the specified *Structural permeability* is the *Shape Factor* for these elements. Also the wind moment must be set to the MODU wind moment, in the **Criteria** file.

Benefits

Allows stability assessment for MODU's..

Compatibility Constraints

None.

For More Information

See User Guide *Initial Design / Hydrostatics / Major Tasks / Rig Wind Heeling Moments in Initial Design*.

Affected Programs

AVEVA Marine Hydrostatics and Hydrodynamics.

10.21 Connected Compartments

Description

Compartments specified as connected to damaged compartments, are now just added to the list of damaged compartments for the analysis and treated as being damaged to the outside waterline. Previously, such compartments were combined to form one multi-compartment, but this meant that only one damage permeability could be applied, which was that of the first damaged compartment. With this new method, each connected compartment will have its own damage and probabilistic stability permeability. The latter can vary with loading draft.

Also compartments are now connected in one direction only. Flood water will flow from the first to second compartment, but not the other way. ***Note that this means that to specify flow in both directions, two connected compartment records are now needed.***

Benefits

Ensures compliance with the latest statutory regulations.

Compatibility Constraints

None.

For More Information

See User Guide *Initial Design / Hydrostatics / Screen Based Reference Guide / Dialogs in Detail / General Particulars / Openings and Deck Edge Points and Other Data*.

Affected Programs

AVEVA Marine Hydrostatics

10.22 ABS Towing Criteria

Description

The special ABS bollard pull criterion has been added. The user must edit a local copy of the Criteria file and specify the bollard pull heeling moment arm for the particular vessel according to the rules, using the Edit/Criteria menu option in the program.

Benefits

Ensures compliance with the latest statutory regulations.

Compatibility Constraints

None.

For More Information

Only noted here.

Affected Programs

maridcalc

11. AVEVA Hull General Functionality

11.1 Reuse of Seam and Profile Numbers

Description

When using the option of free naming for seams and shell profiles the same number will be given to objects with the same name within one session. I.e. creating seam seam_at_fr32 results in the seam getting the number 123. If the seam is deleted and then a new seam is created with the same name in the same session the new seam will get number 123. If the seam “seam_at_fr32” is deleted and then the application is restarted and a new seam with the same name, “seam_at_fr32”, is created then it will not get the same number. The same is relevant for shell profiles as well.

When starting batch generation of seams and shell profiles from the interactive application, the information needed to recreate any deleted seams and shell profiles with the same number as they had in the interactive application session, will be sent to the batch process.

Benefits

The name sequence database is better utilised and thus less numbers will be used.

Compatibility Constraints

None.

For More Information

Only noted here.

Affected Programs

AVEVA Marine Structural Design

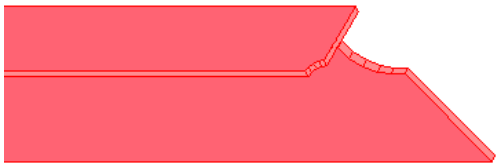
AVEVA Marine Detail Design

11.2 Multiple Negatives when Designing User Defined End Cut

Description

The current implementation of user-defined end cuts has been restricted to only one negative extrusion and to cut angles less or equal to 90 degrees.

This has now been improved, allowing any number of negative extrusions defined in any plane, e.g. one negative extrusion used to define the end cut for the web and another one defining the flange end cut. Furthermore, extensions of the profile is supported, allowing also cut angles greater than 90 degrees.



Benefits

The improvement makes it possible to define any type of complex end cuts

Compatibility Constraints

None

For More Information

See User Guide *Hull Detailed Design / Setup, Customisation and Standards / Profiles in AVEVA Marine / Profile Endcuts in AVEVA Marine / Customer Set-up of Endcut Standard / User Defined Endcut / Setting up User Defined Endcuts.*

Affected Programs

AVEVA Marine Structural Design

AVEVA Marine Detail Design

11.3 Split of Hull Notes and Posno

Description

The identification of a Hull Note and Position number has been split in the way that a Hull Note is recognized as a note and not as a position number.

Benefits

Possibility to handle all the Hull Notes without disturbing the position numbers in e.g. delete notes/all.

Compatibility Constraints

None.

For More Information

Only noted here.

Affected Programs

AVEVA Marine Structural Design

AVEVA Marine Detail Design

11.4 Enhanced Selection Filtering

Description

The OR syntax can now be used when defining filters in the Selection Tool.

In the general Selection Tool different kind of filters are used to extract the model items both when defining the scope of plane panels and the groups within these panels. The filters can be used both for selecting blocks or panels with wildcards, and by using the scheme syntax to select panels or groups.

The wildcard characters % and * represents any single character and any number of characters respectively. But certain selections could not be made, e.g. a selection of both stiffeners and flanges was not possible because making a filter accepting stiffeners will exclude flanges and vice versa. Likewise selecting only the blocks AB123 and AB124 but not the other blocks with names starting with AB12 was not possible.

This can now be done using the vertical bar character | as the OR operator. The two alternative patterns must be surrounded by parentheses having the OR operator between them.

E.g. in the example above with the two blocks the expression **`(AB123|AB124)`** will only accept panels belonging to these two blocks. Note that no blanks are added around operator and parenthesis. **`(AB1%%-FR*|AB2%%-FR*)`** will accept panels with a name containing the letters FR and starting in AB1 or AB2.

To select stiffeners and flanges with a material grade equal to A23 the expression can be **`(STI|FLA)*, QUA=A23*;`**

The parenthesis are necessary to define the two alternate patterns separating the OR clause from the common part of the filter. If the parentheses are left out they are added at the beginning and the end of the filter which may give unexpected results. E.g. if the parentheses where left out in the example above only the flanges would match as the stiffener pattern will only be the three characters STI which doesn't match any statement.

Benefits

By using the OR operator in defining the filters a greater variety of panels and groups can be collected in one selection.

Compatibility Constraints

None.

For More Information

Only noted here.

Affected Programs

AVEVA Marine Structural Design

AVEVA Marine Detail Design

11.5 Blocks and Panels from Tree View

Description

Like some other functions within Hull Design, the Panel Scope of a Selection can now also be defined by picking blocks or panels via a tree view dialog in addition to the existing picking from the picture.

Benefits

Tree view available for picking blocks and panel for the Panel Scope

Compatibility Constraints

None.

For More Information

Only noted here.

Affected Programs

AVEVA Marine Structural Design

AVEVA Marine Detail Design

11.6 Set-up of a Project to Use Free Naming

Description

Today the environment variable SBH_FREE_SEAMPROF_NAMES is used to control if a project is set in free naming mode or not. From now on this has to be set using the InitHull application.

Benefits

It will no longer be possible to change this setting if seams or shell profiles have been created in a project.

Compatibility Constraints

The variable will still be used as a last resort for determining whether the project allows free naming. However, as soon as the hull reference object has been recreated in InitHull, the variable will not be used any longer in that project.

For More Information

Only noted here.

Affected Programs

AVEVA Marine Structural Design

AVEVA Marine Detail Design.

11.7 Hole Annotation Enhancement

Description

The possibility to annotate holes in symbolic views has been extended with more customisation possibilities. The following 3 default values have been added to the Hull Modelling default file:

HOLE_ANNOTATE_SIGN

The sign in the dimension string between the dimensions (e.g. the X in HO200X500). Default value is X.

HOLE_ANNOTATE_USE_TYPE

If set the text in the hole type will be omitted (e.g. HO200X500 will be 200X500). The value is unset by default.

HOLE_AN_MIN_TEXT_HEIGHT

The minimum text height for the hole annotation. Default value is 2.0.

Benefits

Enables the user to control the annotate hole note better.

Compatibility Constraints

None.

For More Information

See User Guide *Hull Detailed Design / Planar Modelling / Default File of Planar Modelling / Picture Derivation.*

Affected Programs

AVEVA Marine Structural Design

AVEVA Marine Detail Design

11.8 Hull Qualities in CATA

Description

The definition of the Hull qualities has been moved from the file assigned to the environment variable SBH_QUALITY_LIST to the catalogue in the Property World. The quality elements can be defined in Paragon using the PML script HullCreateQualityList. Input to the script is the file defined by the environment variable SBH_QUALITY_LIST.

Benefits

This change is beneficial for projects using Global.

Compatibility Constraints

The qualities must be defined on cata.

For More Information

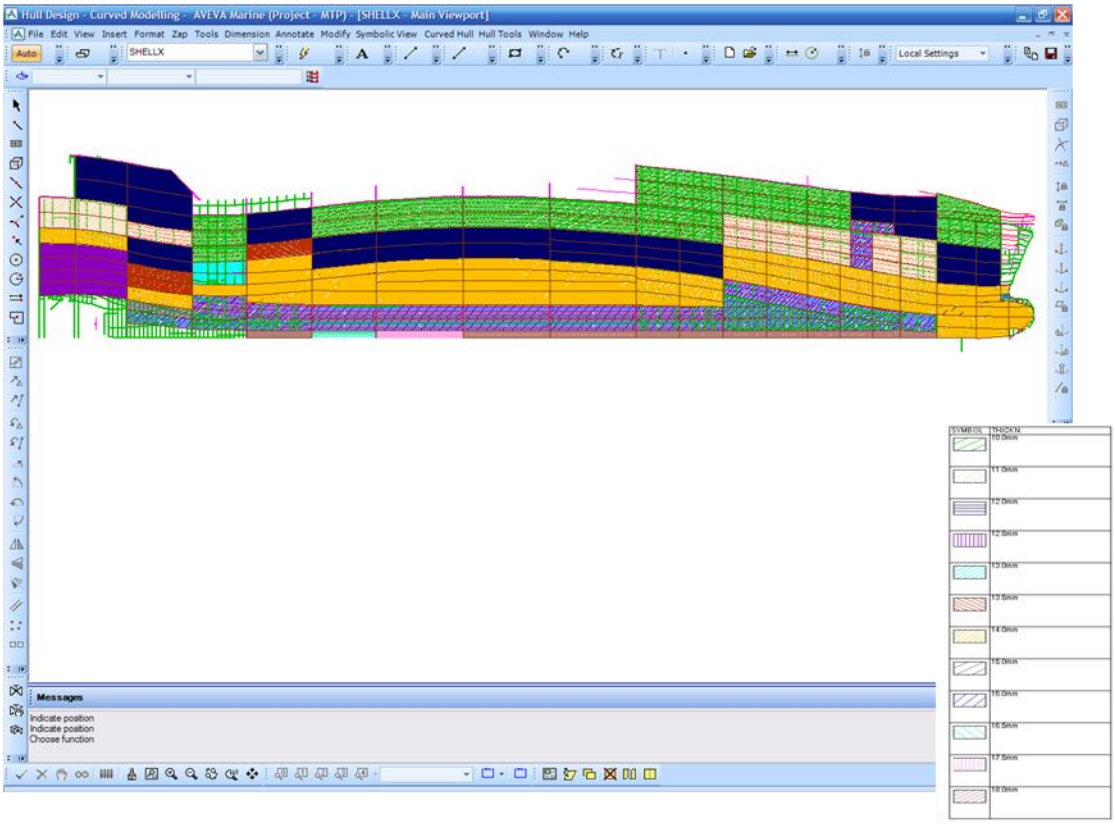
Further details are given in the *12.0 to 12.1 Upgrade* manual.

Affected Programs

AVEVA Marine Hull Design

11.9 Shellx with Plate Scantlings, Position Numbers and Material Quality

Description



The shell expansion view is now created with plate thickness, plate quality and plate position number annotated on each plate. Furthermore, each plate is drawn with a hatch pattern chosen to display the plate thickness that is used.

The user can control the visibility of this information in two ways:

By using the function Symbolic View->Curved Hull View->Properties and picking a shell expansion view. The user will get the possibility to display or hide the plate information. Furthermore, if plate hatching is chosen to be shown, an accompanying legend can also be created that shows each used hatch pattern and the thickness it represents.

The shell expansion view is initially presented with shown information controlled by new keywords available in the default file:

SHX_DRAW_PLATES = TEXT		Plates are shown with plate thickness annotated
	= DRAW	Plates are shown with hatch patterns representing the plate thickness
	= NOT SET	Plates are shown with plate thickness information hidden (default)

SHX_SHOW_POSNO when given, plates are shown with position number annotated

= NOT SET	Plates are shown with position number hidden (default)

SHX_SHOW_MATQ when given, plates are shown with material quality annotated

= NOT SET	Plates are shown with material quality hidden (default)

Benefits

Visual overview of plate thicknesses in shell expansion view.

Compatibility Constraints

None

For More Information

Refer to User Guide *Hull Detailed Design / Curved Modelling / Interactive Functions, Curved Hull Menu / Curved Panel*.

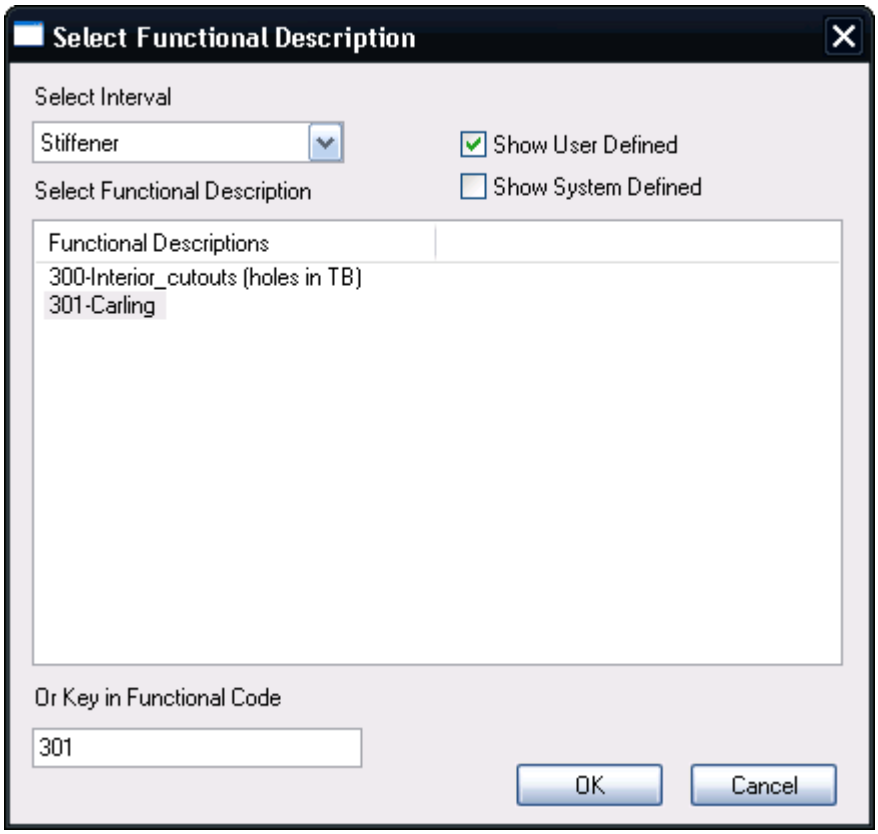
Affected Programs

AVEVA Marine Detail Design

11.10 New Dialog when Setting Functional Descriptions

Description

The dialog for the function **Hull Tools > Functional Description** has been changed. The following dialog is now presented when activating the function:



First select an interval from the drop-down list. This interval represents either a component on a planar or curved panel or a planar or curved panel. When the selection is made, the functional descriptions that are specifically defined for this interval will be presented and possible to select. A Tick-box is available to show all system defined functional descriptions in case these are the ones to be set on components or panels. It's also possible to key in any integer value. Once the selection is made, the use of the **OK** button will hide the dialogue and the user is requested to pick components or panels depending on the interval that was selected. Picked elements will be updated with the selected functional description. Involved objects are made active before the update and it's necessary to apply the changes to get the update confirmed.

Benefits

Easier update of functional descriptions

Compatibility Constraints

None.

For More Information

See User Guide *Hull Detailed Design / Planar Modelling / Interactive Planar Hull Modelling Functions / Hull Tools*.

Affected Programs

AVEVA Marine Hull Design

11.11 Increased Number of Surfaces

Description

The number of surfaces to be used in the Hull system is limited. With the possibility to add parametric surfaces, the limit of 100 is easily reached. To be able to add and handle more surfaces, the limit has been increased to 1000. This affects the Hull default keyword SURFACES, where the surface numbers to be used in Create View are listed.

Benefits

More surfaces can be handled

Compatibility Constraints

None

For More Information

Only noted here.

Affected Programs

Marine Planar and Curved Hull

12. AVEVA Surface Manager

Description

Surface Manager is a new module that allows transfer (import/export) of surfaces from/to external systems by the use of neutral standards. It also offers tools for the assessment of the quality of the imported surface and if needed can repair selected defects detected in the surface coming from 3rd party.

Surface Manager requires a specific license.

Benefits

Key features are:

- Import surfaces into AVEVA Marine projects
- Graphically displays the layout of the surface
- Finds problem areas and shows them graphically
- If possible optimises the surface by removing problem areas
- Extract curves for use in Hull Design
- Extracts surfaces from existing AVEVA Marine projects
- Exports surfaces to file
- Possible to select only part of a surface to export
- Mirror surfaces in the centre line plane
- Supports the most commonly spread formats: IGES, SAT, DML, STEP AP203

Compatibility Constraints

None

For More Information

See User Guide *AVEVA Surface Manager / Tools and Functions.*

Affected Programs

AVEVA Marine Hull

12.1 Surface Manager Replacing Surface Server

Description

For a long time the only way of using an external surface with Aveva Marine has been through the surface server. This has limited the type of operations performed on the surface and control of the quality, “fit for purpose”, of the surface.

Starting with AVEVA Marine 12.1 all surfaces have to be released into the database and the surface server will not be used. To help with this when working with surfaces created by non Aveva software, there is a new application, the AVEVA Surface Manager. It can import surfaces in IGES, SAT, STEP and dml formats. It also has a number of features for checking and repairing the surface.

Benefits

More advanced operations can be performed on the surface and the user can check the externally created surface before importing it to the database.

Compatibility Constraints

None

For More Information

See User Guide *AVEVA Surface Manager*

Affected Programs

None.

12.2 Surface Manager – Compare Surfaces

Surface manager has a function which can compare surfaces in Tribon M3SP6 and AVEVA Marine 12.1. To create the input from Tribon M3SP6 there is a program sj708 that intersects a surface and writes a text file with sample points that can be read by Surface Manager compare function. To get the program sj708, please contact regional support representatives.

13. AVEVA Space Management

Description

Space Management is a new application that can be used to create and manage an automatic subdivision of a ship into spaces. Space Management can also be used for analysis, planning, monitoring and follow up on space arrangements generated for different purposes such as:

- SOLAS classification of compartments
- Design Zones
- Compartmentation and stability assessment
- Sub-contractors subdivision
- Production Planning
- Painting areas
- Fire/Noise/Thermal insulation plans
- Etc.

Space arrangements can be reused in all other modelling disciplines and as the design evolves, spaces can be interrogated regarding all objects within each space.

Space Management requires a specific license.

Benefits

Key features are:

- A new tool for simulations, estimations and decisions, de-risking design of more complex ships
- Better productivity for GA activities and drawings
- Better cost follow-up by getting early and precise estimates of e.g. insulation material or painting areas
- Increased production efficiency by optimisation of block structure

Compatibility Constraints

None

For More Information

See User Guide *Space Management*

Affected Programs

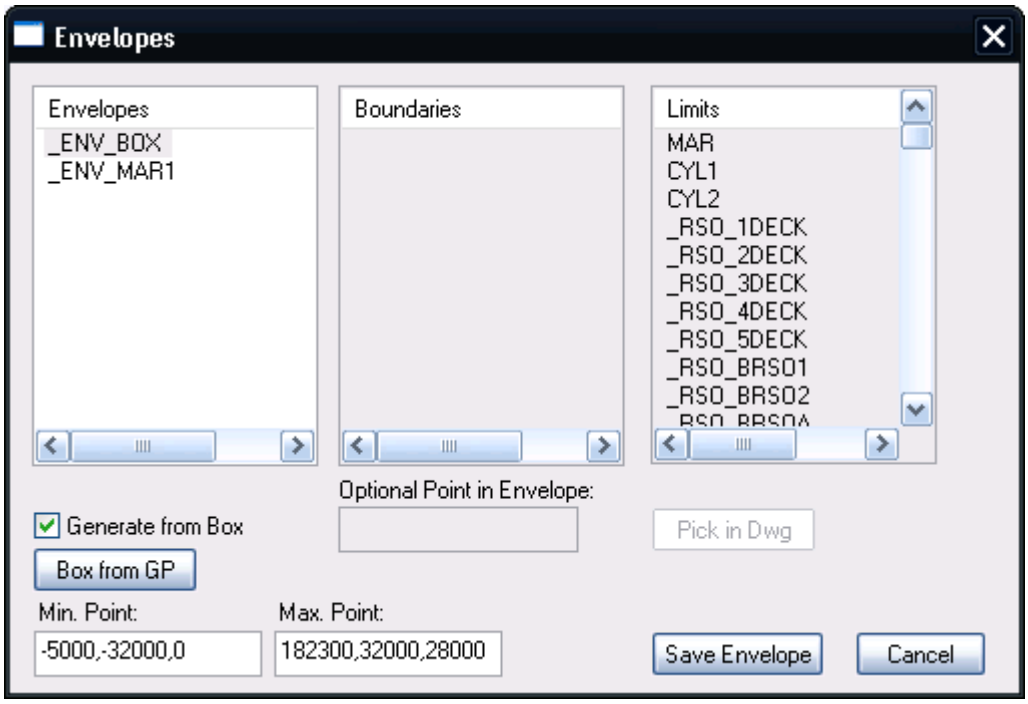
AVEVA Marine Space Management

14. AVEVA Hull Structural Design

14.1 New Options when Creating Envelopes

Description

The function Envelope has been updated with an option to define an envelope as an axis-parallel box in space. The dialogue has changed as shown below:



When a new envelope is defined, the tick-box 'Generate from Box' can be used. When ticked the boundary list will be dimmed and the key-in fields for minimum and maximum points are enabled. If data for general particulars is available, these will be fetched and added to the key-in fields when using the function Box from GP. The fetched values are extended with one meter in all directions.

When the limits selected to generate an envelope generate more than one closed volume there is now the possibility to select which one to use as the desired envelope, by specifying a point inside the created envelope.

Benefits

The new possibility to generate envelopes enables RSO modelling to be made in a more flexible way.

Compatibility Constraints

None.

For More Information

Only noted here.

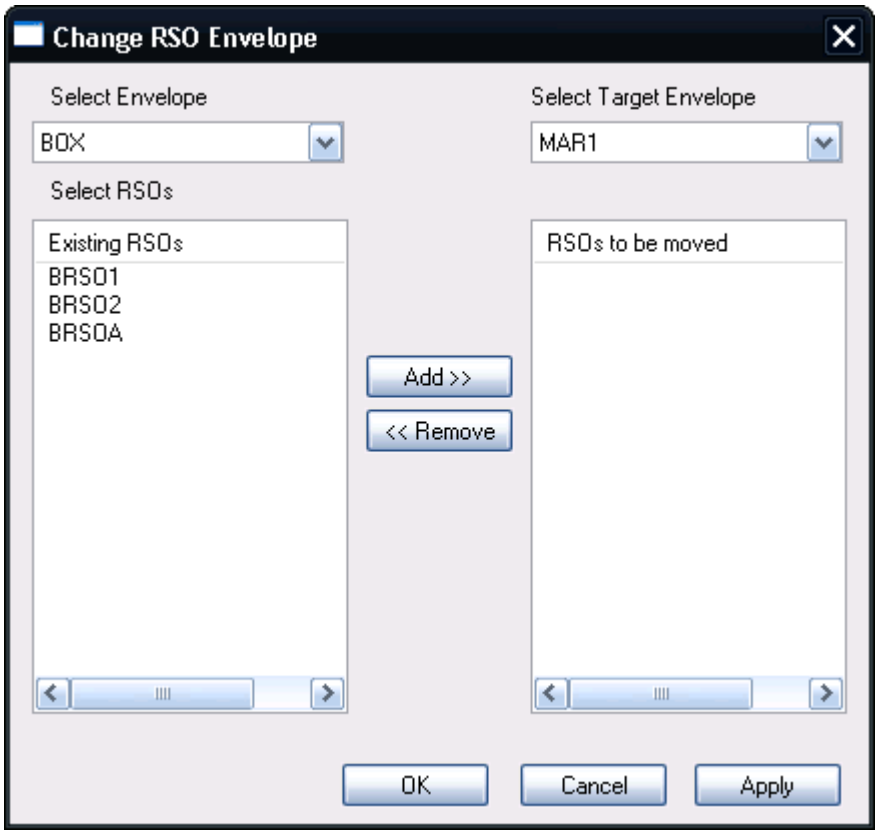
Affected Programs

AVEVA Marine Structural Design and Space Management.

14.2 RSO Change Envelope

Description

A new function RSO Change Envelope has been added, which allows the user to move RSOs from one envelope to another. When moved, the RSO is recreated in the target envelope. The following dialog is presented when the function is activated:



When an envelope is selected from the drop-down list, all RSOs belonging to this envelope are presented in the list. When a target envelope is selected, one or many RSOs can be selected and added to the target envelope. The added RSOs are recreated in the new envelope by selecting Apply or OK.

Benefits

Enables RSO modelling to be made in a more flexible way.

Compatibility Constraints

None.

For More Information

See User Guide *Hull Structural Design / Functions Overview / Functions in the Project Menu / Envelope* and *AVEVA Space Management / Functions Overview / Functions in the Project Menu / Envelope*.

Affected Programs

Structural Design

Space Management

14.3 RSO Recreate

Description

A new function “RSO Recreate” has been added, which recreates the geometry of the RSO based on the current definition of limiting objects and the envelope. The function is activated from the RSO menu, when right-clicking a RSO or as a right-click menu option in the function “RSO Property”.

When the function is activated from the RSO menu, the user is asked to pick an RSO in the drawing. By using the Option button, the user can select all RSOs within a view on the drawing.

When the function is activated within the function “RSO Property”, the user can select to recreate the indicated RSO or all RSOs.

When the function is activated by right-clicking the geometry of an RSO, the indicated RSO is recreated.

Benefits

Enables RSO modelling to be made in a more flexible way.

Compatibility Constraints

None.

For More Information

See User Guide *Hull Structural Design / Functions Overview / Functions in the Functional Structure Menu / RSO* and *AVEVA Space Management / Functions Overview / Functions in the Functional Structure Menu / RSO*.

Affected Programs

AVEVA Marine Structural Design and Space Management

14.4 RSO Rename

Description

A new function RSO Rename has been added, which renames a RSO, updates all panels located in the renamed RSO and updates all other RSOs that are topologically dependent of the renamed RSO. All other topological dependences are currently not updated, e.g. hull panels using the RSO as boundary limit needs to be manually updated.

The function is activated from the RSO menu, when right-clicking a RSO or as a right-click menu option in the function RSO Property.

Benefits

Enables RSO modelling to be made in a more flexible way.

Compatibility Constraints

None.

For More Information

See User Guide *Hull Structural Design / Functions Overview / Functions in the Functional Structure Menu / RSO* and *AVEVA Space Management / Functions Overview / Functions in the Functional Structure Menu / RSO*.

Affected Programs

AVEVA Marine Space Management

AVEVA Marine Structural Design

14.5 Naming of Multiply Copied RSOs

Description

The naming of multiply copied RSOs is improved in the following way:

If name XXX is given as target name and multiple copies are requested, then the copied RSOs are named XXX, XXX1, XXX2, … XXXn

If name XXX10 is given as target name and multiple copies are requested, then the copied RSOs are named XXX10, XXX11, XXX12, … XXXn

If name XXX10(10) is given as target name and multiple copies are requested, then the copied RSOs are named XXX10, XXX20, XXX30, … XXXn

Benefits

More accurate naming can be defined.

Compatibility Constraints

None.

For More Information

See *Hull Structural Design / Functions Overview / Functions in the Functional Structure Menu RSO / Copy.*

Affected Programs

AVEVA Marine Structural Design and Space Management

14.6 Pick Option Added in RSO KeyIn

Description

An option to pick limiting RSOs has been added in the function RSO KeyIn.

The dialogue is presented with new command buttons which will hide the dialogue and ask the user to pick an RSO in the current drawing.

The command buttons are enabled when the function RSO KeyIn is activated from the RSO menu or when right-clicking a RSO, but disabled when the function is activated from the RSO Property function

Benefits

Enables RSO modelling to be made in a more flexible way.

Compatibility Constraints

None.

For More Information

See User Guide *Hull Structural Design / Functions Overview / Functions in the Functional Structure Menu / RSO /Properties* and *AVEVA Space Management / Functions Overview / Functions in the Functional Structure Menu / RSO / Properties*.

Affected Programs

AVEVA Marine Structural Design and Space Management

14.7 Pick Option Added in RSO Edit

Description

An option to pick limiting RSOs has been added in the function “RSO Edit”.

The dialogue is presented with new command buttons which will hide the dialogue and ask the user to pick an RSO in the current drawing.

The command buttons are enabled when the function “RSO Edit” is activated from the RSO menu or when right-clicking a RSO, but disabled when the function is activated from the RSO Property function

Benefits

Enables RSO modelling to be made in a more flexible way.

Compatibility Constraints

None.

For More Information

See User Guide *Hull Structural Design / Functions Overview / Functions in the Functional Structure Menu / RSO /Properties* and *AVEVA Space Management / Functions Overview / Functions in the Functional Structure Menu / RSO / Properties*.

Affected Programs

AVEVA Marine Structural Design and Space Management

14.8 Right Click Menu on RSO

Description

A right click menu with RSO functions has been added when right clicking RSO geometry in a drawing.

The following menu is displayed and functions can be selected to operate on the indicated RSO:

Benefits

Enables RSO modelling to be made in a more flexible way.

Compatibility Constraints

None.

For More Information

See User Guide *Hull Structural Design / Functions Overview / Right Click Contexts Menus* and *AVEVA Space Management Functions Overview / Right Click Contexts Menus.*

Affected Programs

AVEVA Marine Structural Design and Space Management

14.9 Stable Multi Face RSO Reference

Description

When positioning a plane panel relative to a multi face RSO either the face number or an axis aligned ray (point) can be used. If e.g. the statement wizard is used to build up the panel and an RSO face is picked via the graphical display the direct face number is added to the panel definition. In the panel statement it shows as a clause of the form “NO=<number>”.

However if the RSO is modified it may be that the faces are renumbered and all the panels located by the RSO may get the wrong face number reference giving unpredictable results when regenerating.

The other option to select a face within an RSO is to give a coordinate pair in the global coordinate system, either (X,Y) or (X,Z) or (Y,Z). These coordinate pairs will geometrically describe a ray in space. If this ray intersects an RSO face, that face will be used to define the panel plane. Using a ray to select a face is more stable than a direct face number as it is insensitive to face renumbering.

From AVEVA Marine 12.1 the system will automatically update the panel definition provided the panel plane is defined via an RSO face number on a multi face RSO. When storing the panel a ray definition will be created and added to the panel definition. The direct face number will be kept as information, but the ray will take precedence.

At storing, if the face number is out of date it will be updated from the ray. Single face RSOs are not affected by this development. If the ray hits multiple RSO faces, the direct RSO number is kept as the primary definition.

Benefits

Panels with location defined by multi face RSOs will be insensitive to RSO face renumbering.

Compatibility Constraints

None.

For More Information

Only noted here.

Affected Programs

AVEVA Marine Structural Design

AVEVA Marine Detail Design

14.10 Seam from RSO

Description

A new way to define seams has been introduced. Seams can now be defined as an intersection between an RSO and a surface.

A seam is defined by using the interactive function for creating seams. Select Surface/Surface type, indicate the intersecting RSO.

Benefits

Enables seams to be defined as an intersection between surface and RSO.

Compatibility Constraints

None.

For More Information

Only noted here.

Affected Programs

AVEVA Marine Structural Design

AVEVA Marine Detail Design

14.11 COR Keyword when Referencing RSOs and Surfaces

Description

The result of using the COR keyword has been harmonised for panel, RSO and Surface references. They now all work in the way planar panels have worked before.

Benefits

Consistency when modelling.

Compatibility Constraints

Panels created, before this release, with the COR keyword referencing RSOs and Surfaces might change when recreated with this release.

For More Information

Only noted here.

Affected Programs

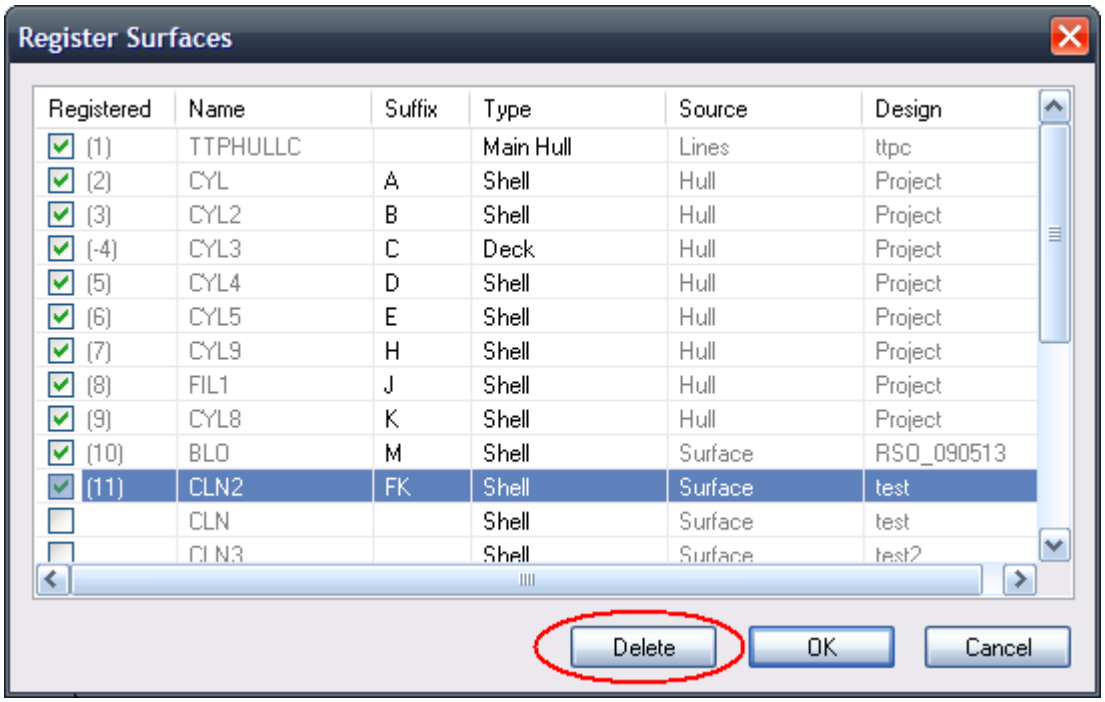
AVEVA Marine Hull Design and Structural Design.

14.12 Delete Surface Object from Design Database

Description

Object of type CSURF can now be deleted from database. In the administration dialog, “Register Surfaces”, a new button, “Delete”, have been added. Selected surface will be deleted.

Note: It is not possible to delete a surface which have objects associated with it, e g the surface have been used when creating curved hull objects.



Benefits

Improved administration of surfaces.

Compatibility Constraints

None.

For More Information

See User Guide *Hull Structural Design / Functions Overview / Functions in the Project Menu / Surfaces*.

Affected Programs

Structural Design

14.13 Block, Recreate All

Description

A new function, Recreate All, has been added to right-click menu in the Block Edit dialogue. When activated, all blocks are recreated using the definition data stored with the blocks.

Benefits

Enables all blocks to be recreated in one operation.

Compatibility Constraints

None.

For More Information

See User Guide *Hull Structural Design / Functions Overview / Functions in the Project Menu / Block* and *AVEVA Space Management / Functions Overview / Functions in the Project Menu / Block.*

Affected Programs

AVEVA Marine Structural Design

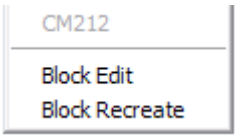
AVEVA Marine Space Management

14.14 Right Click Menu on Blocks

Description

A right click menu showing the block edit function has been added when right clicking block geometry in a drawing.

The following menu is displayed and the block edit or the recreate function can be selected to operate on the indicated block:



Benefits

Enables block modelling to be made in a more flexible way.

Compatibility Constraints

None.

For More Information

Only noted here.

Affected Programs

AVEVA Marine Structural Design and Space Management

14.15 Jumbo Panels Removed

Description

The functions handling jumbo panels have been either removed or modified to handle any kind of planar panel. The functionality of the removed functions is covered by more recent concepts like modelling panels on RSOs and the use of Design Panels. The term “jumbo panel” is removed from dialogs and messages and the data type (object code 1) interval previously associated with them (800 – 899) is reserved for future use.

Benefits

Obsolete functions removed from the system.

Compatibility Constraints

None.

For More Information

Only noted here.

Affected Programs

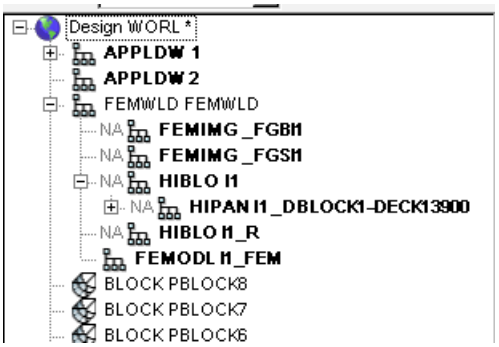
AVEVA Marine Structural Design

AVEVA Marine Detail Design

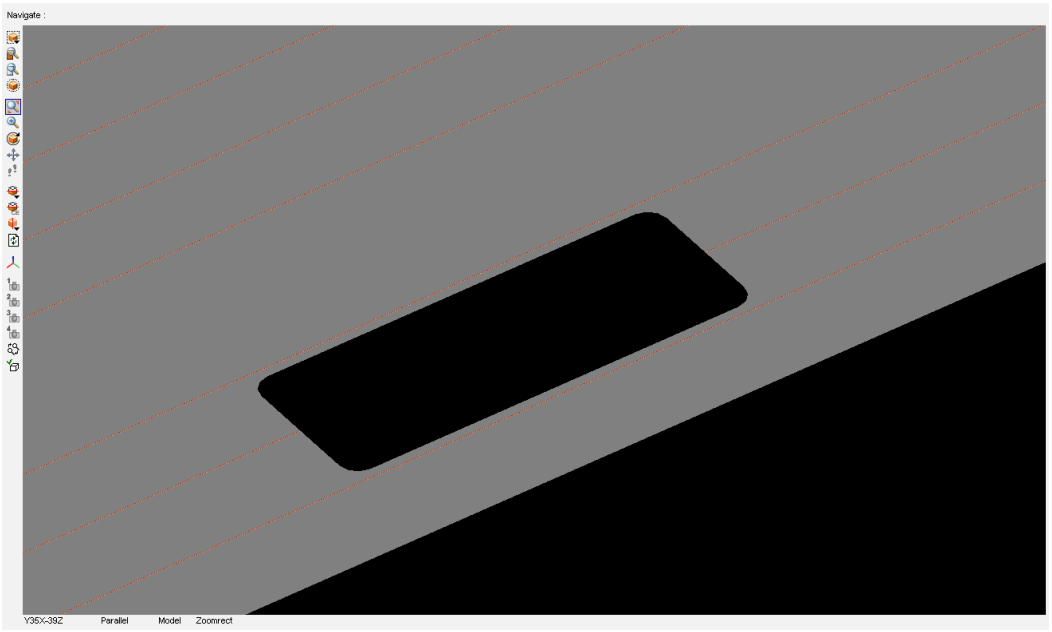
14.16 FEM World for Idealised and FE Models

Description

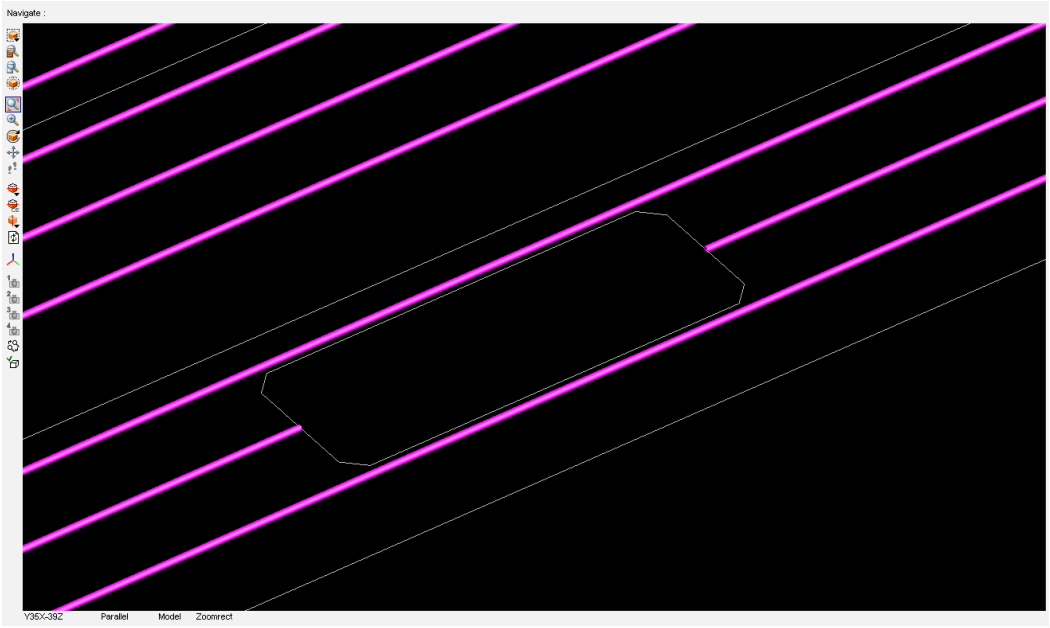
A new top level element FEMWLD for FEM related items has been introduced. The FEM world can contain idealised blocks (HIBLO), idealised plane (HIPAN) and curved panels (HICPAN), FE models (FEMODL) and FE images (FEMIMG).



Idealised plane panels are now drawn in the 3D canvas according to the applied idealisation settings (no thickness, stiffeners as lines…):



It is also possible to draw FE images in the 3D canvas for inspection purposes (example contains shell and beam image):



Benefits

All FEM related items can be found in one place.

Compatibility Constraints

Before running new idealisations in 12.1 a FEMWLD element needs to be created in a design database. It is recommended to store all FEM related objects in a separate database.

Idealised models and FE models from AM 12.0 are not upgraded to AM 12.1. All FEM related objects are deleted from the project under the upgrading process.

For More Information

See User Guide *Hull Structural Design /Finite Element Model.*

Affected Programs

AVEVA Marine Structural Design

14.17 FEM Additions

Description

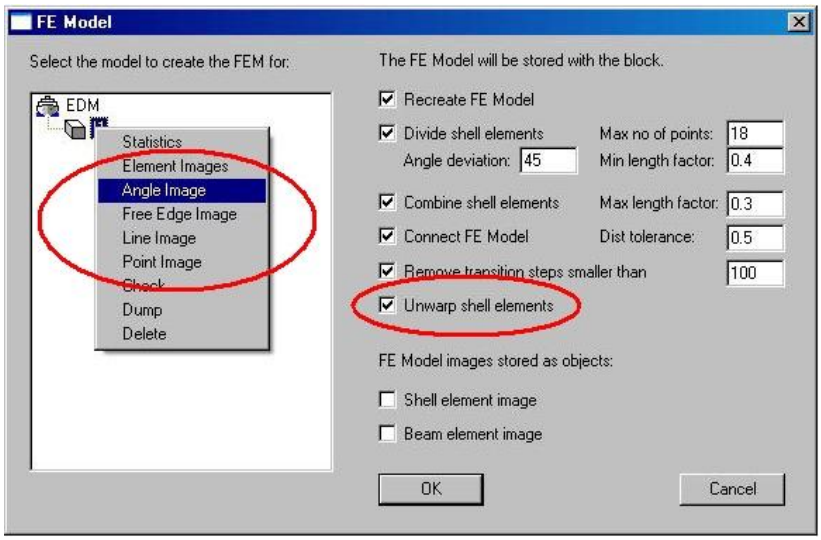
Analysis | Idealise Model, Idealisation Settings:

The idealisation option *ignore if prof. height smaller than' has been added to filter stiffeners, pillars, flanges and swages by their profile height.

The idealisation option 'ignore if prof. area smaller than' has been added to filter stiffeners, pillars and flanges by their profile area.

Analysis | Create FE Model:

All options to create images for investigation of FE models have been moved to the idealised block's context menu. Only the options to create model images are left in the dialogue. Now two separate images are created for beam and truss elements.



The check box **Unwarp shell elements** has been added. Previously unwarping was done unconditionally. That makes it possible to create the FE model in steps applying one option after another or in different orders. Unwarping can then be done in a separate step at the end of the process.

Benefits

More flexible creation of idealised and FE models.

Compatibility Constraints

None

For More Information

See User Guide *Hull Structural Design /Finite Element Model.*

Affected Programs

AVEVA Marine Structural Design

14.18 FEM Improvements

Description

Handling of knuckled panels:

Knuckled main panels are now part of the idealised model. Before, idealised panels had been created from the subpanels without creating a knuckled main panel. But then references to main panels where no longer correct which has been solved now.

This means that a knuckled panel in the original model will be represented as a knuckled panel also in the result from the XML Hull Steel Export as opposed to before when it was represented by the individual subpanels exported as ordinary panels.

Symmetry issues of idealised subpanels have been solved.

Using a limiting box for idealisation:

Now the idealisation process uses the common Block Division facility for plane panels. Temporary copies of the original panels are no longer necessary.

Benefits

Quality improved. Redundancies removed.

Compatibility Constraints

None

For More Information

Only noted here.

Affected Programs

AVEVA Marine Structural Design

15. AVEVA Hull Detailed Design

15.1 Separate Handling of Auto Bevel for Stiffener End Web and Flange

Description

Today bevels can be defined automatically at a stiffener end by defining a bevel set in the bevel default file and then specifying that the set is to be valid for stiffener end in the bevel set file. The bevel is then automatically defined for both flange and web. It is possible to prevent auto bevel for the stiffener end by giving the key word NABE in the stiffener statement.

It is now possible to prevent bevel for the web or flange separately. Two new keywords have been added NABF and NABW for the stiffener statement, deactivating auto bevel for stiffener end flange or web respectively.

Benefits

Makes it possible individually control the use of automatically defined bevelling for the web and flange at a stiffener end.

Compatibility Constraints

None, the keyword NABE remains and has the same meaning as before.

For More Information

See User Guide *Hull Detailed Design / Planar Modelling / Design Language of Hull Modelling / Stiffener Statement / Stiffeners Except Connection Stiffeners*.

Affected Programs

AVEVA Marine Structural Design

AVEVA Marine Detail Design

15.2 Bevel Chamfer Option

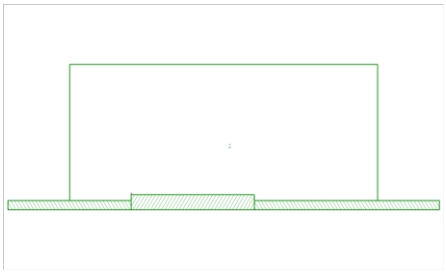
Description

Previously when no bevel was set for a seam or boundary, the system to some extent assumed a bevel type 10 (square butt welding). The benefit here was that chamfer was taken in to consideration when such an edge was included in an abutting boundary.

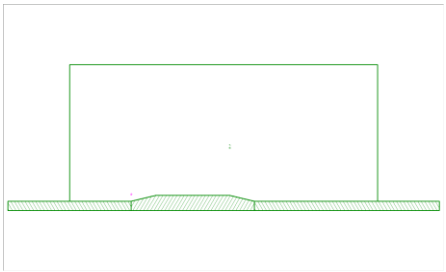
When the option 99 was introduced to the CHAMFER_ADJUST default keyword this faulty way of handling edges without any bevel was removed. This has caused problems when reusing old designs since the behaviour now is different.

In order to get this default behaviour back in older designs, an environment variable, SBH_DEFAULT_BEVEL, has been introduced and should preferably be set to a tight butt bevel type that is defined in the bevel control object.

Behaviour when SBH_DEFAULT_BEVEL is defined (as a tight bevel code of type 10)



Default behaviour.



Behaviour when SBH_DEFAULT_BEVEL is defined (as a tight bevel code of type 10)

Benefits

Old designs are still presented with correct chamfer information.

Compatibility Constraints

None.

For More Information

Only noted here.

Affected Programs

AVEVA Marine Structural Design

AVEVA Marine Detail Design

15.3 Bevel for Shell Stiffener Ends

Description

The handling of automatic definition of bevel for shell stiffener ends has been harmonised with the corresponding functionality for planar panel profiles. Therefore it is no longer controlled by the environment variable SBH_PROF_TIGHT but by settings in the file as defined by the environment variable SBH_BEVEL_SETS.

Benefits

Unified automatic bevel setting for all profiles.

Compatibility Constraints

None.

For More Information

See also User Guide *Hull Detailed Design / Setup and Customisation / Bevel Excess and Weld / Bevel Handling in AVEVA Marine / Customer Set-up of Bevel Standards / Automatic Bevel Definition.*

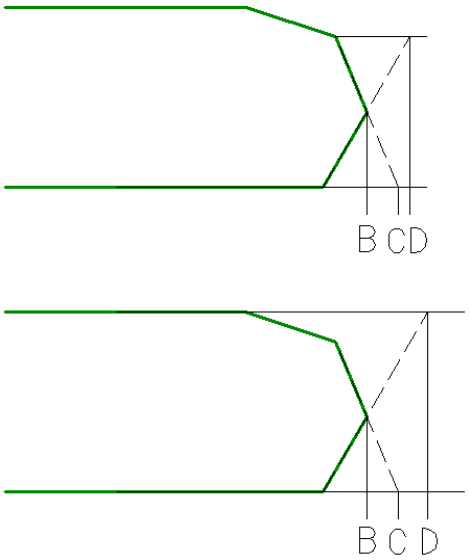
Affected Programs

AVEVA Marine Structural Design

AVEVA Marine Detail Design

15.4 Position of Upper and Lower Cutting Curve

Description



The upper and lower material curves of a plate edge are calculated from the plate thickness of the bounding plate, i.e. the e-measure of the current bevel. This means that the upper material curve ends according to the point D in the upper view in the figure above. This is also the position of the so called bump contour.

However, since the chamfer defined by the variants is cut (or grinded) off after the normal end cutting, the nested plate parts might be positioned to close to each other.

A more correct way to calculate the upper and lower material curve is to take the current plate thickness and the current variant into consideration when calculating the curves. This means that the upper material curve will be positioned according to the point D in the lower sketch in the figure above.

The environment variable SBH_ADJUST_FOR_BEVEL_VARIANT can now be used to switch to the new way of calculating the material contours. By giving the variable the value YES, the new method will be used. In any other case, the old method is still applied.

Benefits

This development enables the user to control the size of bump contours of plates when variants are involved, avoiding potential problems with plates being nested too close too each other.

Compatibility Constraints

None

For More Information

See also User Guide *Hull Detailed Design / Setup and Customisation / Bevel Excess and Weld / Bevel Handling in AVEVA Marine / End User Handling of Bevelling / Bevel and Extraction of Parts.*

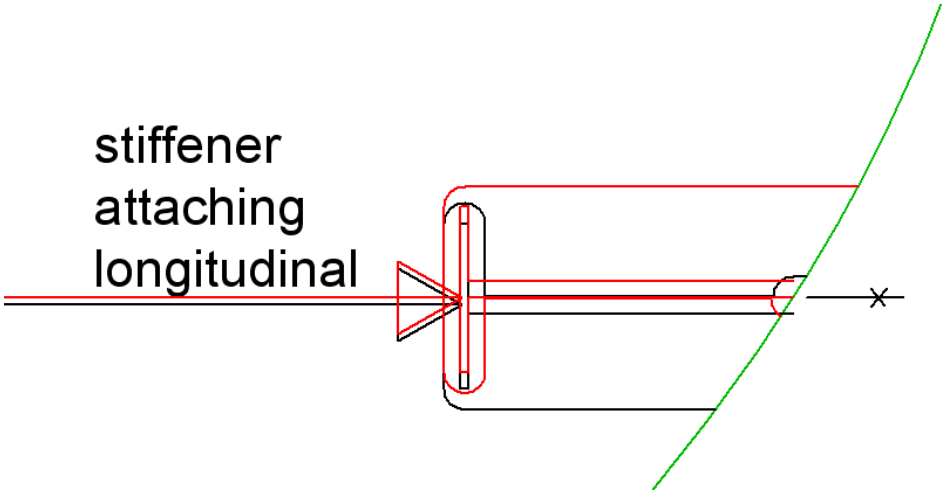
Affected Programs

Hull Design

Plane Parts Generation

15.5 Position Control of Shell Profile and Plane Panel Stiffener

Description

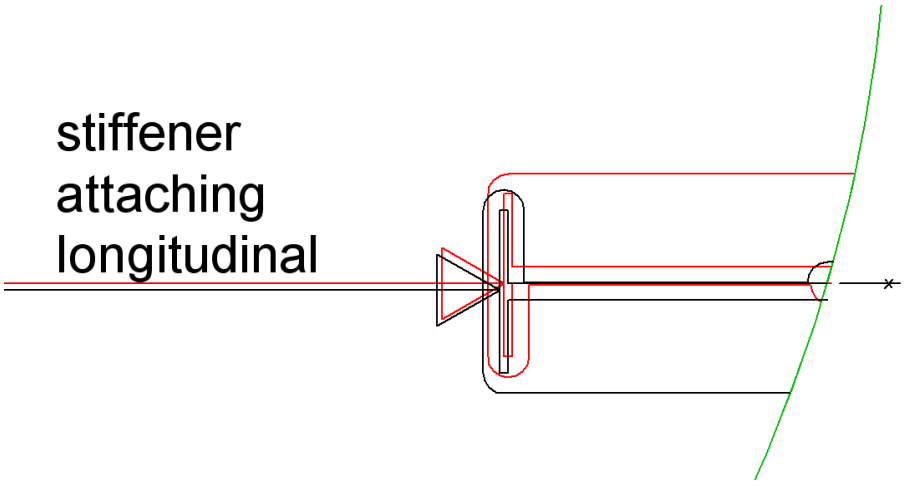


The figure above is showing a plane view with two longitudinals, one with the material pointing upwards (the red one), one pointing downwards (the black one).

In this example, the Automatic Bevel box in the Profile section of the Shell Stiffener has been given the value No. The intersection point of the mould plane of the Shell Stiffener and the hull curve in the panel plane is the same.

In the plane view two different panels have been defined. Each of them containing a stiffener abutting one of the longitudinals and a cutout for the same longitudinal.

The figure below shows two other longitudinals where the value Yes has been given in the Automatic Bevel box.



Here the automatic bevel defined in the Shell Stiffener is considered. This means that the intersection point of the mould plane of the Shell Stiffener and the hull curve in the panel plane will be modified to accept tight connection at the trace of the Shell Stiffener. When modelling plane panels, components (e.g. stiffeners, cutouts) referring such a Shell Stiffener, will be adjusted to meet this modification.

When creating profile parts of these Shell Stiffeners, there are no problems with the profile size.

When creating plate parts of the Shell Stiffeners, via a control file defined by the logical name SBH_PROF_TO_PLDB, there are no problems with the profile size of the web plate when the inclination angle, seen from the mould edge of the Shell Stiffener, is positive, i.e. for the lower profile in the figure above.

However, if the connection angle, when seen from the mould edge of the Shell Stiffener, is negative, the current solution in the system will result in a too big profile part.

The first step when creating the plate part of the web of the profile is to build up the geometry in the profile plane. The upper part of the web plate is positioned at a distance, equal to the web height, away from the trace part.

Next step is to calculate the dotori angles along the trace curve of the plate and to create a guiding contour. In this step the plate part is made wider and wider. There is no problem with the material size because the plate part is cut from a bigger plate, but the final web plate part will be too big and the position of the flanges in the figure above will coincide, except for the web thickness. This means that e.g. an abutting stiffener will be to wide and a cutout maybe to small.

Since the described process for converting profile parts to plate parts has been the same for a long time, some customers may have found their own workarounds to meet this problem.

Therefore this functionality is now enhanced to give the customer a possibility to have the profiles positioned as shown in the first figure. By setting the Environment Variable SBH_CHECK_PROF_TRACE to any arbitrary value, further checks will be done. If the profile to be examined fulfils the criteria to be converted to plate part according to the rules given in the file assigned to SBH_PROF_TO_PLDB, calculations of connecting components like stiffeners, brackets and cutouts will be performed according to the first figure.

Inclined plane panel stiffeners will be examined and treated in the same way as described for the shell stiffeners.

Another way, already in the system, to control the position of inclined profiles is via the Environment Variable SBH_PROFPT_ADJUST. However, automatic bevel selection via SBH_BEVEL_SETS will always be the first choice.

Benefits

Enables the user to control the position of inclined profiles, curved as well as planar.

Compatibility Constraints

None.

For More Information

See also User Guide *Hull Model Concept / Run Mode Control / Control on Application Level / Reference Point of Profile Section*.

Affected Programs

Hull Structural Design

Hull Detail Design

15.6 Compensation for Shell Plate Thickness

Description

For each shell profile, an additional trace is calculated considering the actual surface of shell plates over which the profile extends. This may be important in areas of heavy curvature along the profile trace if the profile and shell plates are located on the same side of the moulded surface, and in particular in areas with thick plates.

In Inithull it is possible to specify per surface whether to compensate for shell plate thickness. This setting is done separately for planar panels and shell profiles.

Benefits

This development means that views will be more accurately drawn and production output such as profile sketches and weight and centre of gravity calculations will be more accurate.

Compatibility Constraints

For a project first created in an earlier AVEVA Marine release, plate thickness options should be setup in inithull before further modelling work is done. Shell profiles must be regenerated before plate thickness is considered. Planar panels must be regenerated if thickness settings for surfaces differ compared to before (i.e. thickness should be considered for some surfaces but not for others).

For More Information

Refer to User Guide *Hull Model Concept / Run Mode Control / Control on Application Level / Compensation for Thickness of Shell Plates*.

Affected Programs

AVEVA Marine Detail Design

AVEVA Marine Production Programs

15.7 Top View of Stiffener Improved

Description

There is as an option in ‘detail view stiffener’ which makes it possible to define the view looking from the top if the stiffener has a flange. The function has now been adjusted to always look at the chosen profile from above the flange.

Benefits

The function always displays the stiffener the same way

Compatibility Constraints

None.

For more information

Only noted here.

Affected Programs

Planar Hull.

15.8 Weld Built Profiles before Bending

Description

When built profiles parts are manufactured, the lengths of the web and flange parts are, by default, calculated to satisfy a manufacturing process where parts are first bent and then welded together. By setting the new ip WELD_BEFORE_BEND in the curved panel parts generation ip-file cpanparts.ip, the lengths will be calculated to fit a manufacturing process where web and flange parts are first welded together and then bent.

Benefits

Support for a manufacturing process where built profile parts are first welded together and then bent.

Compatibility Constraints

None.

For More Information

See User Guide *Hull Detailed Design / Manufacturing / Automatic Generation of Curved Parts / Release of Curved Parts for Production / Set-Up of Program / Default File*.

Affected Programs

AVEVA Marine Production Programs.

15.9 Weight Unit in Profile Sketches

Description

It will now be possible to choose if the approximate weight of profiles should be presented in tons or kilograms in profile sketches. This is accomplished by setting the new keyword WEIGHT_UNIT in the restriction file identified by the logical variable SBH_SKETCH_RESTRICT. Possible settings are WEIGHT_UNIT=KG and WEIGHT_UNIT=TON, where the latter setting is default.

Benefits

More possibilities to customise output data.

Compatibility Constraints

None.

For More Information

See User Guide *Hull Detailed Design / Manufacturing / Profile Manufacturing / Production, Output Profiles / Automatic Generation of Profile Sketches / Creating Profile Sketches.*

Affected Programs

AVEVA Marine Production Programs

15.10 Generic File Viewer

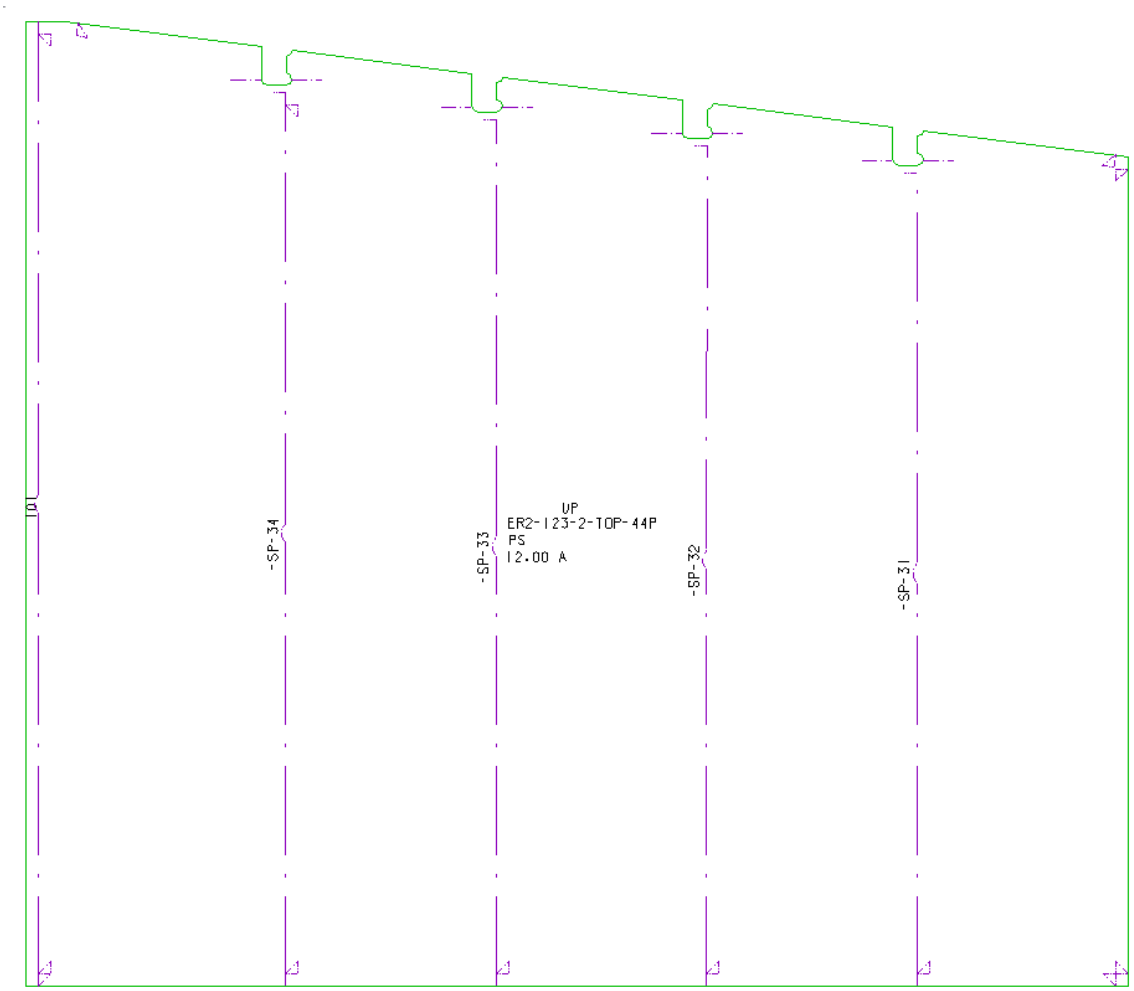
Description

The generic files of type 2AXIS and 3AXIS generated in Plate Nesting and Plate Interface, can now be viewed graphically using the new function “GenFile Viewer” in the function **Hull Tools**

> Part Checking.

Benefits

The viewer is an easy and fast function for visually controlling the data in the generic files. All geometric data and production information texts can be displayed with different colours and line types for different kinds of geometry (burning with bevel, burning without bevel, marking etc). The colours and line types are user-controlled and defined in the Nesting default file.



Compatibility Constraints

None

For More Information

See User Guide *Hull Detailed Design / Planar Modelling / Interactive Planar Hull Modelling Functions / Hull Tools / Part Checking*.

Affected Programs

15.11 Looking Field Changed for Hull Mark Projection

Description

When a hull text is to be projected on a planar panel or surface, the orientation in space of the hull text in space before projection is defined by several fields in the dialog. One of these is “Looking”, which replaces “Looking from” in previous versions. This means that the opposite value compared to earlier versions should be set to get the same result. For example, a “Looking” value of PS is equivalent to the previous “Looking from” value of SB.

Benefits

This change aligns the way looking direction is defined with that of other functions, e.g. for creating symbolic hull views.

Compatibility Constraints

None.

For More Information

Refer to User Guide *Hull Detailed Design* / *Miscellaneous Functions* / *Hull Marks*.

Affected Programs

AVEVA Marine Detail Design

15.12 Control of Marking Gap at Holes

Description

When creating plane panel parts via the Plane Part Generation (ppanparts) functionality, the user has the possibility to set a default parameter value, MARKGAP, that controls the distance marking lines will be cut off at the outer contour of the plates. If a marking line ends at (or crosses or is close to) a hole, no check on any marking gap has been done so far.

However, there is one exception. Marking lines defined via the MARKING statement in the Hull Modelling will be cut off at holes using the parameter MARKGAP.

Because of possible plate damage when burner cutter crosses a marking line, the possibility to reduce other type of marking lines have been implemented.

Three new default parameters have been entered into the ppanparts function. The names of the parameters are:

REDUCE_MARKGAP_OF_STI_AT_HOLES,

REDUCE_MARKGAP_OF_PLANE_AT_HOLES,

REDUCE_MARKGAP_OF_PANEL_AT_HOLES,

By giving REDUCE_MARKGAP_OF_STI_AT_HOLES, marking lines of the mould lines of stiffeners (default parameter STI must be given) will be checked for and reduced if the conditions mentioned above is fulfilled.

By giving REDUCE_MARKGAP_OF_PLANE_AT_HOLES, marking lines of the reference planes (default parameter REFPLANE must be given) defined in Hull Modelling will be checked for and reduced if the conditions mentioned above are fulfilled.

By giving REDUCE_MARKGAP_OF_PANEL_AT_HOLES, marking lines of abutting plane panels (default parameter PAN must be given) will be checked for and reduced if the conditions mentioned above are fulfilled.

Benefits

Enables the user to control the extension of marking lines around holes.

Compatibility Constraints

None.

For More Information

See also User Guide *Hull Detailed Design / Manufacturing / Manufacturing of Plane Panel Parts / Plane Panel Part / Set-up of Program / Set-up of the IP File*.

Affected Programs

Sf416d.exe

15.13 GSD Marking of Built Profiles

Description

When assembling built profiles there is a need for marking the flange and the web parts so that they may be correctly aligned to each other. This may now be done by setting the new keyword BUILT_FLA_SHAPE in the GSD default file.

BUILT_FLA_SHAPE may be assigned three different values giving different options for the marking of the flange part.

BUILT_FLA_SHAPE=THICKNESS will mark the flange with two parallel lines indicating the web thickness. This is the default option.

BUILT_FLA_SHAPE=HOOK will mark the flange with a hook.

BUILT_FLA_SHAPE=HOOK_THICKNESS will result in a marking which is a combination of the thickness and hook marking, where a line and the hook together indicate the web thickness.

The generic files created by the Plate Interface and the Profile Sketch and List programs will contain the new marking types FACE_PLATE_ALIGNMENT.

Benefits

Increased accuracy when assembling built profile parts.

Compatibility Constraints

None.

For More Information

See User Guide *Hull Detailed Design / Setup, Customisation and Standards / Alignment Marking / Marks for Assembly (GSD) / GSD Customising / Control of GSD:s via a Default File*.

Affected Programs

AVEVA Marine Production Programs.

15.14 Mark Reference Plane on Both Sides of Profiles

Description

If REFPLANE is defined in the ppanparts.ip then reference plane markings will be added to plate and profile parts when running Plane Panel Parts Generation. Profile parts will however only be marked on the moulded side.

By defining REFPLANE, BOTH_SIDES, in ppanparts.ip profile parts will be marked on both sides of the profile web.

Benefits

Increased marking possibilities.

Compatibility Constraints

None.

For More Information

See User Guide *Hull Detailed Design / Manufacturing / Manufacturing of Plane Panel Parts / Set-up of Program / Set-up of the IP file.*

Affected Programs

AVEVA Marine Production Programs.

15.15 Nest Profiles without Rest

Description

It will now be possible to nest profile parts on raw profiles without creating rest profiles.

To accomplish this do the following two steps:

- Define a raw profile with type and dimensions the same as the profile part that should be nested. Define the length as zero.
- Insert the new keyword NEST_WITHOUT_REST=YES in the general section of the profile restriction file, as defined by SBH_PROF_RESTRICT.

Nesting will now be performed as if the length was the maximum length for the profile type. When nesting is completed the length will be set to the exact length needed, so that no rest part will be created.

Benefits

Flexibility.

Compatibility Constraints

None.

For More Information

See User Guide *Hull Detailed Design / Setup and Customisation / Setup for Production / The Restriction File / Keywords in the General Section of the Restriction File*.

Affected Programs

Profile Nesting.

15.16 New Nesting Default Parameters

Description

The following additions/changes have been made for the Nesting/PLCM defaults:

SYMB_HEIGHT_EXCESS

Symbol height for excess text in burning sketch

DISPLAY_EXCESS_SYMBOL

Code for displaying the excess symbol in the burning sketch:
0 = No display
1 = Display

MULTIPLE_NEST_NCOL (Nesting only)

The number of nests in each column for multiple nest.

LABEL_AUTO_POSNO_METHOD (PLCM only)

The method used for presenting labelled position numbers:
None = label posno as given
Partname = label posno via partname control

CVBA_SKETCH_ANGLE

The code for the cvba angle display in the burning sketch:

Along	=	End angle in burning direction
Maximum	=	The maximum of the start and end angles
Minimum	=	The minimum of the start and end angles
Average	=	The average of the start and end angles

AUX_VALID_START_POS

Text presented for auxiliary functions valid in the starting position

AUX_VALID_END_POS

Text presented for auxiliary functions valid in the ending position

EDIT_PRODUCTION_TEXTS

Code for editing production texts in burning sketch using Right-Click:
No = Editing not possible
Yes = Editing possible

DRAW_RAW_PLATE_CORN

Code for drawing the raw plate corners in the burning sketch:
No = Do not draw
Yes = Draw

MOVE_START_CONFIRM_OPPSITE

Code for confirmation when a marking start is moved to a marking line valid only on the opposite side:
No = No confirmation
Yes = Confirmation

MARK_AUTO_OPPOSITE

This default is now valid also in PLCM.

CUTSEQ_MIN_AREA

Minimum area of plate for which cutting sequence information are added to the sketch.

ALL_STARTS_TYPE

The type of starts to be treated when the start sequence is added in the burning sketch:
All starts
All burning starts

ALL_STARTS_COLOUR

The colour for the start sequence information in the burning sketch.

ALL_STARTS_HEIGHT

The text height for the start sequence in the burning sketch.

AUTONEST_ASSEMBLY_LEVEL

The assembly level for the parts. Ignored if zero.

AUTONEST_CUSTNAME_CTRL

Customised part name control:

= No Do not use customised part name

= Yes Use customised part name

AUTONEST_PART_SELECTION

The minimum area in mm2 for the parts to be nested ‘large parts first’. If < 0, the ‘

Parts are not nested by area.

AUTONEST_ROTATION_CTRL

Rotation control:

= No No control, any rotation angle can be used

= Yes Only rotation angles which are a multiple of 90 degrees are used

AUTONEST_STOP_MULTIPLE

The time limit in milliseconds for a multiple nest

AUTONEST_STOP_SINGLE

The time limit in milliseconds for a single nest

Benefits

Improved configuration possibilities.

Compatibility Constraints

None

For More Information

See User Guide *Hull Detailed Design / Manufacturing / Nesting / Hull Plate Nesting / Initialisations for Nesting / Defaults.*

Affected Programs

AVEVA Marine Plate Nesting

15.17 Nesting Plug-In Interface

Description

In the Nesting Plug-In Interface, additional parameters have been added to some of the interface modules. The new parameters have been defined as Nesting Defaults.

Benefits

The new parameters will make it easier to control any external pattern generator.

Compatibility Constraints

The new parameters must be added in all applications using the Plug-In Interface.

For More Information

See User Guide *Hull Detailed Design / Manufacturing / Nesting / Hull Plate Nesting / Nesting Plug-In / Plug-In Interface and Hull Detailed Design / Manufacturing / Nesting / Hull Plate Nesting / Initialisations for Nesting / Defaults*.

Affected Programs

AVEVA Marine Detail Design

15.18 Storing Changes after Running Production Programs

Description

The production programs are not updating any data in design databases (DESI) anymore. Furthermore, some objects previously stored in manufacturing databases (MANU) are not stored at all.

Bracket panels have until now been split and stored as plate parts in MANU. The brackets pointing at that bracket panel have been stored without geometry, but with a reference to the bracket panel plate part. From now on the information stored in the bracket panel plate part is copied into the bracket plate part and the bracket panel plate part will no longer be stored.

Sub panel plate parts have until now been split and stored as plate parts in MANU. Since the main panel plate parts are either referring to a single sub plate or to two or more sub plates and the main panel plate parts are built up by these parts, there is no need to have the sub panel parts stored in MANU.

When creating bending templates for a curved plate, previously the sight plane and sight line plane were stored in the plate in DESI. This information will from now on be stored in the plate templates in MANU.

When creating plate jigs for curved panels, previously the calculated assembly plane and some additional information about the orientation of the plate jigs were stored in the curved panel in DESI. From now on this information is stored in the plate jigs in MANU.

When creating jig pillars for curved panels, previously the jig pillar was stored in DESI. The jig pillar contains information similar to that stored in the plate jigs. From now on the jig pillars are stored in MANU and the orientation information is no longer copied to the curved panel.

Benefits

This change means an improved structure of stored data, and is beneficial for projects using Global.

Compatibility Constraints

Projects created in an earlier AVEVA Marine release needs to be upgraded before continued use with AVEVA Marine 12.1. The upgrade will change the storing of selected objects as described above, as well as reorganise the MANU contents (described in another release note).

For More Information

Further details of the upgrading of old projects are given in the *12.0 to 12.1 Upgrade* manual.

Affected Programs

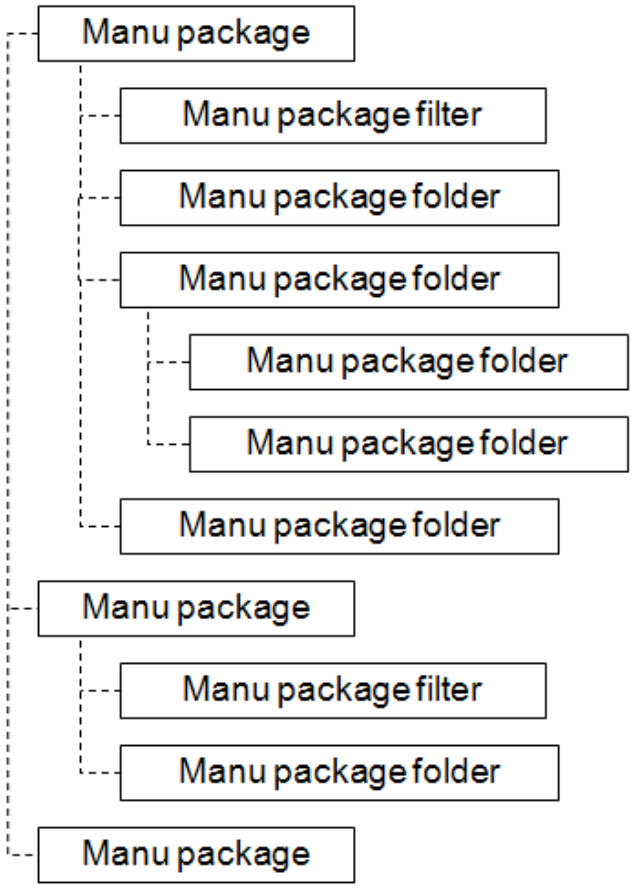
AVEVA Marine Production Programs

15.19 New MANU Data Model

Description

In AVEVA Marine 12.0 the manufacturing data base (MANU) reflected the design and for each design block (BLOCK) the corresponding block (MBLOCK) was automatically created when the production parts where created. Below each MBLOCK, MPANEL elements were created and the production parts were stored below the MPANEL element. The production part elements are MPLATE for planar and curved plates, MPROF for planar and curved profiles and MBPRO for built profiles.

In AVEVA Marine 12.1, the MBLOCK and MPANEL elements are obsolete and the production parts are stored in manufacturing package elements MANPKG. These elements contain a filter element (MPKGFT) as well as one or more manufacturing package folders (MPKGFL). The rules defined in the MPKGFT elements determine in which manufacturing package the production parts will be stored. Each folder within a manufacturing package has a rule which makes it possible to e.g. store different types of plate parts in different folders.

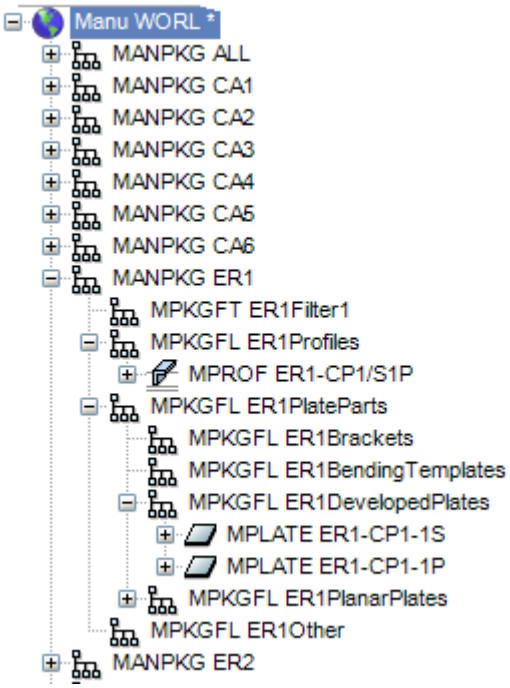


Examples of rules are:

- MATCHWILD (ATTRIB NAMN, ‘ER5*’)
- ATTRIB TYPE EQ ’MPLATE’
- ATTRIB TYPECD EQ 91

- MATCHWILD (ATTRIB QUATXT OF FIRST MPLRWI, 'A*')
- ATTRIB NAMN OF OWNER INSET('ER2', 'TEST')
- TRUE

The last rule can be used in a last folder to ensure that there always is a folder to put the production part in. This folder should normally be empty.



Benefits

- Easier to use
- Easier to find information
- Easier to distribute

Compatibility Constraints

Old projects must be upgraded to 12.1 using the Upgrade tool in the new ManuConfig addin.

For More Information

Further details of the upgrading of old projects are given in the *12.0 to 12.1 Upgrade* manual.

15.20 Automatic Naming of Production Sketches

Description

Hull production programs running in batch can create receipt sketches which are given automatically generated names. With this release a new set-up tool is introduced for a uniform customisable naming of production sketches.

Users may now define how the sketch names should be put together by a set of rules. The naming rules are stored in a file referenced by the logical variable SBH_DWGNAME_RULES. Naming rules are defined individually for a number of applications. Each rule consists of a keyword identifying the application, followed by a number of attributes defining how the name is built up.

The naming rule attributes are applied in the order they are given. Only rule attributes valid for the application may be given. First rule attributes are interpreted and the resulting values for each attribute are concatenated to form a sketch name. The rules are of mainly three types:

5. Names (Current object name, part names, block name and computer name).
6. Numbers (Next global sequence number for the application, job numbers and counters local for the application)
7. Other (Free text, page number)

Benefits

Naming of production sketches may be customised in a uniform way.

Compatibility Constraints

Old techniques for generating automatic sequence numbers for the Parts List and WCOG applications are not valid any more. The keyword NAME_METHOD in the profile restriction file may not be used anymore and should be removed.

For More Information

See User Guide *Hull Detailed Design / Manufacturing / Production Program Interface / Automatic Naming of Production Sketches.*

Affected Programs

AVEVA Marine Production Programs.

15.21 Find Documents Related to Production Parts

Description

A large number of different reports and sketches are created by production programs.

To be able to easily view documents valid for a specific production part, production programs will now create links from parts to relevant reports and sketches. The user will be able to view related documents in the Linked Documents dialog in Hull Design.

This is done by the following steps:

1. Bring up the Linked Documents dialog and mark Follow CE (current element).
2. Indicate a production part in the Manufacturing Explorer and related reports and drawings for the indicated part will appear in the Linked Documents dialog. The reports and drawings may then be opened by right-clicking on the displayed link.

Benefits

Reports and sketches related to a specific production part may be easily viewed.

Compatibility Constraints

None.

For More Information

Refer to User Guide *Hull Detailed Design / Manufacturing / Production Program Interface / Hull Production Program Interface / Links to Documents from Related Production Parts.*

Affected Programs

AVEVA Marine Production Programs.

15.22 Naming of Curved Plates and Stiffeners

Description

Handling of names is slightly changed for shell plates and stiffeners in DESI databases and curved plate parts in MANU databases.

It is no longer possible to have shell plates and stiffeners automatically renamed when adding them to a curved panel. This option (controlled by the environment variable SBH_CPAN_RENAME_PARTS) was a legacy from much older versions of the system and might cause problems if used wrongly. Shell plates and stiffeners will now always keep their initial name even after being added to a curved panel.

Secondly, it is possible to control how curved plate parts are named in MANU by use of the above mentioned variable.

In earlier versions, after parts splitting, the names of curved plate parts belonging to a CL panel have ended in SP even for PS/SB specific or symmetric plates.

It is now possible to control the plate part names in such cases, optionally having the names reflecting the actual plate symmetries.

The old naming for a panel BLOCK1-2SP with one CL-plate and one symmetrical plate (both PS and SB) was:

- BLOCK1-2SP-1SP
- BLOCK1-2SP-3SP
- BLOCK1-2SP-4SP

The new naming will be:

- BLOCK1-2SP-1SP
- BLOCK1-2SP-3P
- BLOCK1-2SP-4S

To use the new naming rules for plates belonging to a CL panel, set the environment variable SBH_CPAN_RENAME_PARTS to ‘CL’.

Benefits

Project administration becomes easier due to increased consistency in naming of shell plates and shell stiffeners as well as production parts. The plates and stiffeners will keep the names as given by the user even after they have been added to a curved panel.

The naming of curved plate parts after parts splitting will reflect the individual storing.

Compatibility Constraints

The new naming should not be mixed with the old one in an on-going project.

For More Information

Refer to User Guide *Hull Model Concept* / *About Naming* / *Specific Name Rules*.

Affected Programs

AVEVA Marine Detail Design

AVEVA Marine Production Programs

15.23 Function to Find and Remove Dangling MANU Parts

Description

When a panel (planar or curved) is removed from the model, any corresponding production parts are automatically removed. If this, e.g. due to a restricted database access, cannot be done, the result will be dangling plate and profile parts which should not be manufactured.

A PML function has been developed to clean up the database and take care of this situation. The function searches for elements of type MPLATE, MPROF and MBPRO and removes all those for which a corresponding panel does not exist.

The function, hullDeleteUnrefMANUParts, can be found in the installation directory, under PMLLIB\hulldesign\functions.

Benefits

The risk of manufacturing unnecessary parts (and thus increasing production cost) is reduced.

The function does not need any parameters when called and is quite easy to use. All parts to be removed will be found automatically, which is more efficient than searching for them manually.

Compatibility Constraints

None.

For More Information

Only noted here.

Affected Programs

None.

15.24 Enhancement in Dialogue for Automatic Position Number Definition.

Description

The automatic definition of position numbers is controlled by an Autopos control object with different cases for position number definition. It may be relevant to have more than one Autopos object, e.g. when defining both with and without the option to treat symmetrical parts equally.

The dialog for Automatic Position Number Definition has been enhanced to present all available Autopos control objects in a drop-down list. The cases available in the highlighted control object are presented in a list. When switching to another Autopos Control Object by selecting it on the drop-down, the user must click the ‘Update’ button to list the relevant cases for the selection.

Benefits

No need for the user to remember the names of cases and objects

Compatibility Constraints

None

For more information

See User Guide *Hull Detailed Design / Manufacturing / Automatic Position Number Setting*.

Affected Programs

AVEVA Marine Detail Design

15.25 Reflection in Hull Element Names and Hurefl Attribute

Description

Slightly changed naming rules apply for hull elements created in the Design database by Planar and Curved Hull:

- For any non-symmetric object there will be only one element. The name of this element will be equal to the object name as given by the user (or in some cases automatically by the system).
- For a symmetric object there will be two elements. One of these will be named as the object and one will have a name composed by the object name and a _R suffix (R meaning “reflected”).
- For a symmetric object with the geometry defined on PS, the PS element will have the shorter name and the SB element will have a _R suffix.
- For a symmetric object with the geometry defined on SB, the SB element will have the shorter name and the PS element will have a _R suffix. Currently only planar panels can be symmetric and have their geometry defined on SB.

The Hurefl attribute will strictly answer the question “Is the current element in its reflected position relative to where the geometry is defined?” This implies two things:

- Even a non-symmetric element may have a Hurefl value of True.
- The Hurefl value (True/False) and the element name (with or without _R suffix) will not always match.

Benefits

There will be less confusion regarding element names for non-symmetric objects, and there will for certain always be an element with the object name as given by the user. This solution is more intuitive and customised development may be simpler as well. Still functionality using the Hurefl attribute, e.g. weld detection, will work properly.

Compatibility Constraints

Objects generated in AVEVA Marine 12.0 that are valid on one side but with the geometry on the other must be recreated before the new rules for element name and Hurefl fully apply. Note in particular that this applies to SB specific curved panels, which internally have their geometry reflected to PS. The objects are recreated via the Recreate functions in the Planar Hull and Curved Hull menus, respectively.

For More Information

Only noted here.

Affected Programs

AVEVA Marine Detail Design

15.26 FRP Additions

Description

Laminate can be given not only for planar plates and stiffeners, but also for flanges.

The old term GRP (Glass fibre Reinforced Plastics) has been replaced by the more general term FRP (Fibre Reinforced Plastics). As a consequence, two attributes in the TIL input file when setting up FRP has been renamed. PERCENT_OF_GLASS is now PERCENT_OF_FIBER and GLASS_WEIGHT has been renamed to FABRIC_WEIGHT.

Benefits

This development means better support for production with laminate technique.

Compatibility Constraints

Old TIL input files for FRP settings must be modified, adapting them to the renamed attributes.

For More Information

Refer to User Guide *Hull Detailed Design / Setup, Customisation and Standards / (Fibre) Reinforced Plastics Option (FRP) / Definition of the FRP Object / Laminate Plate Statement*.

Affected Programs

AVEVA Marine Detail Design

AVEVA Marine Production Programs

15.27 Tribon 5 Curved Hull Input Data

Description

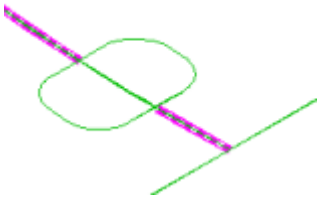
In the Tribon M series there is an option to convert Tribon 5 Curved Hull Input data for Seamgen, Profgen and Cpangen. This option existed only so that users could more easy migrate from Tribon 5 into Tribon Mx version. The way of creating data in Tribon 5 format does not exist anymore and is not described anywhere in the documentation. This option to convert old data files into newer XML format will in AVEVA Marine 12.1 be deprecated and finally removed in AVEVA Marine 12.2.

16. AVEVA Hull Weld Planning

16.1 Weld Calculation Curved Panels

Description

The calculation of welds on curved panels with holes crossing seams, is now excluding the part of the plate boundary that represents the hole.



Benefits

The result of the weld calculation is more accurate

Compatibility Constraints

None

For More Information

Only noted here.

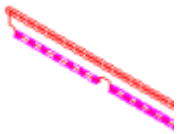
Affected Programs

AVEVA Marine Weld Planning

16.2 Weld Calculation Shell Profiles

Description

The calculation of welds on shell profiles with notches is now excluding the part where the notch is defined.



Benefits

The result of the weld calculation is more accurate

Compatibility Constraints

None

For More Information

Only noted here.

Affected Programs

AVEVA Marine Weld Planning

17. AVEVA Design Reuse

Description

Design Reuse is a tool to simplify the work required to copy design data between projects and thereby reuse design work. Design data that is copied is re-generated and adapted to the design context of the target project. Copying design data follows an export/import scenario with an intermediate storage in a Transfer Set. The functionality provided is accessible through the command line and through a graphical user interface. Design Reuse is made as a so-called addin and is hosted by the Hull Design, Outfitting Design and Marine Drafting modules.

Design Reuse requires a specific license.

Benefits

- Very useful for design reuse between ships. The design is copied from one ship to another, and adapted to the second ship. The model is re-generated and adapted to the design context of the second ship.
- Support for different naming conventions by fully customizable name substitution rules.
- Maintains the references within the model as well as between drawings and models by reference adaptation at import to the second ship.
- Drawings keep their associations and are updated at import.
- GUI for interactive usage inside Hull Design / Outfitting Design / Marine Drafting.
- Commands supporting all available functions.
- Provides high level customization through trigger functions.
- Sisterships can be synchronized by customer written automation scripts executed at regular intervals.

Compatibility Constraints

None.

For More Information

See User Guide *Design Reuse*.

Affected Programs

Hull Design, Outfitting Design, Marine Drafting

18. AVEVA Assembly Planning

18.1 Curved Hull Panel as Base Panel for Assembly Orientation

Description

Through the assembly properties dialog, when the predefined orientation is set to “Specific Panel”, it is now possible to select curved panel from the enumeration list of hull panels. The orientation of the selected curved hull panel is calculated and assigned as the orientation of the assembly.

The method to calculate the orientation of a curved hull panel utilizes a plane derived from the corner points provided by the seam limits, the same method as used by the Jigs calculations.

Benefits

Can use curved hull panels as base panel for assembly orientation.

Compatibility Constraints

None.

For More Information

Refer to User Guide *Assembly Planning / Graphical User Interface / Context Sensitive Menu Functions / Properties*.

Affected Programs

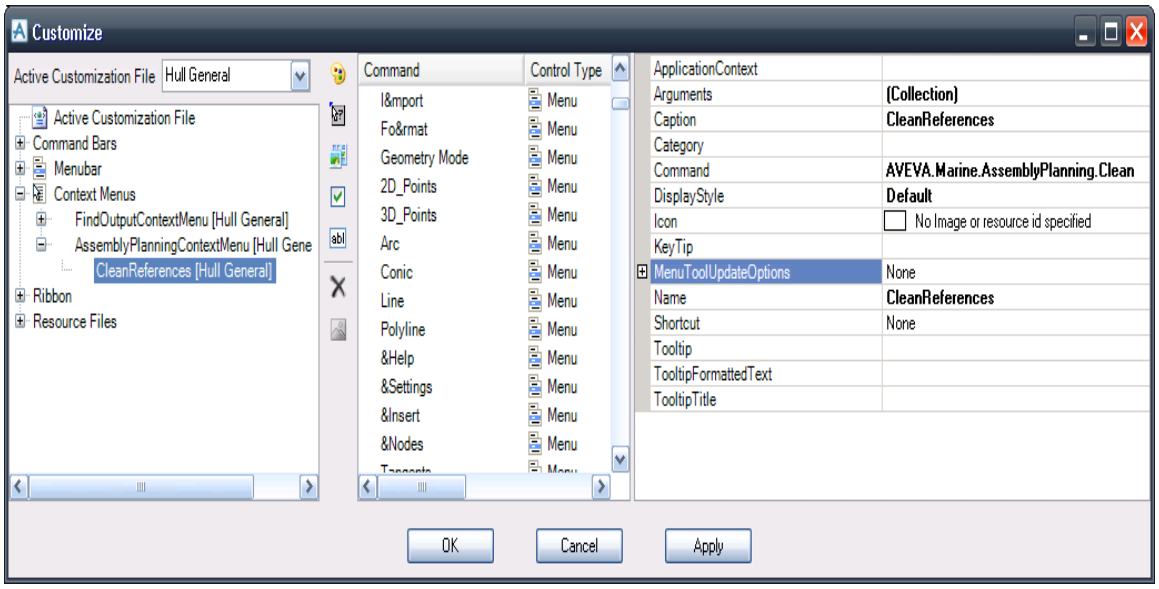
Assembly Planning

18.2 Clean Up Assembly References

Description

Any type of element deleted is captured for an assembly specific evaluation to see if the element is referenced from any assembly node, and if so then the reference is deleted too. However, this follow up mechanism works only when it is the precise element specified for deletion that also is referenced from an assembly. I.e. it is not working if the element deleted holds a substructure into which assembly references are made. E.g. if a hull plate is assembled the assembly reference will be deleted if the plate is specifically deleted. But, if the hull panel is deleted the assembly reference is kept as an invalid reference and is denoted as <Missing> in assembly planning. To extend this general follow up mechanism with more assembly specific code would slow down the system as it is acting generally for all delete operations.

As a solution an assembly planning specific core command is created that top down from the assembly selected will remove all references to parts no longer existing. This core command is at delivery not available from the Assembly Planning context sensitive menu, but can be added through the ordinary customize function. I.e. you can add your “Clean invalid part references” function and connect the command "AVEVA.Marine.AssemblyPlanning.Clean" to it. The reason why it not is added from start is that it is a quite powerful command and should be used with caution and is better configured per user.



Benefits

Remove invalid assembly references.

Compatibility Constraints

None.

For More Information

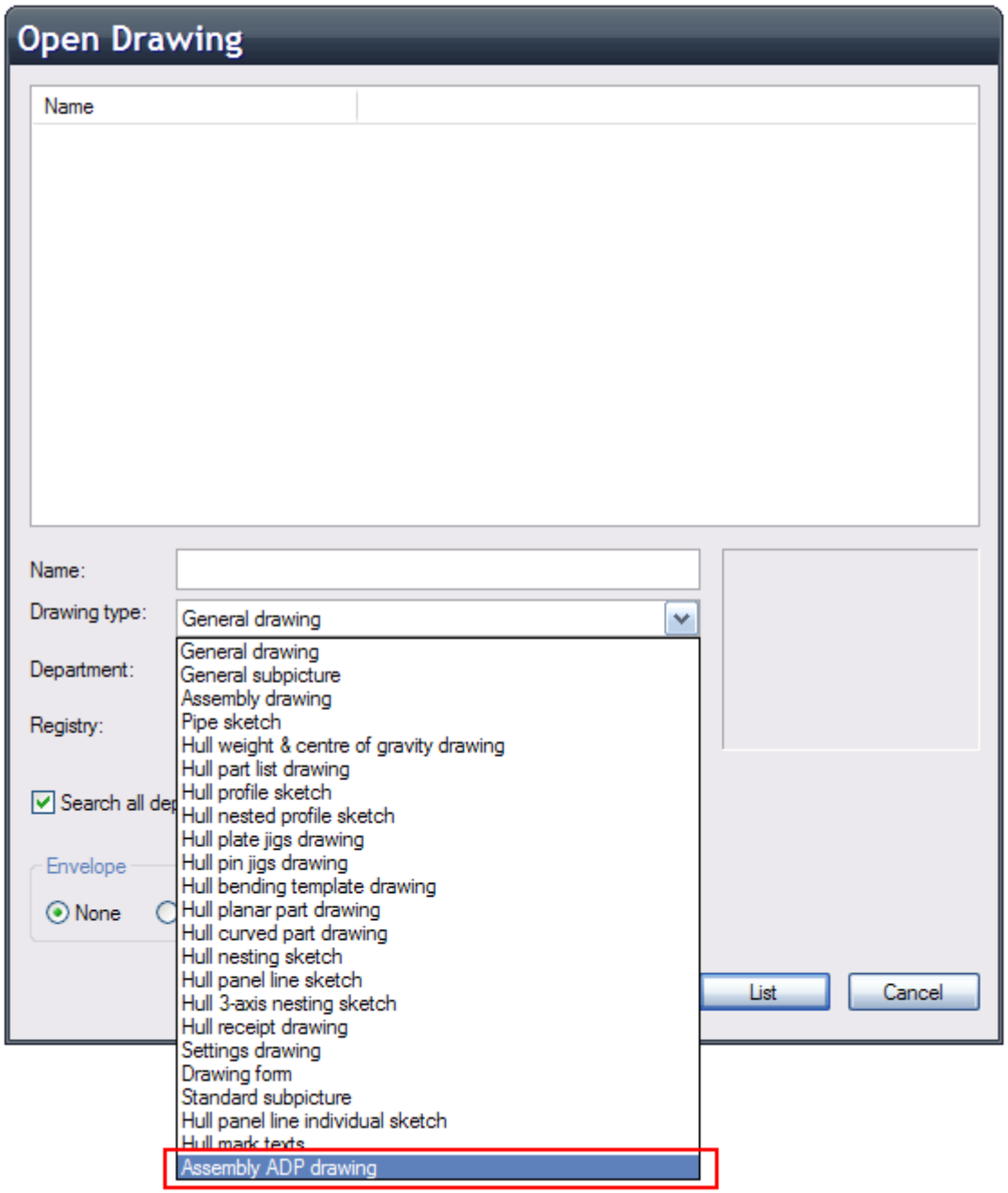
Only noted here.

Affected Programs

Assembly Planning

18.3 New Drawing Type for Assembly ADP Drawings

There is a new drawing type in 12.1, “Assembly ADP drawing” dedicated for drawings created by the Assembly Automatic Document Production application. You can see that there is a new drawing type in the open/save drawing dialogues:



If you want to handle the new drawing type in your project you need to assign two new logical names in your marine project setup file (D065<proj>.sdb):

```
SB_ASSADP_PDB                    SB_ASSADP_PDB
```

```
SB_ASSADP_PDB_PADD            <name_of_dept>;<name_of_regi>
```

This is for the system to recognize the type.

This defines the name of the DEPT and then REGI where you want Marine Drafting to find your Assembly ADP drawings.

Benefits

To make a distinction between general assembly drawings and drawings generated by Assembly ADP.

Compatibility Constraints

Assembly Drawings created in earlier versions will still have the old drawing type (Assembly Drawing) and will thus not be listed as an Assembly ADP Drawing but as an Assembly Drawing.

For More Information

Only noted here,

Affected Programs

Assembly Planning

18.4 Multiple Select

Description

A very useful method for user to populate the assembly structure by design parts is provided by the drag & drop facilities. However, collection elements from Design Explorer only allow single element selection. With the EditElements addin, now available in the Hull and Outfitting Design modules, multiple element selection is enabled e.g. for collecting elements to assembly.

This addin is enabled in Hull and Outfitting Design only for the purpose to facilitate multiple select. Additionally the addin exposes a general function to an edit element, such as create and delete.

Please note that, although the addin is called Edit Elements, it must never be used to edit any elements in Hull. In Hull it is useful for listing members, making selections etc.

Benefits

Extended possibilities to make element selections for e.g. drag & drop operations.

Compatibility Constraints

None.

For More Information

Only noted here.

Affected Programs

Hull Outfitting Design

Assembly Planning

18.5 Change Projection of an Assembly ADP Drawing View

There are some improvements when using the Marine Drafting function **Tools > Model view > Change Projection** in an Assembly ADP drawing. Before there was a problem that labels and bounding box were not updated to fit the new projection. This is now taken care of. If the drawing is of type ‘Assembly ADP Drawing’ then the user will be asked if he wants to regenerate the labels and bounding box.

Limitations:

This will only work for drawings that are of the new drawing type ‘Assembly ADP drawing’.

Assembly ADP drawing generated in previous program versions will not be handled since they are of another type.

The utility doing the label and bounding box calculations is a part of the Assembly ADP application. Therefore this function will only work in Marine Drafting, not in Hull Design.

18.6 POS attribute available for ASMBLY Elements

Description

The ASMBLY element has been given a POSition attribute. The attribute is not yet used in any specific functionality but added for future purposes and to facilitate for some general (draft) functionality.

Benefits

None.

Compatibility Constraints

None.

For More Information

Only noted here.

Affected Programs

Assembly Planning

19. AVEVA Marine Drafting

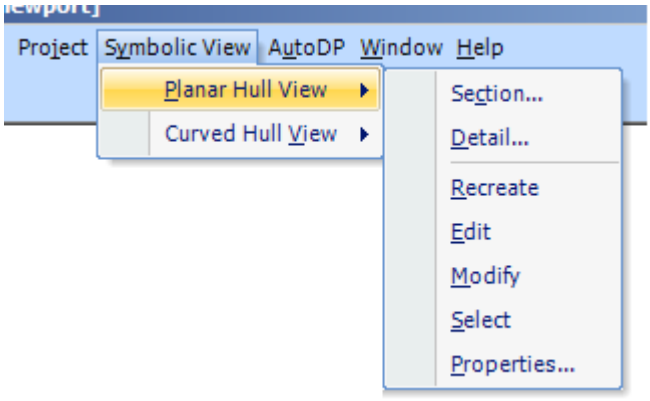
19.1 Symbolic View Menu

Description

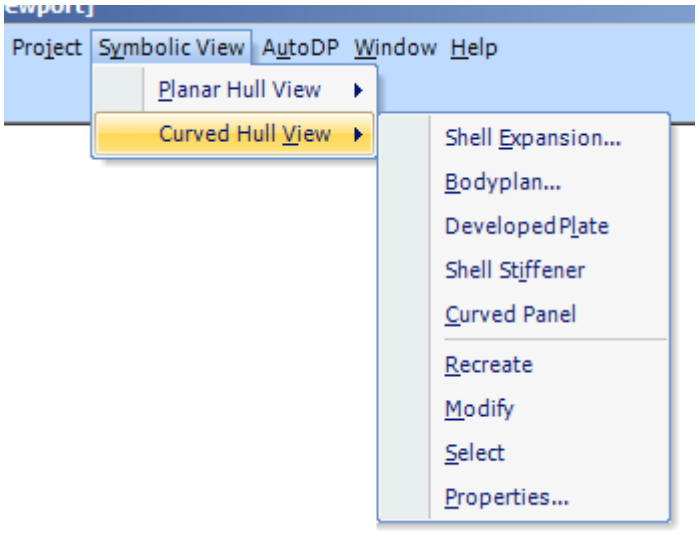
All functionality handling symbolic views has been moved to a new top menu “Symbolic View”.

The “Symbolic View” menu is available in the following applications:

- Hull Design – Curved Modelling
- Hull Design – Planar Modelling
- Hull Design – Structural Design
- Hull Design – Space Management
- Marine Drafting



Please note that the menu function previously called “Create” has now been renamed to “Section...” to unify the function names in this menu.



This means that the following has been removed:

- The Planar Hull/View menu in Planar Modelling and Structural Design.
- The Curved Hull/View menu in Curved Modelling and Structural Design.
- The view handling buttons in the Model Selection dialog (Insert/Model).

Benefits

All symbolic view functionality is available in one single place making it easier to find these functions.

All symbolic views are also available from Marine Drafting making it possible to use Marine Drafting for more types of drawings.

Compatibility Constraints

None.

For More Information

Please see the Hull Design documentation.

Affected Programs

Hull Design

Marine Drafting

19.2 Default Action at Start-up

Description

Using a default variable INITIAL_DRAWING it is now possible to define what Marine Drafting and Hull Design should do at start-up.

The following possibilities exist:

Value of INITIAL_DRAWING	Action
NONE	Do nothing (same as Hull Drafting 12.0).
NEW	Open a new drawing named UNTITLED<n> where <n> is selected so that UNTITLED<n> is non-existing.
LAST	Open the most recently used drawing during last session.
ASK_NEW	Show the New Drawing dialog.
ASK_OPEN	Show the Open Drawing dialog.

Benefit

Most functions in Marine Drafting require an open drawing so the first thing a user does is to either create or open a drawing.

This new default variable will allow users to start working directly when Marine Drafting has started.

Compatibility Constraints

None.

For More Information

See User Guide *Marine Drafting* / *Appendices* / *Drafting Default File Keywords* / *Miscellaneous*.

Affected Programs

Hull Design

Marine Drafting

19.3 New Module Name

Description

Hull Drafting has been renamed to Marine Drafting.

This name change affects the following:

Old name	New name
Hull Drafting	Marine Drafting
PDMSUI\hdra	PDMSUI\mdra
PMLLIB\hulldrafting	PMLLIB\marinedrafting
PMLLIB\hulldrafting\hDraPickElement.pmlfnc	PMLLIB\marinedrafting\mDraPickElement.pmlfnc
PMLLIB\hulldrafting\apphdramain.pmlfrm	PMLLIB\marinedrafting\appmdramain.pmlfrm
marhdra.exe	mardra.exe

Benefits

Previous name was in many cases misleading and made customers confused when it came to which Drafting module to use. Using the Marine Drafting name strengthens our recommendation to use Marine Drafting for both hull and outfitting users.

Compatibility Constraints

Please note that in order to use Marine Drafting 12.1 with a project, the module definition in the project must be modified. This will be done using the upgrade script for 12.1.

There is also a macro PDMSUI\mdra\admin\hdra2mdra.mac that can be used from the Admin module to change the module definition.

It is important to note that any customisation done by customers that checks the module name might have to be modified to work properly.

For More Information

See User Guide *Marine Drafting*.

Affected Programs

Marine Drafting

19.4 Drawing Export Formats

Description

Marine Drafting can export a drawing to the following formats (File/Export):

- DXF
- HPGL
- HPGL/2
- IGES
- SDB
- SVG
- TIFF with LZW compression

The following formats have been removed:

- CGM
- TIFF with PackBits compression.

Benefits

Supporting both HPGL and HPGL/2 will make it easier for customer to interact with different 3rd-party products.

TIFF with LZW compression offers better compression.

Compatibility Constraints

The CGM format is no longer supported.

For More Information

See User Guide *Marine Drafting / Operator's Instructions / File / Export*.

Affected Programs

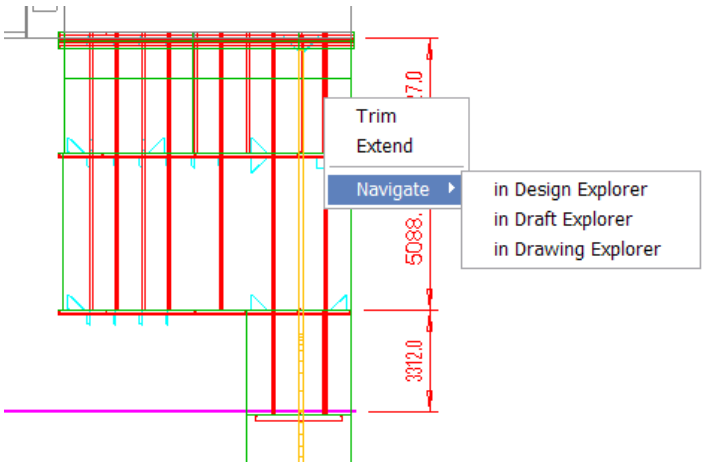
Hull Design

Marine Drafting

19.5 Navigate To

Description

The context menu available in the 2D canvas of Marine Drafting/Hull Design has been extended with a set of new “Navigate to” functions:



The functions are useful to quickly find out what a selected graphical entity represents. The functions will identify the closest entity in the drawing and navigate to the corresponding element in one of the explorers: “Draft Explorer”, “Design Explorer” or the “Marine Drawing Explorer”. You will only see the effect of the function if the corresponding explorer is currently opened.

Benefits

It will make it easier to get information about a graphical entity in a drawing.

Compatibility Constraints

None.

For More Information

Only noted here.

Affected Programs

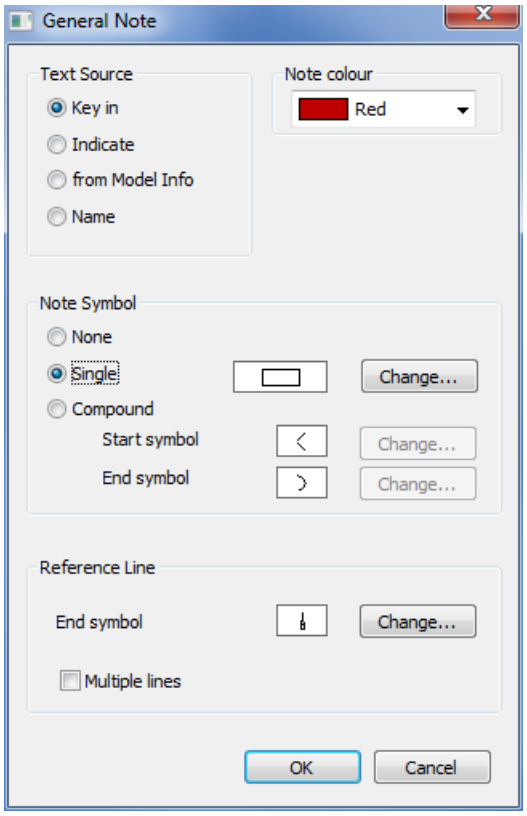
Hull Design

Marine Drafting

19.6 General Note

Description

The General Note function is extended by multiple-lines feature and a new Options dialog.



Benefits

More user friendly way of creating general notes.

Compatibility Constraints

None.

For More Information

Only noted here.

Affected Programs

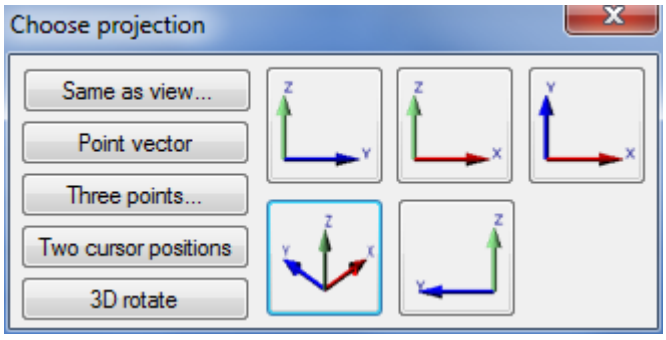
Hull Design

Marine Drafting

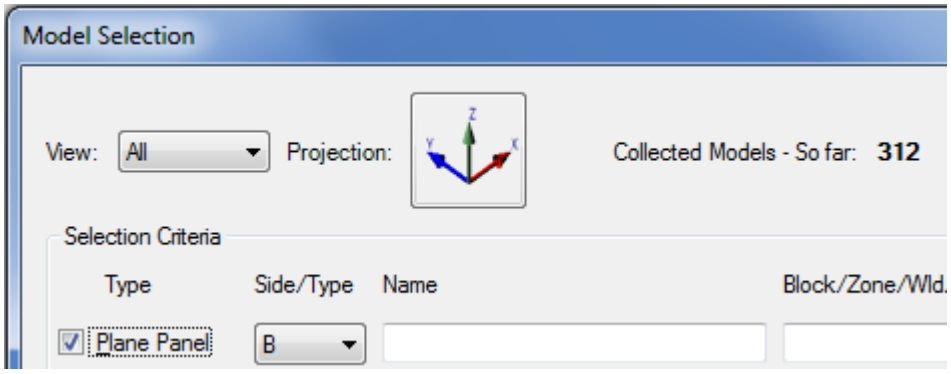
19.7 Choose Projection

Description

The Choose Projection dialog has been re-designed.



It can be displayed by clicking on the Projection button in the Insert→Model… dialog:



It is also displayed during drag & drop from an Explorer tree when choosing to drop an element into a new view, or by choosing the Tools→Model View→Choose Projection menu function.

Benefits

This re-designed dialog provides a more modern and attractive user experience.

The choose projection step during the Insert/Model process is now removed if the user wants to use the already selected view projection.

Compatibility Constraints

None.

For More Information

Only noted here.

Affected Programs

Hull Design

Marine Drafting

19.8 Fill Styles

Description

The Outfitting draft Fill Style concept has been implemented in Marine Drafting, making it possible to add any combination of hatch patterns to contours in the drawing. A Fill Style can be system-defined or user-defined, and contains the definition of an arbitrary number of hatch patterns.

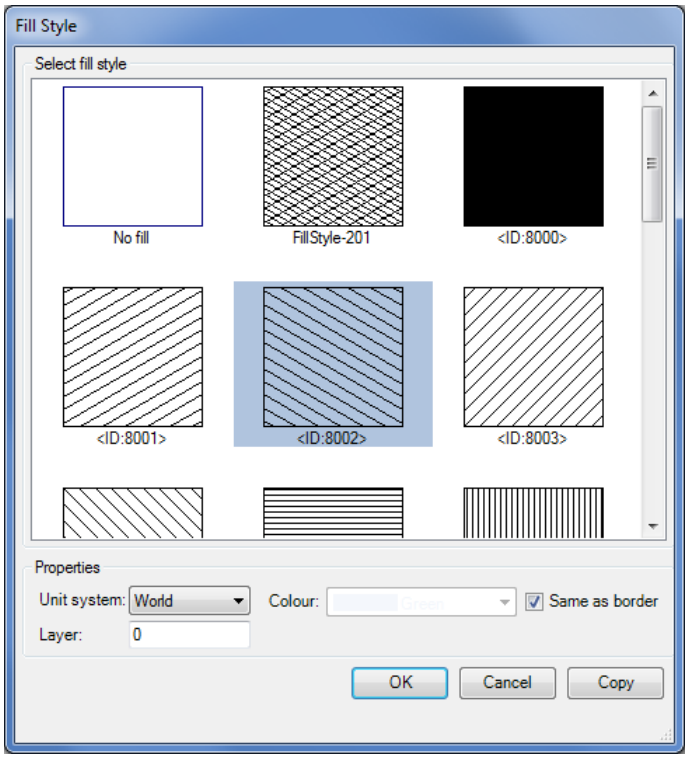
Compared to the existing Hatch Pattern functionality, the Fill Style concept is associative and can combine any number of Hatch Patterns. Also Solid Fill is available.

The Fill Style can be applied to any contour in the drawing, closed or possible to close. It is also possible to apply the fill style on a general area defined by multiple contours. In both cases, the fill style will be persisted in PADD.

The Fill Style can be selected and applied to contours in two ways:

- MB right-click on a contour to define, or modify the fill style applied on that contour.
- Select the Modify/Fill Style function to select a Fill style to apply to given contours.

The dialog for selecting Fill Styles looks like below:



Benefits

Possibility to use the Outfitting Draft-defined Fill Styles in Marine Drafting, including association.

Compatibility Constraints

The new attributes added to HPATTErns (see Outfitting Draft) might not be handled in Marine Drafting.

Note that the old Hatch Pattern concept will be deprecated in a future release.

For More Information

See User Guide *Marine Drafting / Operator's Instructions / Modify / Fill Style*.

Affected Programs

Hull Design

Marine Drafting

19.9 Symbol Files

Description

The files holding the different symbol fonts have been changed from binary to ASCII format and renamed from d012syxxx.sbd to d012syxxx.port. The reason for this is that these files now will be easier to maintain and also somewhat more readable for the human eye (even though updating such a file still should be done with specific Drafting functionality).

Benefits

It will be easier for both provider and customer to maintain the new format.

Compatibility Constraints

The system-defined symbol font files will be delivered in the new ASCII format. However, please note that any symbol font files modified or created by the customer at site must be converted to the new ASCII format before it can be used. This is done by running the conversion utility sb022 that is part of 12.0 or older releases.

Note also that the utility programs sb022 (convert from binary to ASCII format) and sb023 (convert from ASCII to binary format) have been withdrawn in this release.

If needed, the 12.0 or older releases can be used.

For More Information

Only noted here.

Affected Programs

Hull Design

Marine Drafting

19.10 Dynamic Highlighting

Description

During the creation/definition/indication of lines, arcs and contours in Marine Drafting, the resulting entity will now be dynamically highlighted as the cursor moves over the drawing. For example, when creating an arc segment with three points, the resulting segment is highlighted dynamically when third point is about to be defined.

Dynamic highlighting is implemented during the definition of

- Line segments: all definition modes
- Arc segments: all definition modes except “Point, radius and Tangent”
- PolyLine segments: all definition modes
- Ellipses: “Circumscribed Rectangle” and “Major & Minor Axis” and in the following functionality:
- Modify/Stretch Node
- Modify/Stretch Elbow
- Insert Rectangle/Square with a fillet radius
- Insert/Staircase

Benefits

Improved UI during geometry definition: resulting entity is pre-highlighted

Compatibility Constraints

None.

For More Information

Only noted here.

Affected Programs

Hull Design

Marine Drafting

19.11 Arc Quarter Points

Description

The UI for defining a point on arc periphery has been improved.

Instead of first indicating the arc and then keying in the angle, the Combo Box in the Geometry toolbar is now used to give the angle. Moreover, by selecting the “Indicate” alternative in the Combo Box the point on the arc is defined as the periphery point closest to the arc indication. Periphery points close to one of the four cardinal directions will snap to the corresponding quarter points (0, 90, 180 and 270 degrees).

Benefits

Easy way of defining arc periphery points and in particular the quarter points.

Compatibility Constraints

None.

For More Information

See User Guide *Marine Drafting / Operator’s Instructions / Format / Geometry mode / 2D points*.

Affected Programs

Hull Design

Marine Drafting

19.12 New Definition of Line Segment, Direction + Length

Description

When creating a Polyline, a new way of defining a segment has been implemented, namely “Line by Direction and Length”. It works in the same way as “Line by two Points” except that the length of the resulting line is given in the Combo Box in the Geometry toolbar.

Benefits

This implements a convenient way of creating a line with a given direction and length.

Compatibility Constraints

None.

For More Information

See User Guide *Marine Drafting* / *Operator’s Instructions* / *Format* / *Geometry mode* / *Polyline*.

Affected Programs

Hull Design

Marine Drafting

19.13 Simple Arithmetic in 2D Offset Input

Description

When giving an offset during point definition, it is now possible to key in simple arithmetic expressions in the 2D Offset input dialog. For example, the following input is valid: 0.02*300 + pi N.

Benefits

Simple arithmetic accepted in the offset input dialog.

Compatibility Constraints

None.

For More Information

Only noted here.

Affected Programs

Hull Design

Marine Drafting

19.14 Automatic Chaining of New Contours to Existing Ones

Description

When creating a new contour, this will optionally be chained to existing contours in the drawing. This options is controlled by a new Drafting default keyword AUTO_CHAIN with values “Yes” or “No” (system default).

The system will compare the start and ending points of a new contour with the ones of existing contours structurally belonging to the same component as the created one. If any of them coincides with the start/ending points of the new contour it will be chained to the new contour. Note that at most two contours can be chained to the new geometry, one in the beginning and one in the end.

The criterion for an existing contour to be chained to the created one is thus:

- AUTO_CHAIN is set to “Yes”
- The existing contour belongs to the same component as the created one
- The existing contour is not closed
- The start or ending points of the existing contour coincides (zero tolerance) with the start/ending points of the created contour

The Automatic Chain concept is implemented in the following functions:

- Insert/Polyline
- Insert/Staircase

Benefits

This will improve productivity. Instead of invoking the Modify/Chain function as post-action, the chaining is performed automatically as new contours are created.

Compatibility Constraints

None

For More Information

See User Guide *Marine Drafting / Appendices / Drafting Default File Keywords / Miscellaneous*.

Affected Programs

Hull Design

Marine Drafting

19.15 Dimensioning UI Improvements

Description

A ”Reset” button has been implemented in all dimension dialogs.

Clicking it will reset the dimension text to its system default value (e.g. #DIM() for linear dimensioning).

When positioning the result of a linear dimensioning (2D, 3D or Axis-parallel), the complete graphics (except witness lines) will be highlighted instead of just the dimension lines.

When positioning the result of a linear dimensioning (2D, 3D or Axis-parallel), it is now possible to change the dimensioning parameters (text height etc) without having to re-define all measure points. Instead of pressing Cancel and enter the “Advanced” function in the dimension dialog, just click Options and do the parameter changes without losing the given measure points.

Benefits

This will improve productivity in dimensioning functions.

Compatibility Constraints

None.

For More Information

Only noted here.

Affected Programs

Hull Design

Marine Drafting

19.16 Improved Dragging Technique

Description

During dragging, the highlight colour will be the same independently of the background colour (like steady highlighting).

TrueType texts will now be dragged with full display.

Benefits

This will improve graphic feedback.

Compatibility Constraints

None.

For More Information

Only noted here.

Affected Programs

Hull Design

Marine Drafting

19.17 Plane Reference Text in Distance-To-Plane Dimensioning

Description

In the Distance To Plane dimensioning, when principal plane is *Centre Line*, *Base Line* or *Aft Perpendicular*, modifications of the Plane Reference Text will be remembered and saved in the Drafting default system.

For this purpose, three new default keywords have been introduced:

Keyword	System Default
DIM_DTP_BASELINE_REF_TEXT	" from BL"
DIM_DTP_CENTRELINE_REF_TEXT	" off CL"
DIM_DTP_AFTPERPENDICULAR_REF_TEXT	" from AP"

Benefits

This will improve productivity. The system remembers user modifications of Plane Reference Text.

Compatibility Constraints

None.

For More Information

See User Guide *Marine Drafting* / *Appendices* / *Drafting Default File Keywords* / *Dimensioning*.

Affected Programs

Hull Design

Marine Drafting

19.18 Delete Last Entity

Description

The Edit/Delete/Last Entity functionality has been re-introduced.

Benefits

Make it possible to “undo” last created entity without having to exit current function and explicitly delete the entity.

Compatibility Constraints

None.

For More Information

See User Guide *Marine Drafting* / *Operator’s Instructions* / *Edit* / *Delete* / *Last entity*.

Affected Programs

Hull Design

Marine Drafting

19.19 Persisting Contours to PADD

Description

In 12.1 release of Marine Drafting, persistence to PADD has been further implemented.

Creation and modification of contours will now be persisted in most situations, like:

- All Insert functions, except Spline and Fillet
- Modify/Transform and Copy
- All Modify/Trim functions (To Entity, By Length, Gap, Cutout)
- All Modify/Stretch functions (Node, Elbow, By Polygon)
- Modify/Chain and Dechain
- Modify/Fill Style
- Tools/Subpicture/Regroup and Split

However, any persistence of contours must be explicit enabled by the user, by setting the environment variable TB_ENABLE_PERSIST_CONTOUR to “Yes”

Benefits

More drawing information persisted in PADD.

Compatibility Constraints

None.

For More Information

Only noted here.

Affected Programs

Hull Design

Marine Drafting

19.20 Text Font Attributes

Description

The attributes Bold, Underline and StrikeOut of texts using legacy system fonts will now be displayed properly.

Benefits

This will improve graphic feedback.

Compatibility Constraints

None.

For More Information

Only noted here.

Affected Programs

Hull Design

Marine Drafting

19.21 Dimming & Checking of Menu Items

Description

The enabling and checking of menu items and toolbar buttons has now been implemented and will reflect the current context and state.

Benefits

This will improve productivity.

Compatibility Constraints

None.

For More Information

Only noted here.

Affected Programs

Hull Design

Marine Drafting

19.22 Unicode

Description

Better support for Unicode (i.e. non-latin characters such as Korean, Chinese and Japanese) has been added to Marine Drafting. Unicode characters may be used in the following areas:

- Drawing names
- Values of Drafting's default variables
- Dimension annotations
- Model names (except Hull)
- MarAPI (nb. Limited or no support for Unicode in Hull functions)

Benefits

Supporting Unicode e.g. provides functionality to make annotations in the user's native language.

Compatibility Constraints

There is limited Unicode support among the Hull Design specific functions.

For More Information

Please see the Marine Drafting documentation.

Affected Programs

Hull Design

Marine Drafting

19.23 Restriction of Symbolic Views

Description

An additional option has been added to the function Symbolic View/Planar Hull View/Modify to change the restriction of an existing symbolic view.

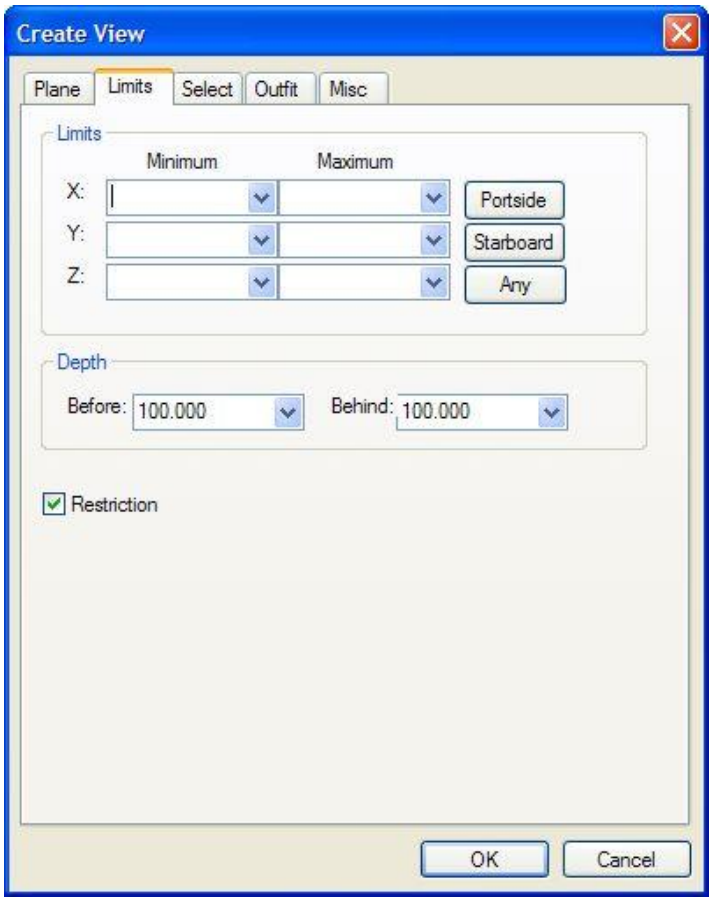
The restriction could be

- an existing contour,
- a contour created interactively or
- an infinite line (the user is asked to choose the side of the line were the geometry is to be kept.

There is also an option to make a new view as the restricted view.

Note that this restriction is an addition to the restriction possible in the view/create function with limitation in the principal axis.

The second tab Limits contains the limits.



It is possible to take away the restriction made in View/modify by removing the tick for the restrict button.

Benefits

Enables the view to be restricted in a more flexible way.

Compatibility Constraints

None.

For More Information

Only noted here.

Affected Programs

Hull Design

Marine Drafting

19.24 Inspect Drawing

Description

In some cases, text will not be displayed properly on drawings migrated from Tribon M3 to AVEVA Hull & Outfitting 12. One reason could be that the codepage used to encode multibyte text has been changed to UTF-8 in AVEVA Hull & Outfitting 12. The ‘Inspect Drawing’ function has been extended with an option to correct such texts. This new function displays a dialog box presenting a list containing all texts within the current drawing, and the user can choose which texts to convert.

Benefits

Make it possible to correct texts with the wrong codepage.

Compatibility Constraints

None.

For More Information

Only noted here.

Affected Programs

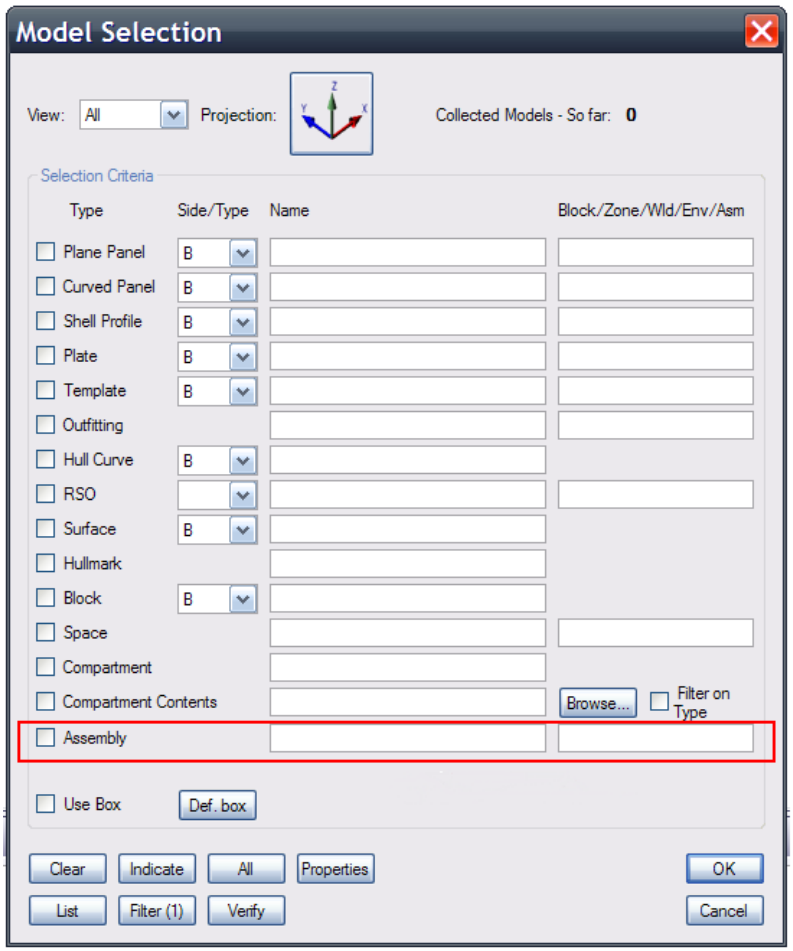
Hull Design

Marine Drafting

19.25 Draw Assemblies

Description

There are new ways to insert an assembly into the drawing. The first one is in the “Insert model” dialog which has been updated with a new line for assemblies:



In the name field you can give the name of an assembly object optionally with wild cards. In the “Block/Zone/Wld/Env/Asm” you can give a name of an assembly or assembly world element. If given, the search will be limited to assemblies below this element. If this field is left empty the whole MDB is searched.

The second possibility to add an assembly to the drawing is to use drag&drop from the design explorer: you select an assembly in the design explorer drag it and drop it in a view in the current drawing. (The drag&drop is a new feature in this release, please see a separate release note for more documentation.)

Another improvement is that the assembly is always shown with the correct number of parts. One effect of this improvement is that the appearance of hull models may be different from what it was in previous releases regarding line styles, colours, p-lines etc. The appearance of the hull models will now be controlled by the representation rule set defined for the view. This is valid for all view types (“Wireline”, “Wireline Hidden Line”, “Modelled Wireline”, “Local Hidden Line”, “Global Hidden Line” and “Universal Hidden Line”).

Benefits

It is easy to add assemblies to the drawing. The assemblies are always drawn with correct number of parts.

Compatibility Constraints

The appearance of hull models may be different from what it was in previous releases regarding line styles, colours, p-lines etc.

For More Information

Only noted here

Affected Programs

Hull Design

19.26 RSO Default Colours

Description

An RSO is given a default colour related to the type of RSO. The following colours are used:

RSO Type	Colour
Compartment limit	Blue
General Inner Structure	Steel blue
Block Limit	Navy Blue
General Limit	Slate blue
Backdrop	Light blue

The colour settings are valid both when an RSO is drawn in drawings and when drawn in the 3D canvas.

Benefits

Easier identification of RSOs.

Compatibility Constraints

None.

For More Information

See User Guide *Structural Design / Functions Overview / Functions in the Functional Structure Menu*.

Affected Programs

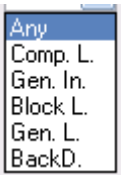
All programs with graphical presentation of RSOs

19.27 RSO Enhancements in Insert Model

Description

Input Model has been enhanced to allow users to easier select and insert RSOs into a drawing.

RSO selection can now be filtered on type. Wanted type can be selected from a drop-down list with the following values:



The values in the drop down list corresponds to

- Any type (no filtering)
- Compartment Limit
- General Inner structure
- Block Limit
- General Limit
- Backdrop

RSO selection can now also be made on envelope. All RSOs belonging to a given envelope are selected.

It is no longer necessary to specify the "_RSO_" prefix when keying in the name of an RSO in the input field.

Benefits

Enables RSO modelling to be made in a more flexible way.

Compatibility Constraints

None.

For More Information

See User Guide *Structural Design / Functions Overview / Functions in the Functional Structure Menu*.

Affected Programs

Hull Design

Marine Drafting

19.28 Curved Panel Holes in Input Model

Description

Curved panels presented using the function *Input model* now displays holes defined to be marked with a dashed line type.

Benefits

The model display reflects the design more correctly.

Compatibility Constraints

None

For More Information

Only noted here.

Affected Programs

Hull Design

Marine Drafting

19.29 Base Line Position Ruler

Description

The Base Line ruler is always located at zero height in the ship. But there are other constructions/ships where it would benefit if this ruler could be located at another height. To be able to control this, a new default keyword, BASE_LINE_POSITION, has been added. By assigning a height to this keyword, the base line in the project can be set to another default position. If not given, the height zero will be applied.

Affected functions are:

- Dimension → 3D → Distance to Plane → Leader → 4 BL
- Dimension → 3D → Distance to Plane → Box → 4 BL
- Annotate → Position Ruler → Base Line

Benefits

Makes it possible to have different Base line and take automatic measure from that.

Compatibility Constraints

None

For More Information

Only noted here.

Affected Programs

Hull Design

Marine Drafting

19.30 Overlays

Description

The ability to use overlays on a drawing has been added to Marine Drafting. Overlays may take the form of external plot files (.plt), or may be database elements.

An overlay sheet can be placed anywhere on the drawing sheet, and can be of any size. Any number of overlay sheets may be used on a drawing sheet.

Benefits

Overlays have been made available to Marine Drafting and Hull Design.

Compatibility Constraints

None.

For More Information

See User Guide *Outfitting Draft / Underlays and Overlays*.

Affected Programs

Hull Design

Marine Drafting

19.31 Protection of the Drawing Form View

Description

In order to give Marine Drafting users better control of how to protect the contents in the drawing form view, the Drafting keyword ALLOW_TEXT_MODIFICATION_IN_FORM_RULE has been replaced by the keyword ALLOW_MODIFICATION_IN_FORM_VIEW.

Keyword:

ALLOW_MODIFICATION_IN_FORM_VIEW

System default value:

"No"

Explanation:

User can modify protection flag for contents in the drawing form view.

Legal values:

"No" :	Whole form view is protected from modification
"OnlyRuleBasedText" :	Texts defined by rules can be modified
"Yes" :	Contents of whole form view can be modified

Benefits

Better control of how to protect the contents in the drawing form view.

Compatibility Constraints

The old keyword ALLOW_TEXT_MODIFICATION_IN_FORM_RULE has been removed.

For More Information

See User Guide *Marine Drafting* / *Appendices* / *Drafting Default File Keywords* / *Miscellaneous*.

Affected Programs

Hull Design

Marine Drafting

19.32 Open Drawing

Description

Lookup of drawings using the “Open Drawing” dialog can be slow in projects with a large number of drawings. This functionality has been improved using a type index.

This means that from this release it is often preferable to have the “Search all departments” option checked. The initial value of this option is controlled via the Marine Drafting default keyword “`SEARCH_ALL_DEPTS`”.

It is also advisable to give one or more initial characters before a wild card since it speeds up the search significantly.

Please note that if the search string starts with a wild card and “Search all departments” is not checked, the performance will be as in previous release.

Benefits

Lookup drawing view name and type in the “Open Drawing” dialog is much faster.

Compatibility Constraints

None

For More Information

Only noted here.

Affected Programs

Hull Design

Marine Drafting

19.33 Drag and Drop to the 2D Canvas.

Description

It is possible to drag and drop model items onto the 2D Canvas. The result of a successful drag-drop operation matches that of an “Insert Model” using the “Insert Model” dialog.

It is possible to drag items to create new views, insert into a specific view or insert into all views. The new functionality includes standard left mouse button drag drop, right mouse button drag drop and other sources such as dragging items from other gadgets than the explorer, e.g. the “Search Result” and “My Data”.

Benefits

Easy ways to insert Model to the 2D canvas.

Compatibility Constraints

None

For More Information

See User Guide *Marine Drafting / Model Viewing and General Drafting / Common Functions and Routines / Drag and Drop to the 2D Canvas*.

Affected Programs

Hull Design

Marine Drafting

19.34 Marine .NET API (hull views)

Description

All hull symbolic views can now be created and modified from the user-interface of Marine Drafting 12.1. The corresponding Marine .NET APIs have therefore been implemented into the AVEVA.Marine.Drafting namespace as well.

The following Marine .NET APIs have been implemented in the AVEVA.Marine.Drafting namespace.

Please note that some APIs have been renamed to reflect changes in menus. The changes are marked with **bold**.

Please also note that MarDrafting.Recreate is used to recreate all kinds of hull views.

Old (still available, marked as obsolete) **Aveva.Marine.Design**	**New** **Aveva.Marine.Drafting**
MarChm.ViewBodyPlanNew	MarDrafting.ViewBodyPlanNew
MarChm.ViewCurvedPanelNew	MarDrafting.ViewCurvedPanelNew
MarChm.ViewDevPlaNew	MarDrafting.ViewDevPlaNew
MarChm.ViewShellXNew	MarDrafting.ViewShellXNew
MarChm.ViewShProfNew	MarDrafting.ViewShProfNew
MarChm.ViewModify	MarDrafting.View**Curved**Modify
MarChm.ViewRecreate	MarDrafting.ViewRecreate
MarHullPan.ViewDetailNew	MarDrafting.ViewDetailNew
MarHullPan.ViewSymbolicModify	MarDrafting.View**Section**Modify
MarHullPan.ViewSymbolicRecreate	MarDrafting.ViewRecreate
MarHullPan.MAR_BRACKET	MarDrafting.MAR_BRACKET
MarHullPan.MAR_BRACKET_PML	MarDrafting.MAR_BRACKET_PML
MarHullPan.MAR_FLANGE	MarDrafting.MAR_FLANGE
MarHullPan.MAR_FLANGE_PML	MarDrafting.MAR_FLANGE_PML
MarHullPan.MAR_SEAM	MarDrafting.MAR_SEAM
MarHullPan.MAR_SEAM_PML	MarDrafting.MAR_SEAM_PML

MarHullPan.MAR_STIFFENER	MarDrafting.MAR_STIFFENER
MarHullPan.MAR_STIFFENER_PML	MarDrafting.MAR_STIFFENER_PML

The following APIs have been renamed to reflect changes in menus.

Old (still available, marked as obsolete) **Aveva.Marine.Drafting**	**New** **Aveva.Marine.Drafting**
MarDrafting.ElementIsSymbolicView	MarDrafting.ElementIs**Section**View
MarDrafting.ViewSymbolicNew	MarDrafting.View**Section**New
MarDrafting.ViewSymbolicModelTra	MarDrafting.View**Section**ModelTra

It is strongly recommended that you change your customisation files (C#, PML) to use the APIs from AVEVA.Marine.Drafting as soon as possible.

Benefits

A Marine Drafting 12.1 license is sufficient to be able to create hull views using the Marine .NET API.

Compatibility Constraints

The APIs have been marked as obsolete in the AVEVA.Marine.Design namespace.

They will continue to be available in this namespace in 12.1 but they will be removed in a future release.

When using the APIs from the AVEVA.Marine.Design namespace, you will get a warning when building a C# solution.

For More Information

See User Guide *Customisation / :NET Customisation / Hull and Marine Drafting .Net API*.

Affected Programs

Hull Design

Marine Drafting

19.35 Removing Default Variables

Description

A number of default variables used in earlier releases of Drafting, but not in Hull Drafting 12.0/Marine Drafting 12.1, have been removed to avoid unnecessary confusion. The obsolete default variables that have been removed are listed below.

Tribon M3 Outfitting has been replaced by AVEVA Outfitting so the following default variables are no longer valid:

- FLOW_UNIT_SYSTEM
- IMPEDANCE_UNIT_SYSTEM
- INDUCTANCE_UNIT_SYSTEM
- LUMINANCE_UNIT_SYSTEM
- PDI_STRUCTURE_VRML
- PDI_TRANS_STRUCTURE
- PRESSURE_DROP_UNIT_SYSTEM
- STRUCT_COMP_CODE_DET
- STRUCT_COMP_CODE_DRAW
- STRUCT_COMP_VOLUME_COLOUR
- STRUCT_KEEP_INSERT_OBJ
- STRUCT_KEEP_STAND_REF
- STRUCT_MODULES_IN_HULL
- STRUCT_MODULES_IN_OUTF'
- TEMPERATURE_UNIT_SYSTEM
- VELOCITY_UNIT_SYSTEM

The volume concept in Tribon M3 has been replaced by AVEVA Outfitting so the following default variables are no longer valid:

- INCL_COMP_VOLUME_EVENT_POINTS_IN_EQUIP
- INITIAL_VOLUME_DB
- PLACVOL_NAME_CODE

The database in Tribon M3 has been replaced by Dabacon so the following default variables are no longer valid:

- AUTO_CLEAN_WORKSPACE
- BACKUP_ACT
- BACKUP_TIME

The control point concept in Tribon M3 has been removed so the following default variable is no longer valid:

- DIM_CONTROLPOINT_MID_TOL

Benefits

Avoid confusion by not showing obsolete default variables in the Format/Defaults dialog.

Compatibility Constraints

Not applicable.

For More Information

Only noted here.

Affected Programs

Hull Design

Marine Drafting

19.36 TBSystemFonts

Description

It is a known issue that the old legacy fonts do not function very well in AVEVA Marine 12. These fonts are:

- TBSystemFont0
- TBSystemFont1
- TBSystemFont2
- TBSystemFont3
- TBSystemFont4
- TBSystemFont5
- TBSystemFont6
- TBSystemFont7
- TBISOFont101
- TBISOFont105

The issue is that these fonts cannot be used for text elements stored in the PADD database. This is for example all texts created with the “Insert\Text” function in Marine Drafting. TBSystemFonts will in this case be replaced with a default true type font.

In 12.1 we have introduced a way to map a TBSystemFont with any true type font available in the project. The mapping is primarily intended to be used when migrating drawings from M3 to 12.

The font mapping is setup in a file with a simple format, where each TBSystemFont can be associated with a true type font (separated by a blank or a TAB). The name of the file is assigned to the environment variable “TB_SYSTEMFONT_MAP”. This is a sample file:

```
TBISOFont101      Arial Unicode MS
TBISOFont105      Lucida Sans
TBSystemFont0     Arial Unicode MS
TBSystemFont1     Times New Roman
TBSystemFont2     Times New Roman
TBSystemFont3     Times New Roman
TBSystemFont4     Courier New
TBSystemFont5     Courier New
TBSystemFont6     Lucida Sans
TBSystemFont7     Times New Roman
```

The font mapping will affect the text font when:

- migrating a drawing with the SY013 migration utility
- importing a drawing with the “File\Import\SDB” utility
- importing a drawing with the Copy Assistant utility.

Benefits

TBSystemFonts can be replaced with any true type font available in the project, not only the default font.

Compatibility Constraints

None

For More Information

Only noted here

Affected Programs

Hull Design

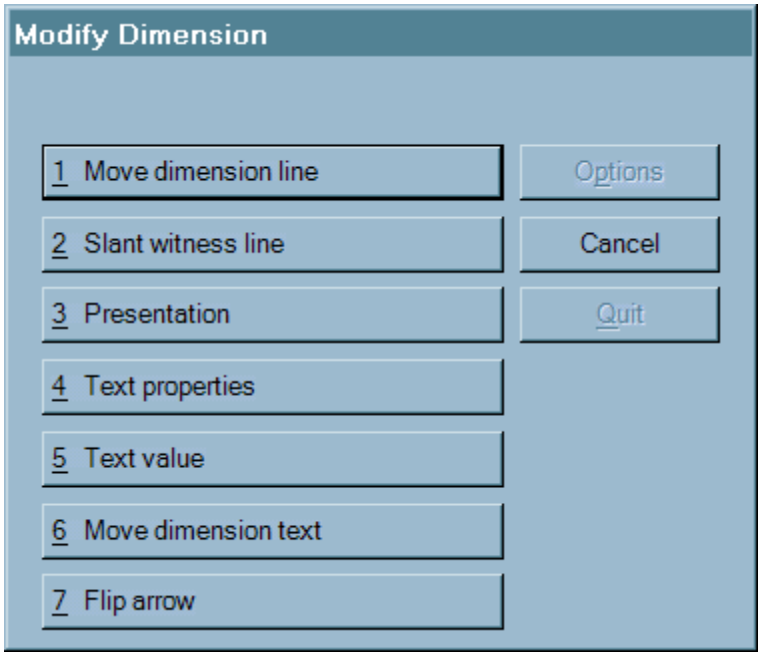
Marine Drafting

19.37 Persisting of part level modifications in Linear Dimensions

Description

In Marine Drafting 12.1, it is now possible for the user to get certain “part level” modifications in linear dimension persisted in Dabacon. Modification on “part level” means e.g changing the size, position, value, colour etc. on individual measure texts in a linear dimension.

The Modify/Dimension sub-functionality has changed slightly



Move Dimension Line

No change of functionality. Modification is persisted.as before.

To be more specific, the caption text has been changed slightly.

Slant Witness Line

No change of functionality. Modification is persisted as before.

Presentation

No change of functionality. Modification is persisted as before.

Text Properties

Functionality has been improved: Here the user can toggle between updating on component level (whole dimensioning) and part level (individual texts in it). To toggle, just press the *Option* button when the system asks the user to indicate the dimensioning (text) to modify. Modifications both on component and part level will be persisted.

The following properties can be modified:

- Font
- Size
- Aspect
- Slant
- Colour

Text Value

Functionality has been improved: Here the user can toggle between updating on component level (whole dimensioning) and part level (individual texts in it). To toggle, just press the *Option* button when the system asks the user to indicate the dimensioning (text) to modify. Modifications both on component and part level will be persisted.

Move Dimension Text

Functionality has been improved and renamed (from Transform Text): Here the user can move individual texts within an arbitrary linear dimensioning. The changed position of the measure text will be persisted.

Flip arrow

No change of functionality. Modification is not persisted as before.

In case the Drafting default keyword DENY_UPDATE_OF_NON_PERSISTED_GEOM is set to “Yes”, the same part-level functionality that is offered within the Modify/Dimension function can be also be invoked by clicking the right mouse button (RMB) on a text in a linear dimensioning and selecting one of the submenus:

RMB/Edit (or Edit/Text)

same functionality as Modify/Dimension/Text Value

RMB/Move (or Modify/Move/Text)

Same functionality as Modify/Dimension/Move Dimension Text

Note the whole dimension line will not be moved (as in 12.0), but only the indicated text within the dimensioning

RMB/Properties

Same functionality as Modify/Dimension/Text Properties

Benefits

Improved productivity in dimensioning modifying functions.

Compatibility Constraints

None

For More Information

Only noted here.

Affected Programs

Hull Design

Marine Drafting

20. AVEVA Outfitting Draft

A number of improvements have been made to Outfitting DRAFT and its associated applications.

20.1 Extended Hatch Patterns

This development has three components:

- An additional 12 system-defined Fill Styles (or patterns) bringing the total to 30. These cover patterns such as brickwork and concrete and are shown in Fig 8-6 of the updated *DRAFT User Guide*.
- Creation of user-defined Fill-Styles has been enhanced to allow the use of non-solid line-styles. Two new attributes have been added to HPATTErns (see below). These provide values for new Wigwam parameters. As a result, users can create very complicated patterns.
- The existing GUI, allowing users to pick the system-defined Fill Styles, has been extended to include the 12 new ones. This meant the provision of 12 new icon files.

In addition, hatch and fill patterns are now exported to DXF as the appropriate entities rather than lines.

20.2 Line Styles

User-defined LineStyle & FillStyle elements have a system-generated Style Number that should be unique within the MDB. These attribute values are automatically created upon element creation. However, if a DRAFT database containing a Style World (STYLWL) is added to an MDB that already has a STYLWL it is possible for duplication of numbers to occur.

At Hull & Outfitting 12.0, it is the later of the duplicates (in database order within the MDB) that has precedence when a Style of a given number is used. This is opposite to the case of duplicate names where it has always been the first that has precedence.

At Hull & Outfitting 12.1, this has been changed to ensure consistency of behaviour between duplicate styles and names. When an MDB contains Styles with duplicate Style Numbers, it is the first (in database order within the MDB) that will be used when that Style Number is used to draw graphical elements.

20.3 Line Widths

Hull & Outfitting 12.1 has been enhanced to allow accurate line widths to be output in all output formats. The definitions of the system line-styles are held in the System database and set up in the Admin module, using Line-style Width Definition elements (LSWIDDEFINITION) in a new Line-style World Element (LINESTYLEWORLD).

The upgrade from Hull & Outfitting 12.0 to 12.1 can do this or Hull & Outfitting can be left to use its default values. The AVEVA sample projects are provided with this hierarchy and new projects will also be created with it present.

Full details are given in the various Draft User Manuals and the *Administrator User Guide*.

20.4 System Defined Line Styles

The system line widths of THIN, MEDIUM, and THICK are now configurable in ADMIN using the new line-style hierarchy in the system database.

By default, they have been changed to standard values from the ISO 128 standard, which specifies line widths of: 0.18, 0.25, 0.35, 0.5, 0.7, 1.0, 1.4, & 2.0 mm. The values chosen for THIN, MEDIUM and THICK are: 0.25, 0.35 and 0.7 mm, rather than the former 0.22, 0.5, & 0.7 mm.

The **Minimum pen line width**, formerly set by a gadget on the **Plotting Options** form, no longer appears. This is a parameter of the Plot command and is no longer required as the user has much better control of the widths. A very low value will be treated as the minimum width allowed for the format specified – PDF, DWG, etc. These may vary or have some special meaning.

Note: the line width resolution of PDF output is currently controlled by a reference printer, which is either the user's default printer (if there is one) or the user's screen resolution. If the resolution of the said printer is 600dpi, it will not be sufficient to show the difference in width of the example lines on A0. One way to prevent this problem from occurring is to set a default printer with a higher resolution, say 1200 dpi.

20.5 User Defined Line Styles

User-defined line-styles will no longer be converted to a multiple of 0.2mm. Instead the precise width in mm specified by the user will be transferred directly to the export format.

20.6 Minimum Line Width

The MINLW parameter is configurable by the user in the DRAFT UI and via the DRAFT PLOT command; it was used to change the value of both THIN and the minimum user-defined line-style width. It applied only to the hardcopy exports (PDF, EMF etc) and did not affect DXF or AVEVA PLOT files.

It is no longer required, as the line-styles are now precisely defined. It has been withdrawn from the UI and the *PDMSUI/dflts/plotter_user_defaults* file where its default value was defined.

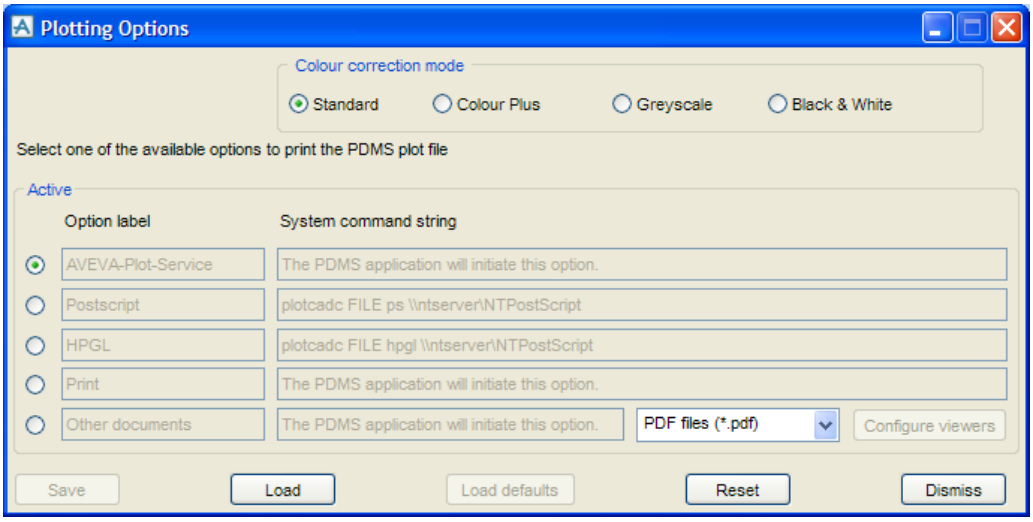
Its use with the PLOT command is deprecated: its value is ignored and a warning given if it is used.

Note that this means that the user no longer has a way to artificially thicken thin lines on a drawing during export. This was introduced at 12.0 and was a side effect of allowing the user to determine the value of THIN line-styles.

20.7 Plotting User Interface

20.7.1 DRAFT "Plotting Options" Form

The plot utility form, accessed from Utilities > Plot CE > Plotters, no longer has the Minimum Line width fields at top left:



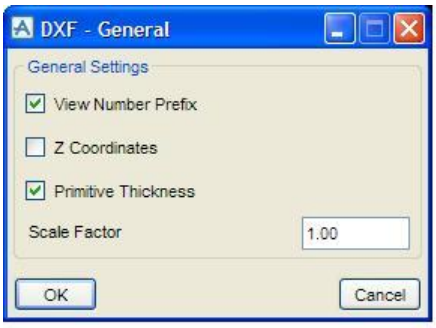
20.7.2 DXF – General Options

The "Polyline width factor" and "Character encoding" fields have been removed from the DRAFT "DXF - General" form, which is accessed from:

Utilities > Configurable DXF output > Modify > General

or in Draft administration mode:

Settings > DXF configuration settings > General

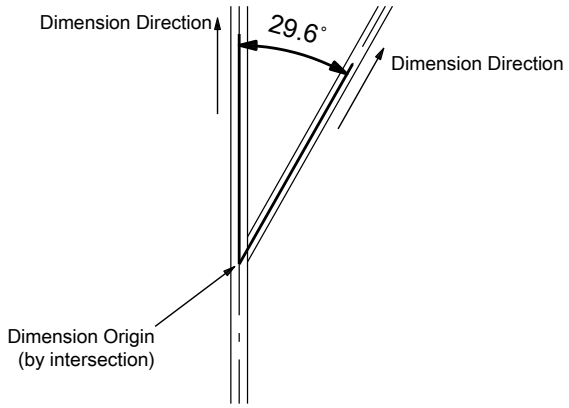


20.8 Enhanced Angular Dimensions

Angular Dimensions (ADIMs) no longer need to have their origin defined, if it can be deduced from the vectors defined by their first two dimension points. Typically these are directions defined by P-lines but they can also be defined by P-points.

For example, the figure shows an Angular Dimension with its origin defined implicitly by the intersection of the two Dimension directions, which are P-lines of SCTNs.

This Angular Dimension could be created by typing the following commands, starting at Layer level:



`NEW ADIM`	Create new Angular Dimension element
`FROM DIR IDPL @ TO DIR IDPL @`	Use cursor to pick P-lines defining the first and second Dimension Directions.
`DPOS @`	Use cursor to pick a Sheet position through which the Dimension Arc will pass.

For full details, please refer to the *DRAFT User Guide*, section 12.6 Angular Dimensions, which has been extensively revised.

20.9 Enhanced P-line Picking

There is now an option for P-lines to behave in a similar fashion to P-points when creating annotation. If enabled on a View, P-lines appear as the mouse passes over them so that they can be picked. They can of course also be made part of the SCTN's permanently visible representation when required on the drawing.

The number of P-lines drawn thus can be limited by use of their PVIF attribute, as for P-points. Performance for `Update Design` when drawing sections with a large number of P-lines will therefore be improved by making suitable adjustments to the catalogue! Pseudo-attributes PLVIFlag and PLVISibility, equivalent to the PPVIF and PPVIS attributes, are also available.

The behaviour for picking is as previous versions when the new option is 'OFF.

For full details, please refer to the *DRAFT User Guide*.

20.10 Improved Performance of Extrusions

These enhancements are focused on speeding up Extrusions and Panels by improving the handling of their vertices. Vertex (VERT) & Panel Vertex (PAVE) elements have 10 p-points, mostly for dimensioning purposes. Each p-point number has a particular functional position:

P0	Origin of Vertex
P1	Bottom panel face in line with panel vertex
P2	Midway through panel in line with panel vertex
P3	Top panel face in line with panel vertex
P4, P6	Bottom face tangent points (for filleted radius at vertex)
P5, P7	Top face tangent points (for filleted radius at vertex)
P8	Bottom face fillet centre
P9	Top face fillet centre.

There are two changes to improve performance:

- calculate all the p-point positions in one go when drawing them in Draft
- omit P5 to P9 when the fillet radius is zero, as they are coincident with the first four

20.11 Drawing Gridlines

Plant Design grids (GRIDSYstem and GRIDAXis elements) may now be added to IDLists, but may not be the sole member of the IDList. They are drawn using the Centreline Style/Colour; their GRIDLNs are considered to be of infinite length and so are extended to the VIEW boundary. AUTO commands ignore these elements when calculating the VSCA, THPOS, and SIZE attributes of a VIEW.

For details, please refer to the *DRAFT User Guide*, section 4.2, 4.3 and 12.9.

20.12 Intelligent Text Handling Enhancement

Draft allows all Design and Catalogue database attributes and pseudo-attributes to be used in the annotation of drawings. It is also possible to use attributes of related elements; for example, #SITE gives the name of site owning the referenced element.

Hull & Outfitting 12.1 additionally allows the more commonly used position attributes (POS, HPOS, TPOS, APOS, TPOS, NPOS, POSS, POSE, DRPS and DELP) to be qualified so as to provide only one of the coordinates. For example:

- #POS full 3D position, e.g. W12250 N7890 U3120
- #POSE Easting coordinate only, e.g. E12250, W9675

#POSN, #POSU, #POSX, #POSY, #POSZ are also provided.

Note that the codeword #POSE can have two meanings depending on the context: for SCTNs it means the POSE attribute (Section End Position), in other cases it means the Easting of the POS attribute

For other position attributes, single coordinates can be obtained by using a single index qualifier. For example:

- #GCOFG[2] would give the Northing (Y coordinate) of the Gross Centre of Gravity.

Positions can be output in '+/-' format by appending '+' to the codeword. For example:

- #POS+ would give -12250 +7890 +3120 for the example above

For full details, please refer to Chapter 14 of the *DRAFT User Guide.*

20.13 Export to CAD Formats

Significant improvements have been made to the export of DXF, DWG and DGN format files from Draft, using the 'configurable' drivers (Draft_XXX_LI).

Recommended AutoCAD versions are 2007-2010, as shown in section 2.9.1. The DXF version used is now AutoCAD 2006, so it cannot be supported in earlier releases. Recommended MicroStation format is now v8. Additional limitations may apply for earlier releases.

For full details of configuration, please refer to the *Draft User Manual.*

20.14 Support for Unicode Text

Drawing export to recent releases of AutoCAD and MicroStation should now cope with all supported languages for which the computer is set up. Full support is not possible for AutoCAD releases before 2007 or for MicroStation DGN v7 format. As noted elsewhere (see section 4.1.3), it is recommended that Latin filenames are used.

20.15 Improved Drawing Feature Export

These changes should result in a much more usable drawing and smaller file sizes. The main improvements for the 3 formats are:

- User defined Line-styles: defined with PATDEF and PATREP but not PATNAM
- Fill Styles: export in native format hatch entities for all system defined styles 1-30: this includes the new ones (see section 20.1)

The following limitations apply:

- Draft's intelligent blanking primitives are not exported
- User-defined line styles with Glyphs and line pictures are not supported
- Only "built-in" line patterns are supported at present for layer definitions, not the full range of configurable line patterns

20.16 Configurable DXF & DWG Export

Improvements also include:

- Symbols and Logos are exported as Nested Blocks; differentially scaled symbols are supported.
- Overlays and Design Elements are exported as Nested Symbols.

- Ellipse is exported as an entity (AcDbEllipse)
- Layers can be defined and exported – new switches control their use; for example rules can create new layers, set their colour, assign elements to layers by type. However, “colour bylayer” is not used for objects in the DXF/DWG file.
- Text Alignment has been improved

20.17 Configurable DGN Export

Improvements also include:

- Symbols, Backing Sheets, Frame and Logos are exported as cells; differentially scaled symbols are supported. Cells are exported with Tag data attached.

The following limitations apply:

- Although user-defined glyphs and line pictures are ignored, it is possible to specify a MicroStation custom line-style for a given DRAFT pen number.
- Hatching (fill) patterns from HPATTERN19 to HPATTERN30 use a common shared cell definition. For these: Colours, Line weight and Line style will not be set.
- Dimensions are not exported as MicroStation dimensions. However, they may be grouped.

20.18 AVEVA Isometric ADP

This add-on application has been completely overhauled for Hull & Outfitting 12.1. It can now be used for drawing detailed drawings, complete with parts lists, of both HVAC and Cable trays.

It is fully configurable and produces a fully annotated Isometric-style drawing with:

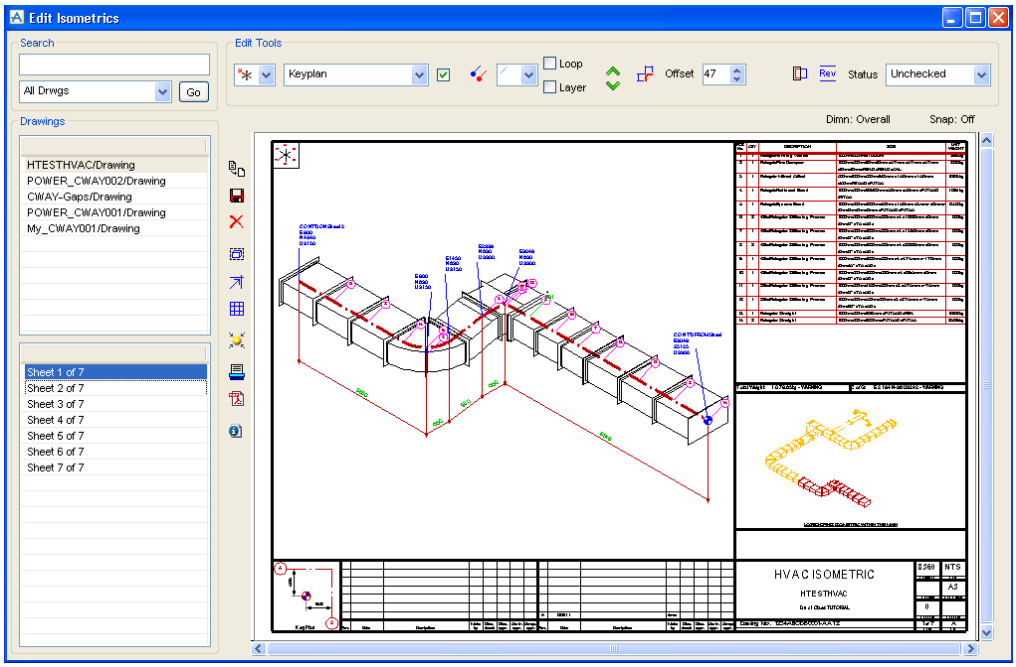
- Dimensioned and labelled Spool
- Material Take-Off Table
- Location Plan of the Spool in the Main
- Keyplan of location to nearest Grid Line
- Revision table
- Total Weight and Centre of Gravity

Drawing output is in PDF format, with Material Take-off to MS Excel. In addition, there is a dedicated Toolbar, Edit tools and a Print Tool for Multiple drawings.

Please note that this new release will not work with earlier versions of Hull & Outfitting and that many areas are significantly different, including the following;

- HVAC Catalogue upgrades
- Draft Library elements for True-Type Fonts

The appropriate changes have been made to the sample data supplied with Hull & Outfitting.



For full details, please refer to the updated *Isometric ADP* user documentation:

- *Installation Guide*
- *User Guide*
- *Administration Guide*

21. AVEVA Marine Migration

21.1 Preparing Databanks for Import into Hull and Outfitting 12.1

The ability to read native Tribon indexed databanks has been removed from AVEVA Marine. Before using the migration program to migrate a Tribon project to AVEVA Marine, the Tribon databanks need to be upgraded to a neutral format (Tribon Model Index). There is a Tribon M3 program called `sa021.exe` for this purpose:

```
sa021 { –sourcedb <dbname> | –sourcedir <dir> } –targetdir <dir>
```

Example. Convert the databanks in a native Tribon M3 project to Tribon Model Index-databanks:

```
sa021 –sourcedir c:\m3projects\testproj –targetdir c:\tmi
```

This will convert all databanks in the directory given by '-sourcedir' to Tribon Model Index databanks and store them in the directory given by the '-targetdir' option.

Please contact your local AVEVA representative to get a copy of the sa021 utility.

Please note that this is a Tribon program and must be copied to and executed in the Tribon bin directory, for example C:\Tribon\M3\bin.

22. AVEVA Schematic 3D Integrator

Integrator has been extensively updated since its first release at 12.0; some of the developments noted below were first introduced in the Schematics Update Release at 12.0.SP6.8.

22.1 New Integrator Object Method

Integrator link information stored on CYMLNK elements consists of references to schematic and 3D elements. It is possible during project execution for these references to become invalid when elements are deleted. A method is provided to clean up CYMLNK elements with invalid references.

```
!!Integrator.ValidateLinks()
```

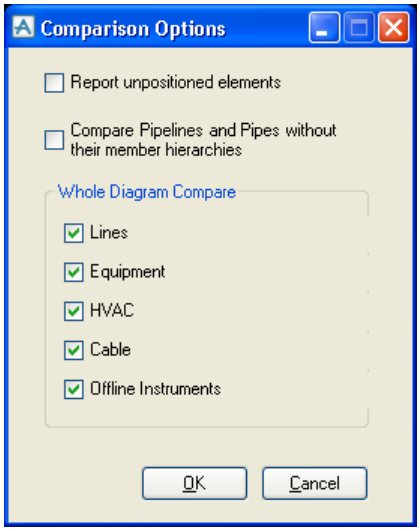
Note: This method should be used only when all of the schematic and design databases, holding elements that have been linked, are current on the MDB.

22.2 Electrical Connections

When building an equipment with a template, Integrator will try to match schematic electrical connections to 3D electrical connections within the template. It already does this for nozzles which are matched on BORE, but for ELCONNs it now tries to match on CATREF. Details are included in the updated *Integrator User Guide* Section 5.4.1 Building Equipment.

22.3 Whole Diagram Compare

The Comparison Options form has been extended with new options. The Whole Diagram Compare options allow you to set which main types will be included in the report for a Compare Diagram operation.

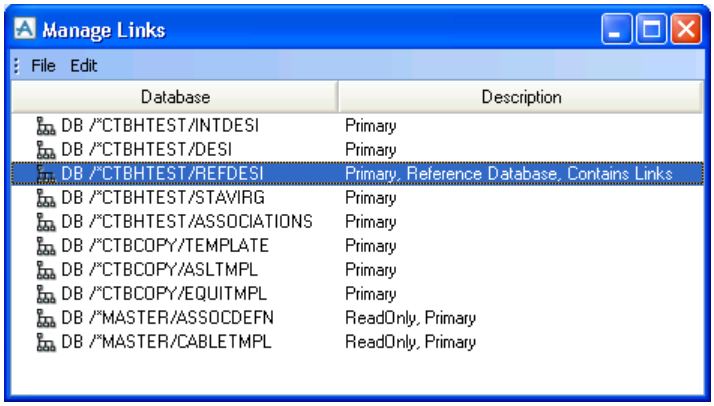


22.4 Selector Rules

Quotes are no longer required in selector rules for long STYPs as Integrator will automatically include quotes for text selectors. For example, a rule with `SCSTYP OF source` operating on an *SCVALV* with *SCSTYP PTFE-LINED* will generate `Choose with STYP |PTFE-LINED|.`

22.5 Improved Links Administration

Integrator no longer automatically creates a Link World. Project administrators are recommended to create a separate Design Reference database to hold links, and then use the new **Manage Links** dialogue, available from the **Integrator > Settings** menu. This can be used to create and manage Link Worlds in the appropriate database, including consolidating links from separate databases.

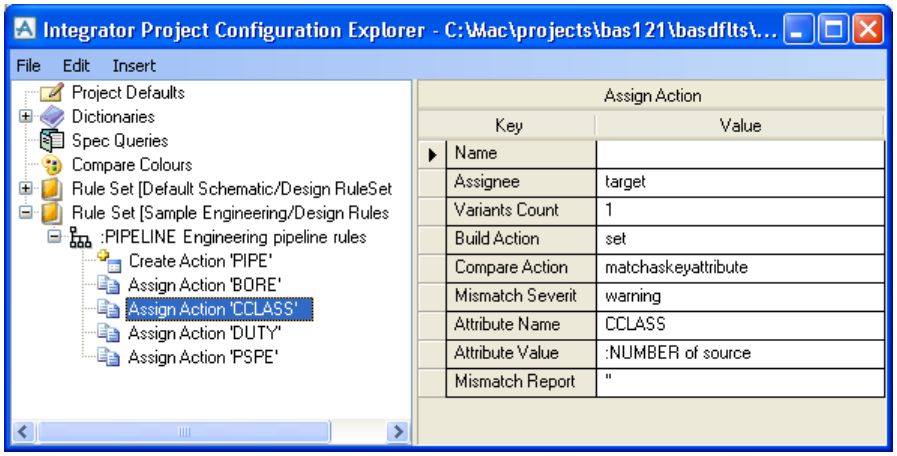


Manage Links is also available with the new Compare/Update Utility.

For More Information, please refer to the *Integrator User Guide* sections 4.7.16, 5.2 and 5.3.

22.6 Configuration Rules Extensions

Integrator's Project Configuration Explorer is now shared with the Compare/Update Utility, and so can hold rules for comparing elements between design, schematic and engineering databases. A Rule Set holds all the Rule Groups for a particular pairing of database types. For example, the sample configuration has a default Rule Set for comparing Design database content against Schematic database content. You can add Rule Sets for other combinations of database types, e.g. schematic and engineering, for use with Compare/Update.



Top level Rule Groups now have a source type which is the type of element for which they will be applied (in place of the condition setting type of source).

For More Information, please refer to the *Integrator User Guide* section 6.5.5.

22.7 Example Macro

Some users may prefer to use a macro to run the comparison. The example macro below compares all schematic equipment and pipelines that appear on a particular diagram:

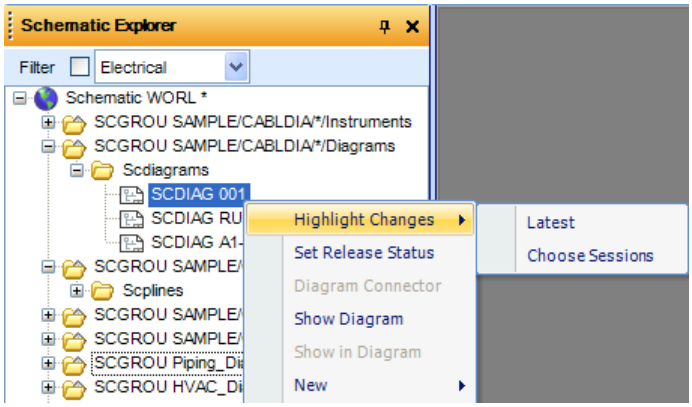
```
-- File: compare macro for user guide.pmlmac

-- Initialise Integrator
!!integratorInit()

-- Collect schematic equipment and pipelines that appear on this
drawing
!scgroup = |/Piping_Diagrams|
!sctypes = |SCEQUI SCPLIN|
!diagExp = |name of diaref eq '/A1-51-2003'|
!sccoll = object COLLECTION()
!sccoll.scope(!scgroup.dbref())
!sccoll.types(!sctypes.split())
!sccoll.filter(object expression(!diagExp))
-- Integrator compare method needs array of strings
!comlist = ARRAY()
do !element values !sccoll.results()
  !comlist.append(!element.ref.string())
enddo

-- Set report direct to file and do compare
!!integrator.setreportvisible(false)
!!integrator.setreportpath('c:\mac\compareReport.xml')
if (!comlist.size() gt 0) then
  !!integrator.compare(!comlist)
  handle any
    write !!error.text
  elsehandle none
    -- Write out the compare summary
    !!integratorSupportHandler.printSummary()
    -- View the report unless running in non graphics mode
    if (not istty) then
      !file = object FILE('c:\mac\compareReport.xml')
      if (!file.exists()) then
        !!integrator.openreport()
      endif
    endif
  endhandle
endif
```

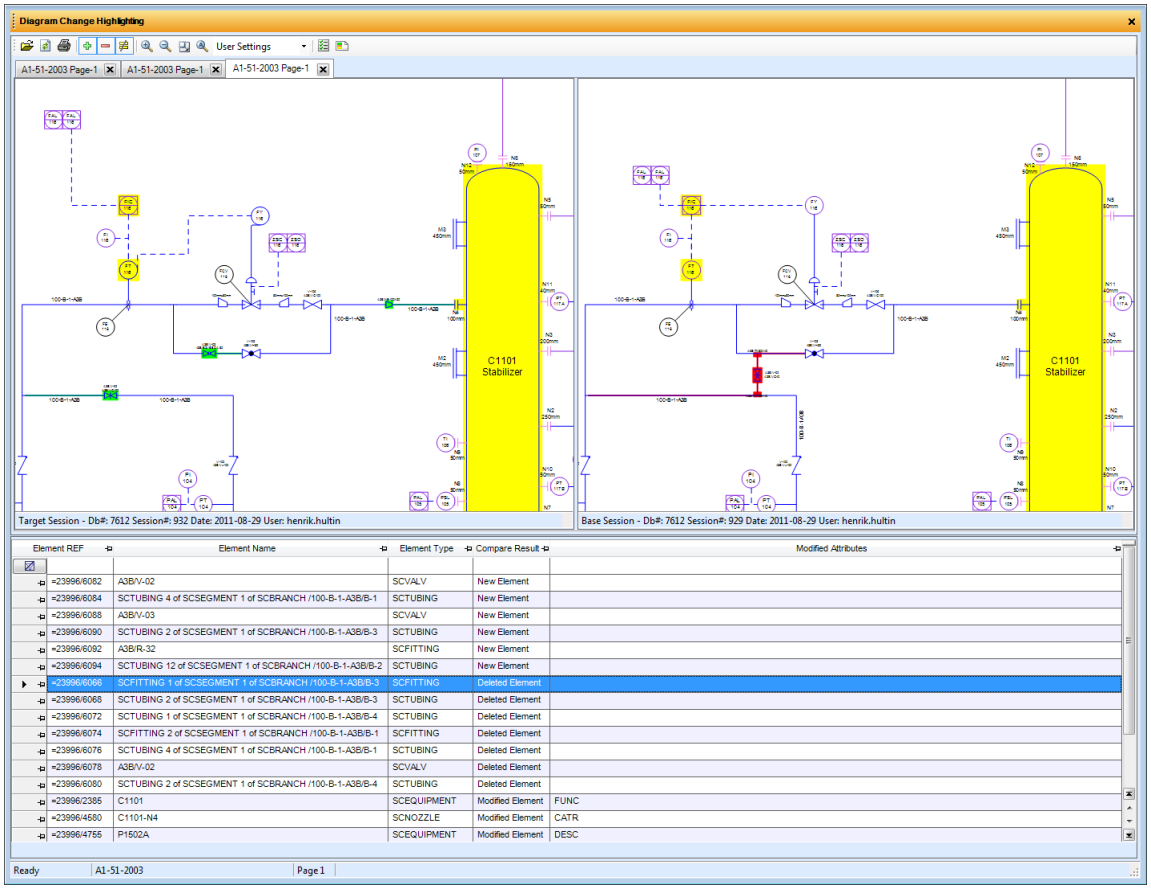
23. AVEVA Diagrams

23.1 Diagram Change Highlighting

Changes to schematic diagrams can now be highlighted in the Diagrams, Schematic Model Manager and Tags modules, using a new Diagram Change Highlighting add-in. This add-in enables the database changes between two database sessions to be viewed, using the AVEVA SVG Viewer to highlight the changes in colour. It also provides a summary of the changes in the list below the two viewer screens.

It can be accessed from the context menu of the Schematic Explorer:



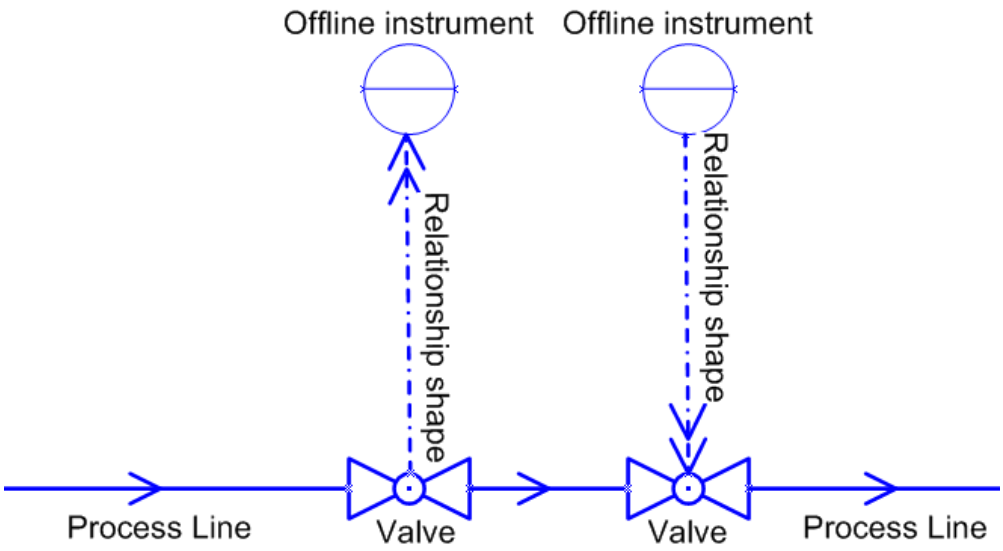


Note: For this function fully to work with the data created by the Diagrams application, it requires that SVG files are created for the relevant sessions. This is affected by the “Keep session files” and “Create SVG on Save Work” settings in Diagrams Options, as well as the possible use of the “Release Diagram to 3D” button.

For more information

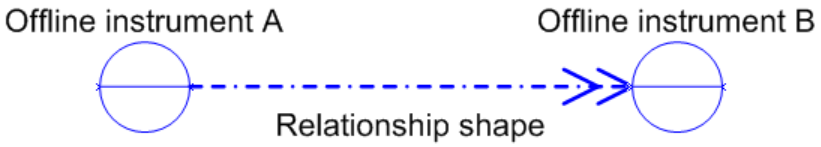
Only noted here.

23.2 Connection between Instrument and Process Items



It is now possible to use Instrument Relationship Shapes to connect Offline instruments or Actuators to any valid process item. The connection point will be created automatically on the shape if connection is possible, so the user will not have to create any additional ones beforehand.

However, connection points on in-line items that were designed for in-line flow connections cannot be used for instrumentation connections.



23.3 Automatic Upgrade of Options Settings Files

The Diagrams Options files (DiagramsDefaultSettings.xml and DiagramsAttributePresentation.xml) are now automatically upgraded from previous versions, so that existing project settings can be preserved in the upgrade process while also gaining access to new settings and options introduced in the latest version.

The process of upgrade relies on a proper placement of the file containing the options values from an older version of diagrams. The proper place for the file is described in detail in the Diagrams User Guide, in the Diagrams→Getting Started→Application Settings→Diagrams Options section. The upgrade is fully automatic and executes upon application start. A report of the upgrade process, containing descriptions and locations of the participant files and any problems that might have occurred is available in the Diagrams Message Log.

23.4 Admin Settings vs. User Settings

It is now possible for customers to define and set up which settings should be Admin Settings and which settings should be possible for regular users to change.

The administrative set has the same format as the current version of diagrams options store, but is located at a location which is write protected for the user but read/write for administrators.

When an option in the administrative set has a “ro” value of the access attribute (access=“ro”), this option’s value will overwrite the value set in the user’s options store, and the option will be disabled (greyed out) in the Diagrams Options dialogue.

23.5 Handling of Units in Annotations

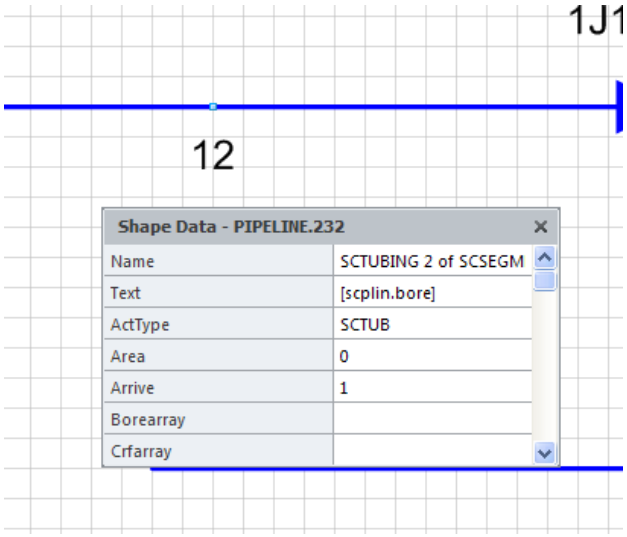
With the release of AVEVA Hull and Outfitting 12.1, some changes and enhancements have been made to the handling of Units.

In AVEVA Diagrams changes have been made to accommodate the new functionality and to allow presentation of values with or without units in shape text and annotations.

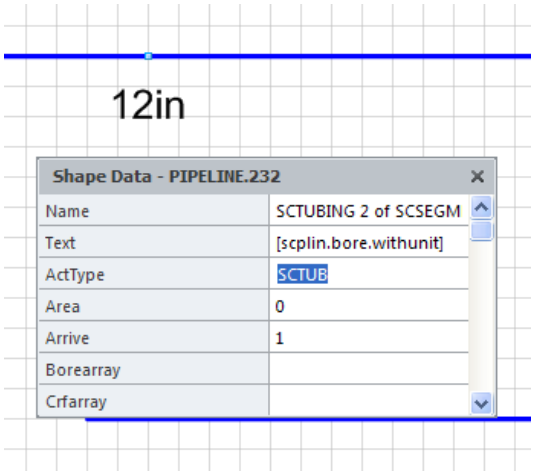
Some attributes with numeric values are now dimensioned and have associated units. For example, attribute PRESS of element of type SCPLIN currently has a dimension of type “pressure” and can have units of pressure (psi, bar, etc.). All attributes that are dimensioned have current session units.

If the current session unit for the dimension of pressure is psi, and the value of the attribute PRESS is 23psi, one can use [scplin.press] to use the value of the attribute in annotation: this will produce the value of the attribute in the current units - “23”. If the units are desired, the “.withunit” keyword can be used - [scplin.press.withunit] will give the result in the annotation text as “23psi”.

The following screenshot shows annotation where the “.withunit” keyword is used:



This shows the same annotation without using the “.withunit” keyword:



For More Information

See User Guide *Schematics / Diagrams / Appendices / Attribute Presentation Notation*.

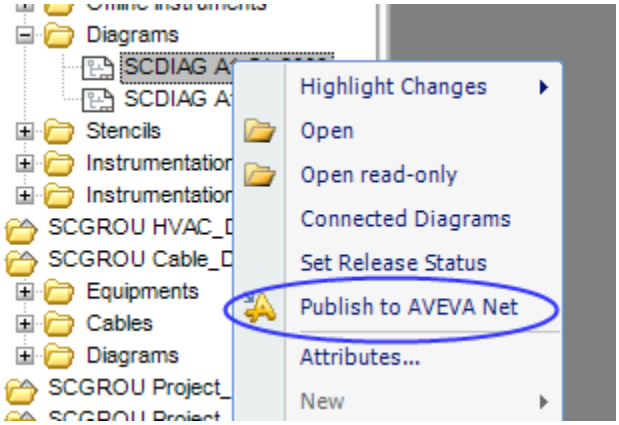
Affected Programs

AVEVA Diagrams

23.6 Publish Diagrams Data to AVEVA NET

Description

This version of AVEVA Diagrams has new functionality to publish Diagrams data to AVEVA NET. Publishing can be done on individual pages in a diagram. This will make the diagram and the schematics data on the diagram available in AVEVA NET.



It is also possible to publish several diagrams using the Batch Job function, and also to publish the diagrams while releasing the Diagrams data to 3D.

For More Information

See User Guide *Schematics / Diagrams / Utilities / Publishing Data to AVEVA NET*.

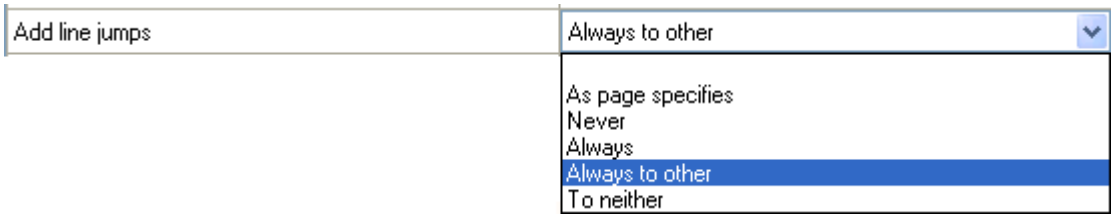
Affected Programs

AVEVA Diagrams

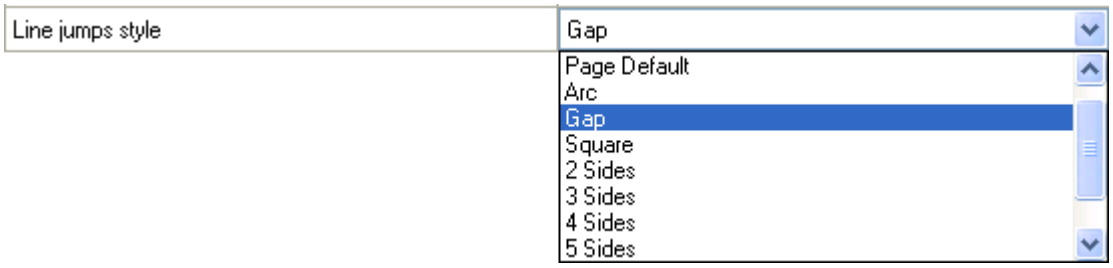
23.7 Automatic Line Breaks Depending on Line Priority.

Support for line jumps has been introduced in the Auto Formatting Rules feature. Two new format types have been added on the 'Format to Assign' tab in the 'Auto Formatting Rule Details' window:

- Add line jumps – allows the user to specify the behaviour of the line when crossing another line shape. It can be selected from a list of standard values:



- Line jumps style – allows the user to specify the style of jump if the line is the one which should break. It also can be selected from a list:



The new settings together allow the user to specify the behaviour of crossing lines depending on defined conditions. If the settings are applied properly by rule, the result is visible on the drawing and also appropriate values are shown for particular shapes on the tab in the Visio Format->Behaviour dialog.

For More Information

See User Guide *Schematics / Diagrams / Working with Diagrams / Auto Formatting Rules*.

23.8 Improved Shape Annotation in Schematic Model Viewer

It is now possible to individually control the shape annotations for the element types in the Schematic Model Viewer. The following settings can now be made using the options dialog in the Schematic Model Viewer:

- Display criteria for selection of shapes
- Display text
- Icon (.png file)
- Stencil shape

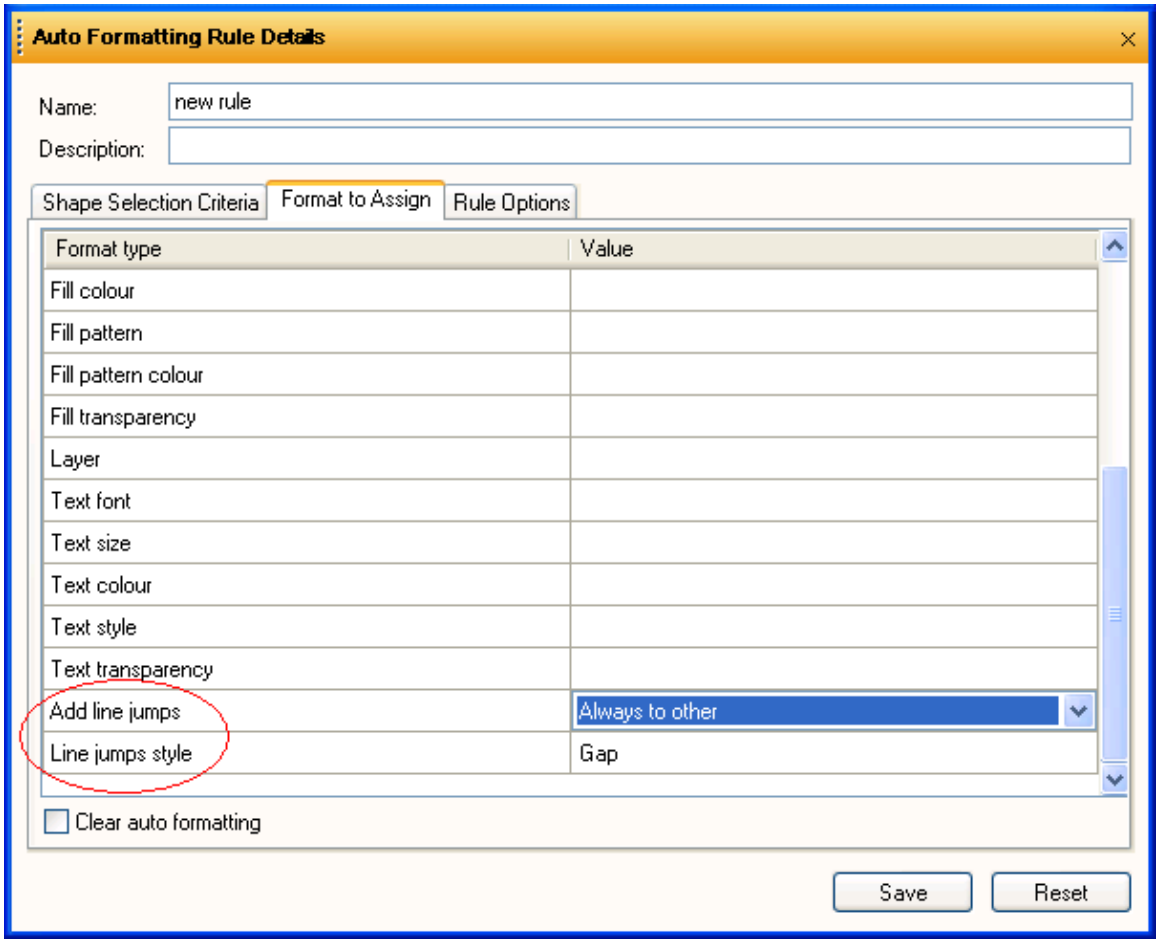
For More Information

See User Guide *Schematics / Diagrams / Schematic Model Viewer*.

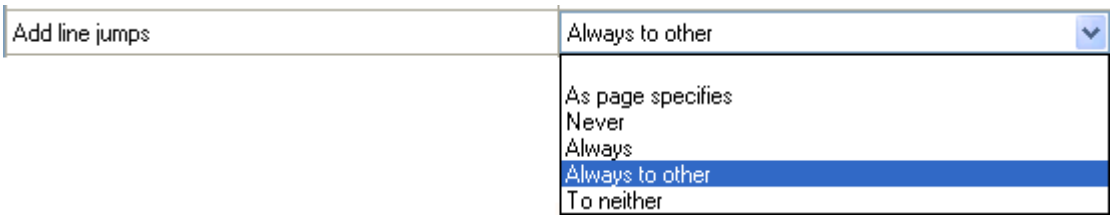
23.9 Automatic Line Breaks Depending on Line Priority.

Description

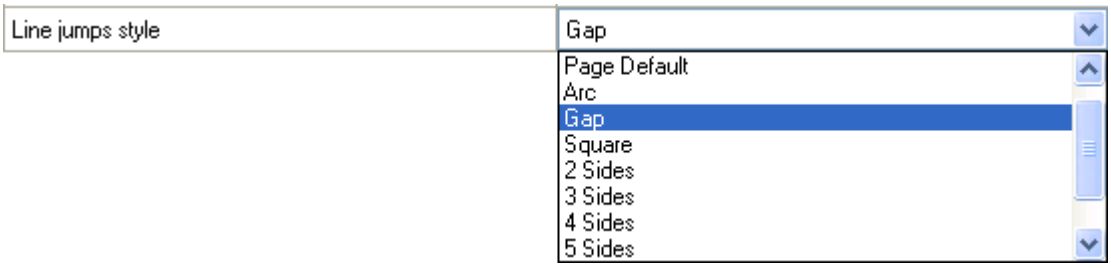
Previously Diagrams did not provide functionality to configure automatic line jumps with priorities depending on attributes. To capture the requirement, support for line jumps has been introduced in the Auto Formatting Rules feature. Two new format types have been added on the 'Format to Assign' tab in the 'Auto Formatting Rule Details' window:



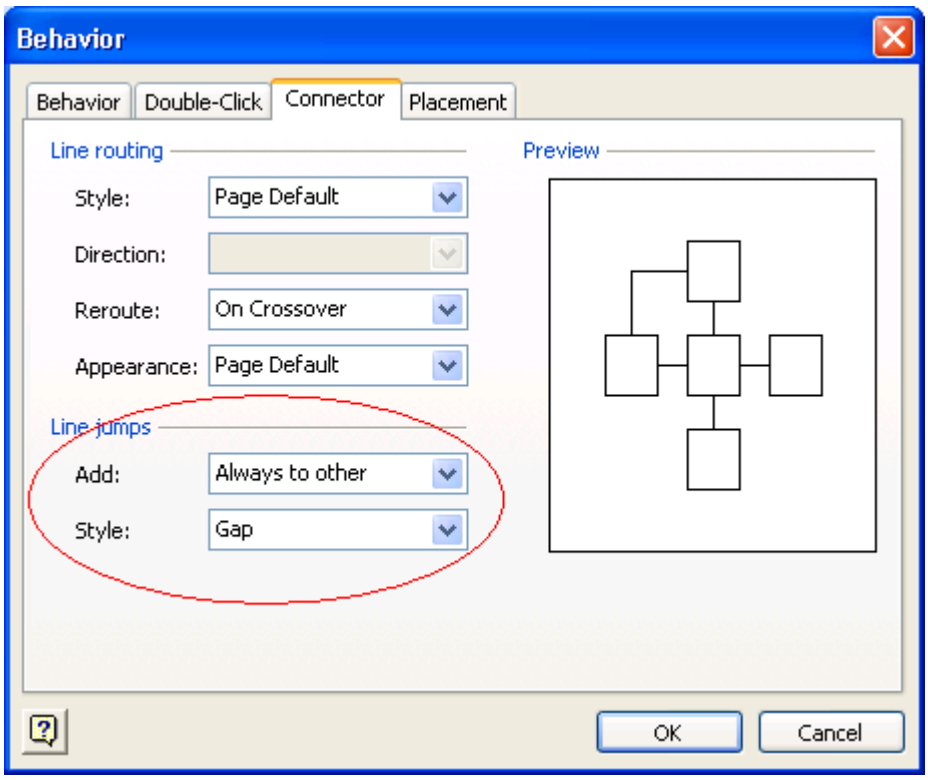
- Add line jumps – the setting allows to specify the behaviour of the line when crossing another line shape. It can be selected from a list of standard values:



- Line jumps style – allows to specify the style of jump if the line is the one which should break. It also can be selected from a list:



The new settings together allow specifying behaviour of crossing lines depending on defined conditions. If the settings are applied properly by rule, the result is visible on the drawing and also appropriate values are shown for particular shapes on the tab in the Visio Format->Behaviour dialog:



Benefits

Auto Formatting Rules functionality covers user needs in a better way.

Compatibility Constraints

None.

For More Information

See User Guide Schematics / *Diagrams / Working with Diagrams / Auto Formatting Rules*

Affected Programs

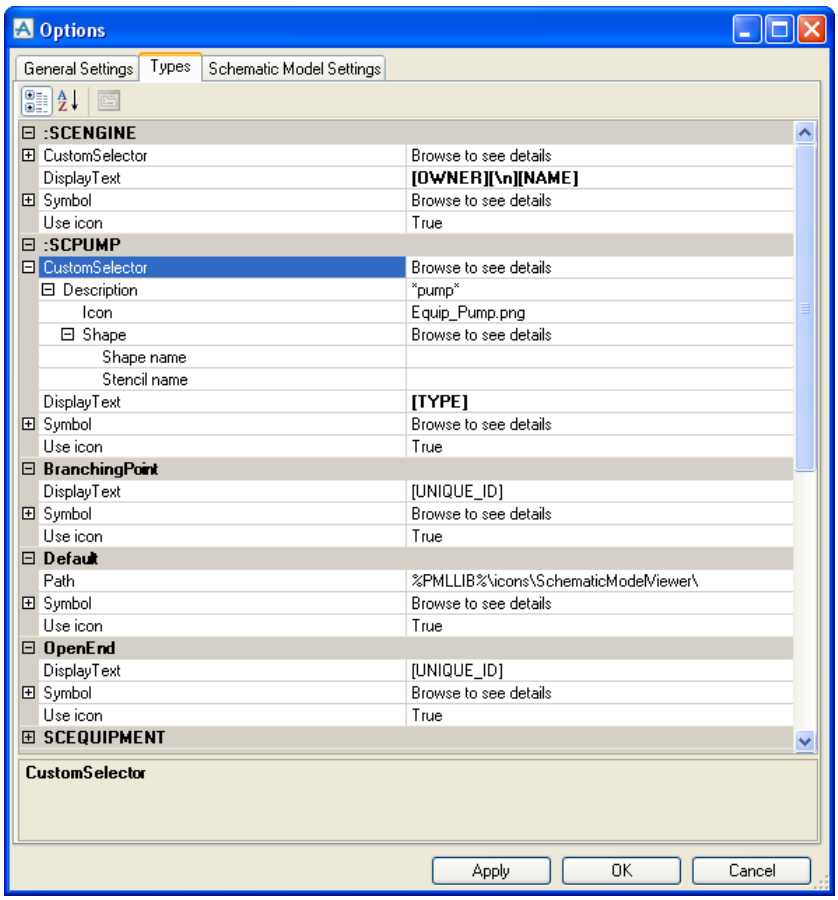
Diagrams

23.10 Improved Shape Annotation in Schematic Model Viewer

Description

It is now possible to individually control the shape annotations for the element types in the Schematic Model Viewer. The following settings can now be made using the options dialog in the Schematic Model Viewer:

- Display criteria for selection of shapes
- Display text
- Icon (.png file)
- Stencil shape



Benefits

Enables the user to better control shape annotations in the Schematic Model Viewer.

Compatibility Constraints

None.

For More Information

See User Guide *Schematics* / *Diagrams* / *Schematic Model Viewer*

Affected Programs

Diagrams

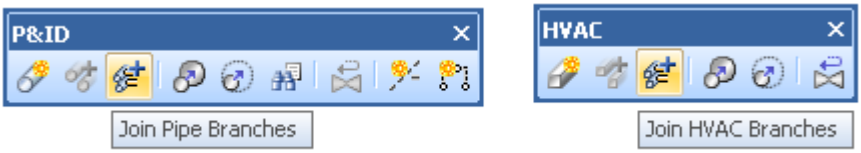
23.11 Split-Merge for SCBRAN

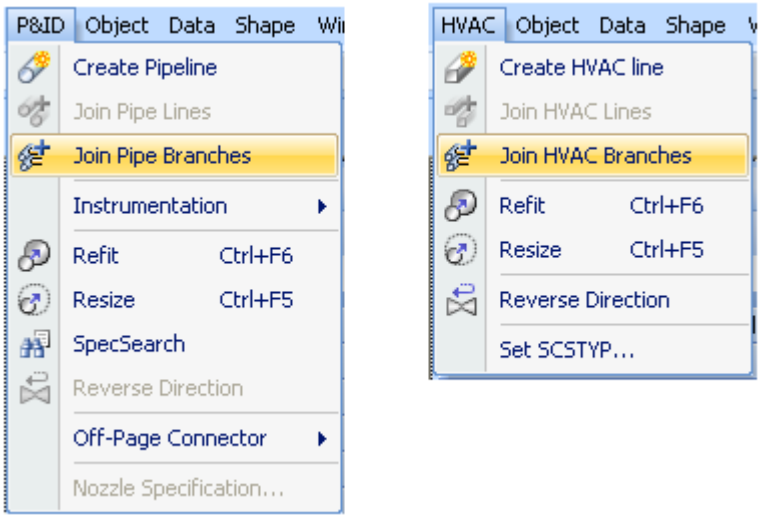
Description

Split-Merge functions for SCBRAN now available in Diagrams.

- Join

To join two branches please select two valid connectors and execute the Join <LineType> Branch option from toolbars or menus:

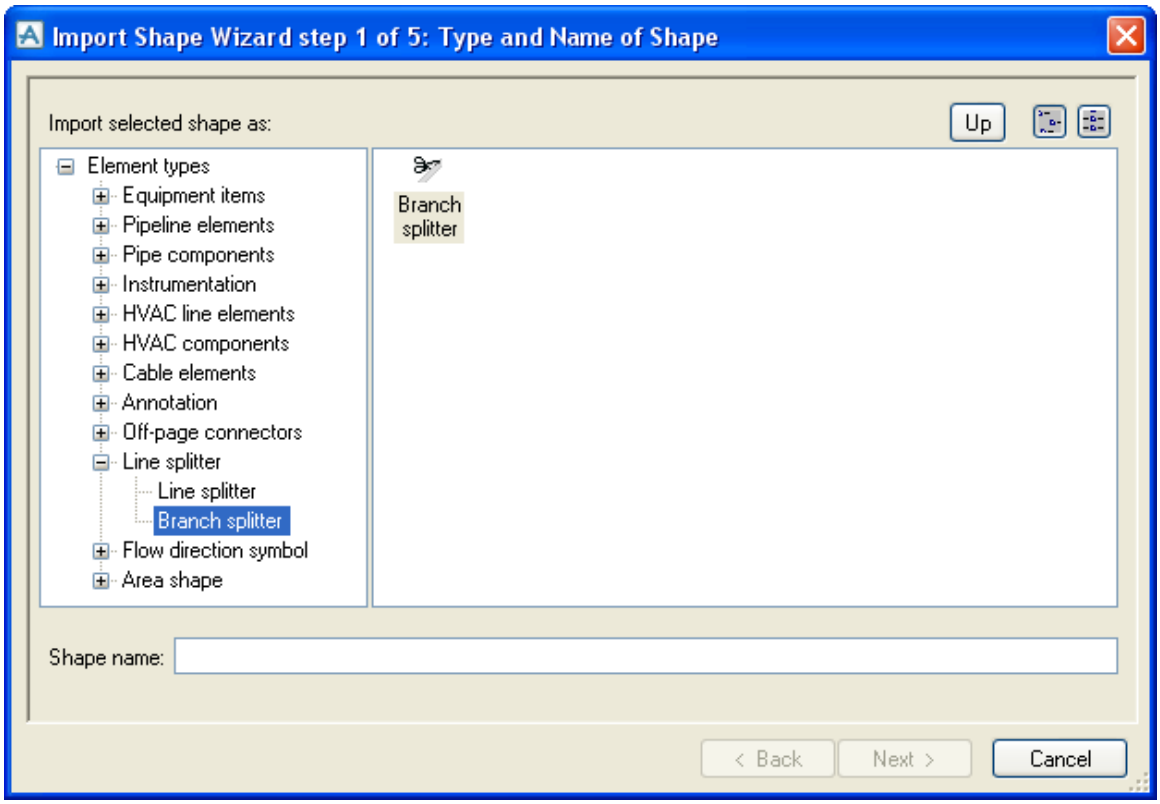




If join will not be possible the system will notify the user in the System Message log.

- Split

To split branches use the ‘Branch splitter’ symbol which works in the same way as ‘Line splitter’.



Benefits

The possibility to join/split branches in simple way without using workarounds.

Compatibility Constraints

None.

For More Information

Only noted here..

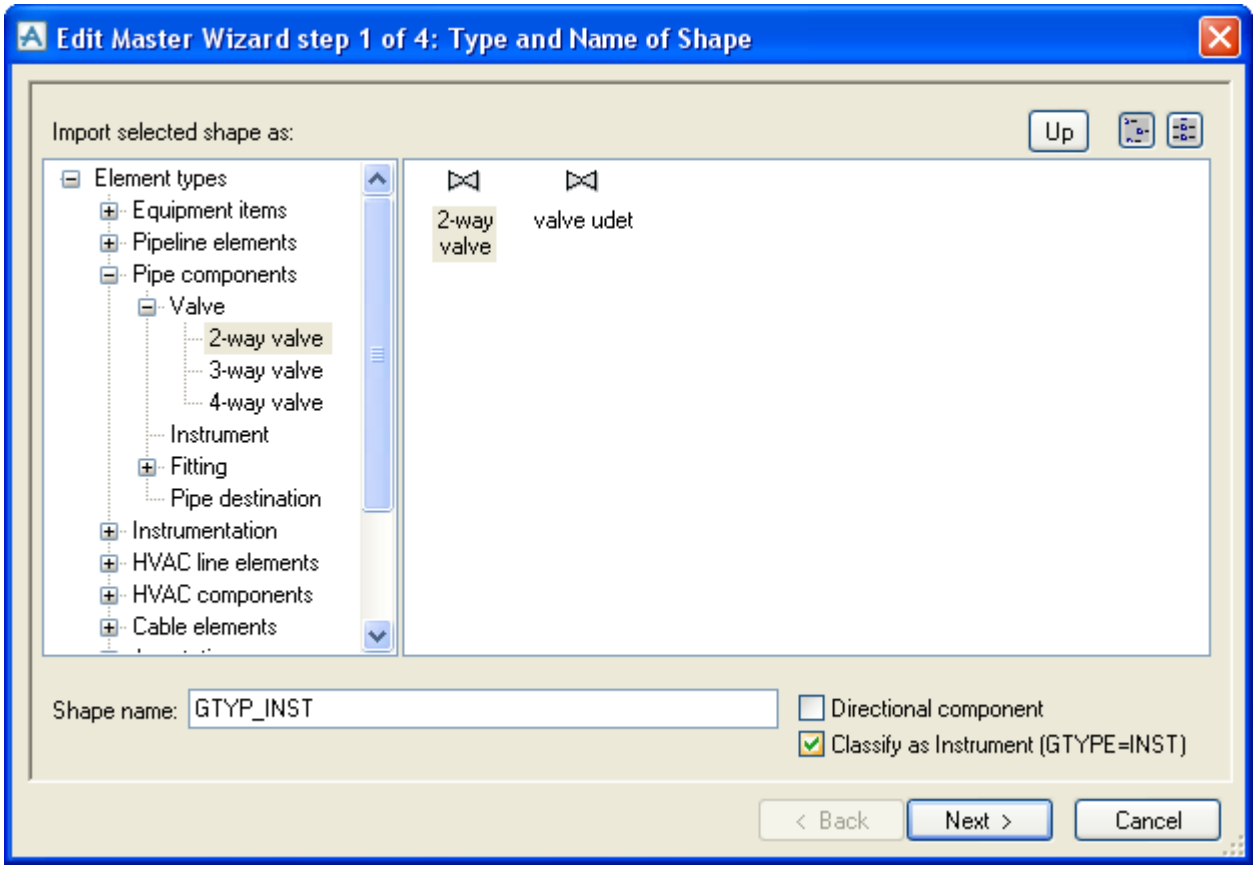
Affected Programs

Diagrams

23.12 Setting SCVALV GTYP to INST rather than VALV

Description

It is now possible to use INST as a GTYP on SCVALV elements instead of VALV, VTWA or VFWA gtypes. To achieve this, the master shape must have the 'Classify as Instrument (GTYPE=INST)' option checked on the Edit/Import master dialog.

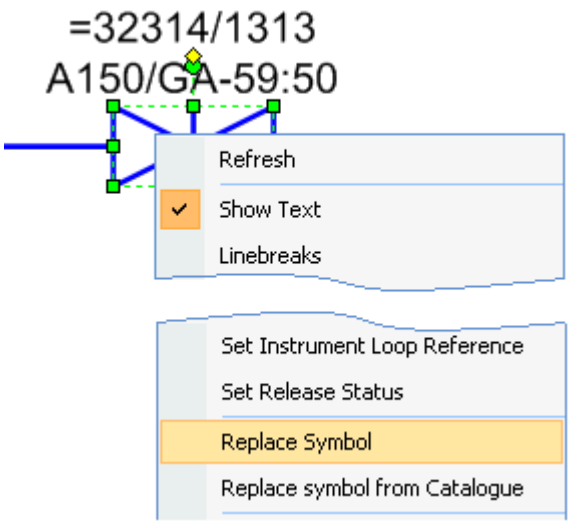


When this option is checked in the master item, all SCVALV's that will be created from this master will have GTYPE set to INST.

Changing existing items

1. Changes on opened diagram

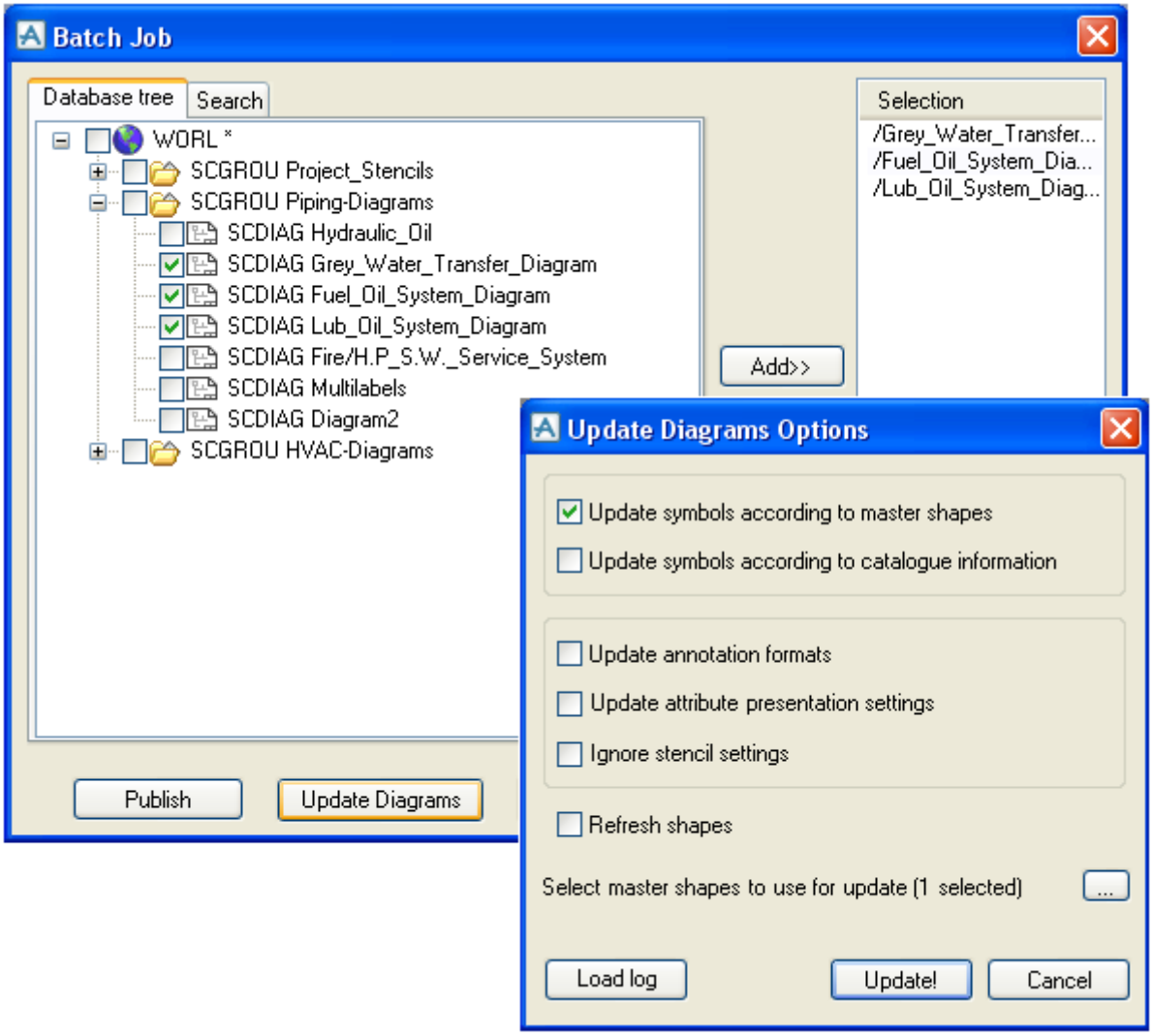
It is possible to change existing SCVALV gtyp from VALV, VTWA or VFWA to INST using the shape context menu option 'Replace Symbol'.



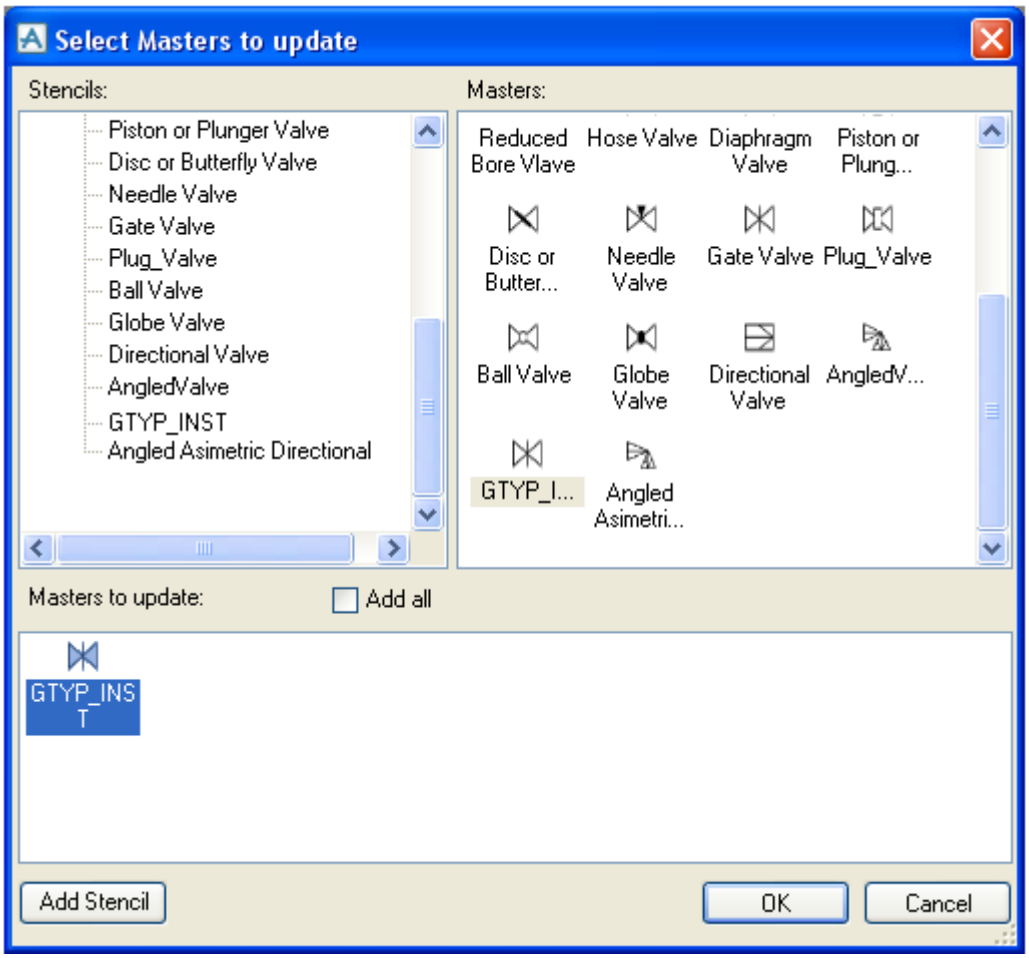
If your current item has a GTYP different to INST and you replace this shape with a master that have the ‘Classify as Instrument’ option checked, then after shape replace, the system will change GTYP from the existing one to INST and give a warning message in the System Message Log. Of course this can work the opposite way around. The system is able to change INST GTYP to VALV, VTWA or VFWA.

2. Batch changes

In case you have many diagrams and you want to update all items on all drawings you can use the ‘Update symbols according to master shapes’ option from the Batch Job update:



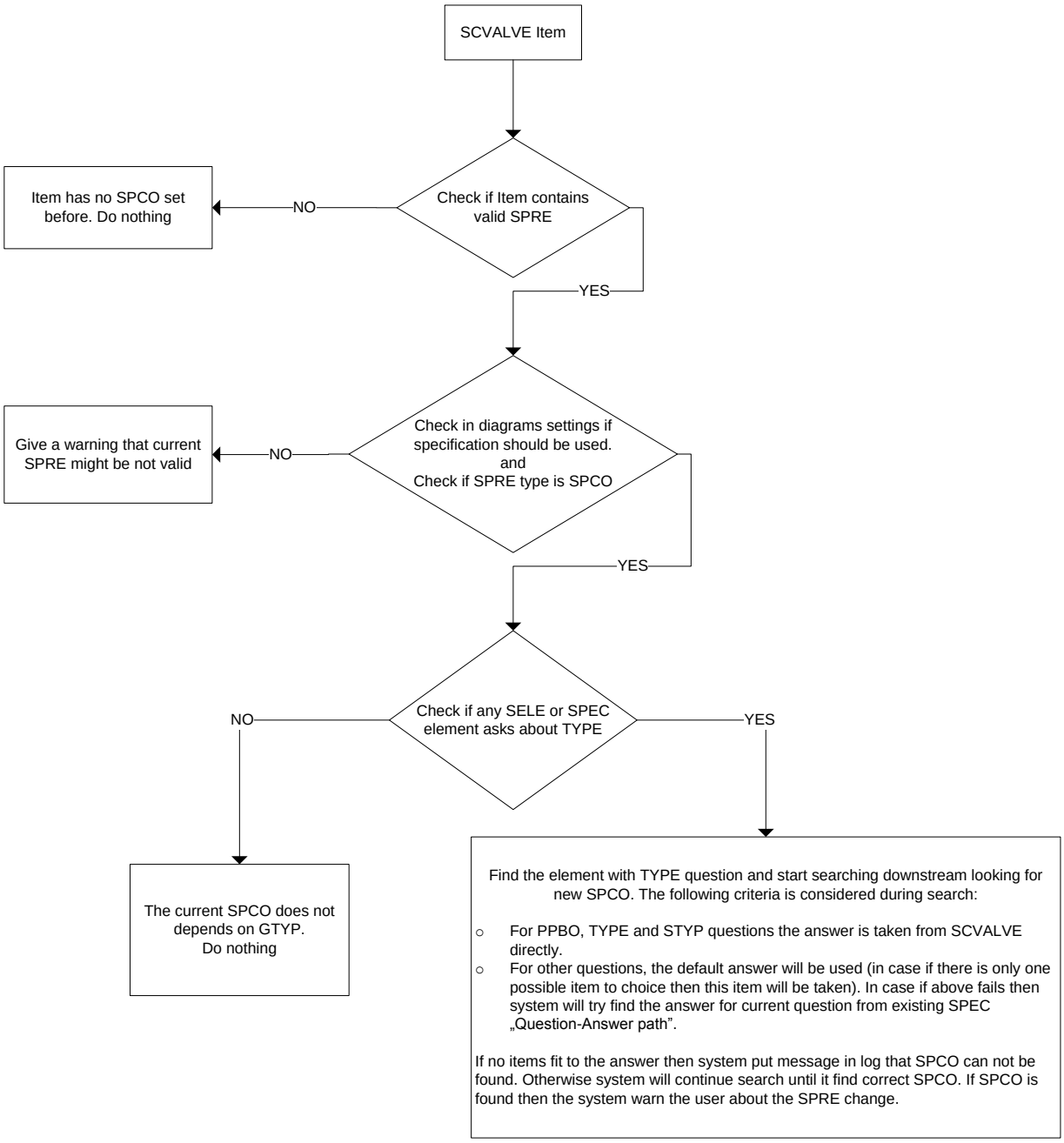
Before you can use this option you have to modify the masters that were used to create valves by checking/unchecking the ‘Classify as Instrument’ check box. After that, you need to select it using the dialog below:



In case the system will change GTYP during this operation, a warning message will be displayed in the batch job log.

Specification search during batch job:

If GTYP has been changed and existing item has valid SPRE attribute set then system will try to find the new specification. The search algorithm is presented below:



For More Information

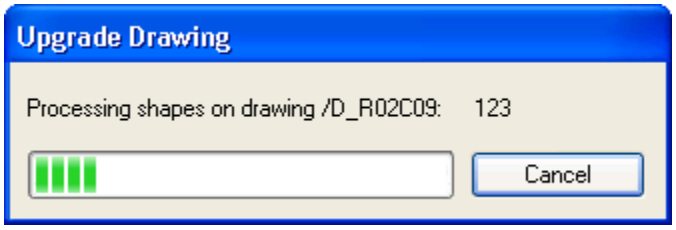
See User Guide *Diagrams / Utilities / Batch Job.*

23.13 Changes to Upgrade Drawing Functionality.

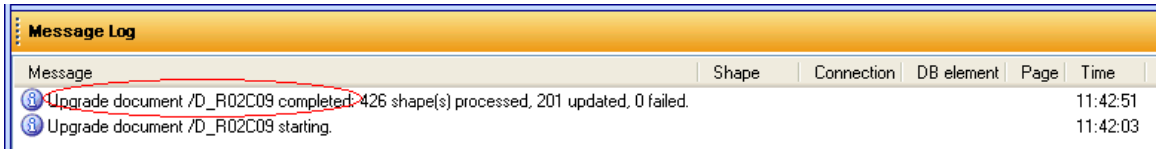
Description

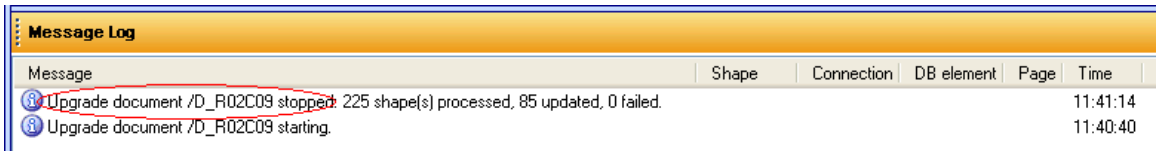
Previously after ‘Upgrade Drawing’ was executed either automatically on open or manually from the Tools menu it was not possible to cancel the operation. However, it was possible to close the drawing before the upgrade was completed and this caused an exception.

Now a progress bar is shown during ‘Upgrade Drawing’ and the operation can be safely cancelled:

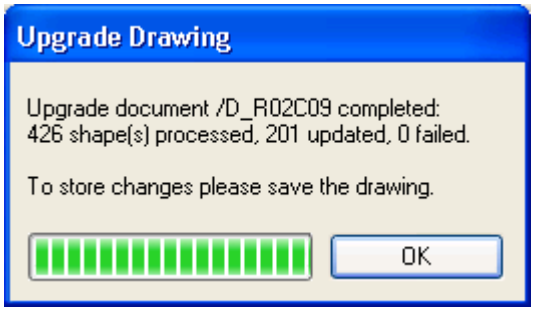


Also, appropriate messages are added to the message log on operations start and cancel/finish:

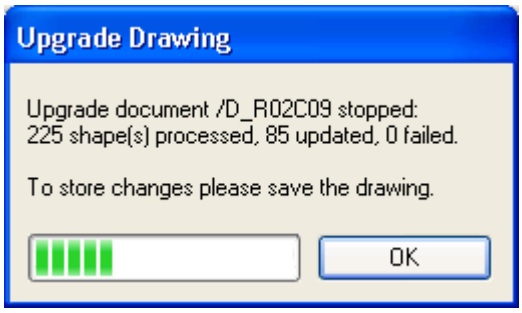




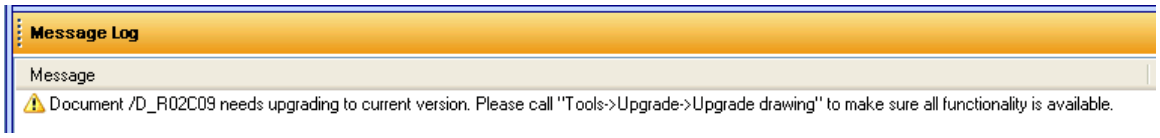
Additionally, when ‘Upgrade Drawing’ is called manually from the Tools menu, a status window appears after the operation is completed:



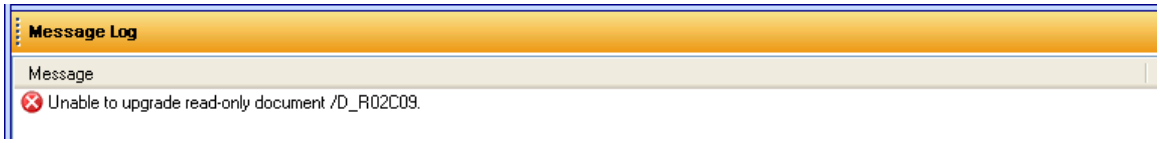
or was stopped by the user:



In case the user opens a drawing that is not updated to the current product version and the 'Upgrade drawing on Open' option is set to false, the following warning appears in the message log:



If the 'Upgrade drawing on Open' is set to true, but for some reason the drawing cannot be opened automatically, an appropriate error message is added to the message log:



Benefits

The 'Upgrade Drawing' functionality works better and does not cause any errors.

Compatibility Constraints

None.

For More Information

Only noted here.

Affected Programs

Diagrams

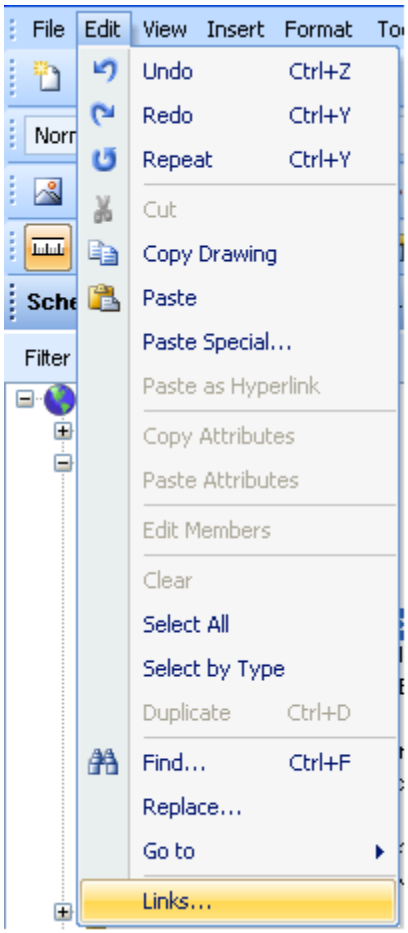
23.14 Linked Files Update

Description

New ways to update linked objects in a diagram.

- Use Edit->Links… dialog

When a drawing that contains linked objects is active then the ‘Links…’ option is active in the ‘Edit’ menu. This option is hidden when a drawing has no linked objects.



- Use ‘Update Diagrams’ in batch job. (File->Batch Job…)

This option allows the user to update linked objects in many drawings in one go.

Benefits

Allows users to update and manage linked objects.

Compatibility Constraints

None.

For More Information

Only noted here.

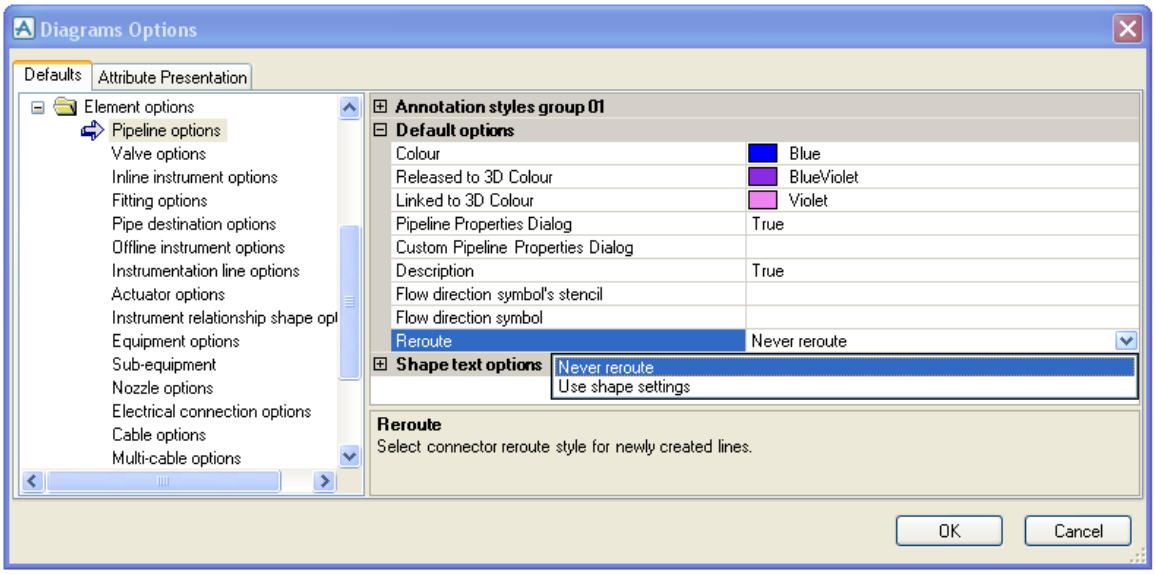
Affected Programs

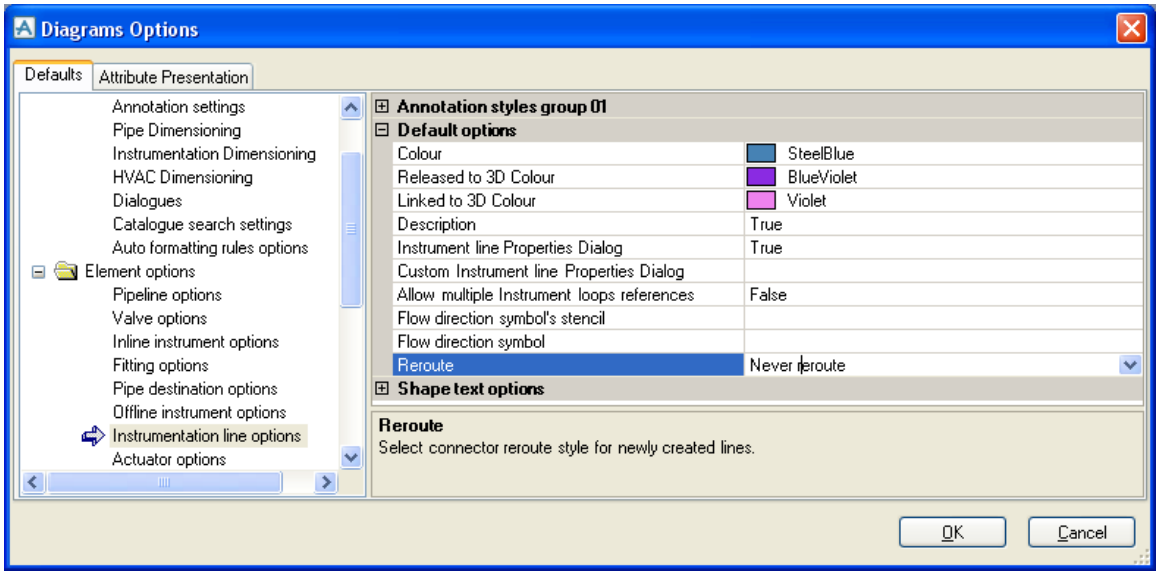
Diagrams

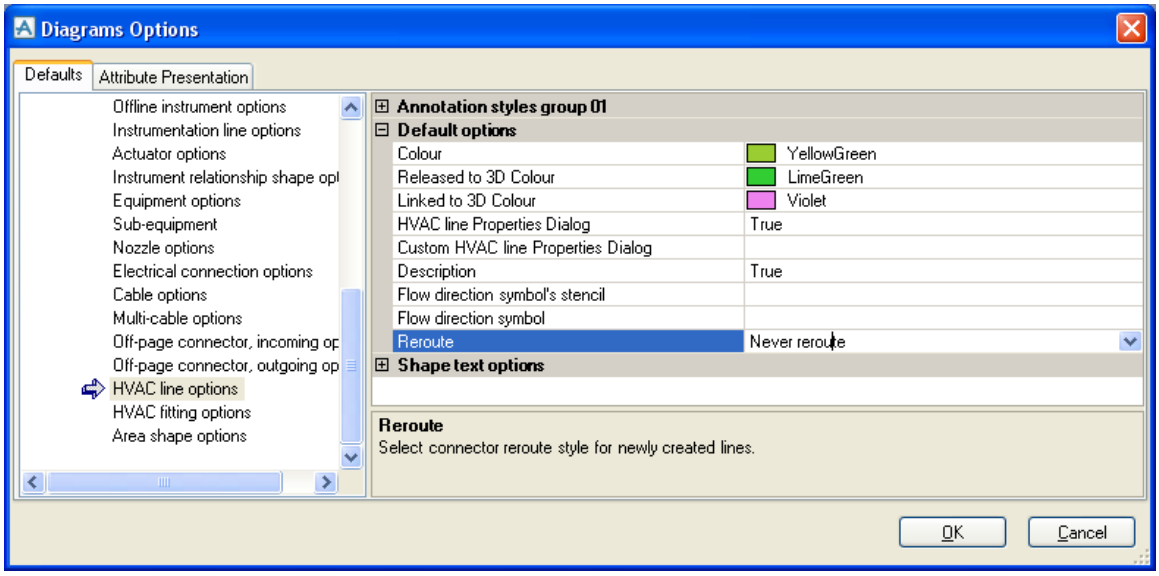
23.15 Possibility to Determine Connector Re-route Style

Description

It is possible to determine a connector re-route style for newly created lines. For HVAC, Pipe and Instrument line types a special option called ‘Reroute’ has been added. This option allows the settings ‘Never reroute’ or ‘Use shape settings’ for newly created connector lines. By default ‘Never reroute’ is selected. In case the ‘Use shape settings’ is selected then Visio decides which setting will be used.







Benefits

Newly created ducts or tubes can have routing style set to ‘Never Reroute’ by default.

Compatibility Constraints

None.

For More Information

Refer to User Guide *Diagrams / Piping and Instrumentation Diagrams / Adding Parts to a Branch / Dropping and Connecting.*

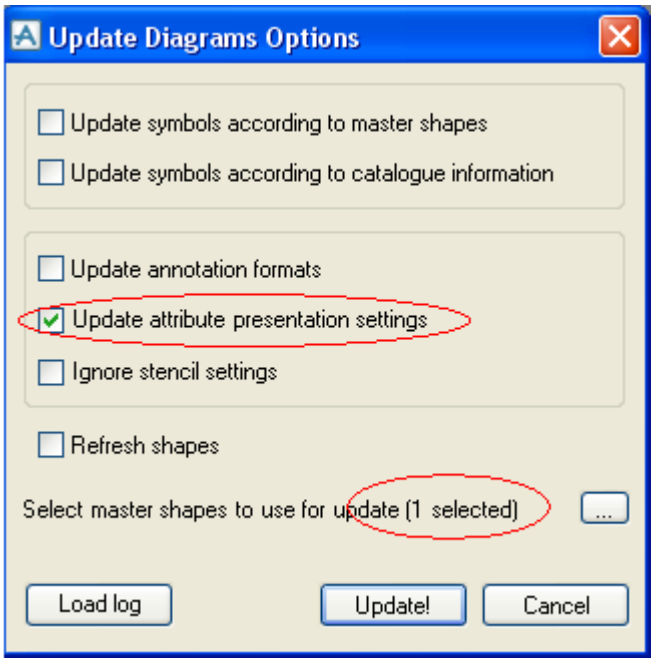
Affected Programs

Diagrams

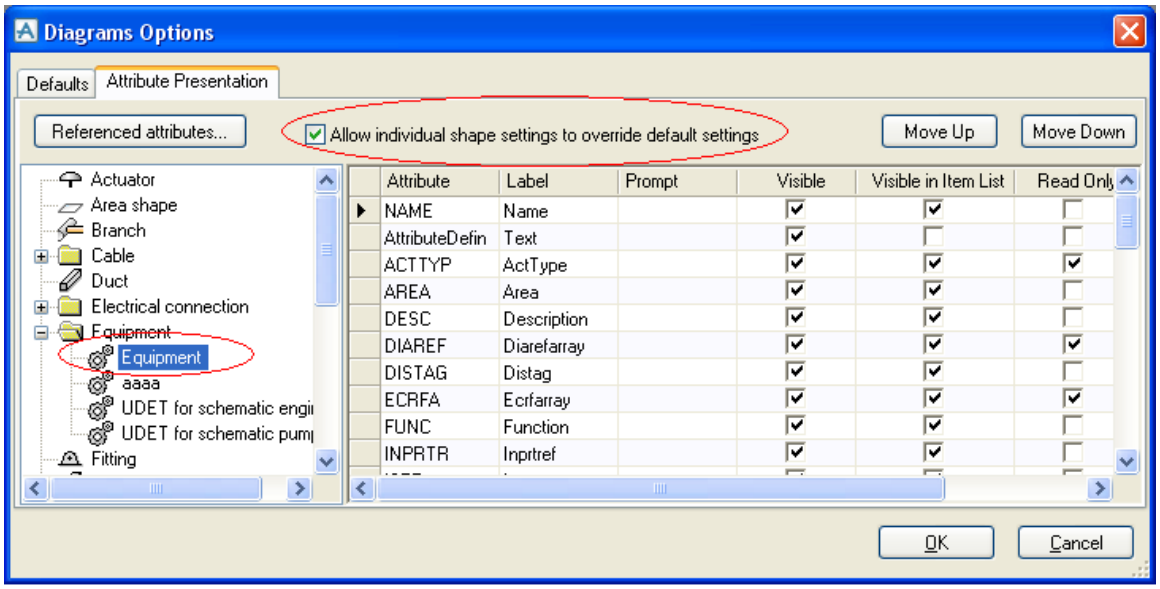
23.16 Default Value of the Stencil in Batch Job

Description

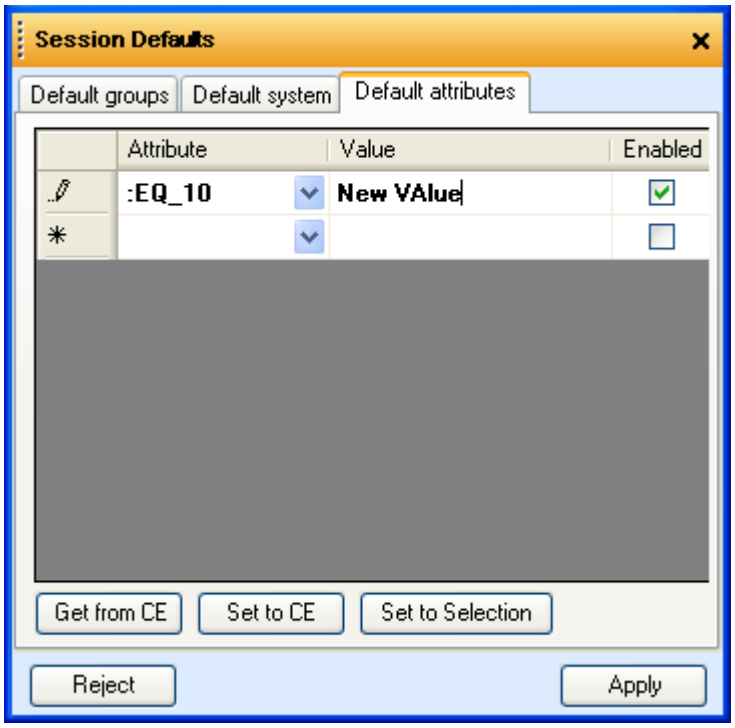
To be able to set default values for all existing items that have been created from particular equipment masters it is necessary to edit the equipment master and set the default value for the new UDA. Then running the Batch Job with 'Update attribute presentation settings' selected. The master that contains the modified data must be selected.



Before starting the batch update it is necessary that 'Allow individual shape settings to override default settings' is checked for items that needs to be updated.



If this setting is not checked, the default value of the new UDA will be taken from ‘Session Defaults’.



If the system changes the database attribute, there will be detailed information in the batch job log.

Please note that the system will not set attribute value for items where a UDA was already defined in shape data. If refresh is executed before the update then refresh will add any missing UDA to shape data with a default value. Then the system detects it and will not set a default value to database.

Benefits

The possibility to update existing items about newly created attributes values using batch job.

Compatibility Constraints

None.

For More Information

See User Guide *Schematics /Diagrams / Utilities / Batch Job / Batch Update*.

Affected Programs

Diagrams

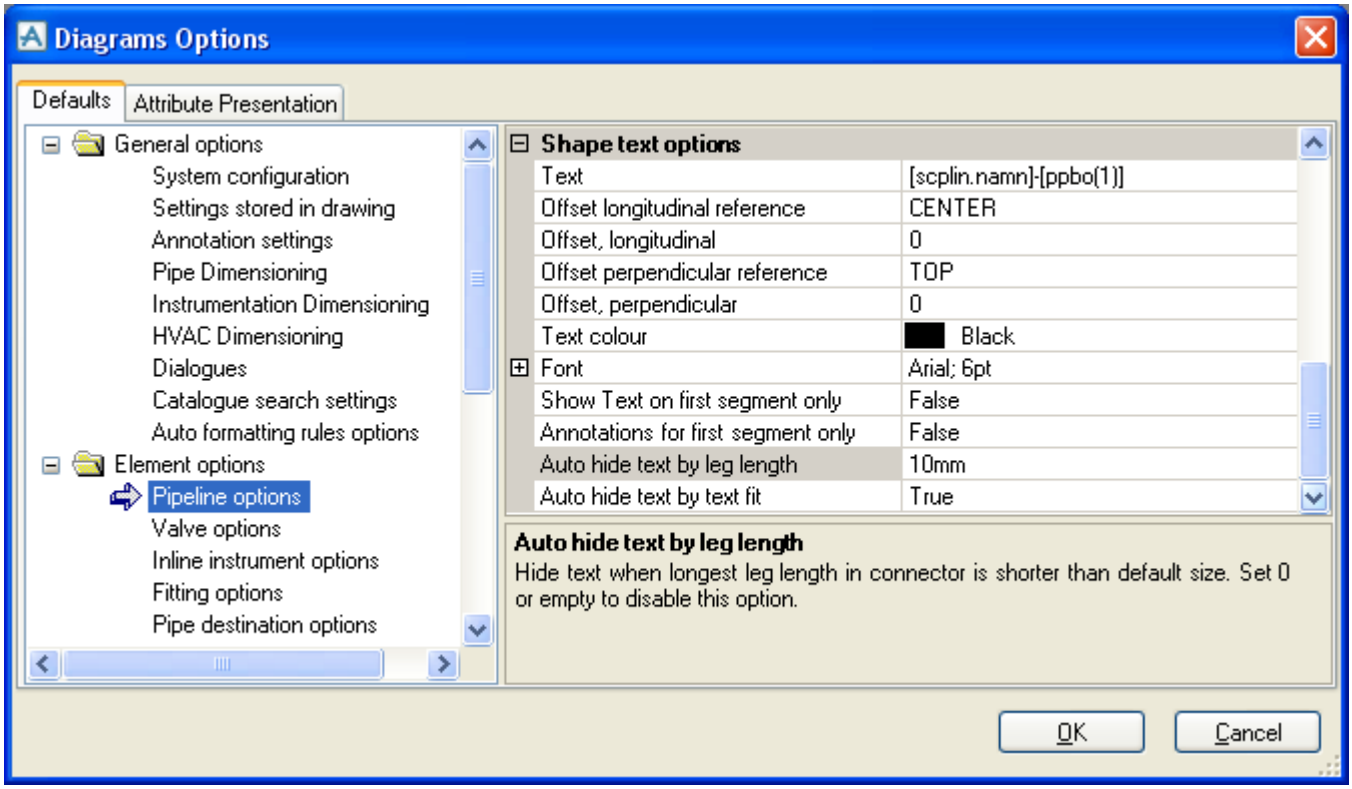
23.17 Auto Hide Option for Shape Text for Short Connectors

Description

Two new options have been introduced to keep diagrams nice and clean where text will be displayed on connectors only when some criteria are met. The options described below are valid for pipelines, instrument lines and HVAC lines.

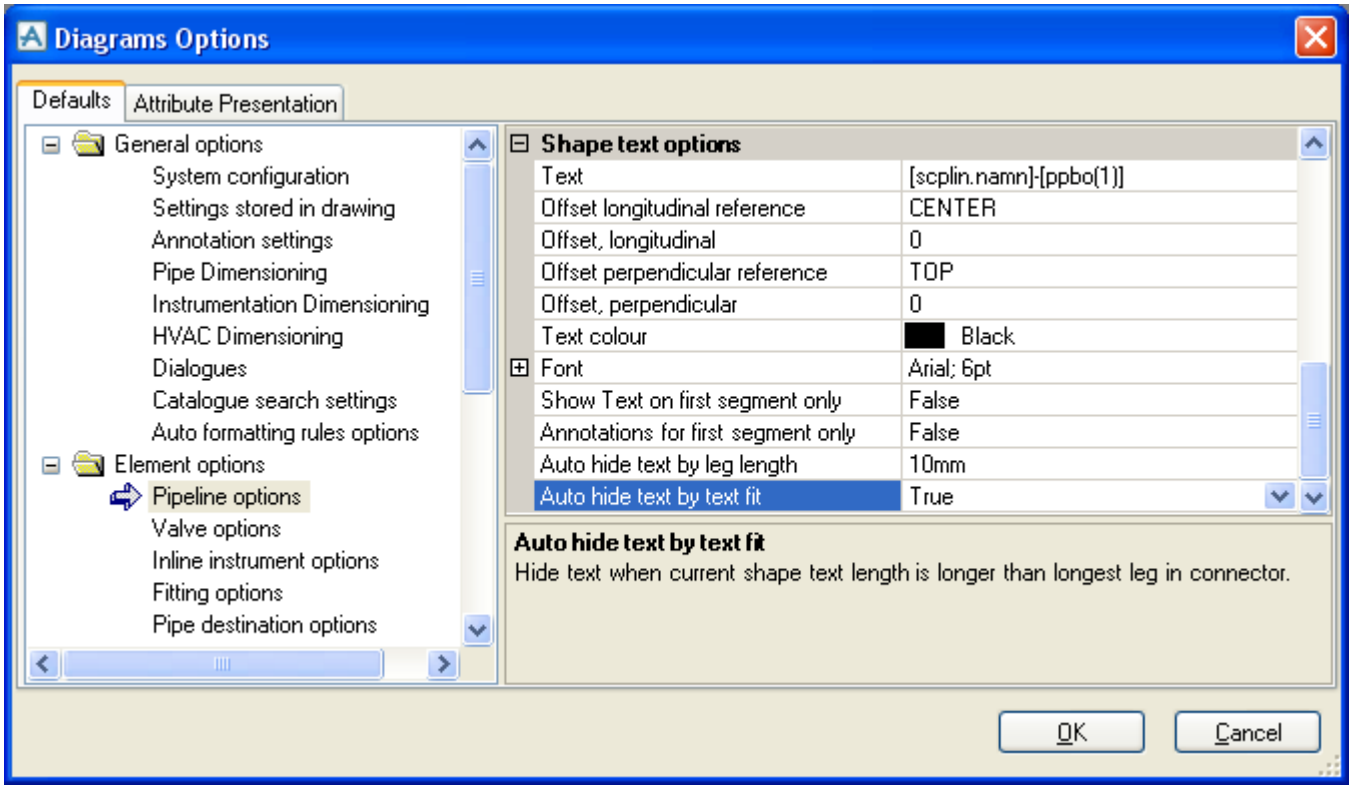
- **Auto hide text by leg length.**

  This option allows to determine a minimum size for the tallest connector leg where text will be visible. If the tallest leg of a connector will be shorter than the default then the text will be automatically hidden and the system will notify about this in the System Message Log. It is possible to use metric as well as imperial units to determine the distance value. To disable this option, set it to 0 or just use blank.



- **Auto hide text by text fit**

  This option will hide the text on the connector in the case the tallest leg of this connector will be shorter than the text that is currently displayed on it. If this happens the system will notify this in the System Message Log.



Both options will work when the connector size is changed. This means that text on connectors will be visible after you modify above options and accept changes. To make it work the connector size must be changed.

To enable text that has become invisible because of these options, the ‘Show Text’ option in the Shape Context menu must be ticked.

Benefits

There is a possibility to hide text on connectors because of the connector leg length.

Compatibility Constraints

None.

For More Information

Only noted here.

Affected Programs

Diagrams

23.18 Miscellaneous Minor Improvements

A number of further improvements have also been made to Diagrams for this release:

- **Area Shapes DB representation:** A new Database Element Type (SCAREA) to represent Area Shapes has been introduced. This allows data to be stored in the database related with Area Shapes, allowing them, for instance, to represent rooms with related attributes and properties.
- **Consistency Check Improvements:** The Consistency Check function now detects further issues that may exist with the objects on the diagram, such as bad references and inconsistent use of fluid between connected pipelines.
- **Auto Formatting Rules Improvements:** The “Format to Assign” tab in the Rule Details window now includes more options for format type; a number of UI enhancements have also been made to the Auto Formatting Rules windows.
- **Diagram and Page References:** Pseudo attributes that return references to the diagram(s) and page(s) on which objects are shown have now been introduced for further types of objects, for instance inline valves & fittings. This may help integration with other data sources such as Instrumentation.
- **Fixed Shape Text and Label position:** For tube & branch labels on Visio connectors, when the option 'Use Control Handle' is set and the text of a line is positioned using this, the position will be kept when the line is split by inserting a component. For all 2D shapes, there is now a new “Move label with 2D shapes” setting in the Annotations section in Diagrams Options. This allows the user to have labels with a fixed position, for instance Equipment Data Block labels that will not move when the equipment item itself is being moved.

24. AVEVA Engineering

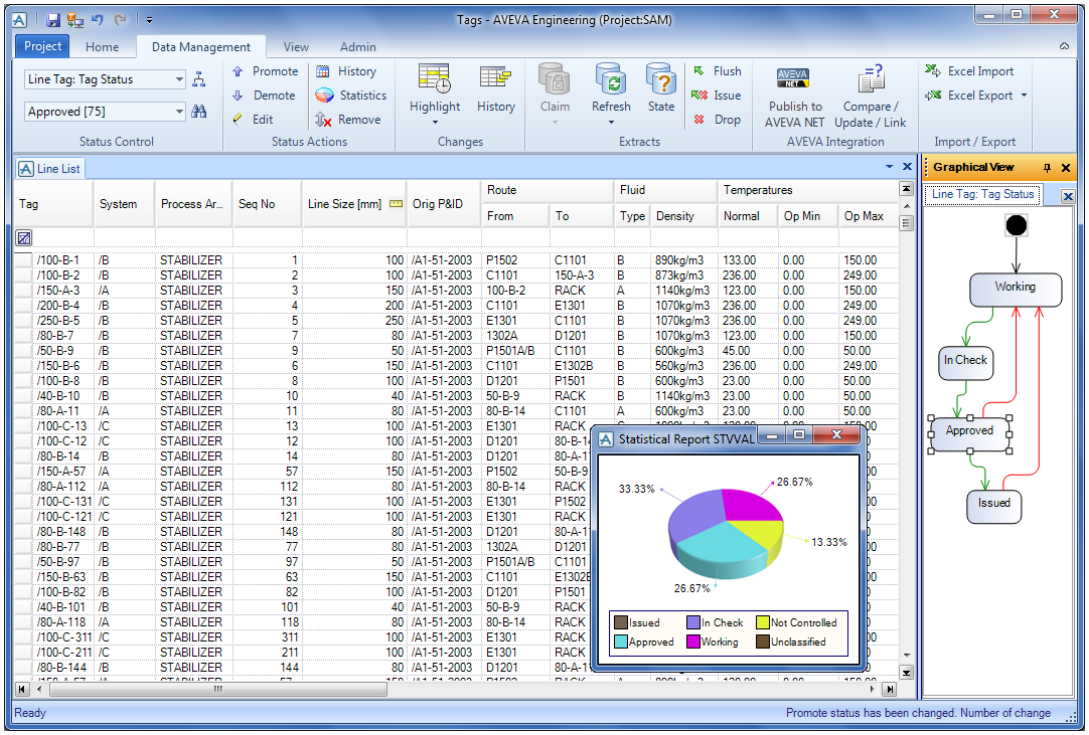
A new AVEVA Engineering product has been introduced with the release of AVEVA Plant and AVEVA Marine 12.1. This new product includes a new Tags module as well as a new ENGIneering Dabacon database type, designed and optimized for Engineering data. The Engineering product also includes Schematic Model Manager, which is no longer sold as a separate product.

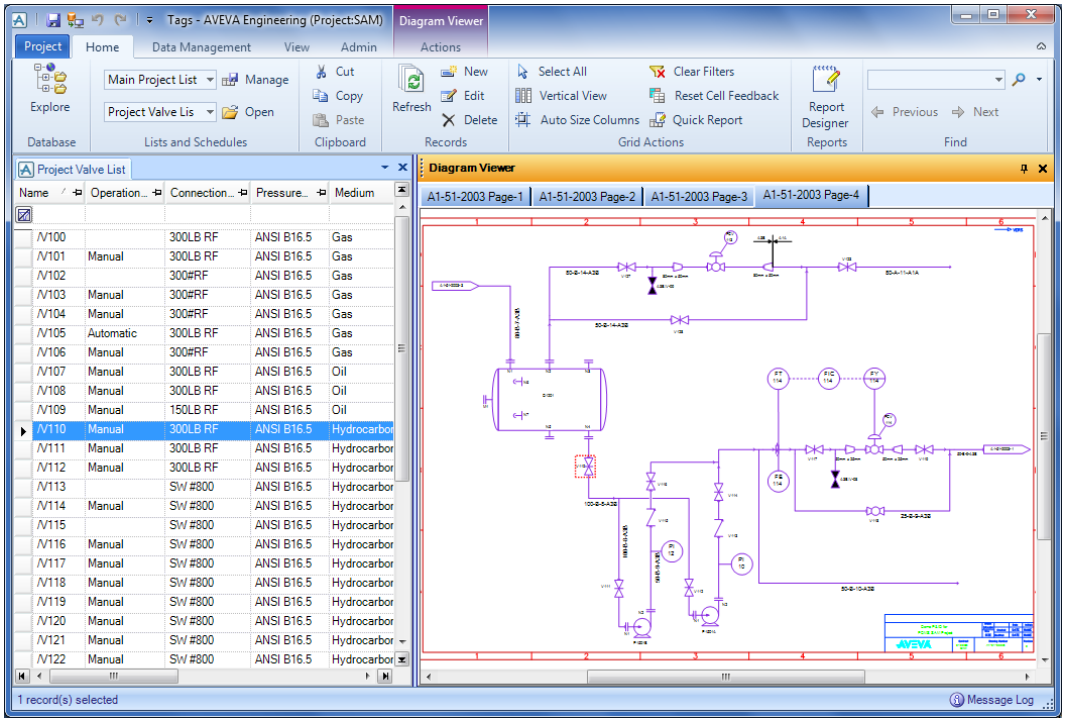
24.1 Tags

The new Tags module provides an easy-to-use and powerful user interface for engineering users, allowing them to work on Engineering Lists & Schedules and related data.

Some of the more prominent features and functions of the Tags module are as follows:

- **Easy-to-use User Interface:** Familiar Microsoft Office 2010-like UI. See pictures overleaf.
- **List Editing:** Grid-based editing of list data in the new ENGI database. List views can be set up Project Wide by administrators. It is also possible for regular users to create and use their own specialized layouts. This includes grouping/filtering and bulk editing capabilities.
- **Multi-discipline concurrent engineering:** By using the new Distributed Attributes and Database Views mechanisms, it is possible to allow true parallel work between different disciplines, even on the same object.
- **Navigation:** In addition to the list editing, it is also possible to navigate the engineering or system hierarchy to find and edit individual items.
- **Data Management functions:** A number of management functions such as Status Control, Change Highlighting, Attribute History and Extracts are available to manage the lifecycles of engineering objects.
- **Change Highlighting:** It is possible to highlight and report on changes made by different users and disciplines. This also includes highlighting of changes made in diagrams.
- **Diagram viewer:** A built-in diagram viewer allows users to view and navigate P&IDs and other schematics.
- **Compare & Update:** Engineering data can be compared and updated against a number of other AVEVA sources, such as Schematics, 3D, AVEVA Instrumentation etc. (see Compare/Update). It is also possible to compare individual items of the same kind against each other to find differences.
- **Excel Import/Export:** Engineering data can be imported from external sources and exported to external applications by using Excel Import/Export utilities.
- **AVEVA NET Integration:** Engineering data can be exported to AVEVA NET
- **Reports:** Project-quality formatted reports can be created direct from the Dabacon databases. As Engineering is based on the same platform as the 3D and Schematics tools, it is very easy to combine data from these sources into common reports.





For full details of this important new module, please see the *AVEVA Tags User Guide*.

24.1.1Admin Tab

The Tags module includes a new concept for administration. There is an “Admin” tab in the ribbon bar which is only available for users that are:

- Free users (Like SYSTEM)

- Members of the TAGSADMIN team

Allocating users to the TAGSADMIN team allows superusers or department managers to perform certain admin tasks in Tags / engineering, without them having to be free users.

24.1.2Tag Deletion

In the new Tags module, data for a single tag can be distributed over multiple databases to allow for different disciplines, possibly operating in different locations. For any tag, the data for each discipline is stored on a separate object but presented as if on a single object. It is thus possible to delete a tag but not have access to delete all of the distributed data, and this can result in orphan objects remaining.

The **Delete Tag Orphans.pmlmac** macro (available from AVEVA Support Knowledge Base) can be run in the Tags module to find and delete orphan objects. Please note that all relevant databases should be current before running this macro (it contains a warning). It maintains a log of its results including any errors where it is unable to delete an object. It may need to be run at different locations to tidy up periodically.

24.2 Schematic Model Manager

24.2.1 Use of units

Schematic Model Manager now uses the new units capabilities rather than its former specific units functions. This means that imported data is automatically converted to the appropriate units chosen for the project. In the Project Options dialogue, the Units tab has been removed.

The specific Units UDAs have been removed from the default file and will no longer be populated on import. Users can choose to use them but will need to set them up as required.

The Attribute Type is no longer needed in the Attribute Mapping file, so has been removed from the Attribute Mapping UI.

24.2.2 Units upgrade

Schematic data imported prior to 12.1 must be upgraded. A check is performed automatically on entry to Schematic Model Manager and the user will be warned if an upgrade is required. The upgrade process must be carefully considered by project administrators as it can affect multiple projects and locations. Firstly, schematic data is scanned to identify changes required. Secondly, UDA definitions are updated for the appropriate units. Thirdly, the changes identified are applied to the schematic data.

Please refer to the *Schematic Model Manager User Guide* for full details of this process.

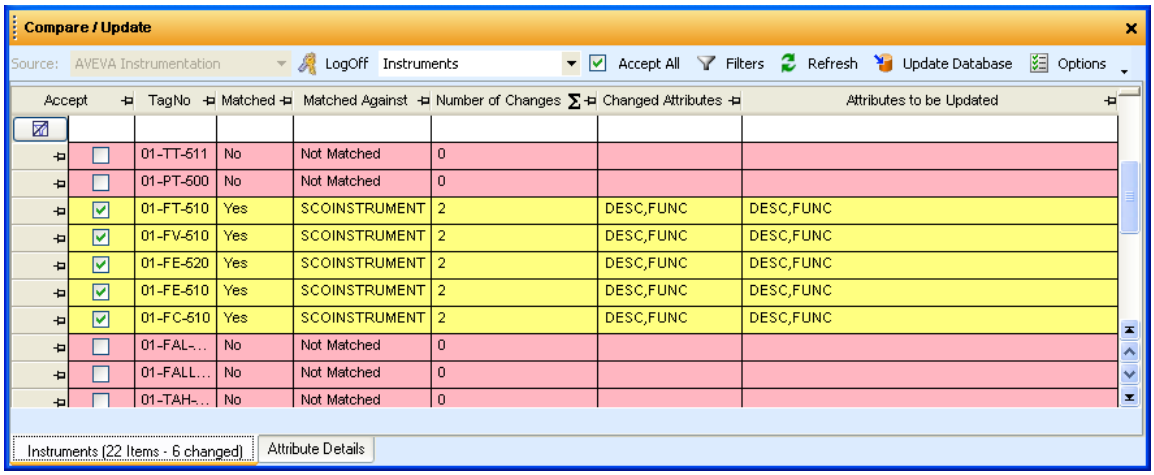
24.2.3 Change Highlighting in Diagram

Changes in Diagrams may now be highlighted in Diagrams, Schematic Model Manager and Tags, using a new Diagram Change Highlighting add-in.

Please see section in Diagrams chapter.

24.3 Tag Compare / Update

The new Compare/Update add-in application can integrate data between Design, Schematic and Engineering databases, as well as data from AVEVA Instrumentation and AVEVA Electrical. It enables populations of tagged objects such as equipment and line lists to be compared, updated and linked between the data sources. Compare/Update supersedes the AVEVA Instrumentation Data Update application and is available in several Design/Engineer modules: Design, Tags, Paragon, Schematic Model Manager and Diagrams.



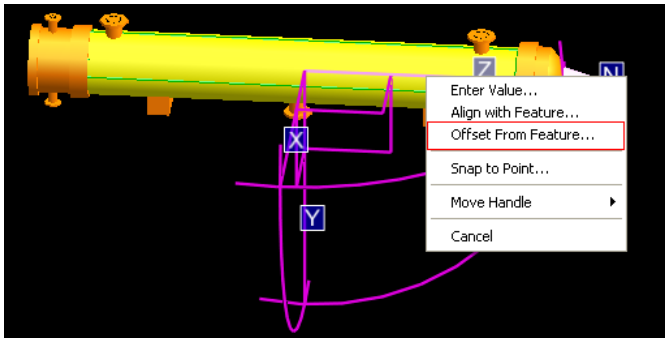
For More Information, please refer to the new *Compare/Update User Guide.*

25. AVEVA Outfitting Module

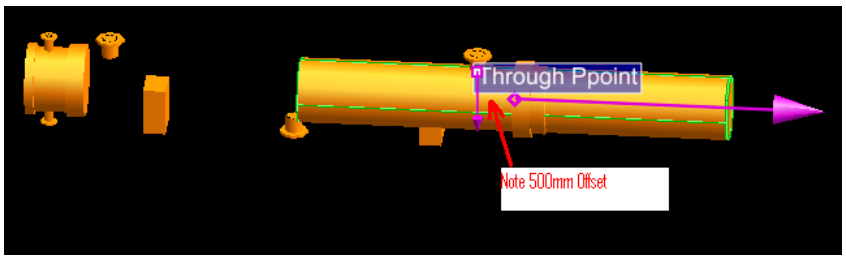
25.1 Model Editor

25.1.1 Offset From Feature… option

This new option has been added to the popup menu for the following Model Editor modes:
Model Editor, Equipment Editing, Quick Pipe Routing and Pipe Component Modification.

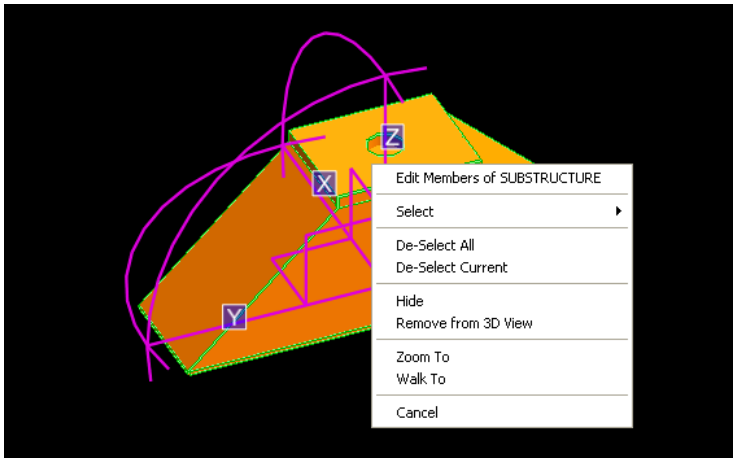


Selecting it gives the user a form to specify the offset and then pick the relevant feature:



25.1.2 Structural primitives

Primitives owned by structural elements can now be edited in a similar way to Equipment Editing, with a right click on the selected item.



Primitives owned by the following additional element types are affected:
STRU, SUBS, VOLM, SVOLM, PTRA, AREADE

25.2 Move, Drag Move and Plane Move Commands

The Piping, Equipment, HVAC and old cable tray application now have new positioning menus. Structural move commands are unchanged.

The new forms provide a WRT gadget to allow direction to be specified in terms of a local co-ordinate system. In addition, UNDO has been implemented for all move operations (i.e. when the Apply button is clicked).

All picks are now EDG picks, replacing the old ID@ style picking. This allows most of the pick functions to be replaced by a single EDG pick (i.e. screen, P-point, graphics and element picks can all be done using standard EDG position picks.)

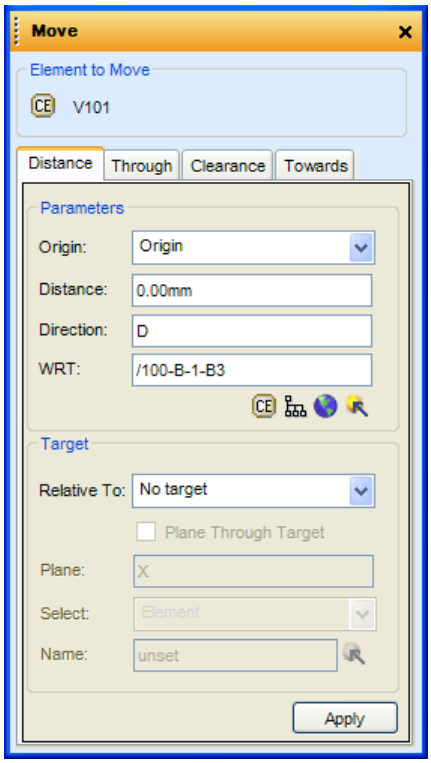
Note that many of the functions provided by these menu commands can also be achieved by using the Model Editor and Pipe Route Editor.

25.2.1 Summary of Move, Drag Move and Plane Move options

The Move commands enable the user to move the Current Element (CE) in a given direction. CE can be moved by a given distance in that direction or it can be moved to a position relative to another element, or relative to a plane through a given position.

For piping and equipment, the Drag command moves a piping item, together with other components, equipment and nozzles connected to it which form a constrained network.

The new form appears with four tabs:



The **Distance** tab moves an element a distance in a given direction.

The **Through** tab moves an element in a given direction until it reaches a point relative to a plane perpendicular to the direction of movement through another point.

The **Clearance** tab moves an element in a given direction so that its obstruction volume or a P-point is a given clearance from another element. The clearance is measured in the same direction as the direction of movement.

The **Towards** tab moves an element a given distance in a direction specified in terms of another element.

For details, please refer to the Design Common Functionality User Guide.

25.3 Change highlighting and reversion

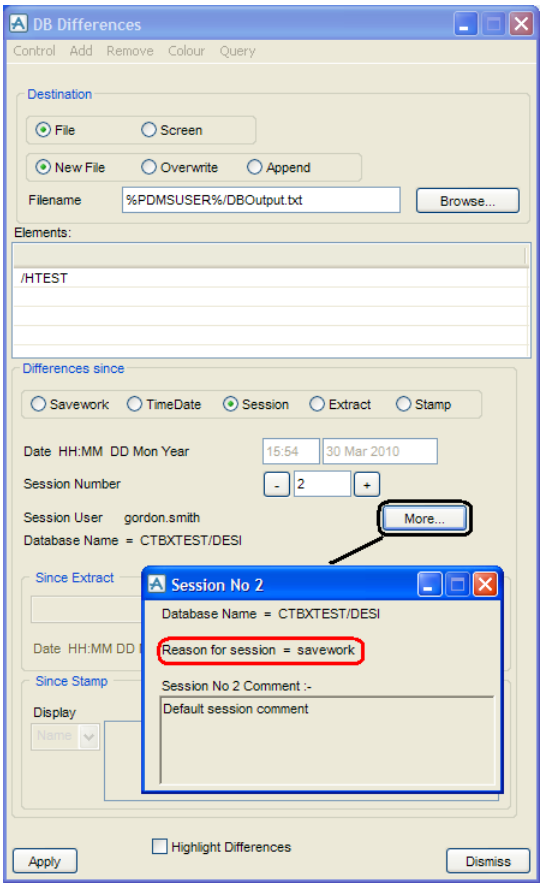
This development provides improvements in the management of change, including that resulting from the use of extracts. These changes fall into four categories:

- Enhanced sessions user interface to show the reason for each database session
- Command syntax to revert an element, or hierarchy of elements, to a previous state
- Improved Extract Data Control dialog to highlight extract changes
- Model Changes Add-in to explore and highlight general changes to the model

There is a separate Comparison add-in – see section 24.2.3 – available from the Schematic Explorer context menu. This can show changes related to diagram elements between two database sessions or stamps and can use the SVG Viewer to highlight the changes in colour.

25.3.1 Enhanced User Interface for Sessions

Forms that display details of a database session now also include the reason for that the session. For example, the database session form, accessed from **Utilities > DB Listing,** shows it thus:



Users can explore sessions containing an added element by selecting **DB Changes** or **DB Differences** from the Control menu, and selecting **Session** in the “Changes Since” radio button set.

25.3.2 Revert Elements Command

A new command can revert an element, or hierarchy of elements, to a previous state:

```
>- REVert -+- ELEment ---.
           |             |
           `- HIERarchy -+- <selele> -+- AT -----.
                                      |          |
                                      `- BEFore -+- <comparison> ->
```

where the <comparison> syntax is similar to that following the SINCE keyword in the DIFFERENCE and OUTPUT CHANGES commands:

```
  -->-+- <date/time> -+-----------------------.
      |               |                       |
      |- LATEST ------|                       |
      |               |                       |
      |---------------+- EXTRACT -+-----------|
      |                           |           |
      |                           |- extno ---+
      |                           |           |
      |                           `- extname -+
      |                                       |
      `- STAMP - <name> ----------------------+->
```

If the BEFORE option is used, the elements will be reverted to the state they had *before* the specified session.

Examples:

```
REVERT HIER /EQUIP AT LATEST
```

reverts the element hierarchy rooted at /EQUIP to the latest saved session.

```
REVERT HIER /EQUIP BEFORE LATEST
```

reverts the hierarchy rooted at /EQUIP to the state it had before the latest saved session.

```
REVERT ELE /E1301 AT 20:16 26 / 3 / 2010
```

reverts the single element /E1301 to the state it had on the given time and date

```
REVERT HIER /PIPES AT STAMP /StampMilestone7
```

reverts the hierarchy rooted at /PIPES to the state it had at the named stamp

```
REVERT HIER CE AT EXTRACT
```

reverts the hierarchy rooted at the current element to its state in the parent extract

The Revert command ensures that every element creation, include, reorder and deletion, and every attribute change is allowed before proceeding. If any of these tests fail, for example due to legality checks, read-only databases or DACs, then the entire revert operation is cancelled and the following error is generated.

```
(43,615)  Cannot Revert elements. No changes have been made.
```

In this case a series of warning messages is written to the console indicating the causes of the error, for example:

```
DAC prevents deletion of element /DELETE_UDET_B
DAC prevents creation of element =15752/1363
DAC prevents modification of attribute Built on element
/MODIFY_B_VESS1
```

Element locks do not prevent a Revert operation if those elements were unlocked in the previous state.

Note that this command is not directly related to the `REVERT` <database name> command available in Admin. This command allows an entire database to be reverted to the state it had at a previous session.

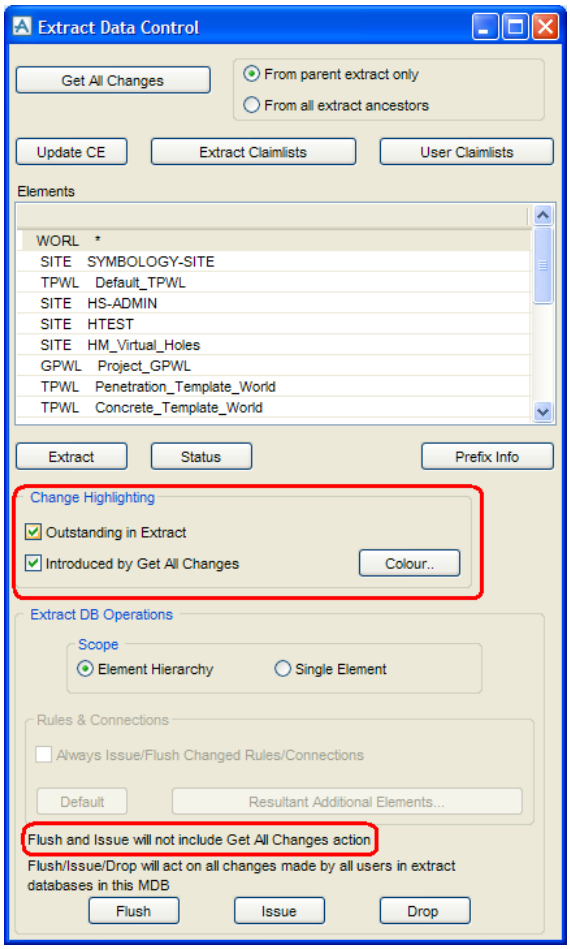
25.3.3 Change Highlighting via Extract Data Control

The **Extract Control** dialog has been enhanced to highlight outstanding changes in a child extract in the graphical view. It can also highlight changes introduced to a child extract by a refresh operation. The highlighting is controlled and customised within a “Change Highlighting” framebox, shown below.

When the “Outstanding in Extract” checkbox is selected, all changed elements in the child extract that have not yet been flushed or issued to the parent are highlighted if they appear in the current graphical view. The Colour button allows selection of the change highlight colour using the standard colour palette. The highlighting is cleared when the dialog is closed, or when a subsequent extract operation is performed using the dialog. In the latter case the checkbox becomes unselected.

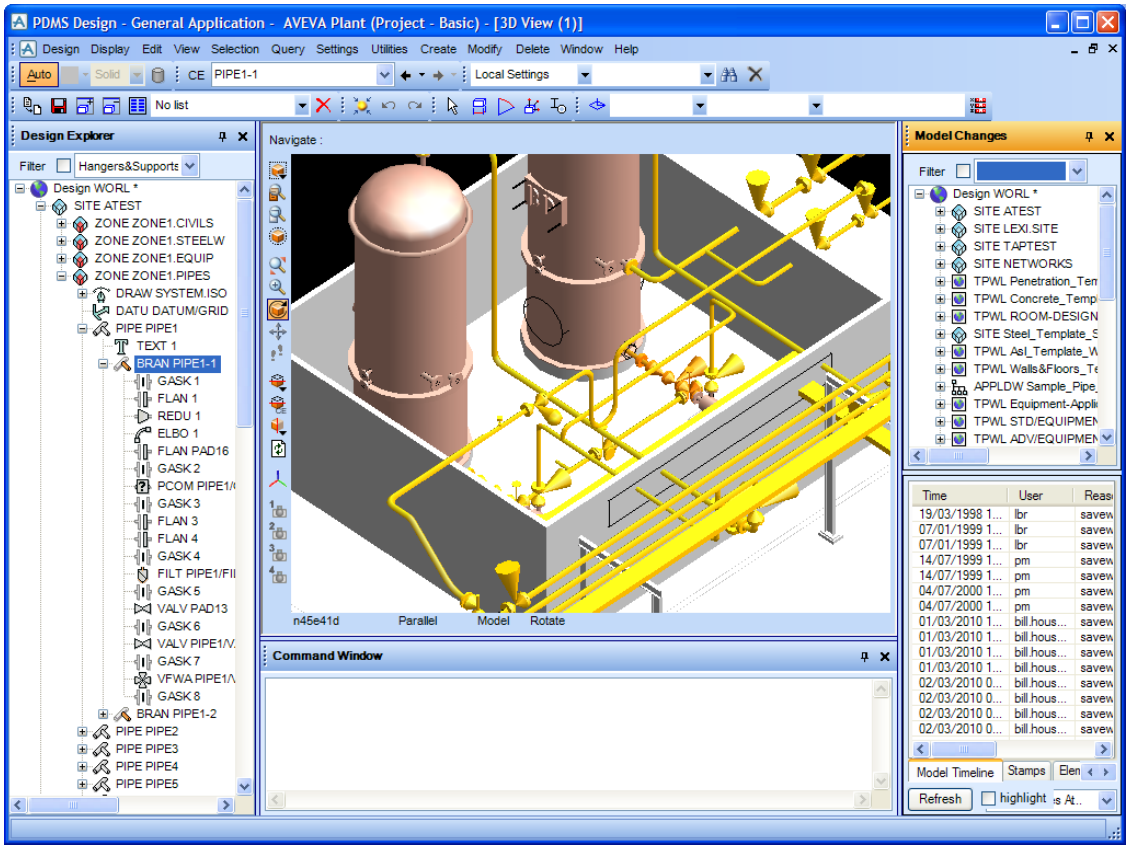
When the “Introduced by Get All Changes” checkbox is selected, all elements that are changed by the next Get All Changes action, or Flush or Issue actions if these include Get All Changes, are highlighted if they appear in the current graphical view. The same highlighting colour is used as for outstanding changes. The highlighting is cleared when the dialog is closed, or if the “Outstanding in Extract” checkbox is selected. In the latter case the “Introduced by Get All Changes” checkbox becomes unselected.

There is a subtlety to the Flush and Issue actions available in this dialog: these operations include an extract refresh by default. The exception is in a Global project, where the parent extract is not primary. In this case a refresh is not included in the operation. In order to clarify whether a refresh will occur as part of a Flush or Issue action, an indication has been added to the dialog, as shown below:

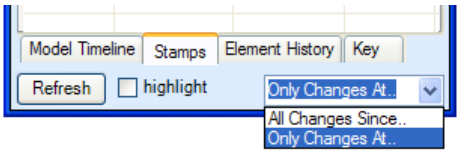


25.3.4Change Highlighting via Model Changes Add-in

A new Add-in has been introduced to provide a general mechanism for exploring change and highlighting changed elements in the 3D graphical view. The **Model Changes** Add-in is activated and de-activated via menu option **Query > DB Changes**. This replaces the previous **DB Changes** option, though this function is still available via **Utilities > DB Listing**: see below. The Add-in is shown in its default layout below:



The Model Changes Add-in has two vertically split panes. The top split contains a Design Explorer; the lower split contains a tabbed pane and controls, as shown below:



Model Changes Add-in tabs and controls

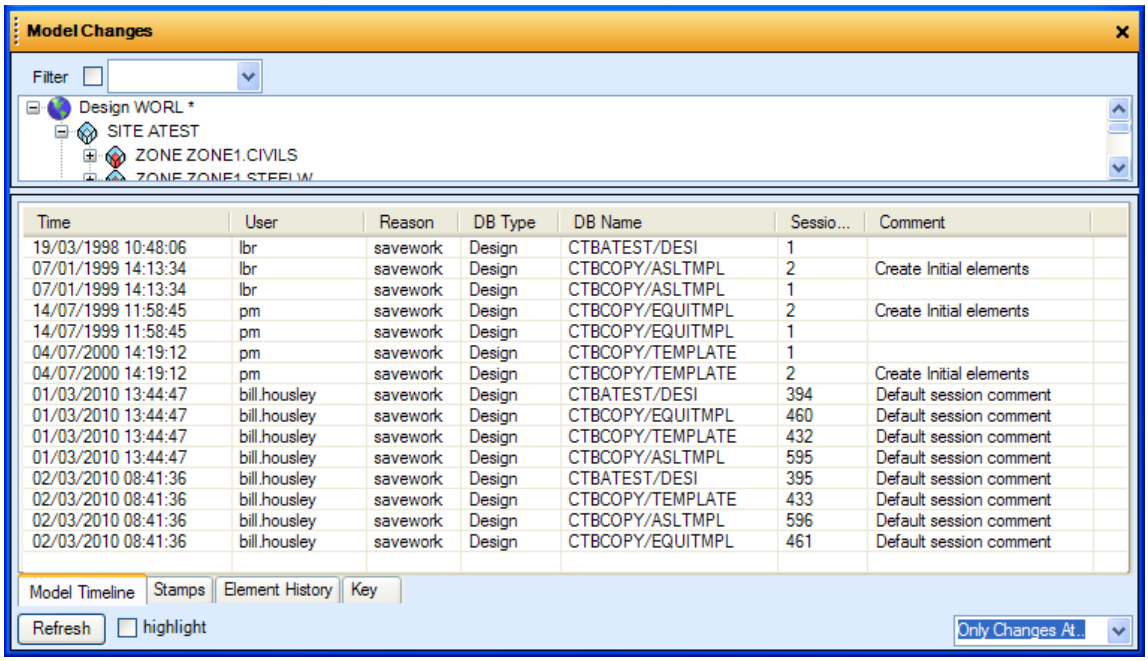
The tabbed pane condenses the following displays (see over):

Model Timeline: every session for every Design database in the current MDB, ordered chronologically.

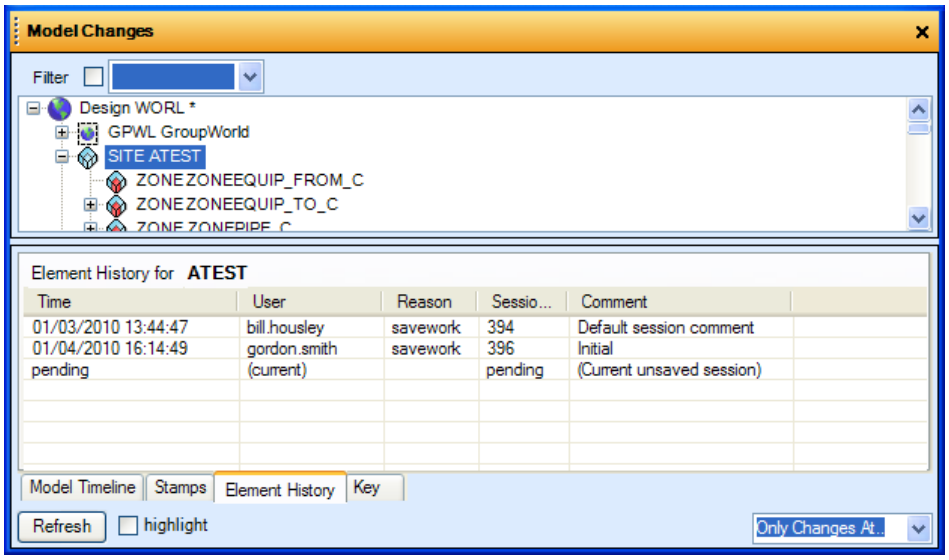
Stamps: details of every stamp that records session numbers for all of the Design databases in the MDB.

Element History: details of every database session in which the selected (current) element has changed.

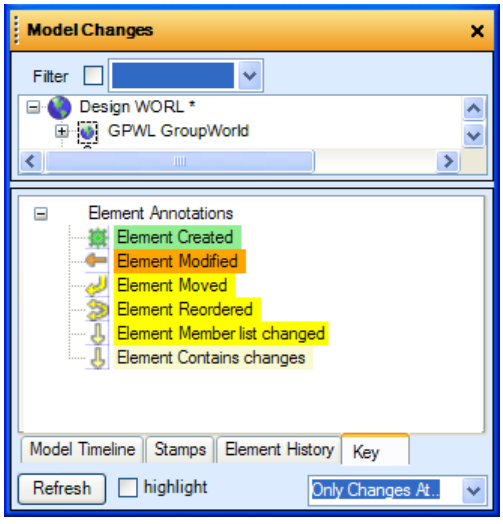
Key: static tree control with images, colour and text explaining annotation of changes in the Explorer.



Model Timeline pane



Element History pane



Explorer Annotations Key pane

The Element History and Key panes are for information only; the Model Timeline and Stamps panes allow selection of a session or stamp upon which to base the display of changes in the Explorer pane, and optional highlighting of changes in the 3D view. Once a session or stamp is selected, changes can be highlighted by clicking the Refresh button at the bottom left of the Add-in (see above).

Two modes of change reporting are supported, according to the current selection in the drop-down list in the bottom right of the Add-in:

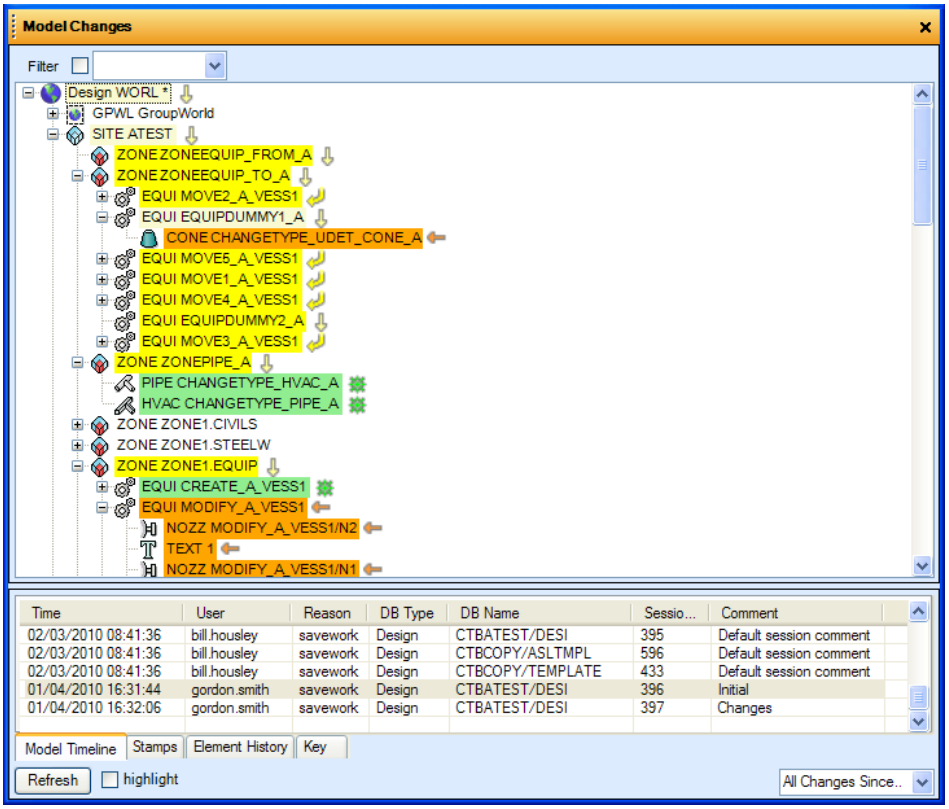
Only Changes At... shows *only* the changes that were made when the highlighted session was created. This may have been a **Savework** or as the result of an extract operation, such as a flush or refresh, as indicated by the Reason column in the Model Timeline table. Note that highlighting in the Explorer pane and in the 3D view is always with reference to the current state of the model; it is possible that no changes from a previous session will be visible, for example if all changes were made to elements that have since been deleted.

All Changes Since... shows *all* changes that have been made in all databases in the MDB between, but not including, the selected session or stamp, and the current state of the model. This does include any unsaved changes. Note that for large models this change analysis can take some time.

When the **Refresh** button is clicked and the change analysis operation is complete the explorer tree is updated with annotations which highlight the changed elements in detail. An example is shown overleaf:

The annotations are as described in the Key pane; in this example, we can see that:

- The World element and `SITE` element `/ATEST` are not themselves changed but have changed descendants. This helps navigation to the changed parts of the element hierarchy;
- `ZONE` element `/ZONEEQUIP_FROM_A` has member list changes only. Since no new or re-ordered elements are displayed, it can be inferred that all child elements have been removed;
- `CONE` element `/CHANGETYPE_UDET_CONE_A` has been modified (its type has been changed);
- `EQUI` element `/MOVE5_A_VESS1` has been moved from the child list of `/ZONEEQUIP_FROM_A` into the child list of `/ZONEEQUIP_TO_A`;
- `EQUI` element `/CREATE_A_VESS1` has been created under `ZONE` element `/ZONE1.EQUIP`, thereby changing its member list.



Annotated Explorer

Clicking the highlight checkbox at the bottom middle of the Add-in (see *Model Changes Add-in tabs and controls* picture above) has an immediate effect on all 3D graphical views if changes are currently displayed in the explorer tree. Any changed elements that have graphical representation and are in the drawlist for any active view are highlighted in colour. This uses the same customisable colour used by the “Highlight element” function available via right-click menu in the standard Design Explorer Add-in. Unchecking the checkbox returns the graphical display to normal colouring.

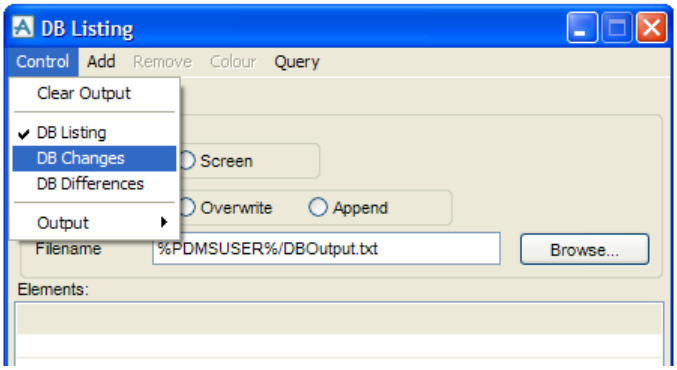
All panes of the Model Changes Add-in are updated and Explorer annotations and 3D graphical highlighting are reset in the following circumstances:

- further element changes
- Savework, Getwork, and Refresh
- User or MDB switch

Following any of these operations, the **Refresh** button must be clicked again in order to update the change highlighting.

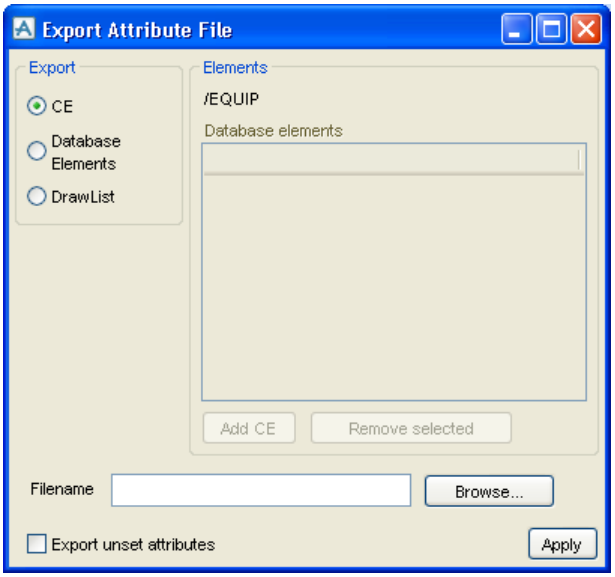
Former DB Changes Dialog

The functions of the **Query > DB Changes** dialog in earlier versions of Hull & Outfitting are still available via **Utilities > DB Listing**. This dialog is very similar, the only difference being the initial mode setting. This mode can be changed using the Control menu on the DB Listing dialog as shown below:



25.4 Enhanced attribute export to Review

The **Export Attribute** form, accessed from the **Utilities** menu, now allows the user various options to specify the element(s) to be exported and to pick the export file name from standard file browser.



25.5 Weight and Centre of Gravity (CofG) form

The **Within Area** option has been removed from this form (**Utilities > Mass Properties > Weight and Centre of** Gravity) as it depends on the INSIDE/OUTSIDE qualifier, which is not supported for these mass properties.

25.6 DRAFT Explorer

The DRAFT Explorer may now be made accessible in Design; this is only useful if the Draft databases are also made accessible in Admin!

25.7 AVEVA Mechanical Equipment Interface

It is now possible to export to a single STEP file by specifying a file name instead of a directory name, e.g.

```
export file /c:\project\a345\pipe1.stp
```

Naming of exported items is unique within this file.

Note: It is still not possible to create a multi-level assembly hierarchy in a single STEP file.

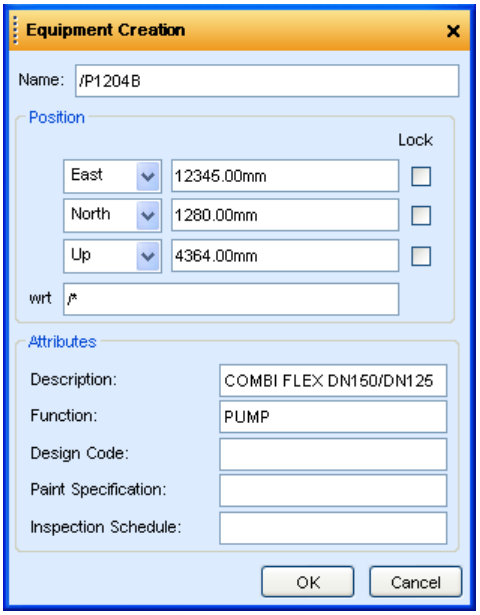
26. AVEVA Outfitting Design Applications

26.1 Equipment

The **Create>Equipment…** form has been redesigned with several enhancements:

- Equipment may be positioned using graphical picking
- Attributes are input directly using the creation form rather than a sub-form
- UNDO is available
- The form is resizable

For details, please refer to the *Equipment User Guide* (Section 4).



26.2 Piping

26.2.1 Sloping piping

The data structure for piping includes two new concepts for better handling of slopes or falls:

- An adaptive or “wobbly” P-point that can accommodate a specified range of angles – this is achieved by introducing a tolerance attribute OFFTOL on all types of P-point (in Paragon). A PDIR pseudo-attribute defines the actual direction, which must be within the tolerance of the nominal direction
- A Slope element or SLOELE, in a Slope table or SLOTAB, that can be referenced by the SLOREF of a SPEC, PIPE or BRANCH to specify default, minimum and maximum slope

The introduction of these new concepts has no effect on existing Cats & Specs or models. The new features are used in Quick Pipe Routing and also for sloping existing orthogonal piping. The Paragon GUI has been extended to cover Slope Tables.

The pipe creation form has an additional option for selecting from a list of slopes and the modify pipe form has the same option for setting branch values. The older pipe and branch modification forms have also been changed to include new options for slopes. Note: If the SLOREF attribute is set at pipe level, it is automatically inherited by new branches.

The Model editor has been extensively revised to handle elbows (as well as bends) and the new P-point options, as well as adding slope options to the menus. A new form can assist in applying a slope to an existing pipe, including all the branches within it. To display it, navigate to an existing pipe and select **Modify>Pipe Slope...**

For full details, please refer to the *Piping User Guide.*

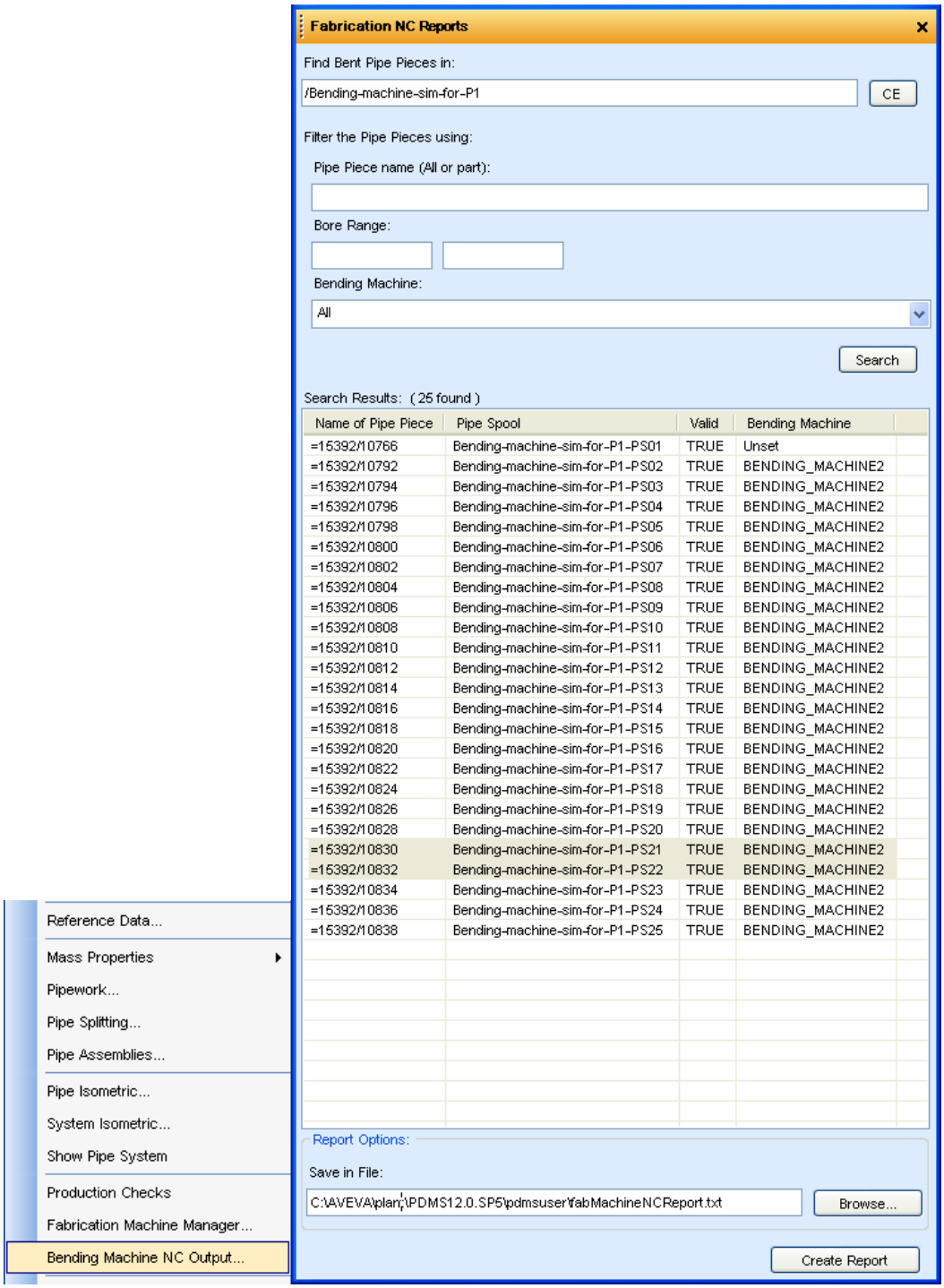
26.2.2 Direct setting of Insulation Thickness & Material

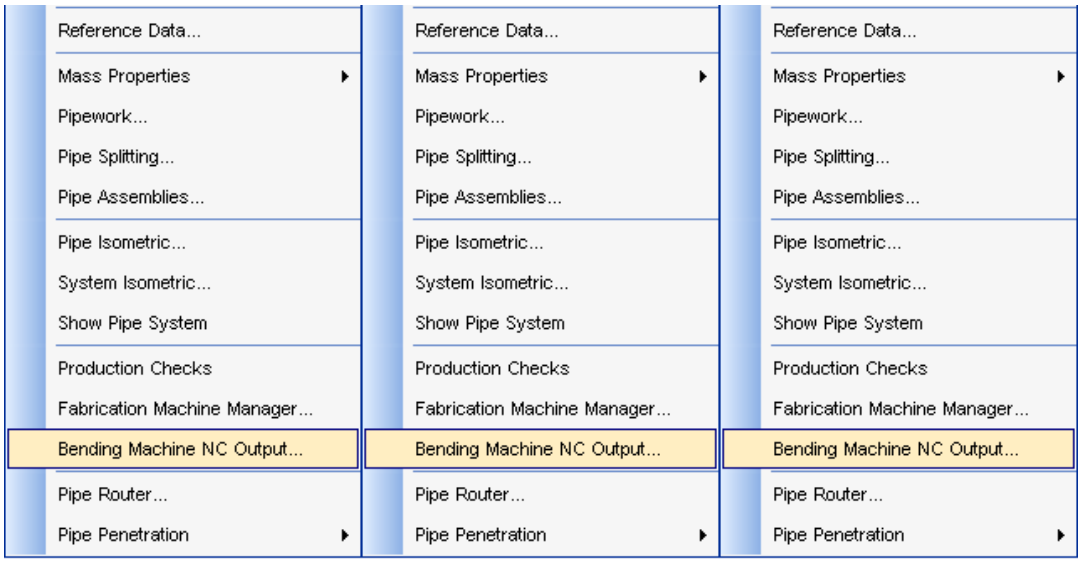
This allows the piping designer to choose piping insulation of a given thickness and material rather than setting the temperature and spec for automatic selection.

New sample insulation specifications are provided as a basis on which users can base company and/or project insulation specifications.

26.2.3 Bending Machine NC Output

A new option **Bending Machine NC Output…** in the **Utilities** Menu allows users to save a file, which contains the bending details of a specified list of pipe pieces. To use this, the current element must be a Site, Zone, Pipe, Pipe Spool List (PSLIST), Pipe Spool (PSPOOL), Pipe Piece List (PPLIST), or a Pipe Piece (PPIECE).





This enables you to search for bent pipe pieces, filter them, and then create a report.

26.2.4 Improved production checks

The Pipe Production Checks can now use a user-defined pipe stock length as well as the bending machine maximum material length (MML).

The Pipe Stock Length is set up in the Pipe Data Table (type PDAELE) using Paragon: the data elements of that table now have a field PStLen for pipe stock length. It may be queried using **q PStLen** on a pipe data table element. New Pseudo-attributes enable the pipe stock length of a particular (implied) tube to be queried: **q ATST** for 'Arrive Tube Stock Length' or **q LTST** for 'Leave Tube Stock Length'.

The production checks perform two tests on each pipe piece:

- Compare the pipe piece length with the stock length for that tube spec. If the piece is longer, the test will fail regardless of bending requirements
- Compare the pipe piece length with the maximum pipe length for the bending machine assigned to this branch or pipe. If it exceeds the machine-defined value, the test will fail

These two tests will be performed in the order above and in addition to any other tests, such as wall thickness, corrosion, etc. The user will be notified of the success or the reason for the failure.

26.2.5 Material search for Pipe Bending Machine setup

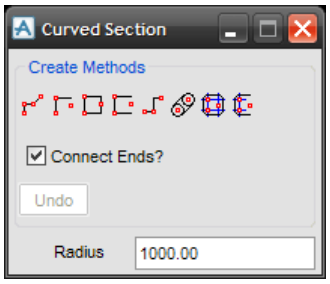
A Search button has been added to allow the user to search for the appropriate material (from all SMTE in catalogue or |SOLI in the Property database, with Filters if required).

26.3 Structures

26.3.1 Steelwork Connectivity Upgrade

The user interface for connecting structural elements has been improved in various places to use event-driven graphics (EDG) interaction. In addition, several operations now also work on GENSEC elements including curved members and UNDO is now available for some functions.

In particular, a **Connect Ends?** check box has been added to the form for creating Curved Section GENSEC elements. This check box allows the user to specify whether they wish to connect the ends if a suitable start or end point is selected.



Minor changes apply to creation of straight and curved members, connection and disconnection and several operations related to joints. For details, please refer to the *Structural User Guide*.

When regenerating the support, e.g. by selecting a new template with a different steelwork section specification, or creating by dimensions, pads will be regenerated if pads already exist before the regeneration process if triggered. If the size of the steelwork sections is not modified then the same pad will be used. If the steelwork section is modified then the pad size will be modified.

26.4 Hole Management enhancements

The Hole Management Utility which creates and manages penetrations in panels has been improved, by the addition of additional catalogue properties in the Pipework catalogue and HVAC penetration components. The utility is available only in the Pipework and HVAC Designer applications and accessed from the Hole Management Utilities toolbar.

To start the application, click the Hole Management Utility icon on the toolbar to display the Managed Hole Utility window. The main utility form is divided into 4 sections – for the creation, merging, modification of holes and utilities.

For further details, please refer to chapter 4 *Multi Disciplinary Penetration and Hole Management* of the *Design Common Functionality guide.*

26.4.1 Create Holes

In the Clearance field, specify the clearance to apply to the penetrating item. This is not applied if the software detects a clash with a pipework or HVAC component that has hole size properties.

Note: The clearance can be controlled by the component that passes through the panel if the penetrating component has a Property AHDI (for circular) or AHX, AHY (for noncircular) in which case these property values will control the clearance. For more information, refer to Configuration Hole Management Data.

Click Auto penetrate CE to automatically create holes in panels in a selected structure.

The clash analysis can take a few minutes; a progress message and bar will be displayed. Once the analysis has taken place, the Hole Association Manager window is displayed with the details of the newly created virtual holes.

Note: The Hole Association Manager window is not displayed if no virtual holes are created.

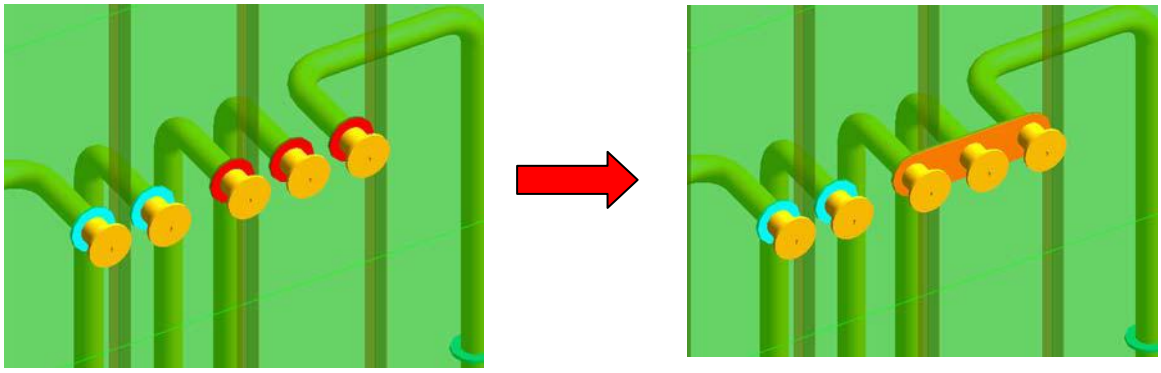
If more than 30 virtual holes have been created, there will be a confirmation message to display the Hole Association Manager window.

To create holes individually, click Create Hole. The user will be prompted to pick a panel, pipe or HVAC branch that penetrates the selected panel. The creation of the hole is identical to the automatic hole creation.

26.4.2 Merge Holes

Merged holes are individual holes merged together into a single hole. To merge holes, click Pick holes; the user is prompted to pick a Managed Hole fitting to be combined into a single merged hole.

Note: A minimum of two holes must be picked.



Click Merge Holes, the software creates a merged hole containing the selected penetrations.

26.4.3Modify (and Delete) Holes

Created holes can be modified, managed or deleted.

To modify a created hole, click Modify CE. The Hole Modification window is displayed, modify the created hole as required, the Free Hole Boundary Editor can also be started from this window.

To manage created holes, from the Hole Association Manager window, select Managed Selected Holes, the Hole Management - Definition window is displayed.

Use this window to add single or merged hole penetrations, define the hole type, penetrating clearance, hole shape parameters, positioning and an option for the hole to revert to the catalogues specifications.

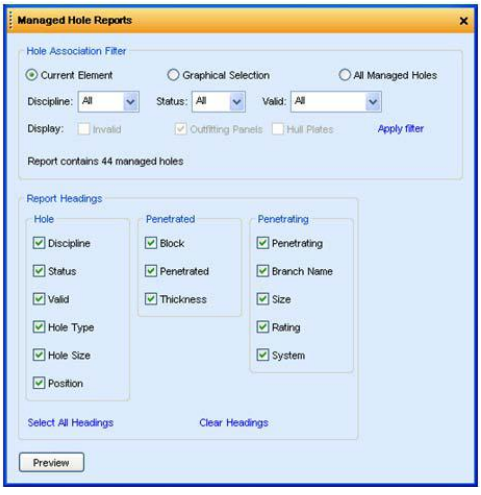
To delete a created hole, the user is prompted to pick a hole. If the hole has no status it is deleted; if the hole is Requested, the user will be prompted to confirm the deletion. If the hole is Approved, deletion is not permitted.

26.4.4Utilities

All panels within the volume of the selected pipe or HVAC can be added to the 3D view. To do this, from the Utilities part of the Managed Hole Utility window, click Add Structure.

To view all pipe or HVAC elements within the volume of the selected structural panels, from the Utilities part of the Managed Hole Utility window, click Add Pipe/HVAC.

To generate and define a report on selected holes, click **Hole Report**. The report can then be printed or exported to Excel.



Managed hole reports

The **Hole Association Filter** enables the user to specify which Managed Holes to list in the Report:

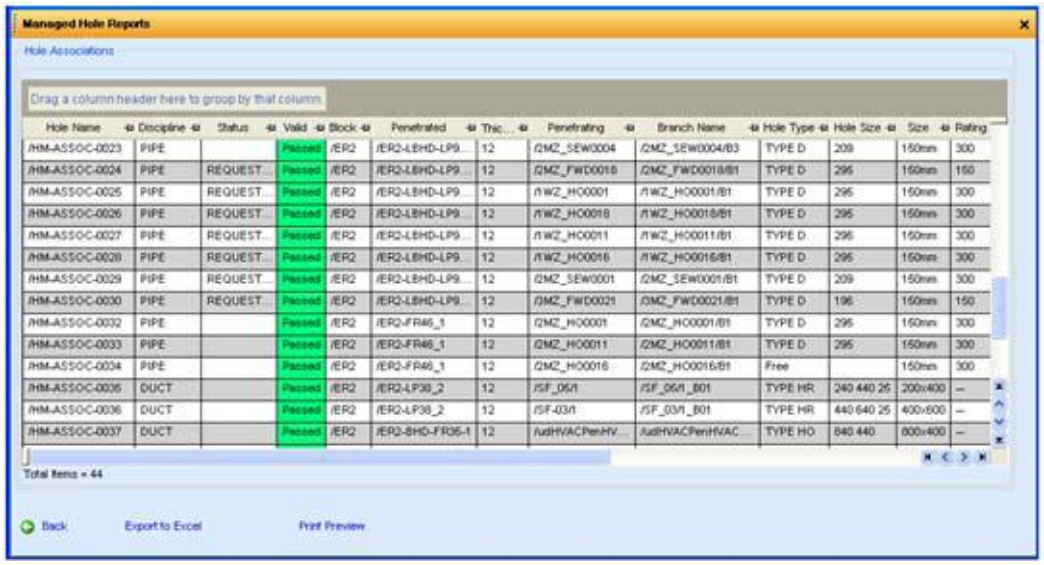
Current Element	Holes associated with the currently selected element only
Graphical	Holes associated with elements in

Selection	the current graphical selection
All Managed Holes	Holes in the MDB

Report Headings may be specified**:**

Discipline	Specify holes for all disciplines or a single one specified using the drop-down menu
Status	Specify holes at any Status or at a single Status option using the drop-down menu
Valid	Select all holes or only those that pass or fail the validation tests **Note:** any option other than Not Checked may significantly slow down report generation as all the validation tests will be run for every selected hole
Invalid	Include hole associations that have any bad references, invalid references or invalid data
Panels	Select holes in panels
Apply Filter	Refreshes the Hole Report according to the element and filtering options selected **Note:** It is necessary to select Headings required on the report before clicking on Apply Filter because heading data is collected when filters are applied.
Report Headings	Select headings required on the report from three categories: information about the hole, information about the penetrated item and information about the penetrating item
Preview	Displays **Managed Hole Report** window

The **Managed Hole Report** window displays the specified report.



You can use grid column functions to sort and filter columns before printing or exporting the report. Select **Print Preview** to view the report or select **Export to Excel** to export it.

Right click the **Hole Associations** list to display the following pop-up menu:

Navigate to	the Association, the penetrated or the penetrating item (single selection only)
Add to 3D view	Adds the selected holes and associated items
Remove from 3D view	Removes the selected holes and associated items
Focus on Hole	Zooms the 3D view to centre on the selected hole and zoom in. Clipping is applied if it is enabled (single selection only).
Export list to Excel	Exports the report grid to Excel
Print list	Shows a standard grid print preview for the report grid

26.4.5Configuration of Hole Management Data

Additional hole size properties on piping and HVAC components are used to control automatic hole dimensions. If these properties are not provided the system uses hole management default sizes (e.g. OD for pipe holes).

Hole Management Design and Catalogue data configuration is as described in the *Design Common Functionality User Guide,* with the addition of new data set properties on selected piping components.

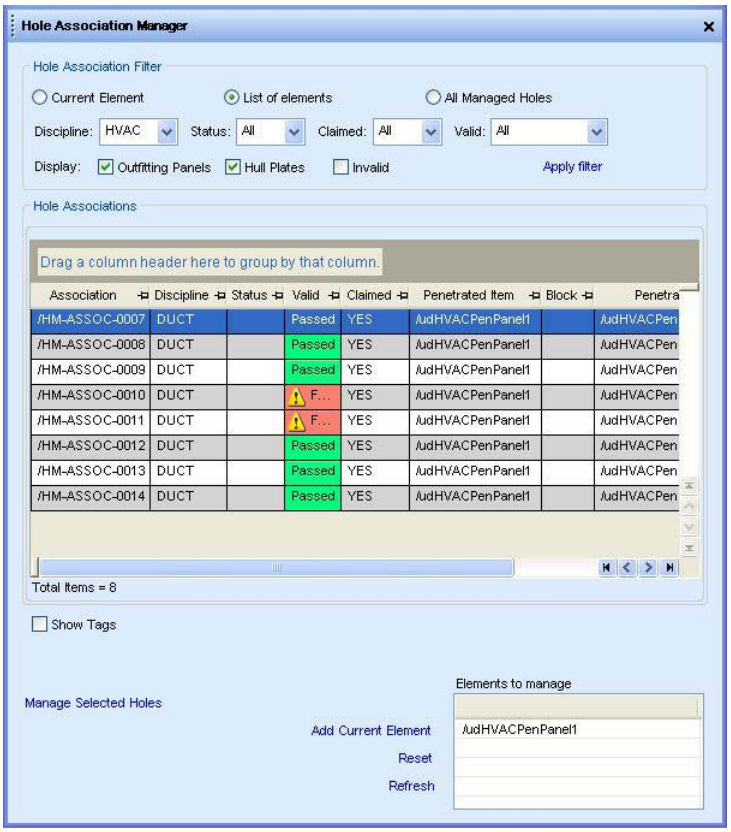
The following properties are used to control automatic hole sizes.

Property Name (DKEY)	Description
AHDI	Property specifying the diameter of the hole required for the component (a REAL DISTANCE expression returning the hole diameter.) The property is used if: 1. It is associated with a piping or HVAC component that clashes with the panel at the penetration. For example, this property may specify the outside diameter of a COUP element that represents a penetration sleeve. 2. It is associated with a FLAN component that is adjacent to a penetration clash with pipe implied tube. This allows for a flange clearance hole to be created. If the AHDI property is applied, the Clearance value is ignored. If the AHDI property is not applied, (Pipe OD + Clearance) is used to calculate the hole size.
AHX	Property specifying the X dimension of a rectangular hole required for the component (a REAL DISTANCE expression.) If the AHX property is applied, the Clearance value is ignored If the AHX property is not applied, (Component width + Clearance) is used to calculate the hole size
AHY	As for AHX, but specifies the Y or height dimension of the hole.

26.4.6Hole Association Manager

The **Hole Association Manager** window is used to manage the tasks associated with holes.

The **Hole Association Filter** is used to select hole association(s) and structural elements to be displayed.



Select the element, specify the filter criteria and structural elements, then select **Apply Filter.** The selected hole associations will be displayed in the **Hole Associations** table.

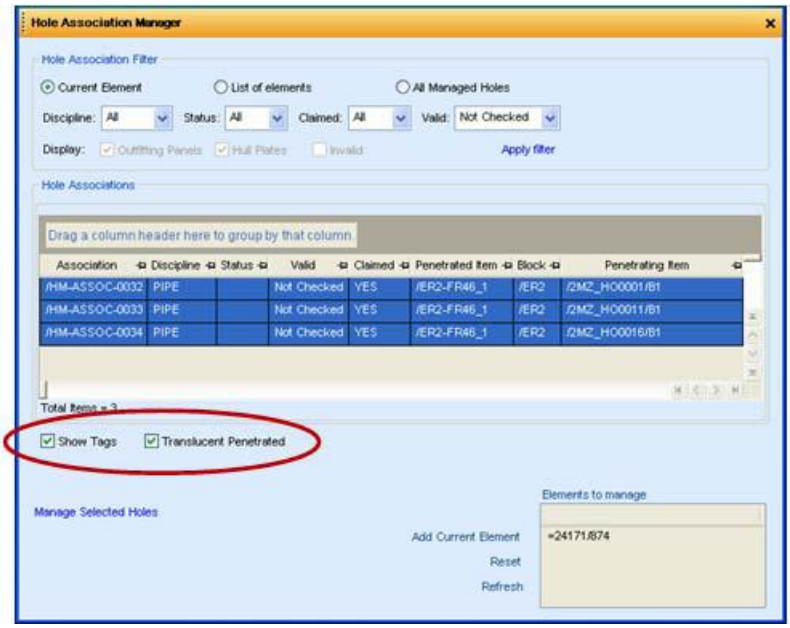
If some of the hole associations fail, navigate to the hole and use hole management to modify the penetration, then select **Apply Filter** from the **Hole Association Manager** window.

To add elements to be managed, select **Add Current Element**.

To remove the automatically created penetrations, select **Reset**, then **Refresh**.

Displaying Holes

The **Hole Association Manager** window can also be used to display selected holes in the 3D view.



Clipped Hole View

The **Focus on Hole** option can be used to zoom in on a selected hole and remove all other elements from the 3D view. Make sure that the clipping and capping options are selected on the active 3D view.

From the Hole Associations table, right click to select a single hole and activate a popup menu. Select **Focus on Hole**; this zooms to the selected hole and clips the surrounding background.

To return to the normal view, de-select the clipping and capping options or select a different view.

Show Tags

To show tags and a box surrounding a selection of holes in the associations list, check the **Show Tags** box.

Translucent Penetrated

To emphasise the penetrated items selected in the associations list, check the **Translucent Penetrated** box.

26.5 Penetration with Piping Component

This new pipe penetration function enables a component such as a watertight bulkhead seal, modelled as a COUP, to be positioned on either side of the plate being penetrated. It can cope with cases where the penetrating pipe is not orthogonal to the plate.

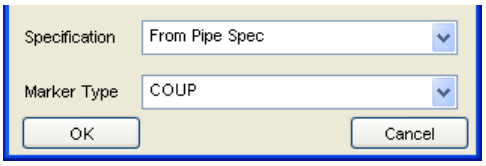
The component can be shown on pipe sketches and isometrics; Isodraft has been modified to add a new SKEY CPCF and a penetration seal symbol. Please see section 26.10.7.

Full details are given in the *Common Functionality User Guide:* Chapter 4. Catalogue Requirements are given in Section 4.2.13 Project Configuration for Hole Management.

26.5.1 Creation of Penetration

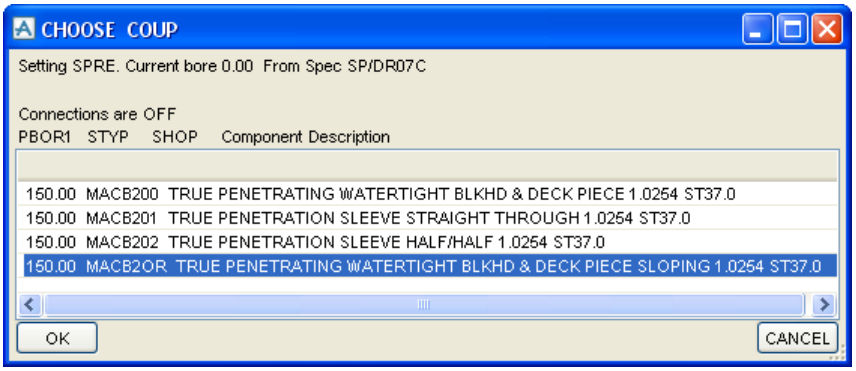
Normally, a penetration ATTA element is created on the pipe to mark the location of a penetration. It is possible to put a pipe component, representing a sleeve or penetration seal, at the penetration if the piping catalogue is suitably configured. Pipe penetration components are modelled as COUP elements.

When a penetration component is required, select **From Pipe Spec** in the Specification pull down, and select Marker Type COUP.

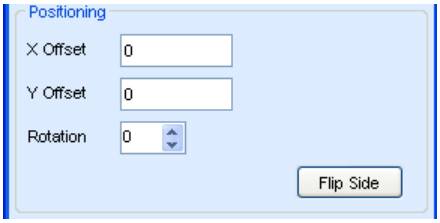


The **CHOOSE** form is displayed showing the couplings available from the piping specification. Select the required component and click the **OK** button.

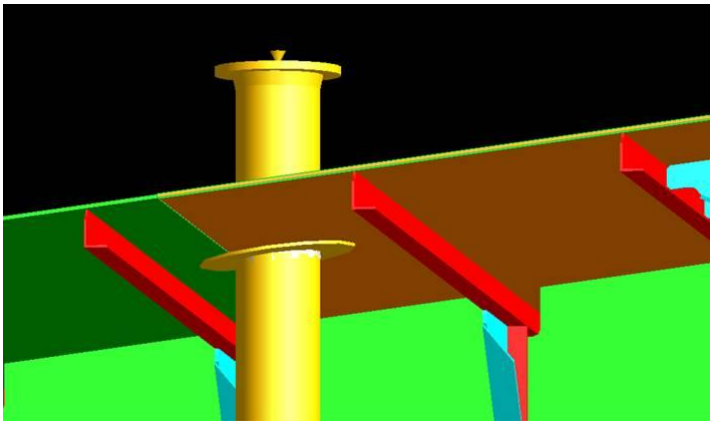
Note: In the sample MAS project, an example of a pipe penetration component can be found in category /MACB2OR.



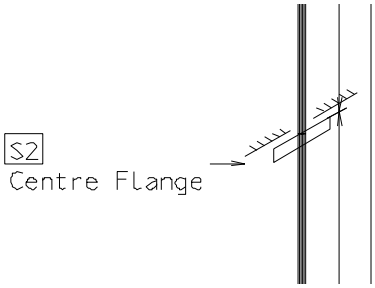
The **Hole Management – Definition** form is displayed. If a suitably configured piping component is selected, it can be placed on either side of the penetrated plate – an additional Flip Side button appears on the form.



Click on the **Flip Side** button to place the piping component on the other side of the penetrated plate.



The symbol for this component is represented on an isometric drawing as:



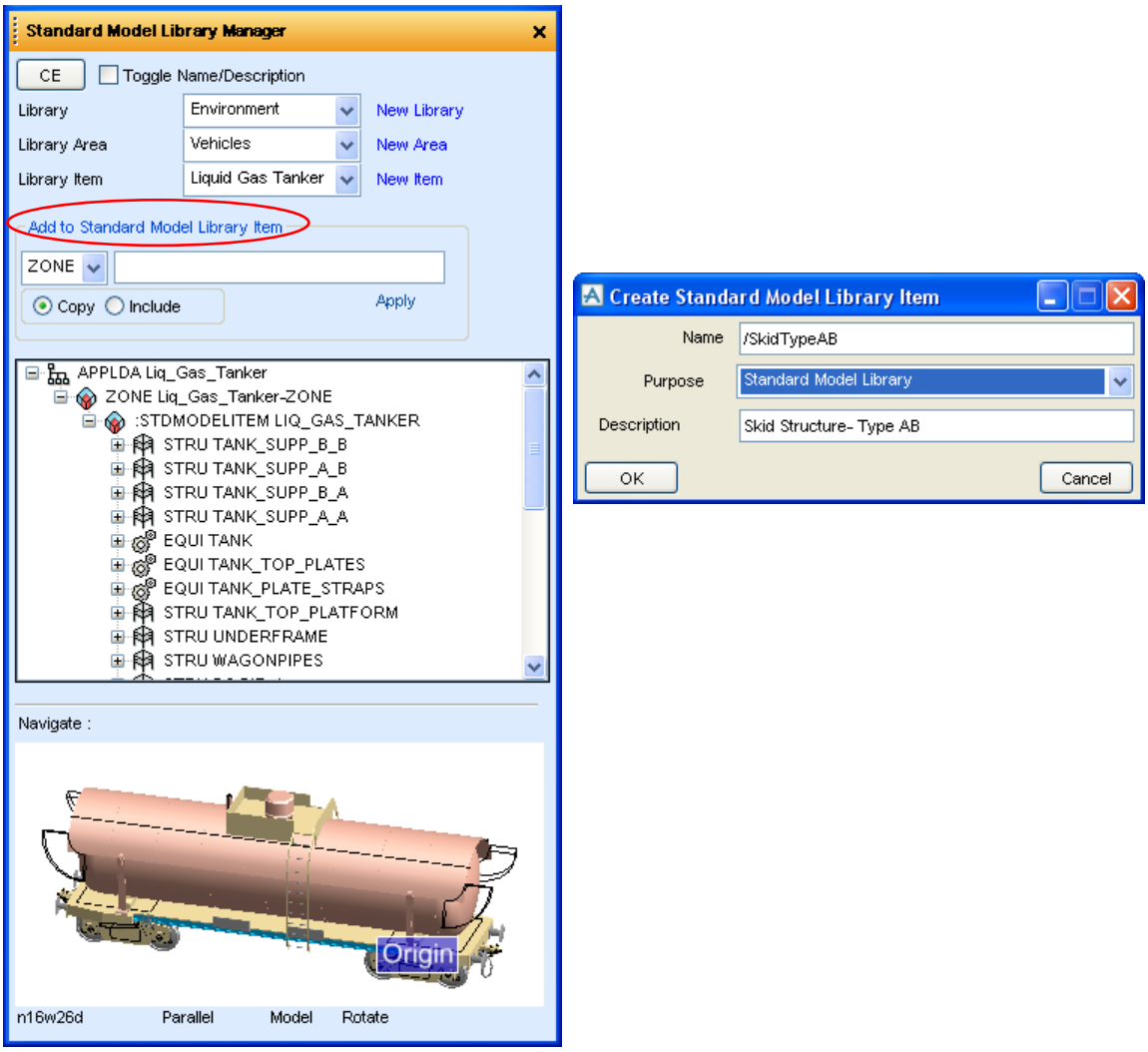
	FITTINGS			
2	PENETRATING WATERTIGHT BLKHD & DECK PIECE SLOPING 1.0254 ST37.0	6	DR07C/MA	2

26.6 Standard Model Library

This new function, an early version of which was included in the Marine Outfitting Update 12.0.SP6.10, allows the user to capture multi-discipline design elements, store them in a library for re-use and then create any number of instances of them at any position in the model, as required.

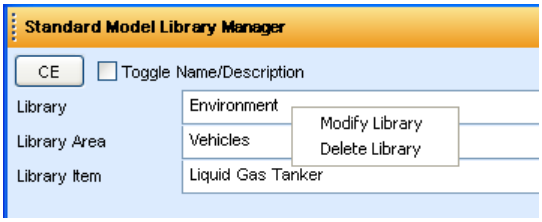
It is accessed from a new **Standard Model Library Manager** form, accessed from the **Utilities** menu and uses a **Create Standard Model Library Item** form; these vary somewhat dependent on whether a user is a library manager or a general user.

The first form to appear is the **Manager** form, which can be used to browse the library and add items to it:



This creates a new element in a Library in the application data world (APPLDW) – the library item is an APPLDA element in an APPDAR. A similar form is used to modify these items.

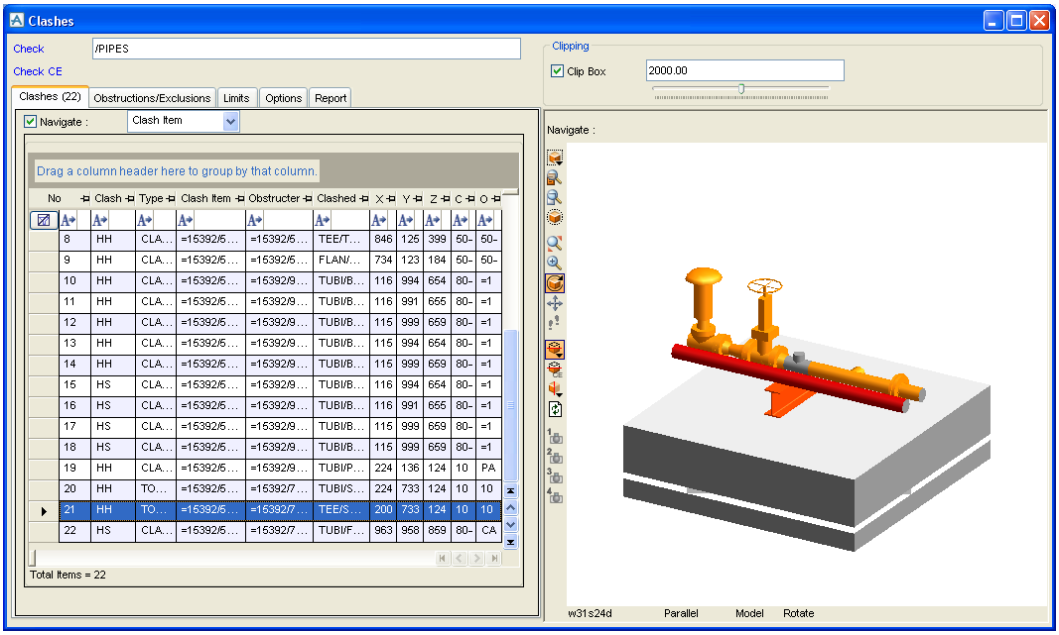
Libraries, Areas and Items are modified or deleted from a pop-up menu on the same form:



For full details, please refer to the *Design Common Functionality User Guide* manual.

26.7 Clash Utility enhancements

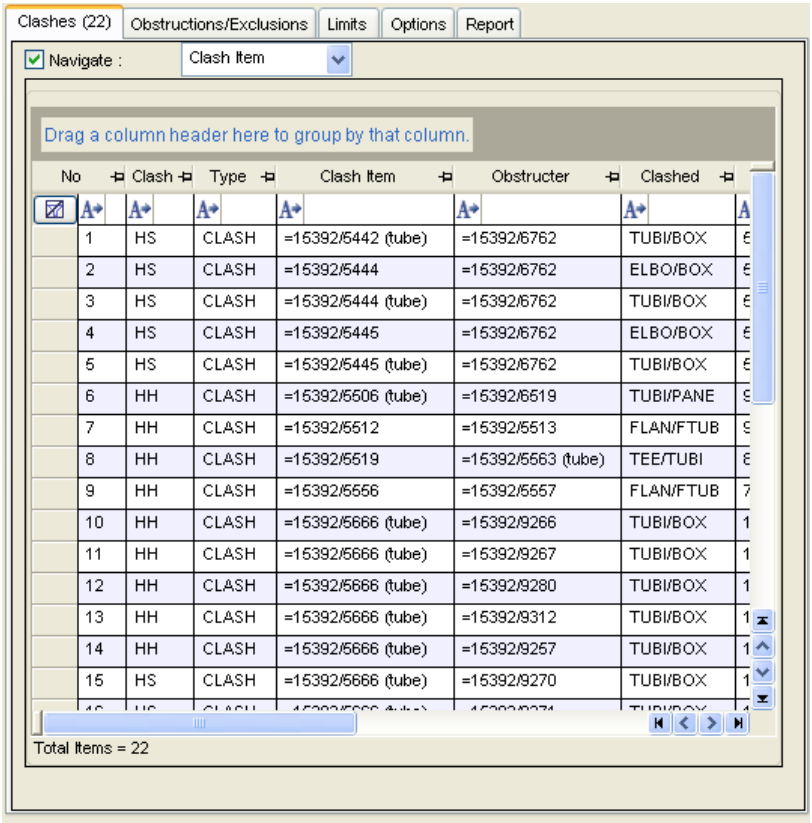
The Clash utility uses a new form, which shows all the options; it uses a grid gadget for filtering and grouping and a 3D view of the clash with aid graphics. Simple clipping, navigation, reporting and printing are also available.



When the form is first shown, the current element is selected in the Check field. Users can change this as they wish by typing any Design name or syntax such as ZONE. The element to be checked is always named in this text box. The options available are:

- **Check** Check the named element for Clashes
- **Check CE** Show the name of the current element and check it for Clashes

The Clashes are displayed in a grid, with the usual facilities for filtering, grouping etc:

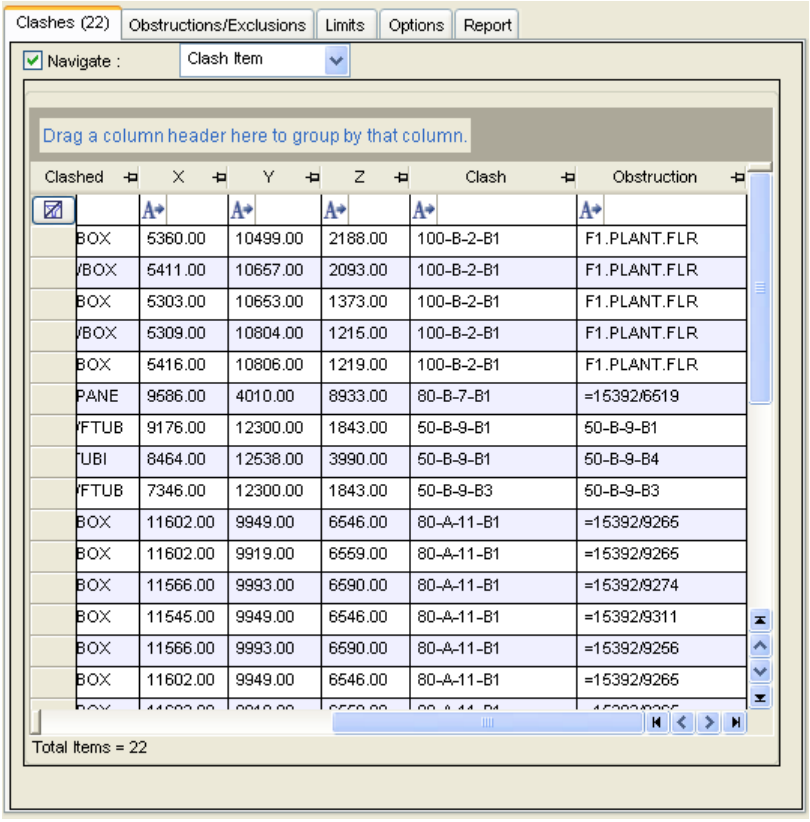


No	Clash	Type	Clash Item	Obstructer	Clashed
1	HS	CLASH	=15392/5442 (tube)	=15392/6762	TUBI/BOX
2	HS	CLASH	=15392/5444	=15392/6762	ELBO/BOX
3	HS	CLASH	=15392/5444 (tube)	=15392/6762	TUBI/BOX
4	HS	CLASH	=15392/5445	=15392/6762	ELBO/BOX
5	HS	CLASH	=15392/5445 (tube)	=15392/6762	TUBI/BOX
6	HH	CLASH	=15392/5506 (tube)	=15392/6519	TUBI/PANE
7	HH	CLASH	=15392/5512	=15392/5513	FLAN/FTUB
8	HH	CLASH	=15392/5519	=15392/5563 (tube)	TEE/TUBI
9	HH	CLASH	=15392/5556	=15392/5557	FLAN/FTUB
10	HH	CLASH	=15392/5666 (tube)	=15392/9266	TUBI/BOX
11	HH	CLASH	=15392/5666 (tube)	=15392/9267	TUBI/BOX
12	HH	CLASH	=15392/5666 (tube)	=15392/9280	TUBI/BOX
13	HH	CLASH	=15392/5666 (tube)	=15392/9312	TUBI/BOX
14	HH	CLASH	=15392/5666 (tube)	=15392/9257	TUBI/BOX
15	HS	CLASH	=15392/5666 (tube)	=15392/9270	TUBI/BOX

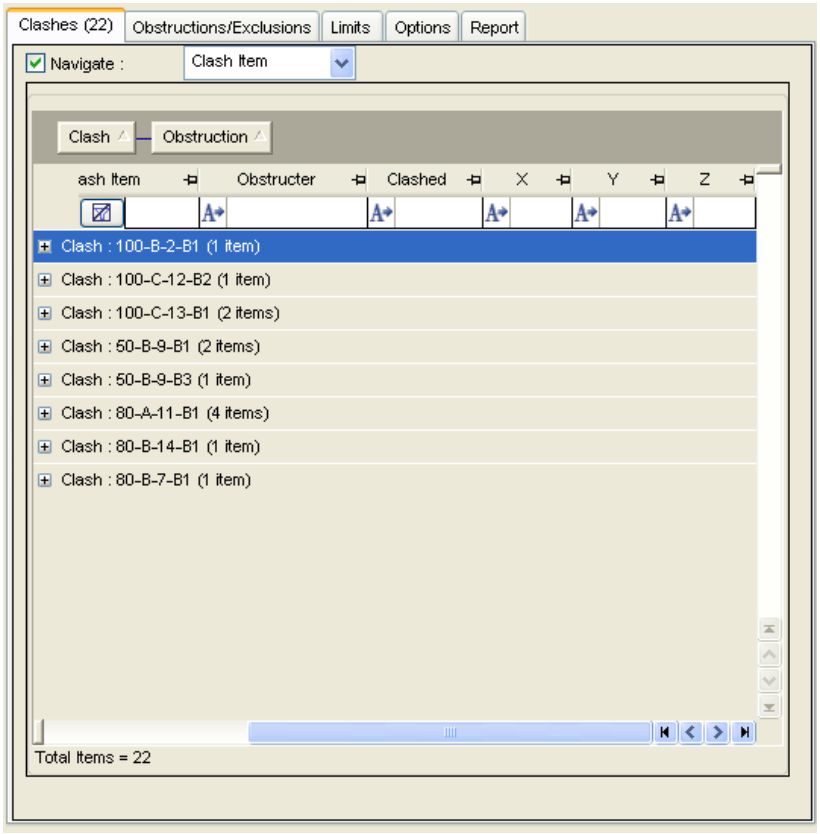
The whole grid can be printed or saved to file by the RH popup menu options:

Print Preview
Save to Excel…

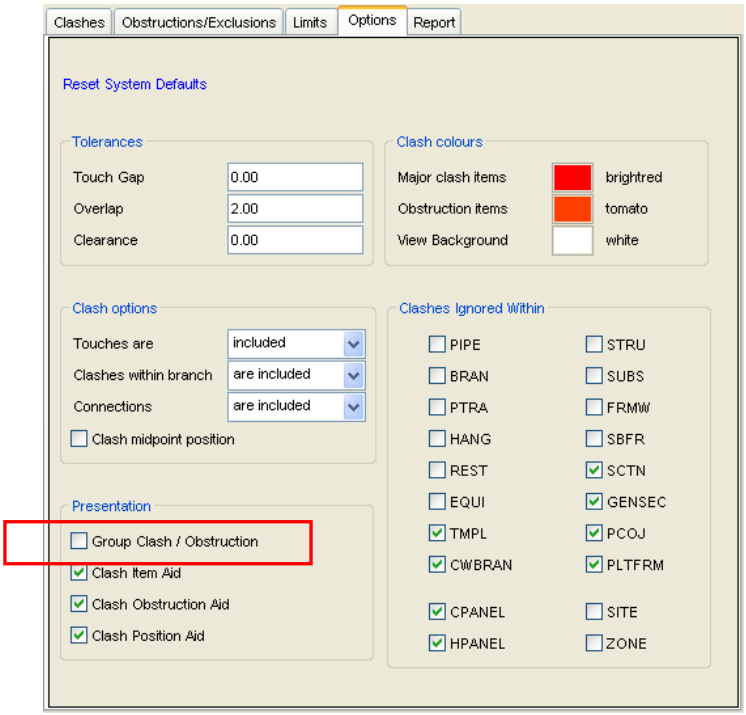
It is necessary to scroll the grid to the right to see all the information about the clash such as Position



There are also columns for the primary element that clashes or obstructs; any column can be dragged in the grid to group rows, for example:

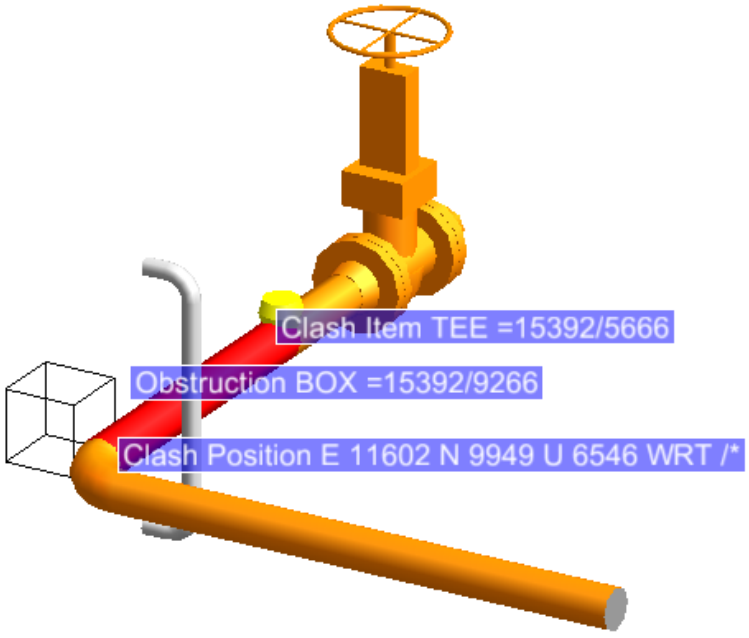


The example groups all clashes per branch and then clashes against the same obstruction. This is a common useful grouping so there is an option to set the default presentation.

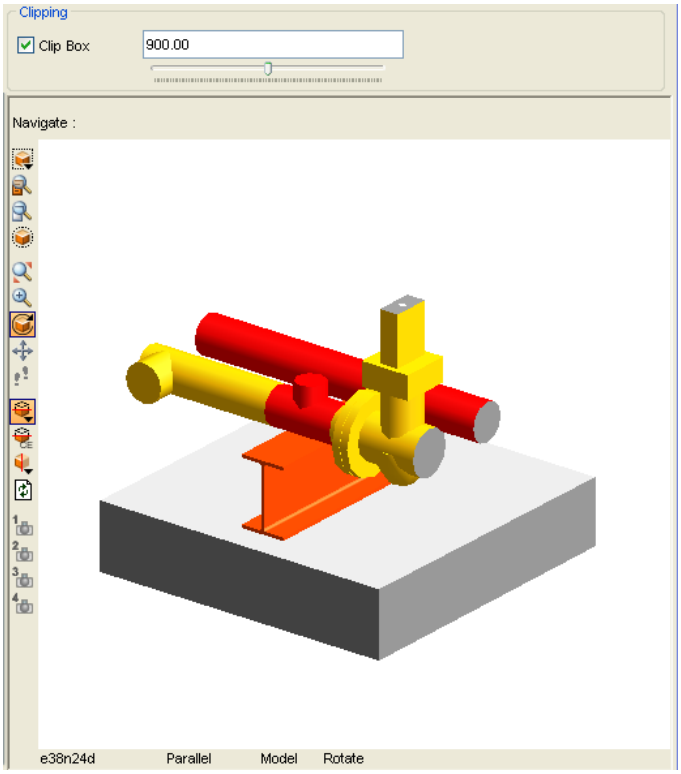


Other options on this panel are covered by the standard DESCLASH defaults.

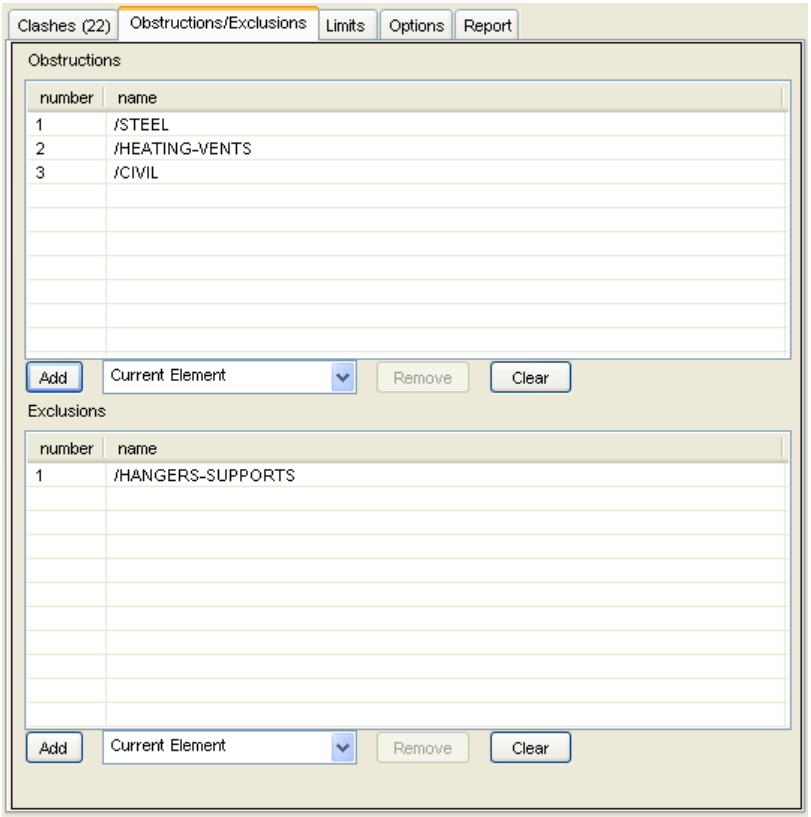
In addition to the DESCLASH options there are various other presentation defaults such as the View background colour and options to display aid constructs to in the 3D view.



By default each clash is displayed in a clipped view; the clip box size can resized by direct input or a slider bar above the view – or clipping can be switched off.



When checking for clashes, the default obstruction is All; this mean that the element is checked for clashes against everything in the MDB. In practice, it is perhaps more realistic to check for clashes against specific obstructions. This is specified in the Obstruction/Exclusions panel:



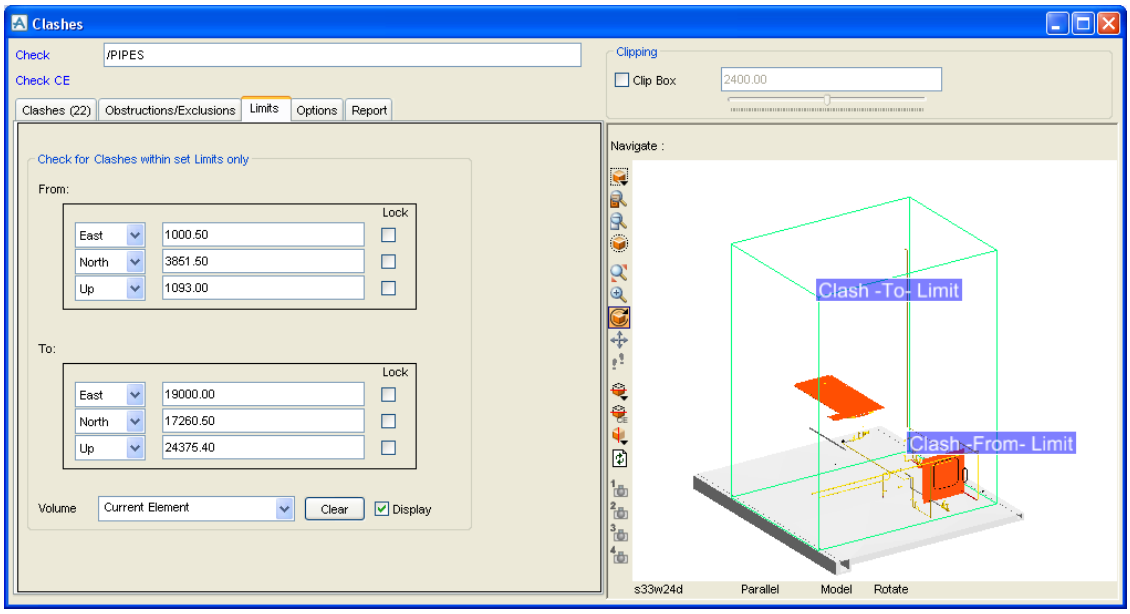
There are several options to help the user add to these lists:

- Current Element
- Pick Element
- Current Selection
- Current List
- All

Remove removes any selected elements and Clear clears the entire list.

The application allows a limits volume to be set so that only clashes within these limits are reported. If all values are zero then there are in effect no limits to the clash check. This can be reset using the Clear button.

The volume box can displayed using the Display option:



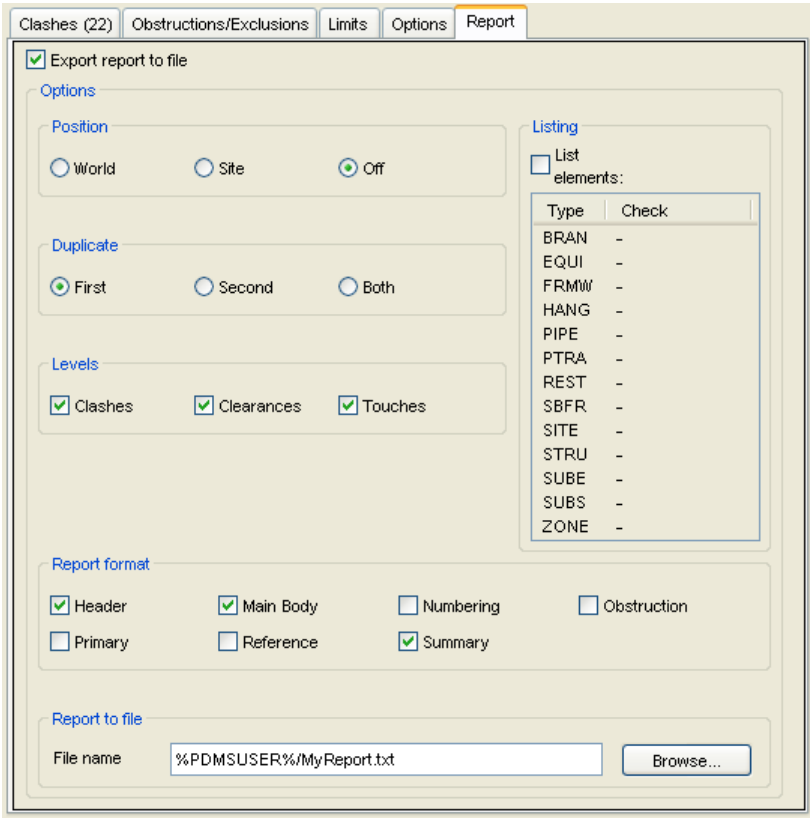
To set limits the Position can be directly input or set using the options:

- Current Element
- Picked Elements
- Defined by 2 Picks
- Current Selection
- Current List

The 3D view has all the expected functionality of a standard 3D view and can be Printed and Saved to file by setting focus to the view and selecting from the View > Print Graphics… and Copy Image options.

26.7.1Reports

If a text report of the clashes is required this can be done by ticking the Export report to file toggle on the Report panel. The report will be written to file each time a Check is performed



Other Changes to the Application

- The old Clasher settings forms from Settings>Clasher have been removed
- The old Clasher form is removed but the Menu Utilities Clashes is still the same

26.8 Cable Design

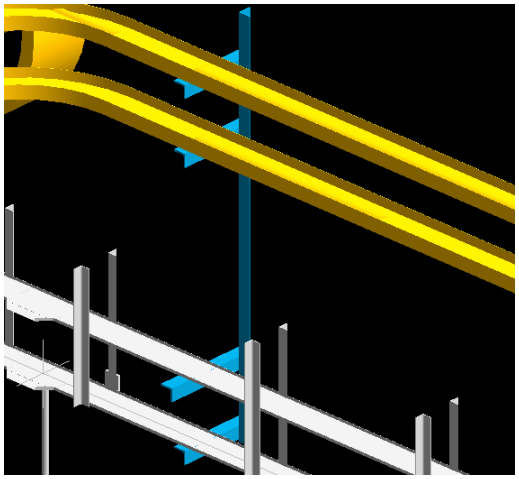
A number of enhancements have been made. Of particular note is a new **Manual Route Cable** 'task' that allows the user manually to create or modify a cable's route between its start and end references. For details, please refer to the *Cable Design User Guide*.

26.9 Multi-Discipline Supports

26.9.1 Cable Tray Supports

MDS can now support the new cable tray CTRAY elements, as used in the Cable Design application. A CTSUPP element is used instead of an ATTA.

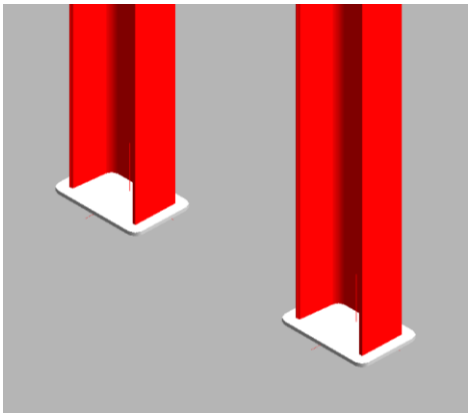
'Old' piping (BRAN) cable trays and CTRAY cable trays can be supported by the same cable tray support using the **Add Rack** function as usual:



26.9.2 Automatic generation of pads

There is a new application default to turn the auto generation of pads on or off; the default is on.

If the setting is ‘on’, pads are created when using a cursor based creation method (CURSOR or CLEARANCE) with a PANEL or HPLATE element identified. The section type is checked and a suitably shaped pad chosen, appropriate to the section type. For example, triangular shapes are used for angle and square (rectangular) for flat bar.



A new ‘Modify pad size’ button on the Modify Section form enables the user to change the dimensions of an existing pad.

In Paragon, the default value for the **Automatic Pads** option can be set On or Off in the MDS Admin Data form, under the top bar menu **Modify > MDS Application Defaults**…

26.9.3 Updating client project defaults

From time to time new or updated component standards will become available in the MDS catalogue. Where users are maintaining their own application defaults databases, these changes will not be immediately available because they need to be added to the database.

A new upgrade tool allows the MDS administrator to update existing standards or add new ones. This is useful for users upgrading from a previous version of a project or continuing work on a project that uses a copy of a previous version’s MDS/APPDEFAULTS database.

The ‘Check MDS Application Defaults’ tool is a new feature in the Utilities menu of the Paragon module and is available to administrators who belong to team ‘CATADMIN’. For details, please see the *Multi-Discipline Supports Administrator Guide.*

26.10 Outfitting Piping Isometrics

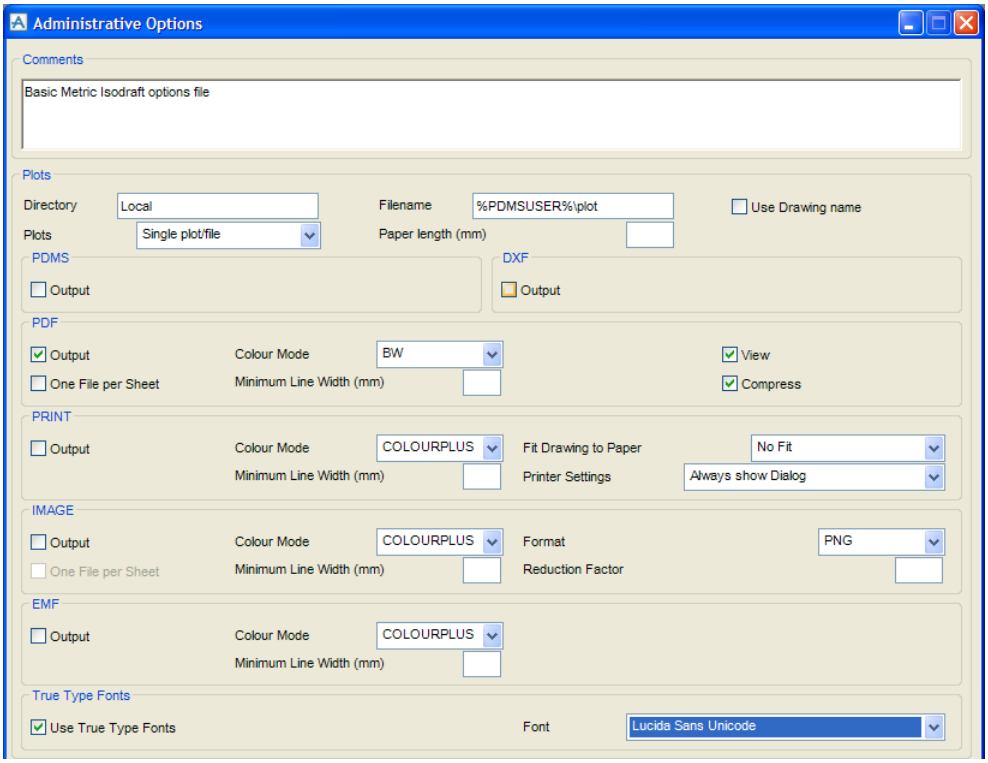
There are several developments in Hull & Outfitting Isodraft version 12.1. For details, please refer to the updated User and Reference Manuals.

26.10.1 New Output File Formats, Including PDF

Isometrics may now be produced in PDF, Image or EMF (Enhanced Windows Metafile) format. This is achieved through an extension of the FILE command, for example:

```
FILE PDF /filename
```

These formats may also be selected from the Options form:



26.10.2 TrueType Fonts

TrueType fonts, as defined in Admin, may now be used on isometrics. The user can select the font type for all the text on the isometric (including material description) by font number, e.g. `TTFONT 5`.

Examples:

`TTFONT OFF`	TrueType fonts are not used
`TTFONT ON`	Selected TrueType font is used
`TTFONT 5`	Times New Roman font as defined in Admin
`TTFONT 6`	Arial font as defined in Admin
`TTFONT NONE`	TrueType fonts are not defined

TrueType fonts may also be selected from the Options form – see above.

Note: True type fonts may only be used when isometric output files are to be produced in DXF, PDF, Image or EMF (Enhanced Windows Metafile) format.

26.10.3 Large Coordinates

ISODRAFT can now handle coordinates larger than other limits in Hull & Outfitting and show them on the isometrics. Its limit is now 2,147,483,647,000 mm (approximately 2 million km).

It can also display large coordinates, such as those encountered when using coordinates related to a GPS datum, on the iso.

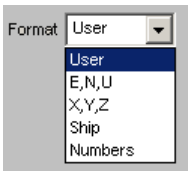
26.10.4 Additional Coordinate Formats

New commands and options on the Annotation Options GUI allow the user to specify format, units and precision for coordinates on the iso:

COFORMAT

Selects the format for the coordinates output on isometrics:

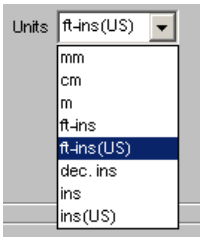
USER	User-Defined using Alternative Texts (as before)
ENU	E, N, U format
XYZ	X, Y, Z coordinates
SHIP	Ship Reference system
NUMBERS	Purely numeric



COUNITS

Selects units for the coordinates:

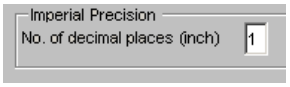
Command	*Units*	*Example*
MM	millimetres	6263.48
CM	centimetres	626.348cm
METRE	metres	6.26348m
FINCH	feet and inches	20’6.19/32”
USFINCH	feet and inches (US style)	20’-6 19/32”
DECINCH	decimal inches	246.59”
INCH	fractional inches	246.19/32”
USINCH	fractional inches (US style)	246 19/32”



CODECP

Selects the precision (number of decimal places) for **DECINCH** (Imperial decimal) coordinates:

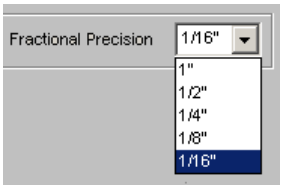
0	precision to nearest inch
1	precision to nearest 1/10 inch



COIMPP

Selects the precision for Imperial fractional coordinates:

FINCH	(feet and inches)
USFINCH	(feet and inches - US style)
INCH	(fractional inches)
USINCH	(fractional inches - US style)

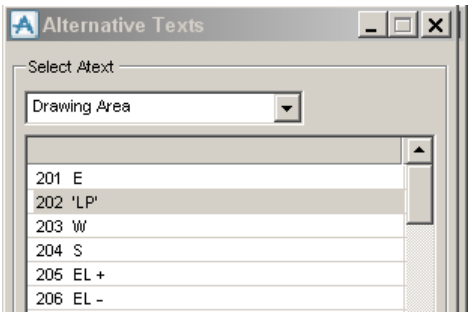


26.10.5 Drawing Pipe Spool

This enables isometrics to be drawn of the PSPOOL elements stored in PIPEs under a PSLIST. This is an alternative, used by pipe fabrication checking, to the SPOOL elements in the SPOOLER database.

26.10.6 'North' Arrow Text

The text shown with the 'North' arrow may be changed by means of the Alternative Text ATEXT(202). The default is 'N'; If the User changes ATEXT(202) to 'LP', the symbol will appear as:



26.10.7 Pipe Penetration Seal Symbol

This new user-definable symbol (SKEY CPCF) represents a Penetrating watertight piece modelled using a COUP element – see section 26.5.

This is in addition to the similar user-definable SKEY CPWP used for a Penetrating piece.

For details, please see the *ISODRAFT Reference Manual* section 3.27 Symbol Key Reference Index.

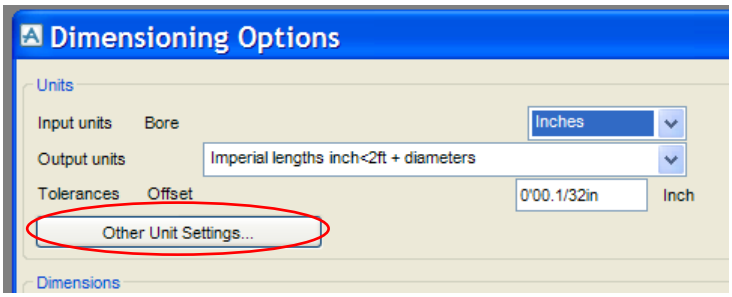
26.10.8 Setting Units in Options files

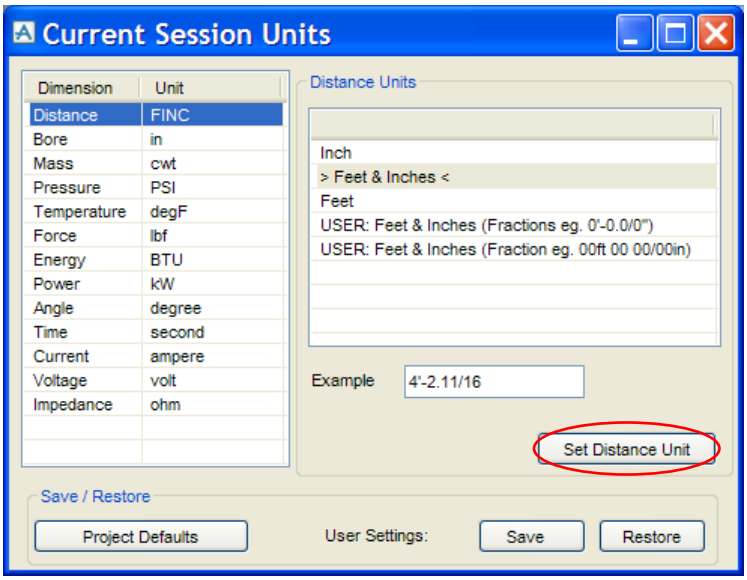
Isodraft loads the current units setting when the user enters the module but has its own units for defining bore and distance on Isometrics; these are built into the individual Isodraft options files. There is no change are to the way that bore and distance units are output but changes have been made to define the units required for some additional items.

Previous versions of Isodraft output units for Weight, Pressure and Temperature; these will be interpreted in current units and converted to the correct output value. For example Pressure is stored in Pascals but the user may require the equivalent in bar on the iso. To ensure this, the options file needs to contain the required output settings.

This is done by adding a block of code for setting units at the end of the options file. Each time an Iso is created, the options file is run as a macro so appending the correct units settings to this will ensure that Isodraft enter the detailing process with the correct units settings loaded. The process of modifying the option file will automatically append the current units so each option file can potentially redefine the current units.

The standard option setting process is to select **Options>Modify** from the main Isodraft menu bar to show the Modify Options form. After selecting an options file to modify, pick **Dimensioning Options.** A new button (**Other Unit Settings**) on this form shows the **Current Session Units** form as in Design:





The units settings can be reset using this form and need to be activated using the **Set … Unit** button.

Clicking OK on the options form will save the current units setting into the current options file. Once an options file has its own units settings, these will be loaded before generating isos or modifying the file.

Notes:

- Until an options file has been modified, the units displayed in the **Current Session Units** form will be the current Design session units as on entry to Isodraft. When an options file has been loaded, the units defined in the options file become current. Existing Options files will have no unit definitions until they have been edited and saved.

Isodraft does not currently perform any units conversion for UDAs. Isodraft will output them in database units.

26.11 Future Considerations

26.11.1 Access platforms, Stairs and Ladders (ASL)

The new application for Access platforms, Stairs and Ladders (ASL), released in 12.0, is being improved to provide an excellent tool for stairs (single flight in the first release), ladders and handrailing. The functionality to create platforms with the application is being removed and platforms will be created using standard Beams & Columns and Panels & Plates functionality, possibly in conjunction with the Standard Model Library utility.

The new application will, therefore, be known as ***Stairs, Ladders and Handrailing*** (SLH).

Until the new application is released the 12.0 ASL application is kept in the product as is .

The old Access platforms, Stairs and Ladders application (from Hull and Outfitting 11.6) is still available, though it will be removed at a future release. It is available, hidden, at Hull and Outfitting 12 and can be reactivated by a simple edit to the PML file `PDMSUI/des/addins/access`. This file is all commented out; activate all the code lines after the header and ensure that the application is shown on the menu:

27. AVEVA Global

27.1 Global WCF

This option was introduced with Hull & Outfitting 12.0.SP6.6 to improve the security of all Global communications. It is an alternative to the use of RPC which has been used in previous versions of Global.

It provides an interface to the Windows Communication Foundation (WCF) as an alternative to Remote Procedure Calls (RPC) for network communications. As a result, Global can now exploit the security configurations provided by WCF, which is enabled and configured by modifying values in XML configuration files.

The following security benefits are now available:

- Transport Layer
    - Apply security to either the connection (ideal for connected networks), or individual messages (ideal when sending messages over the internet)
- Bindings
    - Determine the low level protocol used, BasicHTTP (textual, unsecured), wsHTTP (textual, secured) or TCP (binary, faster, but cannot be validated)
    - Determines which ports to use for connections
- Encryption
    - WCF provides many encryption algorithms to protect data en route
- Encoding
    - Tied in with the binding, this determines how the message will be sent: text (slow), binary (fast) or Message Transmission Optimisation Mechanism (MTOM) which will send what it can in text, but will send binary data as binary (a combination of the previous two)
- Authentication
    - At the server side, the message is verified to be from a known source; at the client side, the message is sent to a known receiver. Messages can authenticate against a Windows account or via a certificate.
- Message Validation
    - Ensure that messages meet a known format by comparing against a Schema

Full details are provided in the *Global WCF Configuration Guide*. Other Global manuals have also been updated for 12.1.

27.2 Global Claim Commands

Global Claim (to an extract) commands issued from Hull & Outfitting now pass only if ALL claims succeed. This is a change as in previous versions, where the Claim command would pass even when some claims had failed.

The *Running Global Projects* manual has been updated with further details.

27.3 Global WCF Service Name

The Global WCF interface name has changed from that in 12.0.SP6. This affects the Global WCF client and server Configuration files. The purpose of this is to force an interface change between 12.0.SP6 and 12.1 as the databases are not compatible.

The name has changed from the unversioned name used in 12.0.SP6. This is reflected in the endpoint definition within the configuration files `GlobalWcfClient.config` and `admindWCF.exe.config`.

The Endpoint has changed from:

`…/GlobalWcfServiceLib/GlobalWcfService`
to:
`…/GlobalWcfServiceLib/GlobalWcfService_11_1_201011`

As a result the WSDL file is now renamed from:

`aveva.globalservice.wsdl`
to:
`aveva.globalservice.11.1.2010.11.wsdl`

The service contract is now:-

`IGlobalWcfService_11_1_201011`

The Endpoint has changed from:

`…/GlobalWcfServiceLib/GlobalWcfService`
to:
`…/GlobalWcfServiceLib/GlobalWcfService_11_1_201011`

The sample configuration files provided with Global 12.1 contain the new versioned names; however if you wish to carry the 12.0.SP6 WCF configuration files forward to 12.1 you will need to change the references above in both the `GlobalWcfClient.config` and `admindWCF.exe.config` configuration files.

27.4 ADUUID Attribute Length

This attribute provides a UUID (Universal Unique Identifier) for the Global daemon. It is a string of hexadecimal values (for example, `92e2714e-0a85-42b0-9d6a-100905aeffc0`). Global will not work if this attribute does not contain a valid UUID.

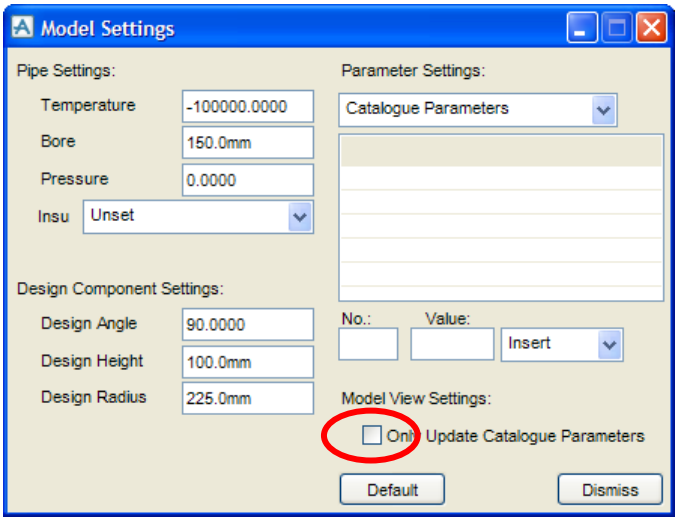
While reviewing all text attributes for Unicode, this one has been shortened to 40 characters; the former length of 120 characters is far longer than the maximum possible value.

28. AVEVA Catalogue & Specifications

A number of improvements have been made to the PARAGON module. The most significant are listed below:

28.1 Model Settings

The Model Settings form has been updated. The most significant change is to allow the alteration of catalogue parameters only.



Model settings can be altered by the Model View form as well as by the Model Settings form. In addition to changing the catalogue parameters, the Model View from may change other parameters based on a category's data set. For example, if the data set includes properties that define design parameters, those design parameters in the model settings are set to the default property values from the data set. If the 'Only Update Catalogue Parameters' box is checked, the Model View form will not update any model settings except those for catalogue parameters.

28.2 Parameterised Detail Text

The GUI will now accept Text Expressions in Detail Text fields: these must be entered as valid string expressions beginning with '(' and ending with ')'. If the expression is not specified in this way, the Detail Text field will be treated as a simple string.

For details, please see section 4.1.15 Detail and Material Text in the *Catalogues and Specifications User Guide.*

28.3 Copy Button for Structural Catalogue

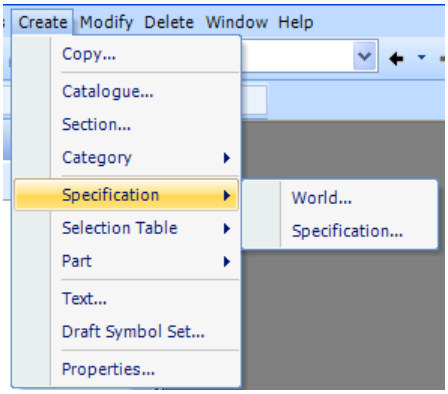
New Copy buttons have been added to the forms for creating structural geometry components and Plines. These make it easy for the user to copy an existing element and then modify the expressions rather than start from scratch. This approach is similar to that used for the Data Sets.

Details of the changes are given in the Catalogue & Specifications User Guide.

28.4 Creation of Structural Specs

In the Specification list form, available from menu **Display > Specifications**, there is now a button **Display Spec**. Pressing this button brings up the Specification form as before except that the form opens in Read Only mode. In this state the form UI changes slightly – the title includes [Read Only] and changes the wording of two link buttons from **Edit Spec Atts...** and **Edit CAT Atts...** to **Show Spec Atts...** and **Show CAT Atts...**

The Create menus in Steel Work and Equipment have had the **Specification** menu restored, moving the **Specification World** entry down to a submenu next to **Create Specification**. The **Modify** menus have had the **Specification...** entry restored.



When modifying specifications, some non-piping specifications cannot be altered by the form. Attempting to modify such a specification will put the form into read only mode as described above.

This form allows you to access various tasks which administer all aspects of a new Specification. The current version is primarily intended for use with piping specifications and may not always be suitable for other specifications.

28.5 Raw Plates in CATA

The raw plate definition has been moved from the manufacturing database (MANU) to the catalogue (CATA) in the Catalogue World. The raw plate elements are defined in Paragon using the PML script HullDefineRawPlates. Input to the script is the file which previously was used to create the raw plates in MANU. This change is beneficial for projects using Global.

29. Known Issues

29.1 Outstanding Faults and Issues

29.1.1 General Issues

Internet Explorer 9

AVEVA does not recommend the use of Internet Explorer 9. In particular, it has a fault associated with the use of the .CHM online help files, when they reference external files such as PDF. It is anticipated that a hotfix will be made available by Microsoft during October 2011.

Unicode Filenames

The use of ASCII (Basic Latin) filenames is recommended for two reasons: compatibility with other systems and various specific issues which have yet to be resolved. This applies to some of the systems to which PDMS is interfaced, and even to some of the interfaces where Hull & Outfitting makes use of third party software such as output of DXF and DGN. PML Publisher does not currently fully support Unicode filenames.

Limitations

AVEVA recommends that changes to Database Views (DBVWs) are not made whilst users are live in the system. Changes to ATTCOL attributes in Lexicon may otherwise cause Tags to crash.

29.1.2 AVEVA Schematic 3D Integrator

Some errors can appear using Integrator if there is no configuration file local to the project. The Integrator Link function can raise an Internal Integrator Error and edits in the Project Configuration Explorer may not be displayed correctly. The Compare and Build functions are unaffected, and if one of these has been run in the session then the Link function will also work.

The workaround is to copy the file ProjectConfiguration.xml from the installed 12.1 folder to the folder <proj>dflts\ModelManagement, where <proj>dflts is the folder defined in the appropriate environment variable, e.g. %samdflts%. The same result can be achieved by a free user starting up Integrator, then clicking on Integrator>Display>Project Configuration Explorer, then saving the file.

29.1.3 AVEVA Global

Global 12.1 does not fully support projects with spaces in their pathnames. Work is in hand to remove this limitation but no definite release date is yet set.

The daemon will work when installed in C:\Program Files\ but there is a known issue, see below.

RPC Daemon cannot detect if a WCF daemon is already running for current location of the project.
PDMS reports "(1,504) Unexpected error contacting Daemon - check versions match" when missing global client dlls.
Element claims can be lost for distributed extracts if an issue fails. This can lead to the error message 'has been deleted in a later session'.
The new Database Distribution allows a collection of DBs to be relocated to another location. If the HUB daemon is down, the form will hang until all relocation commands have timed out.

Default Drawing files and Stencils are not propagated to location project on creating the new location.
REMOTE CHECK will fail to run Standalone DICE if the daemon is installed in a folder which contains spaces, partly due to the semi-colon delimiter.
Global WCF cannot process database filenames with large DB numbers unless these are named using FINO. This is a range error in the validation in the Global WCF Config file. Administrators can correct it by modifying admindWCF.exe.config: FileNumber UpperBound should be 250000 inclusive. Please see Pivotal Knowledge Base article 3736.

29.1.4New Reporting Add-in

This new feature has a number of known limitations at this release, which will be improved in future releases. These include:

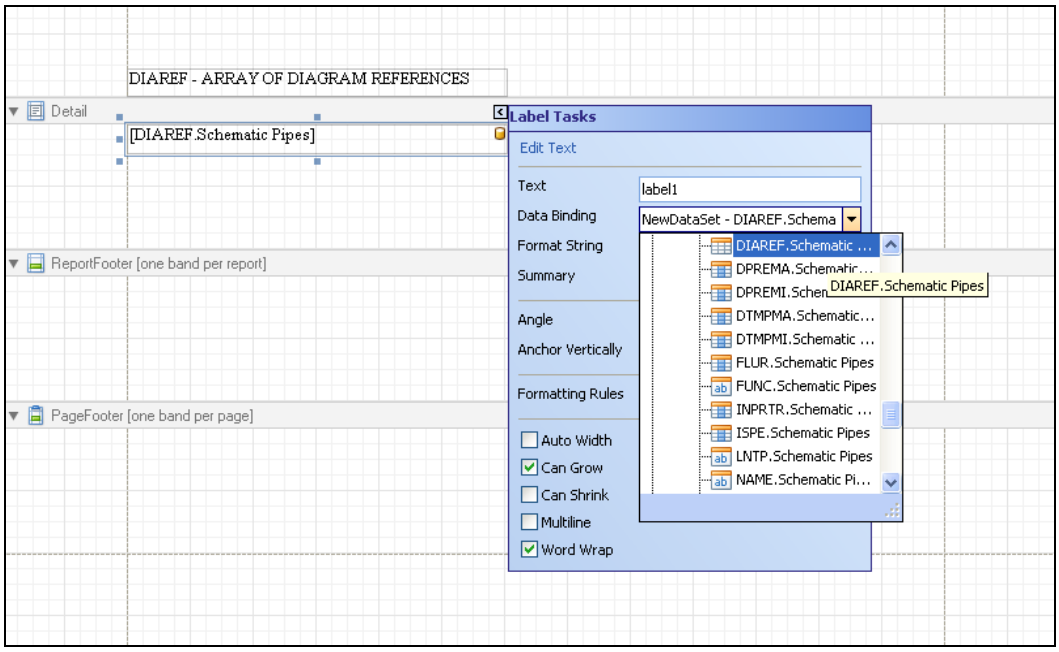
- Improving performance while running reports in batch mode
- Background colour not exported in RTF format
- Watermark fails to display in the report
- No Copy / Cut / Paste available in table modifications
- Changing the Zoom in the Report designer causes Report to crash – with Exception error message, which you cannot close, making it hard to close Tags as Report Designer keeps screen focus.

Some other limitations may be worked around as follows:

Drag and Drop of DBView Array Fields to Report Designer

This does not work at present; as an alternative, you can use an Array field in a report and place a control which can be bound to a field on the report. By setting the Data Binding property of the control it can be bound to an array field.

In the example below a Label has been placed in the Detail section of a report for binding to the array field.



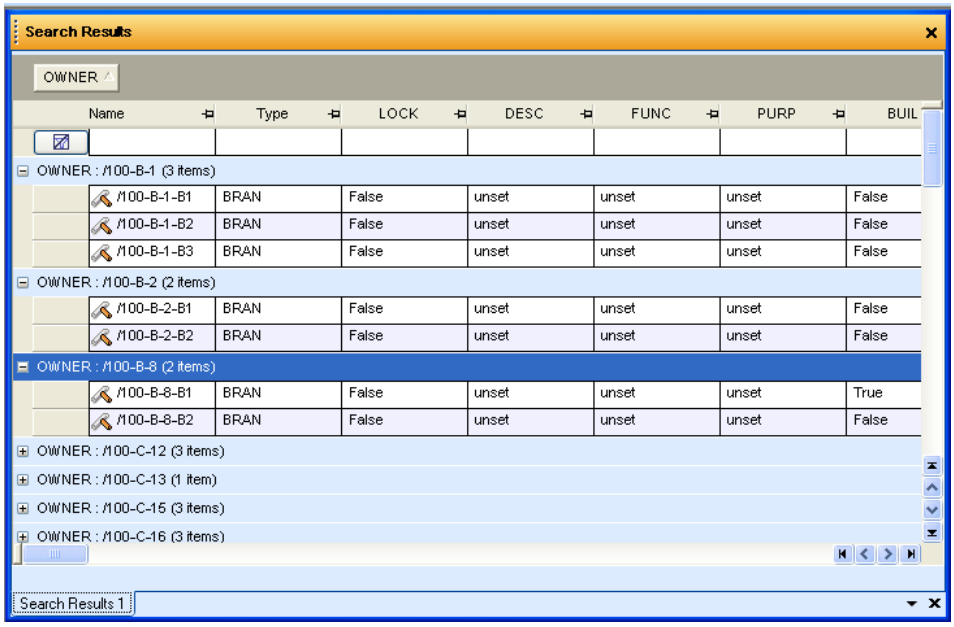
Quick Reporting – Handling of Grouping

Where grouping is applied in the search results grid, the group layout result will not be maintained when a quick report is generated.

This is because:

- This would lead to an inconsistency with quick reporting functionality in Instrumentation
- Different layouts need to be maintained for use in the reporting tool for grouped and non-grouped quick reports

Note: To enable group sorting: right click on the search results grid column heading, selecting Enable Group Sorting, and then dragging the column heading of the attribute you wish to group by into the group area of the search results grid (see example below).



Use of Summary in Calculated Fields

Where a summary field is used in a report the results of this summary cannot be used in a calculated field.

This has been identified as a future enhancement. A workaround is available.

Use of the Results of one Calculated Field in Another Calculated Field

It is not possible to use one calculated field in another calculated field.

This has been identified as a future enhancement. A workaround is available.

Not Possible to Hide Group Header Only

In the report designer, hiding a group header via the Group and Sort window also hides the group footer. However, hiding the group footer still leaves the group header visible.

Workaround: To hide only the group header, assign the height as 0 to group header.

PageRange Property Ignored when the ExportMode Property is set to SingleFile

DevExpress recommends that the ExportMode should be set to any other value to resolve this issue.

AVEVA Net Gateway - Unicode Characters

The field list explorer will not display Unicode characters unless the respective language pack is installed. The user can specify Arial Unicode font for reporting to display multi-byte characters in the report, PDF, excel, etc. without installing the respective language pack.

Reporting Default Values in Cells

When a value is not found, the error text “!Error” is given. In the UDA definition there is a default value defined, which should be in the report.

Workaround: This workaround removes “!Error” from the report field, and replaces it with empty string.

- Select the cell/label or control in report designer
- Add the script for before print, select new when creating script for the first time.
- Change the text from !Error to desired string as below:

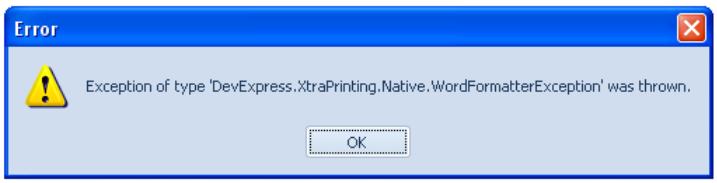
```
private void label8_BeforePrint(object sender, System.Drawing.Printing.PrintEventArgs e) {
 if(label8.Text == "!Error")
        label8.Text = "";
}
```

Reporting Document Fails to Attach to the Mail

This occurs for PDF files only when you have a Unicode character in the filename; it does the save but doesn’t send it to Outlook. The workaround is to attach to email or right click the file to send it manually

Quick Report exception thrown

Doing a quick report and then using the HTML VIEW tab throws an exception.



This occurs only with a large number of columns, so the report cannot accommodate them within the visible area.

Large length Reports fail to export at certain formats

A 509 page report exports as PDF, CSV and TEXT, but fails for all other formats. If you run the Excel (XLS) export it warns you and says use (XLSX) but fails on doing so. It can export to the CSV version that can then be loaded into Excel. Even if you select single page versions of the image export it fails.

Reporting output differs for different Excel formats

Exporting the output from Reporting, the data exported differs between XLS and XLSX. The XLSX format creates #VALUE! (errors in the cells that are PDMS REFs in the DBViews); whereas the XLS format creates the data correctly.

This issue arises because export to XLSX format considers the data in Value (object) mode by default. The workaround is to use the Text export mode: please see below:

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