A large, light blue wireframe sphere is positioned on the left side of the page, partially overlapping the top and bottom borders. It consists of a grid of lines forming a sphere, with a smaller, more detailed wireframe sphere nested inside it, creating a sense of depth and perspective.

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MARINE

Clash Manager User Guide

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1 Introduction

This guide introduces AVEVA's Clash Manager product. As part of Model Management it is provided as an extension to AVEVA Marine OUTFITTING DESIGN. As Standalone Clash Manager it is provided as an extension to AVEVA Marine Outfitting. This chapter lists the different types of user who would need to read this guide and sets out what knowledge they will need before they start.

Clash Manager complements the built-in design clash capability of AVEVA Marine Outfitting. It provides comprehensive recording, trend analysis, identification, management and the resolution of clashes through an approval mechanism.

Clash Manager provides reports on clashes and enables a status, history and responsible discipline to be allocated to each one. This enables the OUTFITTING user to prioritize, control and monitor the work involved in the resolution of all clashes. The module aids in assembling the required input data to deslash, transparently running deslash and loading the resulting deslash output into a separate database that provides reporting, viewing and approval mechanisms.

The Clash Manager GUI displays information on the occurrences of the clashes, and can request the OUTFITTING GUI to graphically display the physical positions of the clashing items.

The GUI enables the user to:

1. Check for clashes within a specified part of the OUTFITTING model.
2. Check for clashes involving the OUTFITTING Current Element (CE).
3. View the number of clashes, at specified status, associated with each discipline.
4. View a breakdown of information about the elements involved in the clashes.
5. Allocate a status (Unapproved, Pending, Conditional or Approved) to a clash, and to add comments regarding any status changes.
6. Specify which discipline is responsible for resolving a clash.
7. Display selected clashes at the OUTFITTING 3D display.

1.1 Who Should Use This Guide

General users should use this guide to understand the tasks Clash Manager can do and to find details of how to achieve a specific task using the controls provided.

General users and Administrators should use this guide to adjust Clash Manager settings to suit project requirements (some settings are visible and editable only for Administrators).

Administrators can also use this guide to set up batch processes using the MMSCMD utility to automate certain Clash Manager tasks.

1.1.1 Assumptions

Users have a valid Model Management or standalone Clash Manager licence and the software has been installed.

Users of Clash Manager have a basic knowledge of AVEVA Marine Outfitting.

Model Management users have access to the PE Workbench database OUTFITTING is running.

Standalone Clash Manager users have access to the Oracle or Microsoft SQL Server database set up for this product.

1.2 How the Guide is Organised

The guide is divided into chapters, as follows:

Introduction introduces Clash Manager.

Concepts describes the Clash Manager concepts.

Design Workflow describes the design workflow to achieve the overall purpose of discovering and resolving clashes.

Procedures describe the procedures for viewing, preparing and running clashes.

GUI describes the GUI and options available.

Entry Information contains information on wildcards, syntax and rules.

Model Management Wizard describes how to use the Model Management Wizard for Clash Manager.

Performance Hints gives hints on enhancing performance.

Implementing Clash Manager on an Existing Project describes the configuration required.

1.3 Product Compatibility

Clash Manager can be used with the following products:

AVEVA Marine OUTFITTING DESIGN 12.0 or later

Standalone Clash Manager can also be used with AVEVA Marine Outfitting 12.0 or later.

As part of Model Management, AVEVA PE Workbench 5.5 (Oracle 9)

As part of Model Management, AVEVA PE Workbench 5.6 (Oracle 10)

As Standalone, Oracle 9

As Standalone, Oracle 10

As Standalone, Microsoft SQL Server

2 Concepts

2.1 Clashes

A Clash occurs when portions of two elements occupy the same 3D space in a OUTFITTING model. The following terms are used to define a clash situation:

Clash number	A unique number automatically allocated to each clash
Element	Any named element in the OUTFITTING model that represents a physical item involved in a clash. An element cannot be a SITE or ZONE. Element 1 and Element 2 within a Group are specified.
Group	Multiple clashes between a pair of elements within a given volume may be grouped into a single Clash Group and may be selected for viewing, reporting or approval as a single entity
Discipline	The discipline responsible for resolving the clashes within a group. The discipline may be automatically or manually assigned.
Status	The following Status can be allocated to a Clash Group: Unknown - an initial or default status Unapproved - no action has been taken Pending - the clash is being investigated Conditional - the clash is approved subject to specified conditions Approved - the clash is an acceptable feature of the Ship Design
Comments	Descriptions of the current and/or historical situation regarding a group / clash detail
Clash Set	<p>Defines the portion of the model to be clash checked. This comprises the MDB name, and Obstruction and Check and Exclude lists. User defined Title and Comment can also be appended.</p> <p>The Obstruction List contains the items that clashes are checked against. They are usually solid or large items such as walls, buildings and primary steel.</p> <p>The Clash List contains the items that are to be checked for clashes with the Obstruction List items.</p> <p>The Exclude List contains items to be excluded from the Obstruction List. An example of its use is as follows. If there are 30 Zones in a Site of which 28 are to be in the Obstruction List, rather than adding 28 Zones to the Obstruction List, it may be more convenient to add the Site to the Obstruction List and add the 2 unwanted Zones to the Exclude List.</p>

Type	Clash types are: 'Clash' 'Clearance' 'Touching'.
Level	Clash levels are: 'Hard/Hard' 'Hard/Insulation' 'Hard/Soft' Insulation/Insulation Insulation/Soft Soft/Soft Not Proven

2.2 Access Rights

Note: Clash Manager Administrator privileges, unlike other Model Management Administrator rights, are based on Windows Login IDs and are set directly using Clash Manager itself. This difference exists to enable Clash Manager to be used without an installation of PE Workbench.

The arrangements for access rights to Clash Manager cover two aspects, namely User Access Levels and Security Levels.

The User Access Levels aspect enables the Administrator to specify the users who are to be the Members and Supervisors of each discipline.

The Security Levels aspect enables the Administrator to specify whether members or supervisors of particular disciplines may change Clash Status, acquire Clash Ownership, perform Clash Checks of the OUTFITTING Current Element and/or add Comments to clash records. Each of these is respectively covered by a separate Security Level namely, Clash, Owner, Clash Check CE and Comments.

Note: There are no options to set a Security level for preparing and running clash checks, setting up Clash Manager options and carrying out the 'Advanced Tasks'. These functions can be carried out only a Supervisor of the ADMIN discipline.

For each Security Level there are five pre-defined states namely, High, Medium High, Medium, Medium Low and Low. Each of these states has corresponding settings (minimum requirements). The default State for each Security Level is Medium and this is used as the guideline when access rights are mentioned in the Clash Manager Procedures.

As required, the Administrator may override the pre-determined settings by specifying custom settings for one or all of the [Security](#) Levels.

3 Design Workflow

This topic is intended for Supervisors of the Administration discipline, and describes when the Clash Manager forms, and the procedures in this guide, are used to achieve the overall purpose of Discovering and Resolving Clashes, as mentioned under Model Management Design Workflow. The start of each Activity summarized in that topic is shown by an italic upper-case heading in the following sequences.

The sequences and descriptions in this topic are intended to be read by users unfamiliar with Clash Manager, as they introduce set-up options and configuration tasks in the context of their effects on the design workflow. An experienced user would endeavour to handle all configuration tasks at the start of a project.

Following the sequences, are notes on:

- [Clash Manager Configuration](#)
- [Roles of the Discipline Designers](#)
- [Automatic Assignment Rules](#)
- [Automatic Acceptance Rules](#)
- [Status](#)
- [Clash Sets](#)
- [Log Files](#)
- [Project-wide Clash Status Reporting](#)

Hyperlinks in the steps of the sequences, draw the reader's attention to the relevant notes.

The tasks in the sequences are carried out only by a Supervisor of the Administration discipline, except where other users are mentioned.

3.1 Initial Configuration and Setup

3.1.1 Initial Project Setup

1. Configuration task that must be set up prior to the following workflow sequence are carried out at the Clash Manager **Configuration Form - Project Tab**. Refer to [Setting Up Clash Management Options](#).

3.1.2 Checking for Clashes and Resolving Them

1. The initial situation is that there are sufficient items built in the 3D Model in OUTFITTING to necessitate checking whether or not any of them clash and, if so, nominating who is the discipline designer responsible for resolving the clash(es).

Disciplines

2. The general principle of assigning the responsibility for the resolution of a clash is that it should rest with the discipline associated with one or other of the clashing elements. (Another discipline can be assigned, where appropriate.) If you are using Clash Manager without the PE Workbench installation (Stand Alone Clash Manager) it is necessary to associate (for example) OUTFITTING MMSDISC attribute values with Clash Manager discipline names so that the appropriate disciplines are identified in Clash Manager. This configuration task and the selection of the OUTFITTING attribute and the default discipline are carried out at the Clash Manager **Configuration Form - Discipline Tab**.

If you use the Check Check CE option you can also set up a special clash set named 'Default' which will be used as a template for all personal clash sets created with the Check CE option.

Refer to [Setting Up Clash Management Options](#).

Clash Sets

3. Before you can run a clash check you have to specify the items to be included. You do this by creating a Clash Set, which essentially contains two lists of objects. The first list consists of objects that are considered to be obstructions (usually steelwork or structure items). The second consists of objects that might possibly clash with the obstructions. You select the contents of the lists in the Clash Set you wish to run, together with other details such as the co-ordinates of the space occupied by the clash set, at the Clash Manager - **Clash Sets Form** and at subordinate forms Clash Manager - **Clash Set Data**, - **Add * List Item**, - **Edit * List Item**, - **Browse OUTFITTING Model** and - **Evaluate**.

Refer to [Preparing a Clash Run](#).

Clash Groups

4. There may be several clashes in close proximity to each other between an item and an obstruction. For example, a pipe running approximately parallel with a steelwork item may hit it several times. You should consider how you want to handle this type of event, because to report every clash may provide more detail than is desirable. For example, an engineer may consider these multiple clashes as one big clash and resolve it accordingly. Clash Manager provides a method of combining such clashes into 'Clash Groups', and reporting on these, as well as on the individual clashes. The configuration task for specifying how the Clash Groups are to be organized is carried out at the Clash Manager **Configuration Form - Group Tab**.

Refer to [Setting Up Clash Management Options](#).

Auto-assign Discipline

5. When both elements of a clash belong to the same discipline, members of that discipline are probably responsible for resolving the problem. However, when two disciplines are involved, it is not obvious which one is responsible (that is, which one is the Owner discipline). To avoid unnecessary manual action, Clash Manager provides a method of automatically assigning the owner discipline to a clash. For the Clash Group, the owner discipline can be set to that of the 'Worst Case' clash in the group. Setting up the Auto-assignment process and its associated Class, Level/Type and Priority considerations is configuration task performed at the Clash Manager **Configuration Form - Assign, Discipline, Class, Level/Type, and Priority Tabs**.

Refer to [Setting Up Clash Management Options](#).

Auto-accept Clash

6. Certain items may clash by design, for example, cables entering a junction box. Clash Manager will see these as clashes, but the design engineers would not wish to take

action and, in other words, would 'Approve' the clashes. For clashes of this kind, Clash Manager provides a method of automatically approving them. The process is based on Rules that, if satisfied, result in the clash being automatically allocated a status, such as Approved. The rules also enable specific comments to be attached to the record of the clash to indicate why it was automatically accepted. The Auto-Acceptance rules and comments are set up as a configuration task at the Clash Manager **Configuration Form - Accept, Status and Comments Tabs**.

Refer to [Setting Up Clash Management Options](#).

Preferences

7. Before you run the clash check, you can specify a number of features that determine how the clash check operates. Also, you can specify the colour-coding of clashing elements in the Clash Reports and in the corresponding OUTFITTING display. These actions are carried out at the Clash Manager **Options Form - Preferences Tab**.

Refer to [Setting Up Clash Management Options](#).

3.2 Clash Set Execution

3.2.1 Run Clash Set and Report

8. You can now run the clash check either from the **Tools>Run Clash Set** menu option or from the **Clash Sets** Form and subsequent **Run Clash Set** Form. Alternatively, the clash set can be run as a batch job overnight using mmscmd and Windows scheduled tasks. The results are presented on **Clash Reports**. (If you have any doubt that the clash set has run successfully, you should check the Log Files.) You can organize the report arrangements to suit your requirements and you can filter the content using the **Clash Report Filter Form**.

Refer to: [Running a Clash](#) and [Viewing Clash Report](#).

3.2.2 Assign Discipline

9. Your concern now is about the clashes that are not approved. The owner discipline may have been automatically assigned, or it may be Unallocated because no auto-assignment rule was satisfied. You can manually assign an Owner Discipline to the unallocated clashes using facilities at the **Clash Report** (and possibly the **Edit Clash Groups Form**) or at the **Clash (Group) Properties Form**.

Refer to [Updating Clash Status and/or Discipline](#).

(It may be necessary to correct the design model to ensure correct automatic discipline assignment is achieved. For example, the PURP attribute may not be set correctly at zone level).

10. Alternatively, for every Clash Group in which all clashes have identical status and/or owner disciplines, you can assign that status and owner discipline to the Clash Group. This is initiated by the 'Reset Group Status' and 'Reset Group Owner' buttons on the Clash Manager **Options Form - Advanced Tab**.

Refer to [Advanced Tasks](#).

Data Access Control

11. The Data Access Control arrangement restricts the entry or updating of comments and status applicable to clashes. The authorized users are members and supervisors of the disciplines of the clashing elements and of the owner discipline. The access control is set up as a configuration task at the Clash Manager **Configuration Form - Security Tab**.

Refer to [Setting Up Clash Management Options](#).

3.3 Engineering Clash Resolution

3.3.1 Clash Checking the CE

12. To ascertain specific clash details, the discipline design engineer, as a supervisor of the CE clash owner discipline, as configured by the Administrator, can run a personal clash check on the CE.

Refer to [Clash Checking the CE \(Current Element\)](#).

Comments

13. As the design engineers change the OUTFITTING model to avoid clashes they can add comments about the clashes, provided they are members or supervisors of the element or owner disciplines. The comments are added at the **Clash (Group) Properties Form**.

Refer to [Updating Clash Properties](#).

Status

14. To enable the progress in clash resolution to be monitored, you, a member of the ADMIN discipline, or a Supervisor of the owner discipline other users, as configured, can periodically update the Status of a clash. This is done at the **Clash Reports** (and possibly the **Edit Clash Groups Form**) or at the **Clash (Group) Properties Form**, until it is finally 'Approved'.

Refer to [Updating Clash Properties](#) and [Updating Clash Status and/or Discipline](#).

Alternatively, the designer may have updated the OUTFITTING model to remove the clash.

3.4 Re-run Clash Set Execution

3.4.1 Re-run Clash Set and Report

15. Periodically you re-run the Clash Check for the Clash Set from the Clash Manager - **Clash Sets Form** to check on progress made in resolving the clashes, both by the 'Display Counts' facility on this form and by viewing the resultant **Clash report** for Status changes. When required, you can check on the clash status of all or selected elements by viewing the Element Report.

Refer to [Running a Clash](#), [Viewing Clash Report](#) and [Viewing Element Report](#).

Note that, following a re-run, a clash detail is deemed to be the same as existing detail, if it is between the same two elements and if the position of the clash is within a tolerance specified when the clash group was organized. When a clash detail from the current run matches an existing clash detail, the clash level and type of the new instance is compared against the existing recorded details. If the level/type detail has worsened, then the clash status of the detail is revised. If a user-defined acceptance rule applies to the detail, then the status is recomputed in accordance with the rule. If no rule applies, then the status is set to the default value. If the new clash level/type is the same as before or better, no adjustment is made to the status.

When processing of all the details is complete, the status recorded against each group affected by the run is reset to the value of the worst case status recorded against any of the member details. This process captures the case where the status of an existing detail changes, as well as cases where a new detail is added to a group or an existing detail is removed from a group. The recorded group status can improve or deteriorate as a result.

3.5 Clash Reporting, Audit and Recomputation

3.5.1 Statistics

16. You can view the clash statistics discipline-by-discipline at the Clash Manager **Form**. Refer to [Viewing Overview of Clash Data](#).

Run More Clash Sets

17. As the design of the OUTFITTING 3D model continues, you can extend the scope of the existing Clash Set and/or create more Clash Sets and run them, as outlined above.

Note: If the normal process of reading desclash output files and post-processing the data and loading it into the Clash Manager database is interrupted or fails, the considerable time already spent running desclash need not be wasted. The entire set of desclash output files may be loaded, replacing any partially loaded. Alternatively, selected files may be merged into the results of the last Clash Run. These actions are initiated by the 'Load Clash File' button on the Clash Manager **Options Form - Advanced Tab**.

Refer to [Advanced Tasks](#).

Recomputation

18. The actions at the Clash Manager **Configuration Form** described in the previous steps, in general, would not be repeated. However, if significant changes have to be made at this form, recomputation must be performed at the Clash Manager - **Clash Recomputation Form**, which, in these circumstances, is automatically displayed.
19. When changes are made to the OUTFITTING Model, it is necessary either to perform Clash Recomputation or to re-run all affected Clash Sets, in order to update Clash Manager data. The Clash Manager - **Clash Recomputation Form** is not automatically displayed following a change in OUTFITTING, and must be accessed manually to enable recomputation to be performed.
Refer to [Advanced Tasks](#).

Track Changes

20. As more Clash Sets are run, the statistics displayed at the Clash Manager **Form** apply to the combination of all Clash Sets. This information, applicable to the current date, can be stored as a 'Milestone' for future reference in determining the progress made on the project. The creation of the Milestone is by selecting 'Track Changes' at the Clash Manager **Options Form - Advanced Tab**. Milestones can be created, as required.
Refer to [Advanced Tasks](#).

Continuing Tasks

21. The appropriate tasks are repeated until all clashes are resolved.
As required, make use of the facilities for automatic overnight operations of Running a Clash Set or Tracking Changes.
Refer to Command Line Interfaces - Clash Manager Functions.
Report on the Project-wide Clash Status by your preferred method.

3.6 Housekeeping Tasks

3.6.1 Following Model Changes

1. When the OUTFITTING model has been substantially updated, the clash details remain in the Clash Manager database (not the OUTFITTING database) even though

the item(s) they refer to have been removed. In these circumstances, the particular clash details continue to be reported until all Clash Sets containing the detail have been rerun.

These clash details, including their comments, can be removed from the Clash Manager database by use of the 'Delete all Unreferenced Groups and Elements, including Comments' button on the Clash Manager **Options Form - Advanced Tab**.

This process removes historical data and consequently the original comments will have been lost, if the clash re-appears.

Refer to [Advanced Tasks](#).

3.6.2 At Project End

2. At the end of a project all clash report data and history data can be removed from the database by use of the 'Delete All Clash Data, including Comments and History' button on the Clash Manager **Options Form - Advanced Tab**. The configuration data and clash set definitions, check list and obstruction list all remain. The remaining data is truncated to recover unused space in the Oracle Table Space.

Refer to [Advanced Tasks](#).

3.6.3 Roles of the Discipline Designers

Clash Manager includes a security model that enables you to specify the users who are to be the Members and Supervisors of each discipline and then to specify whether members or supervisors of particular disciplines may change Clash Status, acquire Clash Ownership, perform Clash Checks of the OUTFITTING Current Element and/or add Comments to clash records (refer to 'Concepts - Clash Manager Access Rights').

Depending on the size and scope of the project, you need to decide what role the discipline designers will take in the clash resolution process. Typically, there are three approaches that can be taken:

1. ALL discipline designers have access to the Clash Manager reports and are responsible for ensuring the clash free status of their part of the design model. This approach is most suitable for medium to large projects where a large clash data set is anticipated and requires frequent review by all designers on a part time basis. For this approach, the Security Levels tend to be towards the Low state.
2. Discipline supervisors or a small number of nominated discipline designers are given access to the Clash Manager reports. These users are responsible for ensuring the clash free status of their discipline's part of the design model. This approach is most suitable for small to medium projects where a small team of users can adequately manage and review the Clash Manager reports on a part-time basis. For this approach, the Security Levels tend to be at the Medium state.
3. An overall clash coordinator is responsible for ALL clashes on the project and is tasked to review the Clash Manager reports and perform clash resolution in consultation with discipline designers. This approach is most suitable for small projects where only a small clash data set is anticipated and can be easily handled by one person on a part time basis. For this approach, the Security Levels tend to be towards the High state.

The approaches described above are for guidance only but are typical of those taken by existing users in the deployment of Clash Manager. You may decide to adopt one of the above approaches, or formulate your own solution to match your specific project requirements.

3.6.4 Clash Manager Configuration

Before Clash Manager can be used on a project, it is necessary for you to perform some configuration tasks. The focus of these tasks is to produce an organized and structured

presentation of clash data that assists in the management of the clashes. All configuration tasks described here are carried out at the Clash Manager Configuration form.

The basic configuration tasks, which are necessary regardless of project size, are as follows:

- **Project** – OUTFITTING project code, user-id, password and MDB
- **Discipline** – determines how disciplines are identified for the clashing elements
- **Security** – controls user, supervisor and administration access rights
- **Group** – controls group settings for consolidation of detail clashes
- **Assign** – determines how clashes can be automatically assigned to a discipline.

The above tasks should serve for small to medium sized OUTFITTING projects, with the remaining advanced configuration tasks namely, **Accept**, **Class**, **Priority**, **Status**, **Comments**, **Level/Type** and **Gtype/Tracking**, safely left at the default values.

For larger projects, the advanced configuration tasks should be carried out, to achieve complex assignment and acceptance rules.

3.6.5 Automatic Assignment Rules

In order to set up successful assignment rules you need knowledge of how the OUTFITTING model is structured and how each discipline will model design items. You need this to enable you to determine the best set of rules for your specific project. Typically, the following situations are considered when formulating the automatic assignment rules:

- Access-ways and Escape routes
- Issued Pipes
- Exotic Materials
- Primary Steelwork
- Issued Secondary Steelwork
- Tertiary Steelwork
- Stress Critical Pipes
- Issued Elements
- Electrical Lighting
- Electrical and Instrument Stands
- Withdrawal Volumes

As your project progresses and Clash Manager is used in earnest, it is inevitable that you will need to either modify or add to your clash assignment rules. When you do this it may be necessary to recompute all or some of the clashes in the database to take account of the new rules.

3.6.6 Automatic Acceptance Rules

Automatic clash acceptance can save a lot of time for the project, removing the need for the designers or clash coordinators to review and approve acceptable clashes. To set up successful acceptance rules for a project, you need knowledge of how the OUTFITTING model is structured and how each discipline will model design items.

The following list contains some example situations where specific acceptance rules may be applicable:

- All Soft/Soft – Touch, Clear, Clash

- Architectural Fittings with Architectural Walls – Touch, Clear
- Supports with Main Steelwork – Touch, Clear
- Structural with Structural – Touch, Clear
- Supports with Stair ways and Ladders – Touch, Clear
- Stair Ways and Ladders with Any Other Discipline – Touch, Clear
- Lay Down Areas with Any Other Discipline – Touch, Clear
- Handling Ways with Handling Ways – Touch, Clear, Clash
- Main Escape Ways with Main Escape Ways - Touch, Clear, Clash
- Secondary Escape Ways with Secondary Escape Ways - Touch, Clear, Clash
- Access Ways with Any Other Discipline – Touch, Clear
- Escape Ways with Any Other Discipline – Touch, Clear
- Penetration Sleeve with Any Other Discipline – Touch, Clear
- Support with Piping – Touch, Clear
- Spray Volume with Spray Volume – Touch, Clear, Clash
- Hazardous Areas - Touch, Clear, Clash

Note that the automatic acceptance facility does not only approve clashes. It can be used to set a clash to any standard status, namely:

- Unknown
- Unapproved
- Pending
- Conditional
- Approved

3.6.7 Status

The standard clash status values that Clash Manager uses to categorize a clash are as follows:

- **Unknown** – an initial or default status applied to new clashes if none of the automatic acceptance rules are triggered
- **Unapproved** – the clash has not been reviewed and remains as a valid or outstanding clash for the project
- **Pending** – this status is used to indicate that the clash is currently under review by the design teams
- **Conditional** – this status is used to indicate that the clash has been reviewed and resolved in the design model. This also implies that following the next clash run this clash will no longer appear in the clash report. For reporting purposes this status implies a resolved clash.
- **Approved** – this status is used to indicate that the clash has been reviewed and is considered acceptable by the design team. The clash will continue to be reported in subsequent clash runs, but its approved status will remain with the clashing items throughout the remainder of the project lifecycle. In Model Management terms, if an element has only 'Approved' clash status in the database, it is considered 'Clash Free'.

For the purpose of evaluating the worst case the standard status always appear in the order shown above, the worst case being at the top of the list.

User-defined status can be inserted into the list to suit specific project requirements. The use of these status can be restricted to specific disciplines, or users. For example, status could be inserted as follows:

- **Piping to Verify** – a **conditional** approval to be used by the PIPING discipline only. This status may be used by the clash coordinator who has conditionally accepted a number of clashes on behalf of the PIPING team. Setting the status to this new value makes it easy for the PIPING team to filter on this status on the clash reports and therefore to review all clashes conditionally accepted on their behalf.
- **For Design Review** – a **pending** status for use by all users. Clashes with this state require further investigation or discussion at the next design review meeting.

3.6.8 Clash Sets

It is recommended that the number of Clash Sets for a project is kept to a minimum.

There are no limits on how you structure the Clash Sets, for example, by area, discipline, design status or combinations of these. The following examples show how Clash Sets have been configured:

- By design area and discipline – with structural as the obstruction and all other disciplines checked against the structures.
- By design discipline and design status – with disciplines checked against each other based in model design status. An example of this approach is to only clash check items with 'built' or 'checked' status.
- By design area/sub-area, discipline and design status – for a large OUTFITTING project, it may be necessary to subdivide design areas into smaller sub-areas, strips or modules, in order to complete a clash set or series of clash sets overnight, in batch mode. These smaller Clash Set runs execute quickly, but incur additional administrative overhead to coordinate the Clash Set execution.

It is recommended that you construct your Obstruction, Check and Exclude lists using wildcards, where possible. This reduces the amount of administration required during the life of the project, because, as sites, zones or elements are added or deleted from the design databases, they will be automatically included or removed from Clash Set lists that use wildcards.

AVEVA has seen a number of situations where clients have started a project with a large number of clash sets (x100s) and, through experience gained during the life of the project, have rationalized these down to a more manageable number (x10s). Therefore, before implementing Clash Manager, think carefully about the approach you will take when defining your Clash Sets, and ensure the number of Clash Sets is kept to a manageable size.

3.6.9 Log Files

Following execution of a clash set, you can check whether the process is successful by interrogating the log files that are generated. The log files for a clash set run are created in a sub directory under the directory referenced by your TEMP environment variable. The most reliable method to determine your TEMP directory is to 'echo' the TEMP environment variable setting in a Windows command window: `echo %temp%`. Alternatively, open a Windows Explorer session with the TEMP path from the Start>Run... dialog. Once you have determined the location for your temporary system files, you will find the files in the directory: `Pclam_'project code'_'windows_username'_'clash_set_number'`

There are five files generated by the clash set, and a series of output files; one for each checked element. The names and purposes of the files are as follows:

pclam.fin – this file will contain the message 'OK' if the clash set processed without error. If an errors occurred during the desclash execution, then the OUTFITTING error message text is written to this file.

pclam.log – this file is the main log file and contains messages to indicate the processing of each check element. The foot of the file contains the message 'Normal Termination' if the clash set completed successfully.

pclam.mon – this file contains a detailed set of messages and time stamps to indicate duration of each stage of processing and loading of clash output files into the Clash Manager database.

pclam.pmlmac – this is the pml macro executed by the clash set to generate the clash output files

pclam_check.pmlmac – this is the check macro called by **pclam.pmlmac** that performs the check check processing in Desclash.

pclam_nnnn.OUT - this is the output file generated for each checked element.

3.6.10 Project-wide Clash Status Reporting

In order to keep project management aware of the model's clash status, it is important to generate regular clash status reports. There are a number of ways of doing this and any combination of the methods described here can be utilized:

- Business Objects – this is AVEVA's recommended method of reporting for all Ship Model Management products. A BO universe is required for this and, once in place, the BO reports can be produced easily and quickly.
- Track Changes – this creates milestones in the Clash Manager database to allow filtering of statistics on the main Clash Manager bar charts. This also allows rudimentary clash trend analysis to be performed. The bar chart graphics directly cannot be saved directly, however a third-party screen capture tool can be used to do this. Alternatively, statistics can be saved in csv format for import into Excel, or similar spread sheet application, as described below.
- Microsoft Excel – a number of clients are using this method to great effect to produce detailed statistics for clash status. An example of how this can be achieved is to take a daily or weekly save of the main form statistics and load these into an Excel sheet. This data can then be used to produce detailed trend analysis reports, using Excel's in-built charting and statistical functions.
- 'Screen Shots' – Simply take regular screen 'shots' from the main Clash Manager bar chart display.

4 Procedures

4.1 Setting Up Clash Management Options

1. Select **View>**Clash Manager or at the Toolbar, select Clash Manager.
2. The '*Main Clash Manager Form*' form is displayed.
3. Select **Tools>Settings**.

Preferences

4. The 'Clash Manager Options' form is displayed. At the Preferences tab, select your preferred methods of handling clash information and highlighting features in the Clash report and in the OUTFITTING display. (Refer to *Options Form*).

Configuration

5. **Security:** This step is available only to Supervisors of Administrator discipline. If configuration of the Clash Manager operation is required, press the Clash Manager **Configuration** button on the Preferences tab of the 'Clash Manager Options' form. The 'Clash Manager Configuration' form is displayed. Enter, update or delete data at the tabs appropriate to the configuration tasks in hand. (Refer to *Clash Manager Configuration Form*).
6. The 'Clash Recomputation' form is displayed, if significant changes have been made to the configuration. Initiate the recomputation process for the required features. (Refer to *Clash Recomputation Form*).

4.2 Viewing Overview of Clash Data

Security: This procedure is available to members of all disciplines.

1. Select **View>**Clash Manager or at the Toolbar, select Clash Manager.
2. The 'Clash Manager' form is displayed. View the listed and graphical data. (Refer to *Clash Manager Form*).
3. As required, display overview data for Clash Groups, or Individual Clashes by selecting **Summary Display** then **Clash Groups**, or **Summary Display** then **Clash Details** at the 'Tools' dropdown menu. Alternatively, the data can be viewed as required using the popup menus. (Refer to *Popup Menus*).
4. Filter the displayed data, as required using the popup menus (Refer to *Popup Menus*) or by selection of **Summary Display** then **Filter Chart** at the 'Tools' dropdown menu.

4.3 Preparing a Clash Run

Security: This procedure is available only to Supervisors of Administrator discipline.

1. Select **View>**Clash Manager or at the Toolbar, select Clash Manager.

2. The 'Clash Manager' form is displayed. Select **Tools>Clash Sets**.
3. The 'Clash Sets' form is displayed. As required, select an existing clash set for editing, or add a new clash set. (Refer to [Clash Sets Form](#)).
4. The 'Clash Set Data' form is displayed. As necessary, update the data for the clash set. (Refer to [Clash Set Data Form](#)).
5. If, in Step 4, items or expressions are to be added to the Clash Set Obstruction, Check or Exclude lists, the 'Add List Item' form is displayed. Enter details as required. (Refer to [Add List Item Form](#)).
- If, in Step 4, elements are to be selected for inclusion in a list, the 'Clash Manager - Browse OUTFITTING Model' form is displayed. Browse the OUTFITTING hierarchy and select an item. (Refer to [Browse Model Form](#)).
- If, in Step 4, existing items or expressions are selected for editing, the 'Clash Manager - Edit List Item' form is displayed. Edit the details. (Refer to [Edit List Item Form](#)).
6. At the 'Clash Set Data' form, as necessary, check the expression expansions by selecting **Evaluate** at the popup menu. (Refer to [Popup Menu](#)).
7. If, in Step 6, expression expansion is checked, the 'Clash Manager - Evaluate' form is displayed. As necessary, remove any unwanted items from the list of items. (Refer to [Evaluate Form](#)).
8. At the 'Clash Set Data' form, as necessary, update the data for Extents, Limits etc, and click on the **OK** button to create a clash set. (Refer to [Clash Set Data Form](#)).

Note: The clash run for this clash set can be initiated directly from the 'Clash Sets' form (see above). In general, clash runs are initiated from the 'Tools' dropdown menu (refer to [Running a Clash](#)).

4.4 Running a Clash

This procedure is available only to Supervisors of Administrator discipline.

4.4.1 Running Clash Set Direct from the Tools Dropdown Menu

1. Select **View>Clash Manager** or at the Toolbar, select Clash Manager.
2. The 'Clash Manager' form is displayed. Select **Tools>Run Clash Set**.
3. A submenu of Clash Sets is displayed. Select the required Clash Set.
4. The Clash Set will be run. The results appear in the 'Clash Manager - Clash Sets' form, and the clashes can be viewed using the Clash Report. (Refer to [Clash Sets Form](#)).

4.4.2 Running Clash Set from the Clash Sets Form

1. Select **View>Clash Manager** or at the Toolbar, select Clash Manager.
2. The 'Clash Manager' form is displayed. Select **Tools>Clash Sets**.
3. The 'Clash Manager - Clash Sets' form is displayed. Select the clash set, which needs to be run and click on the **Run Desclash** button. (Refer to [Clash Sets Form](#)).
4. The 'Run Clash Set' form is displayed. As required, change the default characteristics of the clash set and initiate the clash run. (Refer to [Run Clash Set Form](#)).
5. The Clash Set will be run. The results appear in the 'Clash Manager - Clash Sets' form, and the clashes can be viewed using the Clash Report. (Refer to [Clash Report](#)).

4.4.3 Running Clash Set as a scheduled batch job

It is common for Administrators of large OUTFITTING projects to run clash sets overnight, as the desclash portion of a clash run can be very time-consuming, making it impractical to run during the day. For full details of this option, refer to [Clash Manager Functions](#).

1. Create a .bat file (using Windows notepad, or other text editor) in a folder of your choosing.
2. The bat file should contain definitions of project evars, so the correct environment is set. See the example file C:\AVEVA\mmsA1.4\runSynchroIPE_evars.bat.
3. Once the evars have been set, add the following command to the batch file to run the clash set. e.g.

```
C:\AVEVA\mmsA1.4\exe\mmscmd enr1 <password> IPEora IPE
W:IPE\PDMS\IPEDFLTS\IPE.cfg
C:\AVEVA\pdms11.5\pdmsuser\logfiles\IPE\clashlog.#date#.#time#.txt -clash set
123 "Batch Run"
```

Where

IPEora is the oracle connect string

IPE is the OUTFITTING project

IPE.cfg is the Model Management Configuration file

clashlog.#date#.#time#.txt is a log file of the resulting clash run

-clash set 123 is the clash option of mmscmd and you have specified clash set no 123

"Batch Run" is a comment that will be stored against the clash run.

4. The clash set can then be run by either double-clicking on the .bat file, or scheduling it to run later (e.g. overnight) using Windows Scheduled Tasks.
5. Multiple clash sets can be run from a single .bat file, by specifying a separate command line for each clash set.

Note that clash sets should be run consecutively, as there may be contention for some oracle data and processes if two clash sets are run in parallel.

4.5 Clash Checking the CE (Current Element)

This procedure is available to users as defined by the administrator (Clash Manager Configuration Form - Security Tab).

Note: The CE must be at or below a Group Element Type. The Group Element is the element that will be clash checked.

1. Select **View>Clash Manager** or at the Toolbar, select Clash Manager.
2. The 'Clash Manager' form is displayed. Select **Tools>Clash Check CE**, to initiate the Clash Check CE process.
3. The first time the user initiates the Clash Check CE process in a particular MDB, a personal clash set titled 'Userid/MDB' is created and displayed on the Clash Manager - Clash Set Data form. Update the default details, as required (see Notes on Personal Clash Set on the 'GUI for Clash Manager' - 'Clash Set Data Form'). When the details are as required, click on the OK button.

Note: Userid is the user's windows UserId and not the OUTFITTING UserId.

4. The personal clash set is run. The clashes can be viewed using the Clash Report. (Refer to [Clash Report](#)).

Note: If a clash is resolved through deleting or relocating one or both of the clashing elements, records of the clash will become dormant when any clash set referencing the elements is re-run.

4.5.1 Viewing Clash Report

1. Select **View>Clash Manager** or at the Toolbar, select Clash Manager.
2. The 'Clash Manager' form is displayed. Select **Tools>Clash Report>Display Report**.
3. The 'Clash Manager - Clash Report' is displayed. Organize the display to show the Clash Groups and/or Clash Detail reports, and the filter pane, as required. (Refer to [Clash Report](#)). View the data displayed and, as required,
 - a) apply the existing filter by selecting **Enable Clash Group/Detail Filter** at the popup menu or **Enable Filter** at the report 'Tools' dropdown menu, or
 - b) change the filtering by selecting **Set Clash Group/ Detail Filter** at the popup menu or **Set Filter** at the report 'Tools' dropdown menu.
4. If **Set Filter** has been selected, the 'Clash Manager - Filter' form is displayed. Enter the required filtering characteristics. (Refer to [Filter Form](#)).
5. If confirmation of the filter characteristics is required, select **Filter** at the report 'View' dropdown menu. The Filter pane appears. (Refer to [Clash Report](#)).
6. Apply the new filter by selecting **Enable Clash Group/Detail Filter** at the popup menu or **Enable Filter** at the report 'Tools' dropdown menu.

4.6 Viewing Element Report

1. Select **View>Clash Manager** or at the Toolbar, select Clash Manager.
2. The 'Clash Manager' form is displayed. Select **Tools>Element Report>Display Report**.
3. The 'Element report' is displayed. (Refer to [Element Report](#)). View the data displayed and, as required,
 - a) apply the existing filter by selecting **Enable Filter** at the popup menu or **Use Filter** at the report 'Tools' dropdown menu, or
 - b) change the filtering by selecting **Set Filter** at the popup menu or **Set Filter** at the report 'Tools' dropdown menu.
4. If **Set Filter** has been selected, the 'Clash Manager - Filter' form is displayed. Enter the required filtering characteristics. (Refer to [Filter Form](#)).
5. If confirmation of the filter characteristics is required, select **Filter** at the report 'View' dropdown menu. The Filter pane appears. (Refer to [Element Report](#)).
6. Apply the new filter by selecting **Enable Filter** at the popup menu or **Use Filter** at the report 'Tools' dropdown menu.

4.7 Updating Clash Status and/or Discipline

The default arrangements are as follows:

Status can be updated by a Supervisor of the Owner discipline,
Owner Discipline can be acquired by a Supervisor of the new owner discipline,
Owner Discipline can be assigned by a Supervisor of the current owner discipline,
Owner Discipline can be imposed by a Supervisor of the current discipline and a Member of the Administrator discipline.

1. Display the 'Clash report', include the Clash Groups and/or Clash Detail, and filter the contents, as required. (Refer to [Viewing Clash Report](#)).

2. At the Clash Groups or Clash Detail report, highlight the clash group(s) or detail(s) concerned. (Refer to [Clash Report](#)).
3. Use the appropriate Toolbar buttons, Quick Assign Keys 1, 2, U, P, C, A, or popup menu options to update the owner discipline and/or status, as required. (Refer to [Clash Report](#)).

Note: To use Quick Assign Keys 1, 2, U, P, C and A, the Enable Quick Keys 1/2 & U/P/C/A option at the Preferences tab of the Clash Manager Option form must be set to 'true'.

Security: Only a Supervisor of Administrator discipline has access to use Quick Assign keys.

4. Repeat Steps 2 and 3 until all required updates have been completed.
5. Save the updated data.

4.8 Updating Clash Properties

The default arrangements are as follows:

Status can be updated by a Supervisor of the Owner discipline,
Owner Discipline can be acquired by a Supervisor of the new owner discipline,
Owner Discipline can be assigned by a Supervisor of the current owner discipline,
Owner Discipline can be imposed by the Supervisor of the current discipline and a Member of the Administrator discipline,
Comments can be added by a Member of any discipline involved with the clash.

1. Display the 'Clash report', include the Clash Groups and/or Clash Detail, and filter the contents, as required. (Refer to [Viewing Clash Report](#)).
2. At the Clash report, highlight the clash group(s) or clash detail(s) concerned.
3. If a single clash group has been selected, select **Clash Group Properties** at the popup menu (refer to [Clash Report](#)). The 'Clash Group Properties' form is displayed. Update the clash group properties, as required. (Refer to [Clash \(Group\) Properties Form](#)).
4. If multiple clash groups or details have been selected, Select **Edit Clash Groups ***** at the popup menu. (refer to [Clash Report](#)). The 'Edit Clash Groups' form is displayed. Edit the properties of the clash groups, as required. (Refer to [Edit Clash Groups Form](#)).
5. If a single clash detail has been selected, select **Clash Properties** at the popup menu (refer to [Clash Report](#)). The 'Clash Properties' form is displayed. Update the clash properties, as required. (Refer to [Clash \(Group\) Properties Form](#)).

4.9 Advanced Tasks

The tasks in this procedure are available only to Supervisors of Administrator discipline.

1. Select **View>Clash Manager** or at the Toolbar, select Clash Manager.
2. The 'Clash Manager' form is displayed. Select **Tools>Settings**.
3. The 'Clash Manager Options' form is displayed. Select the Advanced tab. (Refer to [Options Form](#)).

4.9.1 Tracking Changes

The Track Changes operation creates a milestone for the display of statistical data at the Clash Manager form. It initiates saving the current discipline/status/counts data, and the

source data for the total number of 'objects', and the numbers not checked, clash free, and clashing

The 'objects' are controlled GTYPEs that have been the subject of a clash check, as an item or subordinate item on a Check List. For each controlled GTYPE, the total number is recorded, together with worst case status, level/type of any clash involving it. (The worst case may be Clash Free.)

Note: The range of controlled GTYPEs that are included in a Track Changes operation can be restricted at the Gtype/Tracking tab of the Clash Manager Configuration form.

To initiate a Track Changes operation, proceed as follows:

1. In the **Description** field, enter a description of the new milestone and click on the **Track Changes** button.
2. A message 'Are you sure you want to perform Track Changes' is displayed. Accept the message to create a Clash History Milestone.

4.9.2 Recomputing Element Properties

If changes have been made in the OUTFITTING model that result in changes to the results of previous clash runs, proceed as follows:

1. Click on the **Recompute Properties** button. The 'Clash Manager - Clash Recomputation' form is displayed.
2. Initiate the recomputation process for the required features. (Refer to [Clash Recomputation Form](#)).

4.9.3 Loading Clash File

This facility is intended to be used if and when the normal process of reading desclash output files, post-processing the data, and loading it into the Clash Manager Database is interrupted or fails, or if the RDBMS becomes unavailable through network or hardware faults. This action avoids wasting the possibly considerable time already spent running desclash. To use the facility, proceed as follows:

1. Click on the **Load Clash File** button. The Load Clash File form is displayed. (Refer to [Load Clash File Form](#)).
2. At the Load Clash File form, use the **Default** button and/or directories pane to select the directory that contains the files to be loaded.
3. As required, click on the **|>>|** button to expand the form on order to view the contents of selected files.
4. To effectively create a new clash run containing all files in the selected directory, **check** the **ALL** checkbox and click on the **OK** button.
OR
To merge selected files into the results of the latest clash run, select the required files, **uncheck** the **ALL** checkbox and click on the **OK** button.

4.9.4 Resetting Clash Group Status

If all elements within certain Clash Groups have the same Status, the Status of each of those Clash Groups can be set to the status of its elements. To update these clash group features, proceed as follows:

1. Click on the **Reset Group Status** button.

2. The message 'Reset Group Status to Worst Case Detail Status. Do you want to Continue?' is displayed. The message box includes **Yes** and **No** buttons.
3. Click on the **Yes** button to reset the group status.

4.9.5 Resetting Clash Group Owner

If all elements within certain Clash Groups have the same Owner discipline, the Owner disciplines of each those Clash Groups can be set to those of its elements. To update these clash group features, proceed as follows:

1. Click on the **Reset Group Owner** button.
2. The message 'Reset Group Owner to Common Detail Owner. Do you want to Continue?' is displayed. The message box includes **Yes** and **No** buttons.
3. Click on the **Yes** button to reset the group owner.

4.9.6 Deleting Unreferenced Data

When the OUTFITTING model has been substantially updated, the clash details remain in the Clash Manager database although the item(s) they refer to have been removed. These clash details, including their comments, can be removed from the Clash Manager database as follows:

1. Click on the **Delete All Unreferenced Groups, Elements and Comments** button.
2. The message 'Are you sure that you want to remove all unreferenced Groups and Elements?' is displayed. The message box includes **Yes** and **No** buttons.
3. Click on the **Yes** button to delete all groups and elements.

4.9.7 Deleting All Clash Data

At the end of a project all clash report data and history data can be removed from the database. The configuration data and clash set definitions, check list and obstruction list all remain. The remaining data is truncated to recover unused space in the Oracle Table Space. To remove the data, proceed as follows:

1. Click on the **Delete All Clash Data, including Comments and History** button.
2. The message 'Are you sure you want to Delete All Clash Data' is displayed. The message box includes **Yes** and **No** buttons.
3. Click on the **Yes** button to continue.
4. The warning message 'This option deletes All Clash Data, Groups, Detail, History and Comments. It cannot be undone! Are you really sure you want to continue?' is displayed. The message box includes **Yes** and **No** buttons.
5. If you wish to delete ALL clash data, including comments, click on the **Yes** button.

5 GUI

5.1 Main and Dropdown Menus

The Main Menu is displayed across the top of the Clash Manager form. Its options lead to the following dropdown menus:



5.1.1 File Dropdown Menu

The available options and their purposes are:

Save As	Displays the standard saving form to enable the user to save the data displayed in the Clash Manager form in: XML output, XML with style sheet, CSV output, or tab-separated text output.
Save/Refresh	Initiates a Savework in an active OUTFITTING DESIGN session, if in a master DB, and initiates a Savework and a flush to the master DB, if in an extract DB. If the Savework/flush is successful, a Save operation is initiated in PE, and the data in the current form is updated accordingly.
Properties	Displays the current settings.
Filenames (one or more)	List of previously displayed P&IDs.
Exit	Closes the Clash Manager form.

5.1.2 Edit Dropdown Menu

The available options and their purposes are:

Select All	Option is not applicable to Clash Manager and is disabled.
Remove Selected	Option is not applicable to Clash Manager and is disabled.
Remove All	Option is not applicable to Clash Manager and is disabled.
Find	Option is not applicable to Clash Manager and is disabled.

5.1.3 View Dropdown Menu

The available options and their purposes are:

P&IDs	Activates Ship Connectivity Manager.
2D Objects	Leads to the Ship Model Object Manager - 2D Objects form.
3D Objects	Leads to the Ship Model Object Manager - 3D Objects form.
Clash Manager	Has been selected to activate Clash Manager.
Toolbar	Controls whether or not the tool bar is displayed.
Statusbar	Controls whether or not the status bar is displayed.
Messages	Controls whether or not the Messages window is displayed.

5.1.4 Tools Dropdown Menu

The available options and their purposes are:

Stop	Option is not applicable to Clash Manager and is disabled.														
Connect to OUTFITTING DESIGN Session	Connects to a current OUTFITTING DESIGN session if either OUTFITTING has been invoked after Clash Manager or the connection has been lost by exiting and re-entering OUTFITTING.														
Connect to Oracle Session	Connects to Oracle session.														
Clear 3D Display	Clears the OUTFITTING 3D display.														
Clash Check CE	Initiates the Clash Check CE process.														
Clash Report	Leads to the following sub-menu: <table> <tr> <td>Display Report</td> <td>Displays the Clash Manager - Clash Report.</td> </tr> <tr> <td>Clash Groups</td> <td>Displays the Clash Groups in the Clash Report.</td> </tr> <tr> <td>Clash Detail</td> <td>Displays the Clash Detail in the Clash Report.</td> </tr> <tr> <td>Use Filter</td> <td>Applies the filter criteria to the data displayed on the Clash Report.</td> </tr> <tr> <td>Set Filter</td> <td>Leads to the Clash Manager - Filter form.</td> </tr> <tr> <td>Metric</td> <td>Sets limits to mm.</td> </tr> <tr> <td>Imperial</td> <td>Sets limits to inches.</td> </tr> </table>	Display Report	Displays the Clash Manager - Clash Report.	Clash Groups	Displays the Clash Groups in the Clash Report.	Clash Detail	Displays the Clash Detail in the Clash Report.	Use Filter	Applies the filter criteria to the data displayed on the Clash Report.	Set Filter	Leads to the Clash Manager - Filter form.	Metric	Sets limits to mm.	Imperial	Sets limits to inches.
Display Report	Displays the Clash Manager - Clash Report.														
Clash Groups	Displays the Clash Groups in the Clash Report.														
Clash Detail	Displays the Clash Detail in the Clash Report.														
Use Filter	Applies the filter criteria to the data displayed on the Clash Report.														
Set Filter	Leads to the Clash Manager - Filter form.														
Metric	Sets limits to mm.														
Imperial	Sets limits to inches.														
Element Report	Leads to the following sub-menu: <table> <tr> <td>Display Report</td> <td>Displays the Element Report.</td> </tr> <tr> <td>Use Filter</td> <td>Applies the filter criteria to the data displayed on the Element Report.</td> </tr> <tr> <td>Set Filter</td> <td>Leads to the Clash Manager - Filter form.</td> </tr> </table>	Display Report	Displays the Element Report.	Use Filter	Applies the filter criteria to the data displayed on the Element Report.	Set Filter	Leads to the Clash Manager - Filter form.								
Display Report	Displays the Element Report.														
Use Filter	Applies the filter criteria to the data displayed on the Element Report.														
Set Filter	Leads to the Clash Manager - Filter form.														

Run Clash Set	Leads to a sub-menu of the five most recently used clash sets, from which the required set is selected. The menu includes an Others option that leads to the Clash Manager - Clash Sets Form , in which other clash sets can be selected.
Clash Sets	Leads to the Clash Manager - Clash Sets Form .
Summary Display	Leads to the following sub-menu:
Clash Groups	The Clash Manager form Discipline List and Chart shows Clash Groups.
Clash Detail	The Clash Manager form Discipline List and Chart shows clash detail.
Filter Chart	Applies the filter criteria to the data displayed on the Clash Manager form Discipline List and Chart.
Settings	Leads to the Clash Manager Options Form .

5.1.5 Admin Dropdown Menu

The available options and their purposes are:

Model Object Manager Configuration	Leads to Model Management Configuration form.
Load Project Settings	Loads current project settings.

5.1.6 Help Dropdown Menu

The available options and their purposes are:

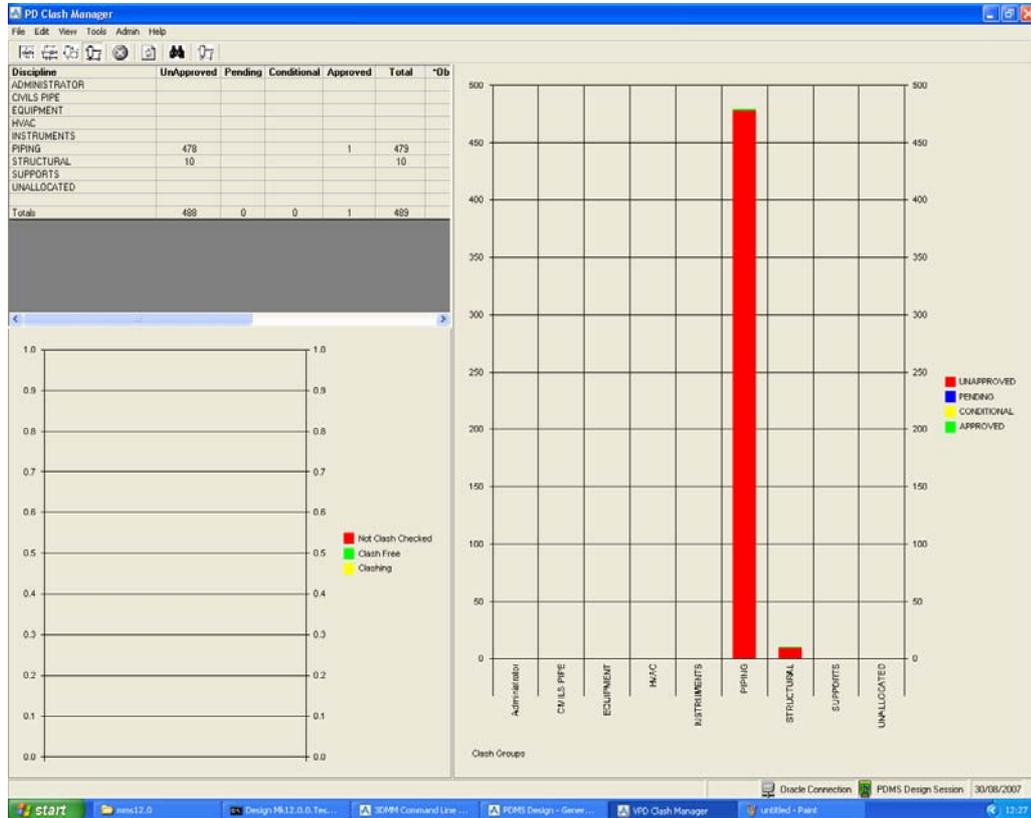
Contents	Displays this Online Guide in a new window.
About	Displays the product version in a new window.

5.2 Clash Manager Form

The form displays summary data on current clashes and provides statistical information on the total numbers of objects and controlled objects and how many of them are clash-free, clashing, and not clash-checked. It is divided into three sections, the sizes of which can be set by dragging their borders. The top left-hand section displays current and statistical data in tabular format. The bottom left-hand section displays statistical information in bar chart format. The right-hand section displays the current and, optionally, historical data, as a bar chart.

Snapshots of data may be saved at appropriate milestones by selecting **Track Changes** at the Clash Manager Options form.

5.2.1 Main Clash Manager Form



5.2.2 Top Left-hand Section

Each row of the table in the top left-hand section is dedicated to a discipline, the names of which appear in the left-hand column. The table is divided vertically in two sections. The left-hand section shows current data; the right-hand statistical data.

The columns in the left-hand section show the numbers of Approved, Unapproved, Pending and Conditionally Approved clashes. The right-hand column shows the total number of clashes for each discipline. The bottom row of the table shows the total numbers of clashes for each category, and the grand total.

The columns in the right-hand section show, for each discipline, the number of 'Controlled GTYPEs' (objects), and the numbers not checked, clash free and clashing. The headings of the columns include an asterisk (*) to draw the users attention to the milestone date, which is shown at the bottom of the discipline column. The bottom row shows the totals for each category. The grand total is the total number of objects.

The bar charts in the Bottom Left-hand Section and in the Right-hand Section can be filtered by using the pop-up menu and selecting 'filter charts', then double-clicking on disciplines in this table. The affected disciplines are then shown in **BLUE**.

5.2.3 Bottom Left-hand Section

The bar chart in the bottom left-hand section displays graphically the data displayed in the right-hand side of the table in the top left-hand section.

Each bar represents a discipline (for a certain period). The height is proportional to the total number of objects. Sections of the bars are colour-coded to show the numbers of Clash free, Clashing and Not Clash Checked objects that make up the total. These default colours may be changed by double-clicking the relevant bar or legend. The legend can be hidden by selection at the popup menu, or moved by dragging with the mouse.

5.2.4 Right-hand Section

The bar chart in the right-hand section shows data for each discipline that has clashes. By default, the current data is displayed. The last period, or the complete history, may also be displayed, as selected at the popup menu.

Each bar represents a discipline (for a certain period). The height is proportional to the total number of clashes. Sections of the bars are colour-coded to show the numbers of Approved, Conditional, Unapproved and Pending clashes that make up the total. These default colours may be changed by double-clicking the relevant bar or legend. The legend can be hidden by selection at the popup menu, or moved by dragging with the mouse.

Chart filtering may be selected at the popup menu. When filtering is selected, disciplines may be added to, or removed from, the chart display by double-clicking the discipline name in the left-hand section of the form.

5.3 Popup Menus

Separate popup menus, displayed by clicking the mouse right-hand button, are available for each section of the form. The options and their purposes are listed below.

5.3.1 Top Left-hand Section Popup Menu

The available options and their purposes are:

Clash Groups	The list and chart show clash groups.
Clash Detail	The list and chart show clash detail.
Filter Chart	Enables the content of the chart to be filtered by double-clicking on the discipline name.
Save As	Displays the standard saving form to enable the user to save in: XML output, XML with style sheet, CSV output, or tab separated text output. The data is saved to file, but the chart graphic is not.

5.3.2 Bottom Left-hand Section Popup Menu

The available options and their purposes are:

Display History	The chart shows the complete history of clashes.
Not Clash Checked	Whether or not the chart includes numbers of objects that are not clash checked.
Clash Free	Whether or not the chart includes numbers of objects that are clash free.
Clashing	Whether or not the chart includes numbers of objects that are clashing.

Show Label	Whether or not the legend for the bar chart is displayed.
Filter Charts	Enables the content of the chart to be filtered by double-clicking on the discipline name.
Save As	Displays the standard saving form to enable the user to save in: XML output, XML with style sheet, CSV output, or tab separated text output. The data is saved to file, but the chart graphic is not.

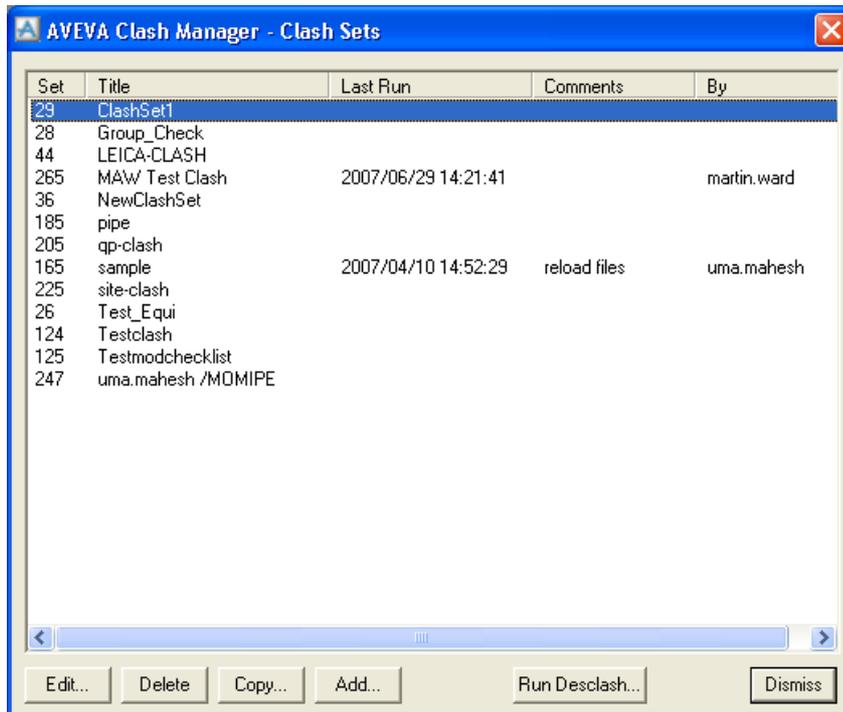
5.3.3 Right-hand Section Popup Menu

The available options and their purposes are:

Display History	The chart shows the complete history of clashes.
UnApproved	Whether or not the chart shows unapproved clashes.
Pending	Whether or not the chart shows pending clashes.
Approved	Whether or not the chart shows approved clashes.
Conditional	Whether or not the chart shows conditionally approved clashes.
Show Label	Whether or not the legend for the bar chart is displayed.
Clash Groups	The list and chart show clash groups.
Clash Detail	The list and chart show clash detail.
Filter Chart	Enables the content of the chart to be filtered by double-clicking on the discipline name.
Save As	Displays the standard saving form to enable the user to save in: XML output, XML with style sheet, CSV output, or tab separated text output. The data is saved to file, but the chart graphic is not.

5.3.4 Clash Sets Form

This form is used to compile a list of all clash sets. It provides the content of the sub-menu displayed by the selection of **Run Clash Sets** at the 'Tools' dropdown menu.



The main area of the form is occupied by a text box that lists current details of all clash sets.

A **Details** button available to users (members/supervisors of all disciplines) leads to the 'Clash Manager - Clash Set Data' form.

The following buttons are available to the Supervisor of the Administrator discipline:

- Add** Used for creation of a new clash set. Leads to the 'Clash Manager - Clash Set Data' form, pre-populated either with the 'Default' clash set, or with default settings derived from environment variables.
- Delete** Deletes the highlighted clash set.
- Copy** Creates a copy of the highlighted clash set, but with a new set number.
- Edit** Used to modify details of the highlighted clash set. Leads to the 'Clash Manager - Clash Set Data' form, pre-populated with details of the clash set.
- Run Desclash** Initiates clash checking for the highlighted clash set. Leads to the 'Run Clash Set' form.
- Dismiss** Closes the form.

In addition to those buttons the following options are available on the popup menu. Right click to display the options.

- Revert Clash Run** Displays details of the previous clash run.

- Display Counts** When this option is checked, the number of clashes generated will be displayed on the Clash Sets form.
- Refresh** Refreshes the form contents.

5.3.5 Clash Set Data Form

This form is used to enter details of a new clash set, or to edit details of an existing clash set.

Clash sets can be defined directly, copied from an existing clash set, or created from the 'Default' template clash set, if defined.

Notes on 'Default' Clash Set: The defaults on this form for new clash sets can be defined by a 'Default' clash set, or by environment variables. The 'Default' clash set method is recommended because using environment variables in a windows environment is particularly user-unfriendly and does not promote re-use of the default data between users of the same project. Also, users may have different environment variables, or access the common database from different installations of the software, served from different file servers.

The 'Default' clash set provides default values for New Clash Sets created via the ADD option on the Clash Sets form and also when a Personal Clash Set is created automatically

during the Clash Check CE process. The 'Default' clash set method enables items in the Check, Obstruction or Exclude Lists to be set as defaults, whereas there is no existing capability to provide default Check, Obstruction or Exclude Lists through the use of environment variables.

To use the 'Default' clash set method, the Administrator must first create a Clash Set entitled 'Default' containing the required default values. When the 'Default' clash set exists, the ADD option will implicitly perform a copy of the 'Default' Clash Set. Note that if environment variables exist, they will be used after the initial values have been set through copying the 'Default' Clash Set. Subsequent alteration of environment variables affect the 'Default' clash set when it is used for new clash sets.

The environment variables and typical default values are as follows:

```
PCLAM_DEFAULT_BCHECK=A|b
PCLAM_DEFAULT_IGNORECONNECTIONS=TRUE|False
PCLAM_DEFAULT_MAPOVER=TRUE|False
PCLAM_DEFAULT_CHECKADD=TRUE|False
PCLAM_DEFAULT_TOLERANCE=0
PCLAM_DEFAULT_NOCHECKWITHIN="STRU EQUI HANG"
PCLAM_DEFAULT_CLEARANCE=2
PCLAM_DEFAULT_GAP=0
PCLAM_DEFAULT_OVERLAP=0
```

Notes on Personal Clash Set: During the Clash Check CE process, the form is used to enter details of a personal clash set. This clash set is used for EVERY clash check of the CE in the particular MDB and, consequently, the default values should be used wherever possible. The **Title** and **MDB** fields are read-only. The **Check List** is automatically completed with details of the group element of the CE. Entries can be made in the **Obstruction** and **Exclude** lists, but it is recommended that neither is populated. In these circumstances the **Obstruction** list defaults to ALL and the **Exclude** list remains empty.

The form includes the following items:

Set	Generated automatically as a unique index for the clash set. Cannot be changed.
Title	The title associated with the clash set. Can be changed from 'Default' or entered if the field is blank.
MDB	The name of the Mdb to be used within OUTFITTING.
Comment	Any comment to be associated with the clash set.
Obstruction List	A list of named elements or wildcards covering a range of elements and their attributes from within the specified Mdb that form the Obstruction List. The popup menu option 'Evaluate' (see below) may be used to verify the resultant Obstruction list is as required. Note that for this evaluation the Exclude List is not used in deriving the resulting Obstruction list.

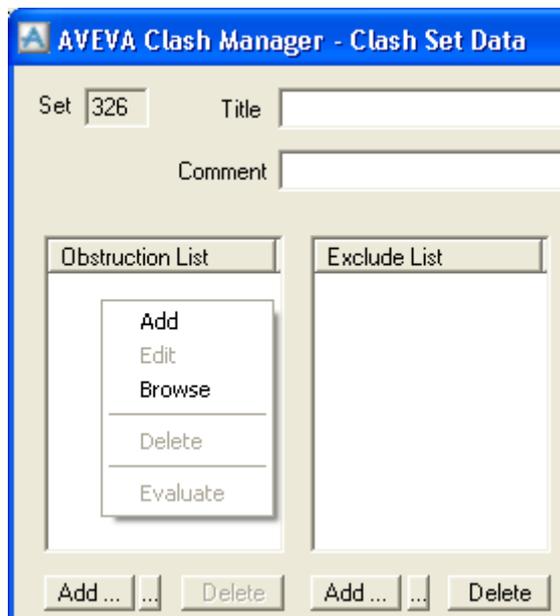
Exclude List	A list of named elements or wildcards covering a range of elements and their attributes from within the specified Mdb. This 'Exclude List' specifies members that are to be excluded from the Obstruction list. . The popup menu option 'Evaluate' (see below) may be used to verify that the resultant Exclude list is as required.
Check List	<p>A list of named elements or wildcards covering a range of elements and their attributes from within the specified Mdb that form the 'check list' for the clash detection. The popup menu option 'Evaluate' (see below) may be used to verify that the resultant Check list is as required.</p> <p>Note: Where minimal clashing activity is expected 'SITES' (or wildcards returning Sites) should be entered into the Checklist. Where much activity is expected, individual ZONEs (or wildcards returning Zones) should be entered into the Checklist. This ensures the best mix of parallel Clashing and Loading.</p>
Add, [...] and Delete	These buttons, below each of the lists, respectively have the same functions as the 'Add', 'Browse' and 'Delete' options of the popup menu (see below).
Extents	The items on this tab are used to specify the overlap, gap and clearances.
Limits	The items on this tab are used to specify the co-ordinates of the space occupied by the clash set.
History	The items on this tab show the dates and details of previous clash runs.
Units	Used to select either mm or inch as the dimensional unit.
Reset to Default Values	Used to reset the values specified for Overlap, Gap and Clearance to the default values.
Nocheck Within	No clash checks <u>between</u> items within the <u>same</u> hierarchy of given Types.
"new" Tolerance	Any clash that is between the same two elements of an existing clash and is within this tolerance is NOT treated as a new clash.
MAP Override	If checked, causes desclash to ignore errors in the Spatial Map, which would otherwise abort the desclash run.
Ignore Connections	Ignore Connections at steelwork Junctions.
Branch Check	<p>Used to select either 'A Check' or 'B Check'. The default is 'B Check'.</p> <p>'A Check' checks for clashes within an item. This option is not normally recommended.</p> <p>'B Check' checks for clashes between different items. This option is normally used.</p>

- Check ADD** Passes the 'Check ADD' option to desclash. This causes the Clash Check List to be automatically added to the Obstruction List.
- OK** Confirms selections made and closes the form.
- Cancel** Ignores selections made and closes the form.

Note on modified checklist items option: some OUTFITTING ADMIN options, including merge (compress) and reconfigure, flag every element as having possibly changed geometry. To obtain maximum benefit from 'Clash Check Modified Elements Only' a full Clash Check will need to be executed after use of these options.

5.3.6 Popup Menu

A popup menu is available from the **Obstruction List**, **Exclude List** and **Check List** panes by right-clicking the mouse.



The available options and their purposes are as follows:

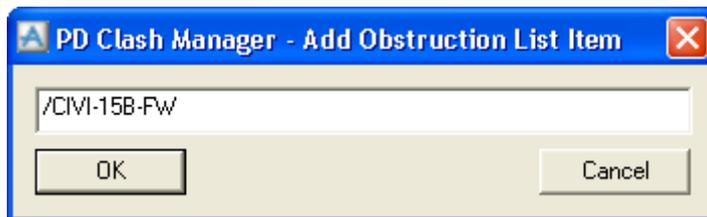
- Add** For adding items or expressions to the particular list. Leads to the relevant 'Add List Item' form.
- Edit** For editing expressions. Leads to the relevant 'Edit List Item' form.
- Browse** For adding elements derived from the OUTFITTING hierarchy. Leads to the 'Browse OUTFITTING Model' form

- Delete** Deletes the selected item from the list. (The item is not deleted from the OUTFITTING model.)
- Evaluate** For viewing the overall list when its wildcards are expanded. Leads to the 'Evaluate' form, which displays a consolidated listing of the results of querying the OUTFITTING model and expanding the expressions in the particular list.

Note: Double-clicking an item in the any of the lists leads to the 'Browse OUTFITTING Model' form if the item is an element name, or leads to the 'Edit List Item' form if the item is an expression or simply a GTYPE.

5.3.7 Add List Item Form

This form is used to add simple items and expressions to the **Obstruction**, **Check** and **Exclude** lists on the 'Clash Set Data' form. (The name of the form includes the name of the particular list.)



The form includes the following items:

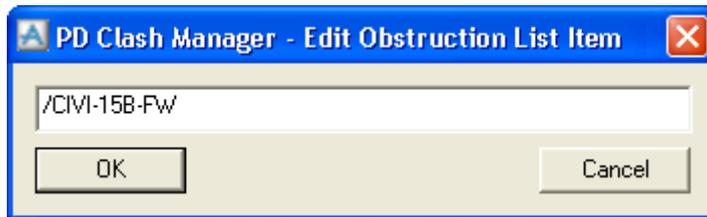
- Unnamed field** For entry of the item name or the expression.
- OK** Closes the form and updates and includes the item or expression in the Obstruction, Check or Exclude list on the Clash Set Data form.
- Cancel** Closes the form and ignores any changes made.

Note: For the syntax of the elements and their attributes refer to [Notes on Element Rule Syntax](#).

Note Regarding Modification of Existing Expressions: Prior to the introduction of expressions to the lists, the syntax was limited to wildcards applicable to item names. For example, <wildcard> of <owner>, which if entered as **^/M of WORL** would have added all Items under WORL which begin with **/M**. This would now be written as an <expressionStypeB>: name like <wildcard> of <owner>, which would be entered as **name like ^/M of WORL**. Refer to [Notes on Element Rule Syntax](#).

5.3.8 Edit List Item Form

This form is used to edit expressions and simple items in the **Obstruction**, **Check** and **Exclude** lists on the 'Clash Set Data' form. (The name of the form includes the name of the particular list.)



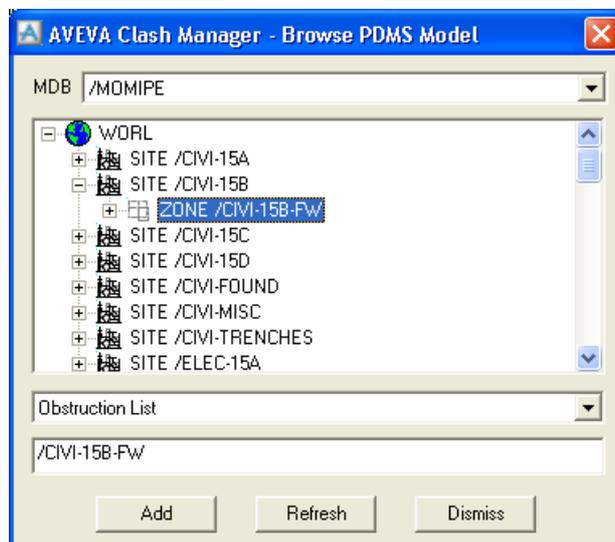
The form includes the following items:

- Unnamed field** Initially includes selected record from the particular list. This record can be edited, as required.
- OK** Closes the form and updates the record in the Obstruction, Check or Exclude list on the Clash Set Data form with the edited version.
- Cancel** Closes the form and ignores any changes made.

Note: For the syntax of the elements and their attributes refer to [Notes on Element Rule Syntax](#).

5.3.9 Browse Model Form

This form is used to add items to the 'Obstruction', 'Check' and 'Exclude' lists on the 'Clash Set Data' form and also to add items to the Tracking Selection Rules on the GTYPE/Tracking tab of the Clash Manager Configuration form.

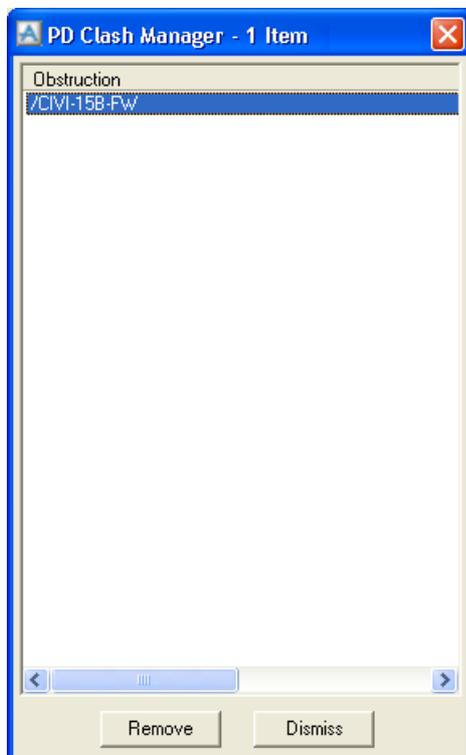


The form includes the following items:

- MDB** For selection of the Mdb associated with the Tracking Selection Rules at the Clash Manager Configuration form. Otherwise read-only.
- Pane displaying the OUTFITTING hierarchy** For selection of the item to be added
Note: A OUTFITTING DESIGN session must be active when a selection is being made.
- Dropdown list** For selection of Obstruction, Check or Exclude list at the 'Clash Set Data' form. Otherwise not used.
- Un-named text box** Shows name of selected item. Direct entries can be made, if required.
- Add** To add the selected item to the form that called up this form
- Refresh** To update the displayed data
- Dismiss** To close the form

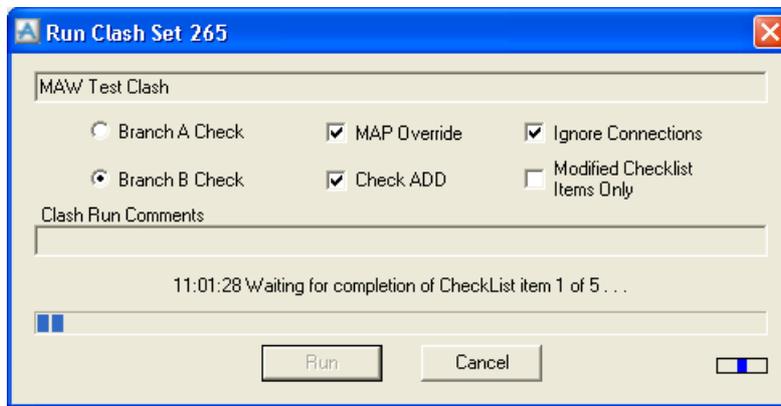
5.3.10 Evaluate Form

This form displays the results of expanding the expressions in the **Obstruction**, **Check** or **Exclude** list on the 'Clash Manager - Clash Set Data' form, or the results of expanding the **Tracking Selection Rules** on the 'Clash Manager Configuration form - Gtype/Tracking tab'. The form includes the following items:



Pane displaying the expanded list	For viewing the items and selecting any to be removed from the particular list, the name of which is shown at the top of the pane.
Remove	Removes the selected items from the expanded list and adds the <!> NOT wildcard to the item(s) in the particular list.
Dismiss	Closes the form.

5.4 Run Clash Set Form



This form provides facilities to:

1. View and, as required, modify the default characteristics of a clash set,
2. Initiate a clash run and
3. View the progress made during the run.

The form includes the following items:

Branch Check Type	Used to select either 'A Check' or 'B Check' for this run. The default is set in the data associated with the Clash Set. 'A Check' does a full primitive by primitive check of every component within a branch. This option is not normally recommended. 'B Check' is a simplified check which ignores clashes between certain pairs of components within the branches. This option is normally used.
MAP Override	If checked, causes desclash to ignore errors in the Spatial Map, which would otherwise abort the desclash run. The default is given in the Clash Set data.
Check ADD	Passes the 'Check ADD' option to desclash. This causes the Clash Check List to be automatically added to the Obstruction List. Any existing contents of the Obstruction List are ignored. The default is given in the Clash Set data.
Ignore Connections	Ignore Connections at steelwork Junctions. The default is given in the Clash Set data.

Modified Checklist Items Only	Sets the date of the last run of the selected Clash Set and each check-item tested for a change in GEOMETRY since that date. Items that have changed or that have not been checked before will be checked as usual. Items that have not changed will be recorded and any previously found clashes will be recovered and incorporated into the current clash run.
Clash Run Comments	Allows the user to enter comments prior to the clash run..
Progress bar and adjacent indications	<p>During the clash run, the bar graphically indicates the percentage progress.</p> <p>During the clash run, a 'Loading item number' message appears above the bar and is continually updated.</p> <p>During the clash run, continually updated numbers below the bar show 'Total clashes processed' and a 'Significant Elements'.</p> <p>During the clash run, a 'Heartbeat' at the bottom right-hand of the form shows that the process is in operation.</p> <p>If the clash update cannot be completed, an error message appears.</p>
Run	To initiate a clash run
Cancel	To abort a clash run

As each item on the CheckList is processed by desclash, the data is loaded into the Clash Manager Database while at the same time desclash continues processing subsequent CheckList items.

5.5 Clash Report

Reports on clashes are presented in a separate window that includes a main menu with dropdown menus, a toolbar and a status bar. A popup menu is available for both reports.

There are two types of report, namely, Clash Groups and Clash Detail. Both reports are in tabular format. The reports appear in separate panes, and either or both can be displayed. The pane that is 'Active' has a dark blue title bar; the 'Inactive' pane has a grey title bar. Scroll bars are available for access to data that overflows the panes. Details of the current filter can be displayed in a separate pane, titled Filter, at the bottom of the window.

When reports are produced as a result of a Clash Check CE operation, both Clash Groups and Clash Detail reports are automatically filtered by a temporary filter that includes all filter options, with the element name filter set to the appropriate Group Element of the Current Element. The reports show all clashes relating to the Group Element. The automatic production and filtering of the reports for a Clash Check CE, can be enabled or inhibited at the 'Clash Manager Options' form.

Example Clash Report

Group	Discipline	Status	Level	Type	Group Elem1	Discipline	GType 1	Group Elem2	Discipline	GType 2	Comments	U:
1821	PIPING	Unknown	HH	CLA	/PIPE-15A-AG	PIPING	ZONE	/PIPE-15A-B	PIPING	ZONE	set discipline: PIPING: (Disc)	me
1822	PIPING	Unknown	HH	CLA	/PIPE-15A-B	PIPING	ZONE	/PIPE-15A-0	PIPING	ZONE	set discipline: PIPING: (Disc)	me
1823	PIPING	Unknown	HH	CLA	/PIPE-15A-B	PIPING	ZONE	/PIPE-15A-RV	PIPING	ZONE	set discipline: PIPING: (Disc)	me
1824	PIPING	Unknown	HH	CLA	/PIPE-15A-B	PIPING	ZONE	/PIPE-15A-PS	PIPING	ZONE	set discipline: PIPING: (Disc)	me
1825	PIPING	Unknown	HH	CLA	/PIPE-15A-AG	PIPING	ZONE	/PIPE-15A-PS	PIPING	ZONE	set discipline: PIPING: (Disc)	me
1826	PIPING	Unknown	HH	CLA	/PIPE-15A-0	PIPING	ZONE	/PIPE-15A-PS	PIPING	ZONE	set discipline: PIPING: (Disc)	me
1827	PIPING	Unknown	HH	CLA	/PIPE-15A-PS	PIPING	ZONE	/PIPE-15A-RV	PIPING	ZONE	set discipline: PIPING: (Disc)	me
1828	PIPING	Unknown	HH	CLA	/PIPE-15A-AG	PIPING	ZONE	/PIPE-15A-0	PIPING	ZONE	set discipline: PIPING: (Disc)	me
1829	PIPING	Unknown	HH	CLA	/PIPE-15A-AG	PIPING	ZONE	/PIPE-15A-RV	PIPING	ZONE	set discipline: PIPING: (Disc)	me
1830	PIPING	Unknown	HS	CLA	/PIPE-15A-VT	PIPING	ZONE	/PIPE-15A-VT	PIPING	ZONE	set discipline: PIPING: (Disc)	me
1831	PIPING	Unknown	IS	CLA	/PIPE-15A-0	PIPING	ZONE	/PIPE-15A-VT	PIPING	ZONE	set discipline: PIPING: (Disc)	me
1832	PIPING	Unknown	HS	CLA	/PIPE-15A-VT	PIPING	ZONE	/PIPE-15A-VT	PIPING	ZONE	set discipline: PIPING: (Disc)	me
1833	PIPING	Unknown	HS	CLA	/PIPE-15A-VT	PIPING	ZONE	/PIPE-15A-VT	PIPING	ZONE	set discipline: PIPING: (Disc)	me
1834	PIPING	Approved	HS	CLA	/PIPE-15A-VT	PIPING	ZONE	/PIPE-15A-VT	PIPING	ZONE	Status changed to Approved	me
1835	PIPING	Unknown	HS	CLA	/PIPE-15A-RV	PIPING	ZONE	/PIPE-15A-VT	PIPING	ZONE	set discipline: PIPING: (Disc)	me
1836	PIPING	Unknown	HS	CLA	/PIPE-15A-VT	PIPING	ZONE	/PIPE-15A-VT	PIPING	ZONE	set discipline: PIPING: (Disc)	me
1837	PIPING	Unknown	HS	CLA	/PIPE-15A-VT	PIPING	ZONE	/PIPE-15A-VT	PIPING	ZONE	set discipline: PIPING: (Disc)	me
1838	PIPING	Unknown	HS	CLA	/PIPE-15A-VT	PIPING	ZONE	/PIPE-15A-VT	PIPING	ZONE	set discipline: PIPING: (Disc)	me
1839	PIPING	Unknown	HS	CLA	/PIPE-15A-RV	PIPING	ZONE	/PIPE-15A-VT	PIPING	ZONE	set discipline: PIPING: (Disc)	me
1840	PIPING	Unknown	HS	CLA	/PIPE-15A-VT	PIPING	ZONE	/PIPE-15A-VT	PIPING	ZONE	set discipline: PIPING: (Disc)	me
1841	PIPING	Unknown	HS	CLA	/PIPE-15A-VT	PIPING	ZONE	/PIPE-15A-VT	PIPING	ZONE	set discipline: PIPING: (Disc)	me
1842	PIPING	Unknown	HS	CLA	/PIPE-15A-VT	PIPING	ZONE	/PIPE-15A-VT	PIPING	ZONE	set discipline: PIPING: (Disc)	me
1843	PIPING	Unknown	HS	CLA	/PIPE-15A-RV	PIPING	ZONE	/PIPE-15A-VT	PIPING	ZONE	set discipline: PIPING: (Disc)	me
1844	PIPING	Unknown	HH	CLA	/PIPE-15A-V	PIPING	ZONE	/PIPE-15A-V	PIPING	ZONE	set discipline: PIPING: (Disc)	me
1845	PIPING	Unknown	HH	CLA	/PIPE-15A-V	PIPING	ZONE	/PIPE-15A-V	PIPING	ZONE	set discipline: PIPING: (Disc)	me
1846	PIPING	Unknown	II	CLA	/PIPE-15A-SL	PIPING	ZONE	/PIPE-15A-SL	PIPING	ZONE	set discipline: PIPING: (Disc)	me
1847	PIPING	Unknown	II	CLA	/PIPE-15A-SL	PIPING	ZONE	/PIPE-15A-SL	PIPING	ZONE	set discipline: PIPING: (Disc)	me
1848	PIPING	Unknown	IS	TOU	/PIPE-15A-SL	PIPING	ZONE	/PIPE-15A-SL	PIPING	ZONE	set discipline: PIPING: (Disc)	me
1849	PIPING	Unknown	HS	CLA	/PIPE-15A-SL	PIPING	ZONE	/PIPE-15A-SL	PIPING	ZONE	set discipline: PIPING: (Disc)	me
1850	PIPING	Unknown	II	CLA	/PIPE-15A-SL	PIPING	ZONE	/PIPE-15A-SL	PIPING	ZONE	set discipline: PIPING: (Disc)	me
1851	PIPING	Unknown	HI	CLA	/PIPE-15A-CV	PIPING	ZONE	/PIPE-15A-SI	PIPING	ZONE	set discipline: PIPING: (Disc)	me

Clash Groups Report

Each row of this report is dedicated to a clash group. The data in the columns is identified by the column headings, namely,

- Group discipline, status, level and type
- Group Element 1 discipline and GTYPE
- Group Element 2 discipline and GTYPE
- Group comments, user, co-ordinates, and when created.

Note: The GTYPE column shows the Gtype of the actual physical clash, not necessarily the Gtype of the element.

The width of a column can be set by double-clicking on the column heading, or by dragging the column edge to the desired position. Double-clicking toggles the width between that of the heading and that of the widest data item in the column.

Columns at the left-hand side of the **Discipline** and **Status** columns display a **Spanner** (wrench) icon when the value has been manually set. A blank signifies that the value has been automatically set. The principle purpose of this icon is to enable the report records to be sorted into manually and automatically applied values of discipline and/or status.

The left-hand column shows the status of the group, as follows:

-  Approved
-  Unapproved

-  Pending
-  Conditional

Fields in the report are colour-highlighted. The colours used and the background colour can be set at the Clash Manager Options form. Typical colour-coding is as follows:

- YELLOW Indicates the owner discipline, and if appropriate, highlights the element which belongs to the discipline
- RED UNALLOCATED discipline
- CYAN Change highlighting
- GREEN Value automatically set
- ORANGE Value manually set.

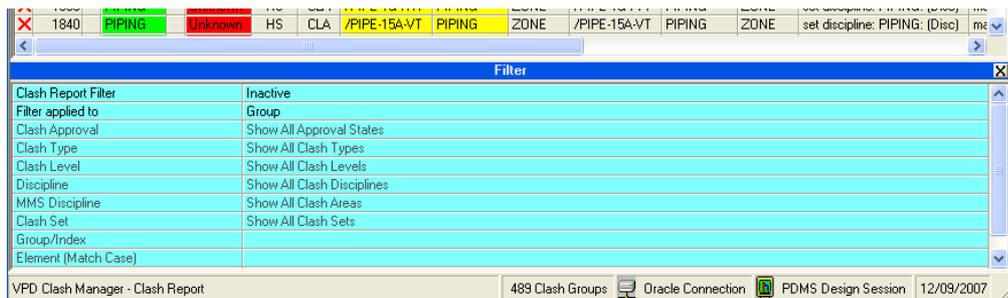
Clash Detail Report

Each row of this report is dedicated to an individual clash within the group(s) selected in the Clash Groups report. The structure of the report, column one indications and field colour-coding are as described for the Clash Groups report. At the right-hand side is an additional column for 'Remarks' that are derived from the 'Clash Properties' form.

Note: In both reports, Clash Level is abbreviated as follows:

Abbreviation	Clash Level Description
HH	Hard/Hard
HI	Hard/Insulation (or Insulation/Hard)
HS	Hard/Soft (or Soft/Hard)
II	Insulation/Insulation
IS	Insulation/Soft (or Soft/Insulation)
SS	Soft/Soft
NP	Not Proven

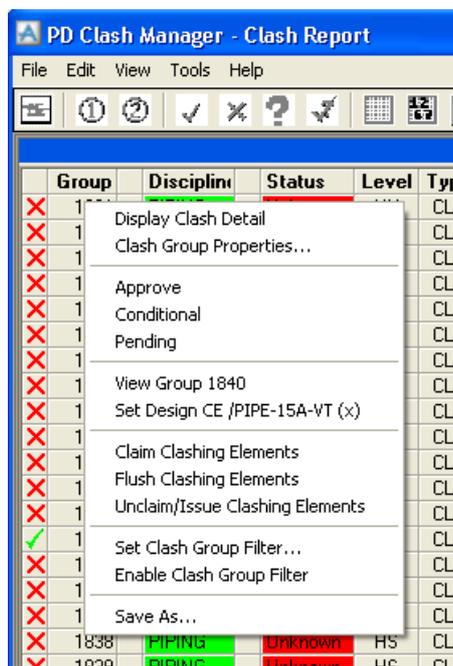
Filter Pane



This pane displays the filter criteria and values currently set to limit the data shown on clash reports. The information appears in a two-column table showing criteria in the left-hand column and values in the right-hand column.

5.5.1 Popup Menu

The options available in the popup menu depend on the number of records selected, the report in which they are selected, whether the Clash Details report is displayed alone, and on the security options set by the Administrator. The options, their availability and functions are as follows.



OPTION	WHEN AVAILABLE (Selection in Report)	FUNCTION
Display Clash Detail	One or more groups in Clash Groups	Displays associated clashes in Clash Details report.
Clash Group Properties	Single clash group in Clash Groups	Leads to the Clash (Group) Properties Form .
Clash Properties	Single clash in Clash Detail	Leads to Clash Properties form.
Edit Clash Groups ***_***	Multiple groups in either	Leads to the Edit Clash Groups Form .
Assign Owner Discipline (Disc Name)	Single group in Clash Groups	Sets discipline required to resolve clash.
Approve	One or more in either	Sets status to Approved.

Conditional	One or more in either	Sets status to Conditional.
Pending	One or more in either	Sets status to Pending.
Unapprove	One or more in either	Sets status to Unapproved.
View Group(s) (number)	One or more groups in Clash Groups	Displays the selected group(s) at the OUTFITTING 3D display.
View Clash(es) (number)	One or more clashes in Clash Detail	Displays the selected clash(es) at the OUTFITTING 3D display.
Set Design CE (first element name)	One or more in either	Sets the selected item to be the OUTFITTING Current Element.
Set Design CE (second element name)	One or more in either	Sets the selected item to be the OUTFITTING Current Element.
Claim Clashing Elements	One or more in either	Extracts the selected item in the OUTFITTING hierarchy and brings it to the user's OUTFITTING workspace.
Flush Clashing Elements	One or more in either	Saves the OUTFITTING changes to the master model.
Unclaim/Issue Clashing Elements	One or more in either	Issues the OUTFITTING changes to the master model.
Set Clash Group Filter	One or more groups in Clash Groups	Leads to the Clash Manager - Filter Form .
Set Clash Detail Filter	One or more clashes in Clash Detail when displayed alone	Leads to the Clash Manager - Filter Form .
Enable Clash Group Filter	One or more groups in Clash Groups	Applies the filter criteria to the data displayed.
Enable Clash Detail Filter	One or more clashes in Clash Detail when displayed alone	Applies the filter criteria to the data displayed.
Save As	One or more in either	Saves the Active pane.

Note: Some of the options above will not be available if the User has insufficient access rights, as set by the Administrator. Typically this may include Assign Owner Discipline, or Approve.

5.5.2 Main Menu

The Main Menu is displayed across the top of the Clash Reports window. Its options lead to the following dropdown menus:



5.5.3 File Dropdown Menu

The available options and their purposes are:

Save As Displays the standard saving form. This enables the user to save information in the report as follows:

- (Current Pane) Comma Separated (*.csv)
- (Current Pane) Tab Separated (*.txt)
- (Current Pane) XML (*.xml)
- (Current Pane) XML & Stylesheet (*.xml)
- Consolidated XML Report (*.xml)
- Consolidated HTML Report (*.html).

The first four options (Current Pane) save information, in the stated format, from the Clash Groups report or Clash Detail report, depending on which pane is active.

The final two options save information from both Clash Groups and Clash Detail reports and from the filter pane. The information is presented as a *Consolidated Report*.

The xml version of the Consolidated report refers to a common style sheet supplied with Clash Manager. The HTML version is a result of processing through this style sheet. Applying the style sheet before output, resolves all problems regarding viewing, saving, copying or emailing, as the HTML version is a self-contained file.

When the 'Save' button on the Standard Saving form is pressed, a 'Report Comments' dialog box is displayed. This dialog box is for entry of any comments that are to appear at the start of the consolidated report.

Refresh If Clash Groups are displayed, refreshes the groups with the current filter and clears the Clash Detail report.

Note: The 'Auto Display Clash Detail' option on the Preferences tab of the Clash Manager Options form is set to False.

If Clash Detail alone is displayed, refreshes Clash Detail using the current filter.

Close Closes the window.

5.5.4 Edit Dropdown Menu

This menu operates on the Active pane. The available options and their purposes are:

Select All	Selects all tabulated items in the report. Is greyed-out if the number of records in the active pane exceeds the Large Transaction>Warnings>Claim/Flush/Issue/Edit/Select All setting at the 'Clash Manager Options' form.
Remove Selected	Removes the selected items from the report. Note: Operations on all clashes in the active pane, such as display, or approve are still applied to the removed items. They are only removed from the active pane.
Remove All	Removes all items from the report.
Find	Leads to the standard 'Find' dialog box.

5.5.5 View Dropdown Menu

The available options and their purposes are:

Clash Groups	Controls whether or not the Clash Groups pane is displayed.
Clash Detail	Controls whether or not the Clash Detail pane is displayed.
Filter	Controls whether or not the Filter pane is displayed.
Toolbar	Controls whether or not the tool bar is displayed.
Status Bar	Controls whether or not the status bar is displayed.

5.5.6 Tools Dropdown Menu

The available options and their purposes are:

Clash Check CE	Leads to Clash Manager - Clash Set Data Form .
Set Filter	Leads to the Clash Manager - Filter Form .
Enable Filter	Applies the filter criteria to the data displayed on the Clash Reports.
Clear 3D Display	Clears the OUTFITTING graphics display.
Clear 3D Labels	Clears the Clash Group/Index Labels on the OUTFITTING graphics display.
Settings	Leads to the Clash Manager Options Form .

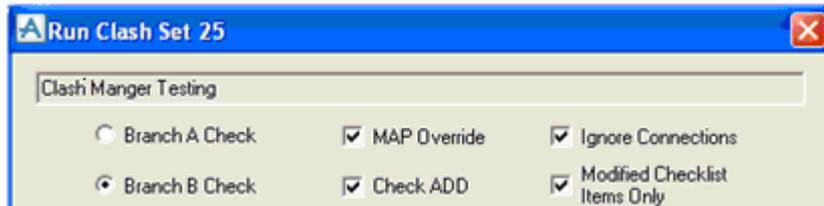
5.5.7 Help Dropdown Menu

The available options and their purposes are:

Contents	Displays this Online Guide in a new window
About	Displays the product version in a new window.

5.5.8 Tool Bar

When selected for display, the toolbar appears under the Main Menu. The icons and purposes of the buttons are as follows:



-  Elements referenced in the Selected Clashes are added to the OUTFITTING Drawlist.
-  Sets Owner Discipline of selected records to Discipline of First element.
-  Sets Owner Discipline of selected records to Discipline of Second element.
-  Sets status of selected records to Approved.
-  Sets status of selected records to Unapproved.
-  Sets status of selected records to Pending.
-  Sets status of selected records to Conditional.
-  Clears the OUTFITTING graphics display.
-  Clears the Clash Group/index Text Labels on the OUTFITTING graphics display.
-  If Clash Groups are displayed, refreshes the groups with the current filter and clears the Clash Detail report.
If Clash Detail report alone is displayed, refreshes the Clash Detail using the current filter.
-  Finds selected data on the current report.
-  Applies the filter criteria to the data displayed.



Leads to the Clash Manager - *Filter Form*.

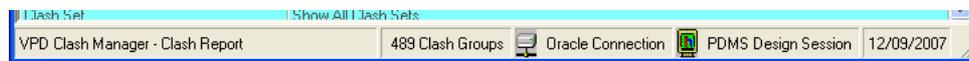


Displays the filter pane.

Note: Some of the icons above will not be available if the User has insufficient access rights, as set by the Administrator.

5.5.9 Status Bar

When selected for display, the status bar appears across the bottom of the window.



It includes information on the:

- filtered or not filtered status of the display (the example shows filter "Area 15B")
- number of objects displayed,
- Oracle connection status,
- OUTFITTING status,
- date.

5.6 Filter Form

5.6.1 Form Usage

This form is used to restrict the data displayed on the Clash Report and Element Reports. All of the filtering facilities are available for the Clash Report, but when the form is used for the Element Report, the facilities are restricted and the unavailable facilities are disabled and shaded out. The standard filtering (on the Filter tab) and the advanced filtering (on the Advanced tab) can be switched on or off separately for the Clash and Element reports.

Users may save filter settings as named filters. This enables you to save and quickly retrieve commonly used filters without having to reset the filter options each time.

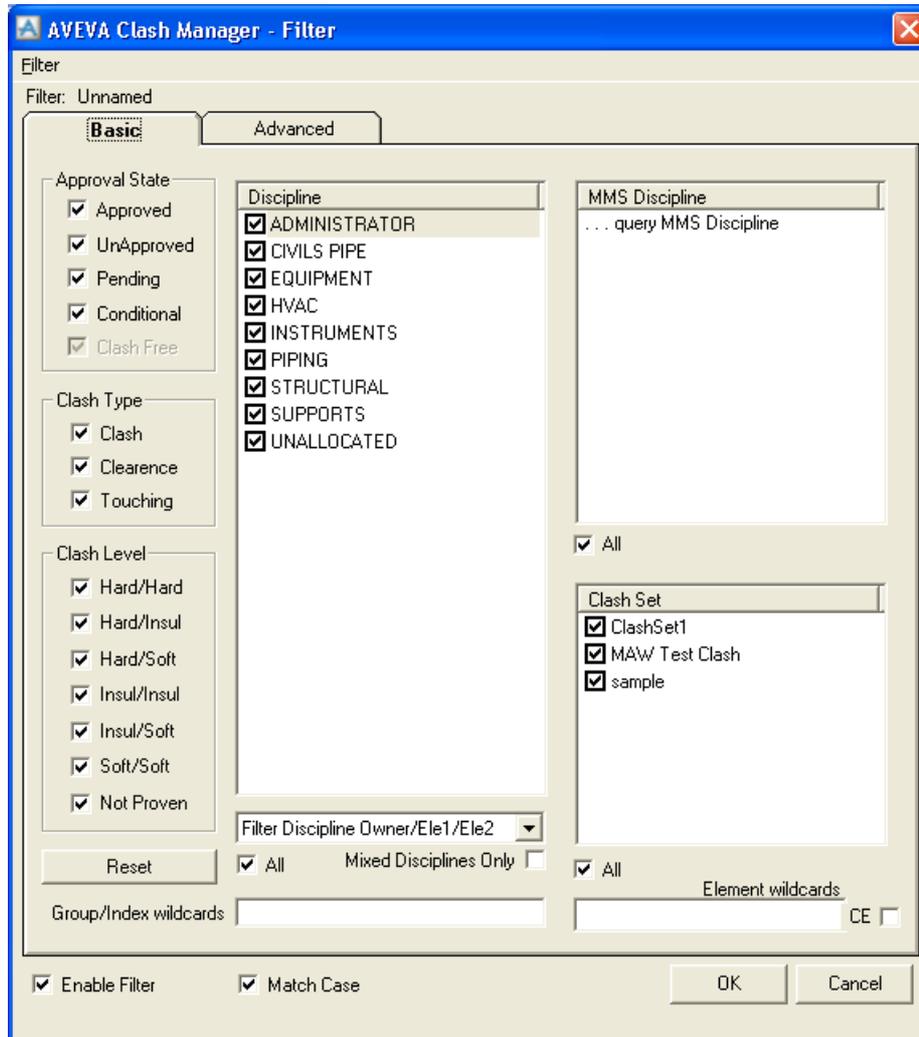
The facilities available for the Element Report are as follows:

On the Filter tab -

- Approval State
- Discipline
- Project-defined field (default Areacode)
- Element Wildcards

On the Advanced tab -

- Project-defined field (default Class)
- Project-defined field (default Priority).



Form Description

The main area of the form is occupied by two tabs, named Basic and Advanced which are described below.

At the top of the form is the option to save and open named filters accessed from the **Filter** dropdown menu.

- New** Creates a new filter by resetting all filter criteria to their default value.
- Open** Opens selection form of existing saved filters (if any). Select the desired filter and click on open to open the filter.
- Save** Saves the current named filter. If the filter is unnamed, you are prompted to give it a name.
- Save As...** Prompts you to save and name the current filter.
- Delete** Deletes the current named filter. You are prompted to confirm deletion.

The following items are at the bottom of the form:

Enable Filter	Enables/disables the filter.
OK	Accepts the recently entered filter characteristics and closes the form.
Cancel	Ignores any recently entered filter characteristics and closes the form.

The items on the **Basic tab** are as follows:

Approval State	Used to select the states of clashes to be included in the report. At least one must be selected. Approval Status are APPROVED, UNAPPROVED, PENDING and CONDITIONAL and CLASH FREE. Note that many Clash Status may be created which have one of the aforementioned states. Status may be filtered using the Advanced Filter.
Clash Type	Used to select the type(s) of clashes to be included in the report. At least one must be selected.
Clash Level	Used to select the levels(s) of clashes to be included in the report. At least one must be selected.
Reset	Checks all checkboxes and blanks all text fields on the tab. Used mainly to check all checkboxes in the above sets.
Discipline list with a checkbox for each listed discipline.	Used to select the discipline(s) of clashes to be included in the report. Any or specific disciplines can be selected at their checkboxes. For all disciplines use the All checkbox. Repeated use of the All checkbox will turn on or off all disciplines.
'Filter' dropdown list and All checkbox below the Discipline list.	The 'Filter' dropdown list defaults to the report being filtered to the clash owner. The other options enable discipline filtering for either of the clashing elements and the owner. The 'All' checkbox is used to check all disciplines.
Mixed Disciplines Only	Used to select clashes between elements having different disciplines, or when only one discipline is selected, clashes within that discipline only.
Project-define (default Areacode) list with a checkbox for each item. All checkbox below the list.	Used to select the areacodes of clashes to be included in the report. For all codes use the All checkbox. Note: The data selected by the Project-defined field is set by the Administrator.
Clash Set list with a checkbox for each set. All checkbox below the list.	Used to select the clash sets to be included in the report. For all sets use the All checkbox. The clash sets are listed with the most recently run clash set at the top.

Group/Index wildcards	Used for selection of clash sets filtering. The textbox can accept a list of index numbers.
Element wildcards	<p>Used for selection of clash items filtered only by their names.</p> <p>Element wildcards are entered as space-separated Oracle wildcards, for example, %42% %43% %44% %45% matches any clash where either element name contains "42", "43", "44" or "45"</p> <p><i>Specific Element</i> wildcards may be separated by a vertical bar, for example, %42% %43% %44% %45% matches any clash where one element name contains "42" or "43" <u>and</u> the other contains "44" or "45"</p> <p>You can filter for individual items by entering their full name in the Element Wildcards field, for example /P-1234 will only find clashes with item "/P-1234". Note that the "/" at the beginning of the item name is needed as Clash Manager stores the full OUTFITTING name.</p>

The items on the **Advanced** tab are as follows:

Project-define (default Class) list with checkboxes for 'ALL', 'Unknown', 'Fabricated' and 'Unclassified'.	Used to select whether or not clashes involving items of unknown Class, or Fabricated or Unclassified, are to be included in the report. For all classes, use the ALL checkbox.
Project-define (default Priority) list with checkbox for each listed priority.	Used to select the Priority(ies) of clashes to be included in the report. For all Priorities, use the ALL checkbox.
Status list with checkbox for each listed status.	Used to select the Status of clashes to be included in the report, or to select 'Unknown status'. For all Status, use the ALL checkbox.
Discipline and Status checkbox groups with And/Or radio group.	The 'Discipline' and 'Status' checkboxes called 'Automatically Set' and 'Manually Set' are for selection of whether the report is to include values automatically set by Assign/Accept rules and/or values manually set. When 'And' is selected at the radio group, both the discipline and the status checkbox selection must be satisfied. When 'Or' is selected, either the discipline or the status selection must be satisfied.
Limits	Used to select items within or outside the defined 3D physical limits.
Remarks Like	Used for selection of clash items filtered only by their remarks. Oracle style Wild cards (%) may be used. For example, an entry of %VALV% will include clashes with VALV (valve) mentioned in the remarks. When entering strings, ensure that the exact string appears in the remarks of the clashes concerned.

Comments list with checkbox for each listed comment	Used to select clashes with particular comments to be included in the report.
Like	Used for selection of clash items filtered only by their comments. Oracle style Wild cards (%) may be used.
Date	Radio group for selection of Any Date, New clashes, Clashes between selected dates, Clashes during a selected preceding period. 'New clashes' are those occurring since the last 'Track Changes' command (see 'Clash Manager Options' form - Advanced tab).
Group/Detail Difference	<p>Two dropdown lists for comparisons of 'Group Status' with 'worst detail' and 'Group Level/Type' with 'worst detail'. The dropdown lists have options of 'Not compared', 'Better than', 'Worse than', 'Equal to' and 'Not equal to'. The report is filtered to include only clashes where the group status (and/or level/type) compared with the worst case detail status (and/or level/type) are as selected at the dropdown lists.</p> <p>Note: The Grading order of standard Clash Status is preset at the Status tab of the Clash Manager Configuration form, but the user can insert user-defined status between the standard ones. The grading order of Group Level/Type is set at the Level/Type tab of the Clash Manager Configuration form.</p>
Reset	Checks all checkboxes and blanks all text fields on the tab.
Search Comment History	Comment filter applies to the last comment only, unless this box is checked
Enable Advanced Filter	All items on the Advanced Filter Tab are ignored unless this box is checked. When the box is checked, only clash groups and details that satisfy EVERY filter selection made on the Advanced tab together with the basic filter selection are reported.

5.7 Consolidated Report

The report shows Project Details, Selected Filtering, Clash Set Details including lists, a Summary of Total Counts, and information on the Clash Groups and Clash Detail applicable to the Clash Reports currently displayed. It is created when 'Consolidated XML Report' or 'Consolidated HTML Report' is selected at the standard saving form accessed from the 'Clash Reports' window 'File' dropdown menu.

The report is generated in a file in neutral XML format, which is then displayed in Internet Explorer (version 6 or later). The layout is determined by the style sheet supplied with Clash Manager.

5.7.1 Report Header

The report header starts with the comments entered by the user at the 'Report Comments' dialog box, displayed when the report file was saved at the standard saving form. The comments are followed by a table giving general project information.

Depending on whether or not the report is filtered, a note appears saying that the filter is inactive, or details of the filter are tabulated.

If a single clash set was selected for the clash run, details of the clash set are tabulated. If multiple clash sets were selected a note appears to that effect.

The report then shows a statistical summary of clash status for clash groups and details.

5.7.2 Clash Groups

Tabulated data is presented showing for each clash group that currently appears in the Clash Reports Clash Group pane:

- Group discipline, status, level and type
- Element 1 discipline and GTYPE
- Element 2 discipline and GTYPE
- Group comments, user, co-ordinates, and when created.

5.7.3 Clash Detail

Tabulated data is presented showing for each clash detail that currently appears in the Clash Reports Clash Details pane:

- Group number, index, discipline, level and type
- Element 1 discipline and GTYPE
- Element 2 discipline and GTYPE
- Group comments, user, co-ordinates, when created and remarks.

5.8 Element Report

The Element Report displays details of all elements that have been involved in clash checks. The report is presented in a separate window that includes a main menu with dropdown menus, a toolbar and a status bar. A popup (right-click) menu is available. A pane showing report filter details can be included.

5.8.1 The Report

The report is in tabular format; each row being dedicated to an element.

Element Name	State	Discipline	Gtype	Class	Group Element
✓ /1.1/2-15B-SW-90001-BBA3.1	Clash Free	UNALLOCATED	PIPE	Unknown	/PIPE-15B-SW
✓ /1.1/2-15A-A-90005-AAN3.01	Clash Free	UNALLOCATED	PIPE	Unknown	/PIPE-15A-A
✓ /1.1/2-15A-A-90007-AAN3.01	Clash Free	UNALLOCATED	PIPE	Unknown	/PIPE-15A-A
✓ /1.1/2-15A-A-90010-AAN3.01	Clash Free	UNALLOCATED	PIPE	Unknown	/PIPE-15A-A
✓ /1.1/2-15A-FW-90018-AAN3.01	Clash Free	PIPING	PIPE	Unknown	/PIPE-15A-FW
✓ /1.1/2-15A-FW-90019-AAN3.01	Clash Free	PIPING	PIPE	Unknown	/PIPE-15A-FW
✓ /1.1/2-15A-FW-90022-AAN3.01	Clash Free	PIPING	PIPE	Unknown	/PIPE-15A-FW
✓ /1.1/2-15A-RV-90010-BFU3.01	Clash Free	PIPING	PIPE	Unknown	/PIPE-15A-RV
✓ /1.1/2-15A-RV-90026-BFU3.01	Clash Free	PIPING	PIPE	Unknown	/PIPE-15A-RV
✓ /1.1/2-15A-RV-90041-BFU3.01	Clash Free	UNALLOCATED	PIPE	Unknown	/PIPE-15A-RV
✓ /1.1/2-15A-RV-90043-BFU3.01	Clash Free	PIPING	PIPE	Unknown	/PIPE-15A-RV
✓ /1.1/2-15A-SC-90004-AAA3.01	Clash Free	UNALLOCATED	PIPE	Unknown	/PIPE-15A-SC
✗ /1.1/2-15A-SC-90004-AAA3.01/B03	Unapproved	UNALLOCATED	BRAN	Unknown	/PIPE-15A-SC
✓ /1.1/2-15A-SL-90007-AAA3.01	Clash Free	PIPING	PIPE	Unknown	/PIPE-15A-SL
✗ /1.1/2-15A-SL-90007-AAA3.01/B01	Unapproved	PIPING	BRAN	Unknown	/PIPE-15A-SL
✓ /1.1/2-15A-SL-90007-AAA3.02	Clash Free	PIPING	PIPE	Unknown	/PIPE-15A-SL
✓ /1.1/2-15A-SL-90014-AAA3.01	Clash Free	UNALLOCATED	PIPE	Unknown	/PIPE-15A-SL
✓ /1.1/2-15A-SL-90015-AAA3.01	Clash Free	PIPING	PIPE	Unknown	/PIPE-15A-O
✗ /1.1/2-15A-SL-90015-AAA3.01/B01	Unapproved	PIPING	BRAN	Unknown	/PIPE-15A-O
✓ /1.1/2-15A-SL-90017-AAA3.01	Clash Free	PIPING	PIPE	Unknown	/PIPE-15D-SL
✓ /1.1/2-15A-V-90001-AAA3.01	Clash Free	PIPING	PIPE	Unknown	/PIPE-15A-V
✓ /1.1/2-15A-V-90001-AAA3.02	Clash Free	PIPING	PIPE	Unknown	/PIPE-15A-V
✓ /1.1/2-15A-V-90001-AAA3.03	Clash Free	PIPING	PIPE	Unknown	/PIPE-15A-V
✓ /1.1/2-15A-V-90002-AAA3.01	Clash Free	UNALLOCATED	PIPE	Unknown	/PIPE-15A-V
✓ /1.1/2-15A-V-90003-AAA3.01	Clash Free	UNALLOCATED	PIPE	Unknown	/PIPE-15A-V
✓ /1.1/2-15A-VT-90007-BBU3.01	Clash Free	PIPING	PIPE	Unknown	/PIPE-15A-VT
✓ /1.1/2-15B-CW-90002-AAN3.01	Clash Free	UNALLOCATED	PIPE	Unknown	/PIPE-15B-CW
✗ /1.1/2-15B-CW-90002-AAN3.01/B03	Unapproved	UNALLOCATED	BRAN	Unknown	/PIPE-15B-CW

The data in the columns is identified by the column headings, namely,

- Element Name** OUTFITTING identification
- State** The worst case *state* of Approved, Conditional, Pending, Unapproved or Clash Free. Note that the worst case *state* is displayed rather than the Status
- Discipline** Owner discipline
- Gtype** OUTFITTING type
- Class** Project-defined field, by default known as Class
- Group Element** The element in the hierarchy at which Clashes may be aggregated

Note: In the example above the Purpose Project-defined field is configured as "MMSDESCRIPTION"

The left-hand column shows the status of the group, as follows:

- ✓ Approved
- ✗ Unapproved
- ?

-  Conditional
-  Clash Free

5.8.2 Filter Pane

This pane appears below the report and displays the filter criteria and values currently set to limit the data shown. The information appears in a two-column table showing criteria in the left-hand column and values in the right-hand column.



5.8.3 Popup Menu

The options available and their functions are as follows:

OPTION	FUNCTION
Show Clashes	Calls up the Clash Reports window displaying reports filtered to include all clashes associated with the selected items.
Set Design CE	Sets the selected item to be the OUTFITTING Current Element.
View Element	Views the elements.
Claim Element	Extracts the selected element in the OUTFITTING hierarchy and brings it to the user's OUTFITTING workspace.
Flush Element	Saves the OUTFITTING changes to the master model.
Issue Element	Issues the OUTFITTING changes to the master model.
Add to Design List	Adds the selected element to the OUTFITTING draw list.
Set Filter	Leads to the Clash Manager - Filter Form .
Enable Filter	Applies the filter criteria to the data displayed.
Save As	Saves the report in a chosen format.

5.8.4 Main Menu

The Main Menu is displayed across the top of the Clash Manager - Element Report window. Its options lead to the following dropdown menus:



5.8.5 File Dropdown Menu

The available options and their purposes are:

Save As	Displays the standard saving form. This enables the user to save information in the report as follows: Comma Separated (*.csv) Tab Separated (*.txt) (XML (*.xml) XML & Stylesheet (*.xml).
Refresh	Refreshes the report using the current filter.
Close	Closes the window.

5.8.6 Edit Dropdown Menu

The available options and their purposes are:

Select All	Selects all tabulated items in the report. Is greyed-out if the number of records in the active pane exceeds the Large Transaction>Warnings>Claim/Flush/Issue/Edit/Select All setting at the 'Clash Manager Options' form.
Remove Selected	Removes the selected items from the report.
Remove All	Removes all items from the report.
Find	Leads to the standard 'Find' dialog box.

5.8.7 View Dropdown Menu

The available options and their purposes are:

Filter	Controls whether or not the Filter pane is displayed
Toolbar	Controls whether or not the tool bar is displayed
Status Bar	Controls whether or not the status bar is displayed.

5.8.8 Tools Dropdown Menu

The available options and their purposes are:

Set Filter	Leads to Clash Manager Filter Form .
Enable Filter	Applies the filter criteria to the data displayed.
Clear 3D Display	Clears the OUTFITTING graphics display.

Clear 3D Labels Clears the Clash Group/index Text Labels on the OUTFITTING graphics display.

Options Leads to the Clash Manager [Options Form](#).

5.8.9 Help Dropdown Menu

The available options and their purposes are:

Contents Displays this Online Guide in a new window

About MMS/Clash Manager Displays the product version in a new window.

5.8.10 Tool Bar

When selected for display, the toolbar appears under the Main Menu. The icons and purposes of the buttons are as follows:



-  Selected elements are added to the active OUTFITTING Design List.
-  Clears the OUTFITTING graphics display.
-  Clears the Clash Group/index Text Labels on the OUTFITTING graphics display.
-  Refreshes the report using the current filter.
-  Finds selected data on the current report.
-  Applies the filter criteria to the data displayed.
-  Leads to the Clash Manager - [Filter Form](#).
-  Displays the filter pane.

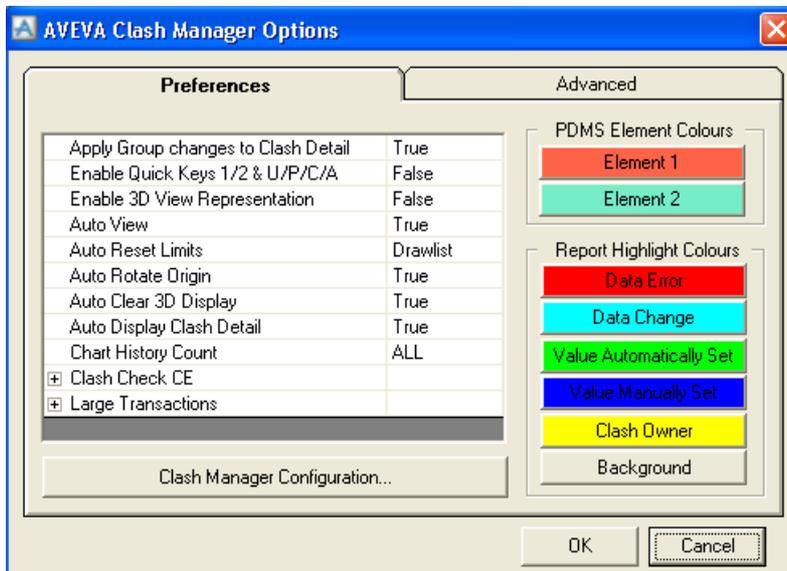
5.8.11 Status Bar

When selected for display, the status bar appears across the bottom of the window. It includes information on the:

- filtered or not filtered status of the display,
- number of objects displayed,
- Oracle connection status,
- OUTFITTING status,
- date.

5.9 Options Form

This form consists of two tabs called Preferences and Advanced. Below the tabs are **OK** and **Cancel** buttons for respectively implementing or ignoring any changes made.



Preferences Tab

The Preferences tab enables users to set their preferred method of handling clash information and highlighting features in the Clash report and in the OUTFITTING display

The pane at the left-hand side of the tab enables the following methods of handling clash information to be chosen from a list, selected (true), or deselected (false):

Apply Group changes to Clash Detail	True/False	Updates relevant data in Clash Detail report when changes are made to Clash Groups.
		Note: Depending on the policy selected for the project at the Clash Manager Configuration form, the options of the dropdown list may be restricted to either True or False. If the user is free to choose, both options are available.
		Caution: It is recommended that this option is set to True. If it is set to False, clash recomputation with the 'Clash Group Status from details' option selected (see Clash Recomputation form) may reset the status of all clash groups to the status of their worst case clash details.
Enable Quick Assign Keys 1/2 & U/P/C/A	True/False	Enables shortcut keys to be used: 1 - to set Owner Discipline to Discipline of First element 2 - to set Owner Discipline to Discipline of Second element U - to set clash status to Unapproved P - to set clash status to Pending C - to set clash status to Conditional A - to set clash status to Approved.
Enable 3D View Representation	True/False	Enables or disables highlighting of clashing elements in OUTFITTING
Auto View	True/False	Elements referenced in the Selected Clashes are added to the Drawlist
Auto Reset Limits	None	No Limits set for the graphics display
	Drawlist	Limits of the graphics display are set to the Drawlist
	Selected	Limits of the graphics display are set to the volume enclosed by the Elements referenced in the Selected Clashes
Auto Rotate Origin	True/False	Sets the rotation origin of the graphics display to the clash position (if one clash is selected) or the centre of Elements referenced in the selected clashes (when more than one clash is selected)
Auto Clear 3D Display	True/False	Clears the graphics display before adding elements to drawlist
Auto Display Clash Detail	True/False	Selecting a Group record automatically populates the related Clash Detail under Clash Detail pane (if displayed)
Chart History Count	Select ALL or number	Sets the number of previous milestones to be included in the statistical display on the Clash Manager form when clash history is selected.

Clash Check CE (leading to **Display Report** and **Retain Filter** options)

<input type="checkbox"/> Clash Check CE	
<input type="checkbox"/> Display Report	True
<input type="checkbox"/> Retain Filter	False

Display Report

When set to True, the clash reports, both group and detail, are automatically displayed after a Clash Check CE process.

Retain Filter

When set to True, the Clash Check CE reports are filtered using a temporary filter that includes ALL filter options, with the Element Name filter set to the appropriate Group Element of the Current Element.

When set to False, the filter is disregarded.

Large Transactions (leading to **Warnings** and **Worst Case Update Threshold** options)

<input type="checkbox"/> Large Transactions	
<input type="checkbox"/> Warnings (record counts...)	
<input type="checkbox"/> Clash Details from Selected Groups	1000
<input type="checkbox"/> 3D View from Selected Groups	10
<input type="checkbox"/> Claim/Flush/Issue/Edit/Select-All...	100
<input type="checkbox"/> Worst Case Update Threshold	100

Warnings (record counts...)
(leads to further options see next column)

Clash Details from Selected Groups (default 1000)
3D View from Selected Groups (default 10)
Claim/Flush/Issue/Edit/Select All (default 100)
(See [Large Transactions](#) below.)

Worst Case Update Threshold (default 100)

(See [Worst Case Update Threshold](#) below.)

Large Transactions

The Warning options enable the user to set the values of record counts that determine when the 'Clash Manager - Large Transaction' dialog box is displayed. This dialog box warns the user that there will be a delay because a large number of records are about to be displayed and/or a large number of operations are about to be performed, and requests confirmation or cancellation of the operation. Details of the record counts are as follows:

Clash Details from Selected Groups - this operates when Auto Display Clash Detail has been selected, clash details are being viewed and the total number of clash groups selected exceeds the set value.

3D View from Selected Groups - this operates when clash Auto View has been selected and the total number of clash groups selected exceeds the set value. (**Note:** Warnings of both Clash Details... and 3D View... may be displayed. This gives the user the opportunity to perform or cancel one or both operations.)

Claim/Flush/Issue/Edit/Select All - this operates when any one of these actions is initiated for a number of clash groups that exceeds the set value. The setting also determines how many records can be present in the active pane of the 'Clash Report' window before the **Select All** option of the **Edit** menu is greyed out.

Worst Case Update Threshold

The value set for this option determines which of two methods is to be used by the software to update the clash status of elements. The methods are referred to as 'Single Update' and 'Global Update'. The Single Update method processes a single clash element, searching the database for the worst case and updating the clash element status accordingly. This method is efficient for single clashes, but the time taken is proportional to the number of clashes involved. The Global Update method is routinely used at the end of every clash run to determine the worst case clash status of all elements in the database. It uses more sophisticated processing methods and is consequently faster per element than the Single Update method, but always processes all elements.

The Single Update method is used for all elements when the number of elements is below the Worst Case Update Threshold setting; the Global Update method is used when the number is above the setting.

The optimum value for Worst Case Update Threshold depends on the speed of the system and the volume of data. This is discussed further in Clash Manager Performance Hints.

5.9.1 Element Colours

The **Element Colours** buttons lead to a Select Colour dialog box, from which the required colours can be selected. The buttons are labelled **Element 1** and **Element 2** and are highlighted with the selected colours.

Select Element Colours:



The **Report Highlight Colours** buttons lead to a standard Windows Colour dialog box, from which the required colours can be selected. Each buttons is labelled with the aspect it controls on the Clash Reports and is highlighted with the selected colour.



5.9.2 Clash Manager Configuration

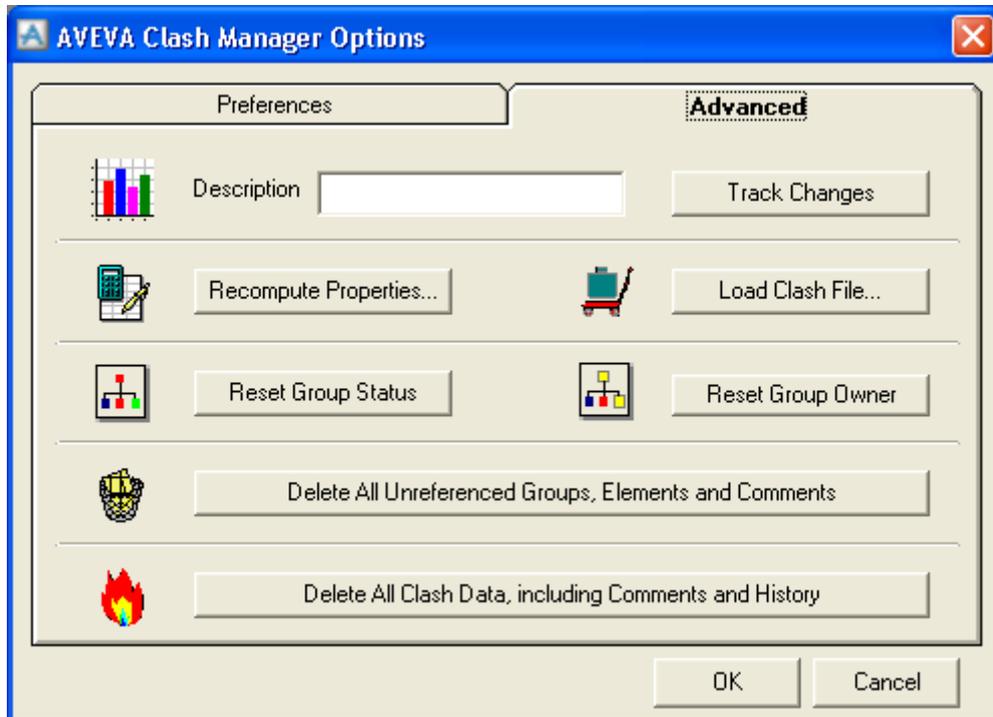
The Clash Manager **Configuration** button leads to the [Clash Manager Configuration Form](#).

Note: In the case of Standalone Clash Manager, a dialog box prompting entry of the Clash Manager Admin Password appears for non-administrative users. This password is set in the 'Clash Manager Configuration' form - Project tab, to prevent unauthorized access to the 'Clash Manager Configuration' form. Once entered, the user will not be prompted again to enter the password until the session ends. Supervisors of Administrator discipline are not required to enter this password.

Advanced Tab

The Advanced tab is used for major 'housekeeping' tasks and to introduce discrete periods or points in the history of clash runs (milestones).

Clash Manager Advanced Options:



Note: It can be accessed only by Supervisors of the Administrator discipline.

The tab contains the following items:

Description	For optional entry of a description of the new period or point (milestone)
Track Changes	Initiates saving the current discipline/status/counts. This has the effect of adding another point in the history shown on the Clash Manager form. 'New' clashes are tracked from this point.
Recompute Properties	Leads to the Clash Recomputation Form . Used following change in the model.
Load Clash File	Leads to the Load Clash File Form . Used following a failure during clash file handling.
Reset Group Status	When all individual clashes within a group have the same status, it is applied to the Group.
Reset Group Owner	When all individual clashes within a group have the same owner discipline, it is applied to the Group.

Delete All Unreferenced Groups, Elements, and Comments Removes from the clash report data any groups or elements that are no longer involved with clashes

Delete All Clash Data, including Comments and History Removes all clash report data from the database, but not configuration data. Therefore, clash set definitions, check list, obstruction list and so on remain, but can be deleted manually. The clash history is deleted. Remaining data is truncated to recover unused space in the Oracle Table Space.

Note: Counters are NOT reset (as Oracle does not provide this facility).

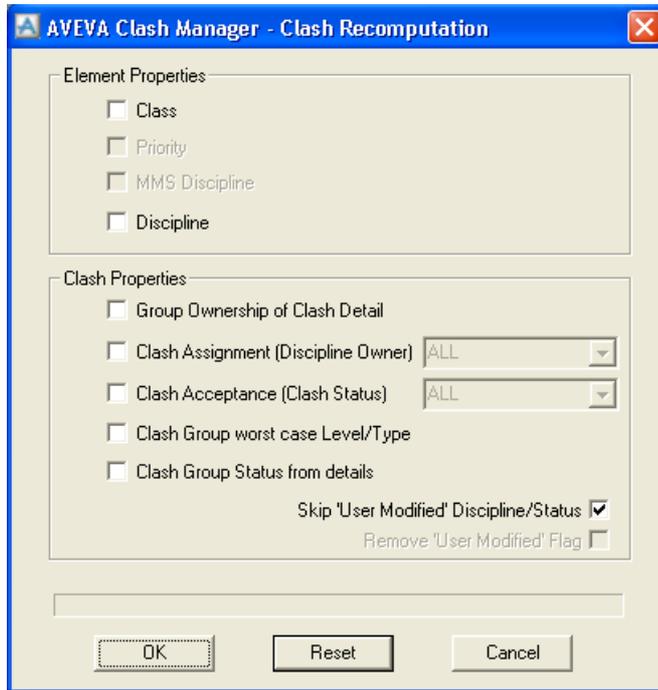
5.10 Clash Recomputation Form

Recomputation is an Administrator Configuration task that becomes necessary when the values of significant attributes in the model have been changed, for example, if discipline codes are changed. This is because these changes to the model are not automatically communicated back to the Clash Manager, unless the relevant clash sets are rerun, or the recomputation process is initiated at this form.

The changes to the model can have been made independently in OUTFITTING, or in Clash Manager at the 'Clash Manager Configuration' form. Following changes made in OUTFITTING, the Recomputation form must be accessed manually. When significant items are modified at the Clash Manager Configuration form, the Recomputation form is displayed automatically with the appropriate default entries in the relevant checkboxes. Examples of the changes that cause automatic display of the form are:

- rules added or deleted
- regular expressions modified
- defaults changed
- defined attributes changed.

Note: When the recomputation process is performed, it is usually necessary to preserve the current approval status, in spite of any change in Acceptance Rules that would subsequently lead to different results. Also, it should be noted that Rules are applied only when a clash is initially discovered; subsequent manual settings of attributes usually need to be preserved. Clash acceptance can be excluded from the process, as can any other aspects, by appropriate entries at this form.



The form contains the following items:

Element Properties block containing:

Class, Priority, Discipline, MMS Discipline, The states are referred to here as 'checked', 'checked shaded', and 'blank'.

.The checkbox titles are the default values of project-defined fields that can be set at the Clash Manager Configuration form. The fields are used for selecting attributes, the values of which are to be copied verbatim into the Clash Manager database for reporting purposes and use for filtering etc. Areacode (and others) are defined on the Project tab of the form. Class and Priority and Discipline have their own tabs. The checkbox titles show the default values and/or those of the attribute(s) set by the user.

When 'checked', the value of the particular attribute is unconditionally recomputed for every element. The phrase **Recompute ALL** appears before the checkbox title.

When 'checked shaded', the value of the particular attribute is only recomputed for elements where the attribute is currently UNSET. The phrase **Recompute only unset** appears before the checkbox title name.

When 'blank", the attribute is not affected by the recompute process.

Clash Properties block containing:

Five checkboxes at the left-hand side of the block. (Checking a checkbox enables recomputation of the associated property. When the checkbox is blank, the property is not affected by the recomputation process)

Group Ownership of Clash Details When the checkbox is checked, Clash Group Ownership is recomputed for every clash detail.

Clash Assignment (Discipline Owner) When the 'ALL' option is selected at the dropdown list, the discipline ownership is recomputed for every clash detail. When a discipline is selected, the ownership is recomputed for clash details for that discipline only.

Clash Acceptance (Clash Status) When the 'ALL' option is selected at the dropdown list, the clash acceptance status is recomputed for every clash detail. When a status is selected, the clash acceptance status is recomputed for clash details where the status is currently the one selected.

Clash Group worst case Level/Type When the checkbox is checked, the Clash Group worst case Level/Type is recomputed for every clash detail

Clash Group Status from details When the checkbox is checked, the status of each active clash group is reset to the value of the worst case status of any of its member clash details. This option is provided for cases where clash detail status has been set by hand and the group status consequently may be out-of-date.

Caution: If any group status has been set by hand, and 'Apply Group changes to Clash Details' on the 'Clash Manager Options' form has been set to False, the member details status will not necessarily match the group status. Therefore, recomputation using the 'Clash Group Status from details' option could change the Clash Group status to that of the worst case member clash detail.

Two checkboxes at the lower right-hand side of the block

Skip 'User Modified' Discipline/Status When the checkbox is checked, the recomputation includes only clash details that have been set automatically using Assignment/Acceptance Rules. When the checkbox is unchecked, the recomputation includes all clashes, and processes them according to the assignment/acceptance rules.

Remove 'User Modified' Flag When the checkbox is checked, all Manual Flags (see Note on Auto Rules checkboxes) are unset and, in future, all clashes are treated as though their details had been set automatically.

Progress bar Indicates the percentage completion of the recomputation process

OK Initiates the recomputation process

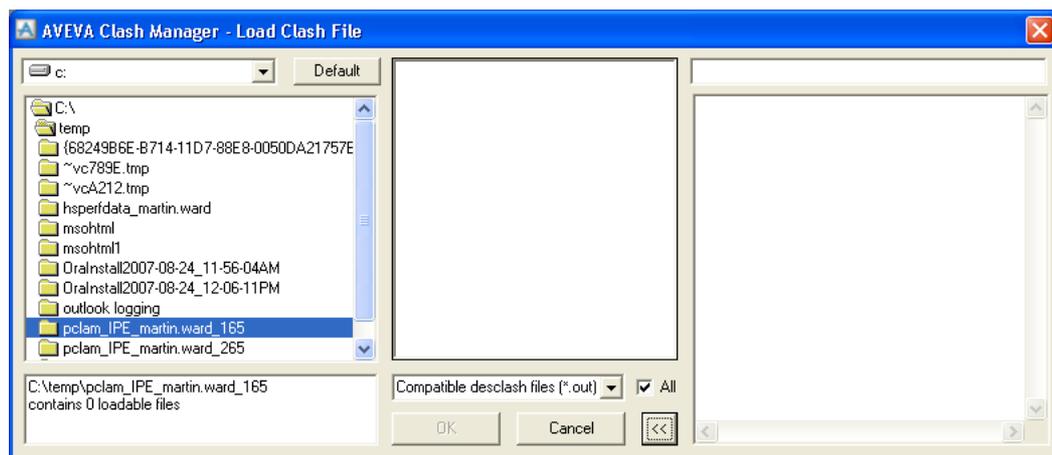
- Reset** Restores the recently changed settings made at the Clash Manager Options form
- Cancel** Cancels the selections made and closes the form

5.11 Load Clash File Form

This form is used for loading desclash output files to replace any that are partially loaded following a system failure. The form also provides facilities for merging selected files into the results of the latest clash run.

The form initially displays three panes; the top left-hand showing directories; the bottom left-hand showing a summary of the selected directory contents; the right-hand showing the file content of the selected directory. Only files compatible with Clash Manager can be selected in the right-hand pane.

The form can be extended at the right-hand side to show a fourth pane that displays the contents of the selected file.



In addition to the panes, the form includes the following items:

- Dropdown list and associated Default button (top left-hand of form)** For selection of drives and directories. The **Default** button sets the directory to %TEMP% and selects the first Clash Manager directory for the current project.
- Dropdown list (bottom right-hand of form)** For selection of the type of file displayed in the pane above it. The options are **Compatible desclash files (*.out)** (the default) and **All Files (*.*)**.
- All** When the box is **checked**, all files compatible with Clash Manager in the selected directory are loaded, when the process is initiated. This has the effect of creating a new clash run containing only those loaded clashes.
When the box is **unchecked**, only the selected files are merged into a copy of the latest clash run, when the loading process is initiated.

- OK** For initiating the file loading process and closing the form.
- Cancel** For ignoring the selections made and closing the form.
- |>>| or |<<|** For extending or contracting the form.

5.12 Clash (Group) Properties Form

This form enables the properties of a clash group or an individual clash to be updated. When a clash group is involved, the word 'Group' appears in the box title. There are minor differences between the fields available for a clash group or an individual clash. These are indicated in this topic by 'Group only' or 'Clash only' after the particular field names.

Status
 Unknown Auto Rules **Unapproved**

Discipline
 Element 1 PIPING
 Element 2 PIPING
 Other **PIPING**
 Auto Rules

Elements
 1 /PIPE-15A-AG
 2 /PIPE-15A-B

Apply to each Clash Detail

Attribute	Element 1	Element 2
PDMS Name	/PIPE-15A-AG	/PIPE-15A-B
Discipline	PIPING	PIPING
Class	Unknown	Unknown
GTYPE	ZONE	ZONE
Worst Case	Unapproved	Unapproved

Details
 Date: 29/06/2007 14:22:31
 East: 38
 North: 0
 Up: 0
 Level: HH Type: CLA

OK Cancel

Note: Auto Rules Checkboxes: The **Auto Rules** checkboxes enable the user to set or unset flags that tell the system that the Status or Owner Discipline has been manually updated. Following the initial automatic acceptance or assignment, the flags are unset, but when the user carries out manual updates, they become set. When a recomputation process becomes necessary, the user often does not want manual updates to be changed, and recomputation options are available to prevent this. However, the user may require that certain manual updates are recomputed and the flag for these can be unset by means of the appropriate Auto Rules checkbox.

The checkbox can also be used to set the flag, if required, thus making an automatic update appear to be manual.

At the top of the form is a **Status** section. The currently selected status is represented by a green tick, green tick over blue question mark, blue question mark or red cross adjacent to a 'Status' element, which can be either a field or a dropdown list. The current status, namely Approved, Conditional Approval, Pending or Unapproved, as applicable, is written at the right-hand of the section. An **Auto Rules** checkbox adjacent to the Status element enables the user to select whether the status is to be treated by the system as automatically applied by the Auto-accept Rules, or manually applied.

When the **Auto Rules** checkbox is checked, the 'Status' element becomes a field, highlighted by the 'Value Automatically Set' colour selected at the 'Clash Manager Options' form. In these circumstances, any recomputation process will treat the Status as having been automatically set and will update it in line with any applicable new rule or design change.

When the **Auto Rules** checkbox is unchecked, the 'Status' element becomes a dropdown list, and a **Spanner** (wrench) icon is displayed to signify manual selection. The new discipline may be selected at the dropdown list, but access controls may restrict the available Status. In these circumstances, any recomputation process will treat the Status as having been manually set and will update it, or skip it, as specified at the 'Clash Manager - Clash Recomputation' form.

The **Discipline** section is for selection of the discipline responsible for resolution of the clashes. Selection is by a 3-button radio group that enables mutually exclusive selection of the owning discipline to be that of **Element 1**, **Element 2** or **Other** discipline. The **Other** discipline element can be either a field or a dropdown list. An **Auto Rules** checkbox adjacent to the **Other** element enables the user to select whether the owner discipline is to be treated by the system as automatically applied by the Auto-assign Rules, or manually applied.

When the **Auto Rules** checkbox is checked, the radio group is disabled and the **Other** element becomes a field, highlighted by the 'Value Automatically Set' colour selected at the 'Clash Manager Options' form. In these circumstances, any recomputation process will treat the Discipline as having been automatically set and will update it in line with any applicable new rule or design change.

When the **Auto Rules** checkbox is unchecked, the radio group is enabled and the **Other** element becomes a dropdown list. A **Spanner** (wrench) icon is displayed to signify manual selection. The new status may be selected at the dropdown list, but access controls may restrict the available disciplines shown in the dropdown list and may inhibit the selection of one or more of the radio buttons. In these circumstances, any recomputation process will treat the Discipline as having been manually set and will update it, or skip it, as specified at the 'Clash Manager - Clash Recomputation' form.

The **Elements** section displays the identity of **Element 1** and **Element 2** within the group or clash.

The **Apply to Each Clash Detail** (Group only) checkbox is checked, if the change of properties is to apply to each clash within the group.

The **Member of Group** (Clash only) field displays the owner group number.

The lower part of the form is occupied by tabs titled Comments and Details respectively. Below the tabs are **OK** and **Cancel** buttons for respectively implementing any property changes and closing the box or just closing the box.

5.12.1 Comments

This tab provides facilities for addition and deletion of comments. The **Quick Comment** button displays a list of pre-defined comments associated with the current owner discipline, together with pre-defined comments that may be applicable to any clash.

The automatic Acceptance & Assignment Rules automatically create comment records showing the name of the rule that succeeded.

Comments may be edited (or deleted) before saving, but thereafter form part of the historical record and may not be changed or deleted.

Note: All comment records are stored together with the user's windows UserID and the current date.

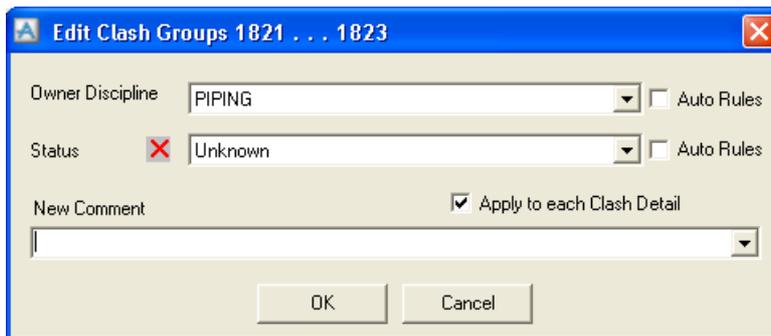
5.12.2 Details

The text box at the left-hand lists details of the attributes of the elements involved in the clash or clash group. The fields at the right-hand show the date and the co-ordinates of the clash or clash group.

The text box (Clash only) at the bottom right-hand displays a narrative description of the clash, derived from the data displayed on the tab. This description is the derivation of the 'Remarks' shown on the 'Clash Details' reports.

5.13 Edit Clash Groups Form

This form enables a supervisor of the Administrator discipline to edit the properties of multiple clash groups or clashes, by changing the owner discipline and/or status and/or adding new comments. If other users edit multiple clash groups or clashes, records to which they do not have access rights are ignored. The clash groups or details concerned are selected at the Clash report.



A change of Discipline or Status automatically creates an additional comment record. This comment will appear in the comments section of the Clash Report and on the Comments tab of the Clash (Group) Properties form.

Any changes to the properties of the clash groups or details are made at the **Owner Discipline**, **Status** and **Comments** dropdown lists. The utilization of the **Owner Discipline** and **Status** dropdown lists depend on whether:

1. All, some or none of the clash groups or details have automatically or manually set owner disciplines,

2. All, some or none of the clash groups or details have automatically or manually set status,
3. The current status is the same in all clash groups or details,
4. The current owner discipline is the same in all clash groups or details.

Situations a. and b. are shown by **Auto Rules** checkboxes adjacent to the dropdown lists (refer to [Clash \(Group\) Properties Form](#)), whereas c. and d. are shown by characteristics of the dropdown lists. The situations and the displays are summarized in the following table (in which 'item' means Owner Discipline or Status):

Situation	Dropdown List	Auto Rules Checkbox
All items manually set	Active - entry can be updated	Blank - can be set to Checked to make the system react as though all items were automatically set
All items automatically set	Inhibited - text is greyed-out - read-only	Checked - can be set to Blank to make the system react as though all items were manually set
Some items automatically set others manually set	Inhibited - text is greyed-out - read-only	Checked greyed-out - can be set to Blank or Checked to make all items appear to be manually or automatically set, as above
All items the same	<item name> displayed	Makes dropdown list active or inhibited, as above
Items diffe	<...> displayed	Makes dropdown list active or inhibited, as above

To update the owner discipline or status of the selected clash groups or details, click on the appropriate **Auto Rules** checkbox until it is blank and then select the new discipline or status at the dropdown list.

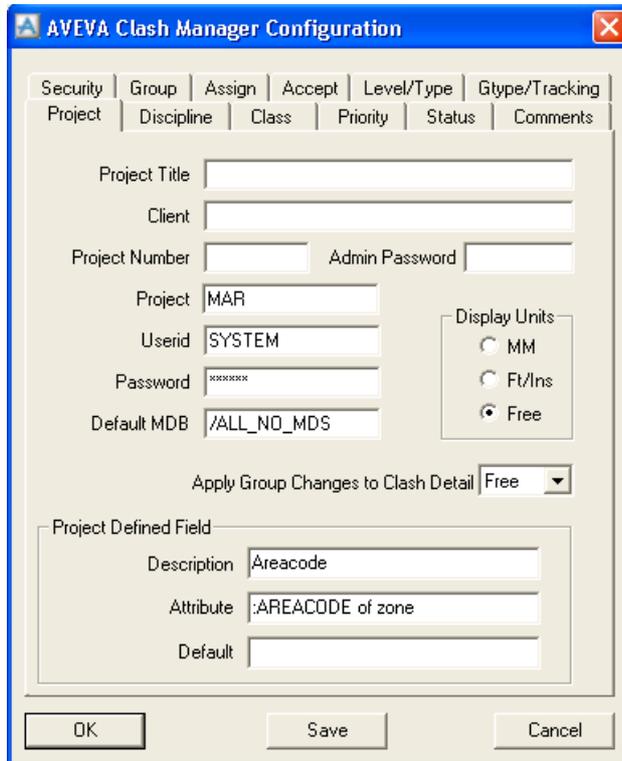
When the **Apply to each Clash** checkbox is checked, the changes made in multiple Clash Groups will apply to each clash within each group.

As required, select the required comment at the **New Comment** dropdown list.

To implement the updates and close the form, click on the **OK** button. To ignore any entries and close the form, click on the **Cancel** button.

5.14 Clash Manager Configuration Form

This form provides viewing and setup facilities for features of clash management. The central part of the form is occupied by several tabs. These are described in separate topics. The clash management features and the tabs associated with them are as follows:



Clash Management Feature

- Data Access Control
- Automatic acceptance of certain clashes
- Automatic assignment of an owner discipline to a clash
- Clash Manager Access Control
- Clash details
- Automatic grouping of primitive clashes
- Advanced Filtering options for Clash Reports
- MDBs and GTYPEs included in Tracking Changes

Associated Tab Titles

- Security
- Accept, Class*, Status
- Assign, Class*, Discipline, Priority*
- Project
- Comments, Level/Type
- Group
- Class*, Priority*, Status
- Gtype/Tracking

* The Class and Priority tabs are user-definable and can be configured for any attribute or user-defined attribute associated with the clashing elements or their owning hierarchy. (The names Priority and Class illustrate the typical configuration, and are used in this Online Guide for the tabs and for any form elements that display information derived from them.) It should be noted that the values of the attributes defined are stored against each clashing element in the Clash Manager database. This additional attribute information can be used in the Assign and Accept rules.

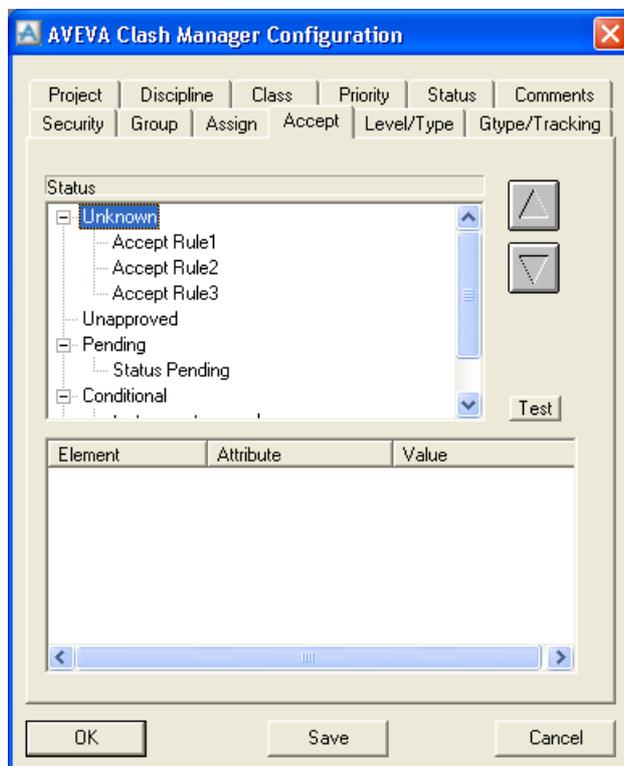
Buttons below the tabs have the following names and purposes:

- OK** Saves updated data and closes the form
- Save** Saves updated data and leaves the form displayed
- Cancel** Closes the form without saving any updates.

Note: If significant changes are made at this form, a message 'changes in Configuration require recomputation of Clash & Element Properties' is displayed. When this message is accepted, the Clash Recomputation form is automatically displayed.

5.14.1 Accept

This tab is for setting up details of clashes that can be automatically accepted and automatically set to a given status, such as Approved.



The clash acceptance process checks a number of 'Rules' in sequence (from top to bottom as displayed on the form). Each Rule consists of a number of 'Rule Expressions'. The first Rule found in which all its Rule Expressions evaluate true is used by the acceptance process. Rule Expressions, which are formed of certain keywords, literals and regular expressions (wildcards) are described under [Notes on Rules and Rule Expressions](#).

The Status of the clash is set to the status owning that rule. A comment is created showing details of the status and the rule which matched is automatically attached to the clash and or clash group record.

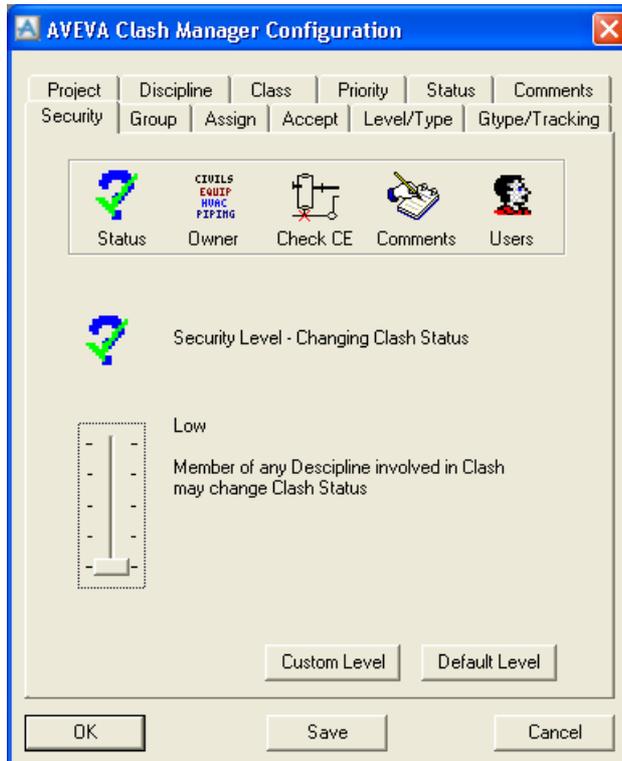
Note: Acceptance Rules may be complicated and time-consuming to develop. A simple method of testing is available to avoid a (very lengthy) Re-Computation option, which may reveal further modifications to the rules are required. The test facilities are available at the 'Clash Manager -Test Rules' form, which is accessed by means of the **Test** button. The new configuration does not need to be saved prior to using the test facilities.

The names and purposes of the items on the tab are as follows:

<p>Upper pane showing a hierarchy with Status as the primary nodes which, when expanded, display the applicable Acceptance Rules</p>	<p>When an Acceptance Rule is highlighted, its rule syntax is shown in the lower pane.</p> <p>A Popup Menu is available (mouse right-click) with options of Edit, Add and Delete. This is used to edit an existing rule name, add a new rule, or remove an existing rule.</p>
<p>Up and Down</p>	<p>These are used to reposition the highlighted rule in the hierarchy.</p>
<p>Test</p>	<p>Leads to the Test Rules Form.</p>
<p>Lower pane showing a list of Rule Expressions under Element, Attribute and Value headings</p>	<p>The listing shows the syntax of the Acceptance Rule that is highlighted in the upper pane.</p> <p>Popup Menus (mouse right-click) are available from the three components of the Rule Expressions. (Note that the current options are omitted from the editing options of the displayed menus and that the Esc key can be used to abort the entry in an in-place options box.)</p> <p>The Element Popup Menu options are:</p> <p>Editing options - <i>@element-1</i>, <i>@element-2</i>, <i>@general</i> Add Rule Delete</p> <p>The Attribute Popup Menu options are:</p> <p>Editing options - <i>@discipline</i>, <i>@class</i>, <i>@priority</i>, etc, and <i>@gtype</i> Edit - leads to in-place editing options box Add Rule Delete</p> <p>The Value Popup Menu options are:</p> <p>Editing options - <i>@element-2</i>, etc, see Notes on Rules and Rule Expressions Edit - leads to list-of-values Add Rule Delete</p>

5.14.2 Security

This tab enables the administrator to update and view the overall security arrangements for Clash Manager. For details of the security arrangements, refer to [Access Rights](#).



The tab essentially displays one of four panes for setting Security Levels (namely, **Status**, **Owner** discipline, **Check CE**, and **Comments**), or a dialog box called 'User Access Levels' for setting the **User Access Levels**. The particular security level pane, or the dialog box, is selected by clicking on the appropriate icon in the row across the top of the tab.

The size of the 'User Access Levels' dialog box, when located on the tab, may unacceptably restrict the displayed information. To overcome this effect, the dialog box can be undocked, by clicking on the button at its top right-hand corner, and resized by dragging its borders. The dialog box is docked by clicking on the button at its top right-hand corner.

Note: The Security Levels panes cannot be accessed while the dialog box is undocked and a message 'User Access Levels Dialog Undocked...' is displayed on the tab.

Status, Owner, Check CE and Comments Panes

The layout of each pane is the same, but the messages displayed are appropriate to the selected Security Level.

Across the top of the pane, the selected icon and a description of the Security Level are displayed.

The elements displayed in the centre of the pane, depend on whether the pre-defined or custom settings are being used. When pre-defined settings are being used, a slider control enables the security to be set to one of the five states namely, **High**, **Medium High**, **Medium**, **Medium Low** and **Low**. The name of the selected state and a narrative statement of its effect appear to the right-hand of the slider control. The default state for each security level is **Medium**. When custom settings are being used, the pane displays the message: 'Custom - To change the settings, click Custom Level - To use the recommended settings, click Default Level'.

At the bottom of the pane are two buttons. The **Custom Level** button leads to the 'Clash Manager - Security Settings' form, at which the pre-defined settings for the particular Security Level can be superseded by custom (user-defined) settings. The **Default Level** button is for selecting the default state.

For each Security Level there are five pre-defined states namely, High, Medium High, Medium, Medium Low and Low. Each of these states has corresponding settings (minimum requirements). The default State for each Security Level is Medium and this is used as the guideline when access rights are mentioned in the Clash Manager Procedures.

As required, the Administrator may override the pre-determined settings by specifying custom settings for one or all of the Security Levels.

The pre-determined States and Settings are detailed in the following tables.

Security Level - Status	
State	Setting - description of minimum requirement
High	Supervisor of ADMIN discipline
Medium High	Supervisor of Owner discipline AND Member of ADMIN discipline
Medium (the default)	Supervisor of Owner discipline
Medium Low	Member of Owner discipline
Low	Member of ANY discipline involved in Clash

Security Level - Owner	
State	Setting - description of minimum requirement
High	Supervisor of ADMIN discipline
Medium High	Supervisor of other discipline and Member of ADMIN may Acquire Ownership Supervisor of current discipline and Member of ADMIN may impose ownership
Medium (the default)	Supervisor of other discipline may Acquire Ownership Supervisor of current discipline and Member of ADMIN may impose ownership
Medium Low	Supervisor of other discipline may Acquire Ownership Supervisor of current discipline may impose ownership
Low	Member of ANY discipline involved in Clash
Note: Only the Supervisor of ADMIN discipline may impose ownership on a discipline not directly involved	

Security Level - Clash Check CE	
State	Setting - description of minimum requirement
High	Supervisor of ADMIN discipline
Medium High	Member of ADMIN discipline
Medium (the default)	Supervisor of CE discipline
Medium Low	Member of CE discipline
Low	Member of ANY discipline
Note: <i>Clash Check CE</i> automatically creates and runs a personal Clash Set. A suitable level of security is important in order to maintain some control of the growth of Clash Sets	

Security Level - Comments	
State	Setting - description of minimum requirement
High	Supervisor of ADMIN discipline or Supervisor of ANY discipline involved in Clash and Member of ADMIN discipline
Medium High	Supervisor of ANY discipline involved in Clash
Medium (the default)	Member of ANY discipline involved in Clash
Medium Low	Member of ANY discipline
Low	Anybody

User Access Levels

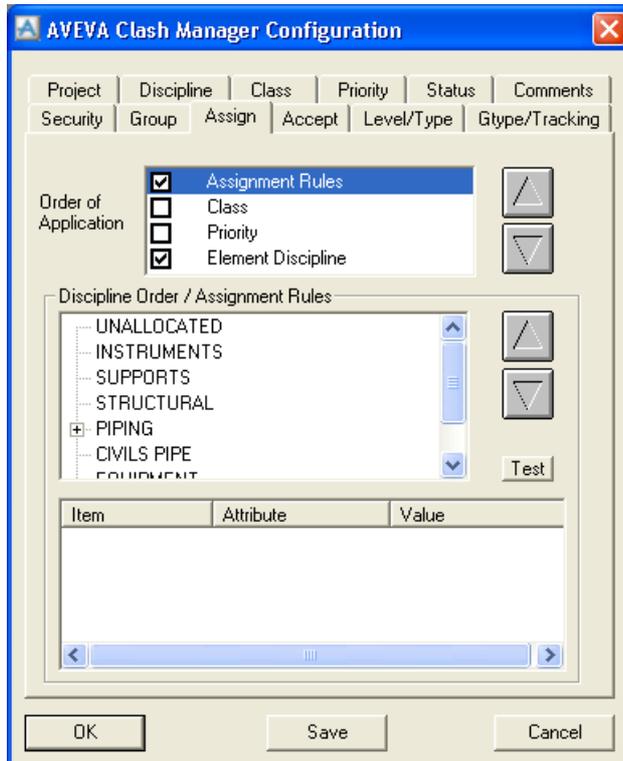
This dialog box is for selecting Users and their access levels. It displays a single pane on which the access arrangements are shown in tree format. The major nodes of the tree are **Users** and **Disciplines**.

User membership of a discipline is granted by dragging the discipline and dropping it onto a user name. Alternatively, the discipline can be selected from a right click menu. Similarly, a user name may be dropped onto a discipline.

A checkbox is located against the left-hand side of each user and discipline symbol. **Supervisor rights** are shown in the tree by a checked box against the discipline under the user and by a checked box against the user under the discipline.

5.14.3 Assign

This tab is for specifying the tests and order in which they are to be performed during automatic assignment of an owner discipline to a clash.



The tests can check the relative Priority, Class and/or Discipline of each element of pairs of clashing elements. The tests can also check a number of 'Discipline Assignment Rules'. The testing process proceeds test-by-test until a result indicates the owner discipline of the clash. The testing process then assigns the owner discipline to that clash and continues by testing the next clash.

In the Priority and Class tests, the owner discipline is set to the element with the higher 'Order'. These Orders are as set at the Priority and Class tabs, respectively.

The Element Discipline test is normally the last of the sequence and consequently is used when none of the other tests have produced an owner discipline. If the discipline of each clashing element is the same, that discipline is set as the owner. If the disciplines are different, the discipline default (as set at the [Discipline](#)) is used. Typically, this is 'UNALLOCATED'.

Each Rule in the Discipline Assignment Rules consists of a number of 'Rule Expressions'. Rule Expressions, which are formed of certain keywords, literals and regular expressions (wildcards), are described under [Notes on Rules and Rule Expressions](#). The first discipline with a Rules whose Rule Expressions all evaluate true becomes the owner discipline, by default. Alternatively a setDiscipline keyword operator may be used in a rule expression to assign the owner discipline to that of one element or the other, or even to a third unrelated discipline.

A comment is created showing details of the discipline assigned and the Rule which matched is automatically attached to the clash and/or clash group record. This comment appears in the Comments section of the Clash Report and on the Comments tab of the Clash Group Properties form.

Note: Assignment Rules may be complicated and time-consuming to develop. A simple method of testing is available to avoid a (very lengthy) Re-Computation option, which may reveal further modifications to the rules are required. The test facilities are available at the 'Clash Manager -Test Rules' form, which is accessed by means of the Test button. The new configuration does not need to be saved prior to using the test facilities.

The names and purposes of the items on the tab are as follows:

Order of Application For selecting which tests are to be performed and the order (from top to bottom) in which they are carried out. The checkbox against the test is checked, if the test is to be part of the sequence. The records show the name of the tests. 'Assignment Rules' means 'Apply the Discipline Assignment Rules'.

Up and Down For setting the sequence of records as displayed from top to bottom of the pane and hence the sequence of the tests.

Discipline Assignment Rules pane containing:

Discipline Assignment Rules pane showing a hierarchy with **Discipline** as the primary nodes which, when expanded, display the applicable **Assignment Rules**

When an Assignment Rule is highlighted, its rule syntax is shown in the lower pane.

A **Popup Menu** is available (mouse right-click) with options of **Edit**, **Add** and **Delete**. This is used to edit an existing rule name, add a new rule, or remove an existing rule.

Up and Down

These are used to reposition the highlighted rule in the hierarchy and hence determine the sequence (from top to bottom) in which the rules are applied.

Test

Leads to the [Test Rules Form](#).

Lower pane showing a list of Rule Expressions under **Element**, **Attribute** and **Value** headings

The listing shows the syntax of the Assignment Rule that is highlighted in the upper pane.

Popup Menus (mouse right-click) are available from the three components of the Rule Expressions. (Note that the current options are omitted from the editing options of the displayed menus and that the **Esc** key can be used to abort the entry in an in-place options box.)

The **Element Popup Menu** options are:

Editing options - *@element-1*, *@element-2*, *@general*
 Add Rule
 Delete

The **Attribute Popup Menu** options are:

Editing options - *@discipline, @class, @priority, etc, and @gtype*

Edit - leads to in-place editing options box

Add Rule

Delete

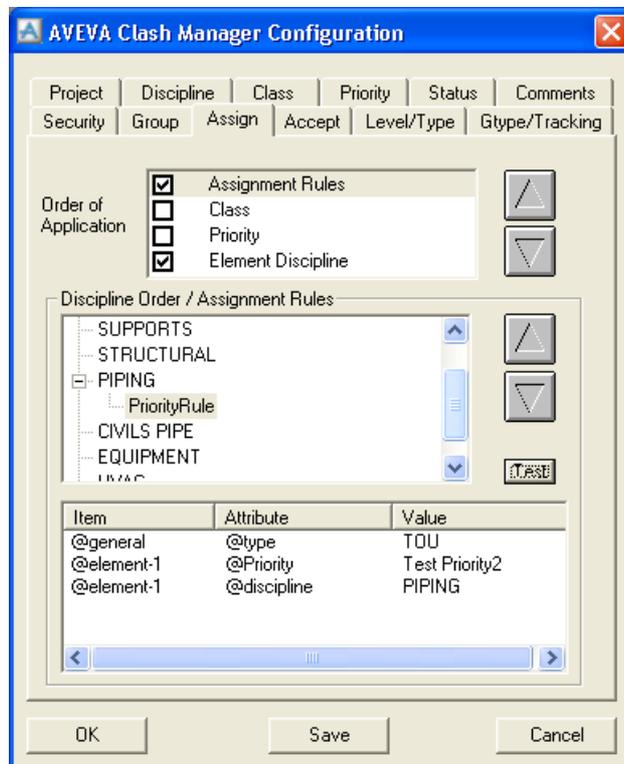
The **Value Popup Menu** options are:

Edit - leads to list-of-values

Add Rule

Delete

Example of Assignment Rules



In the above illustration of the tab, the order of the tests is Assignment Rules, Priority, Class and finally Element Discipline. The testing process is as follows:

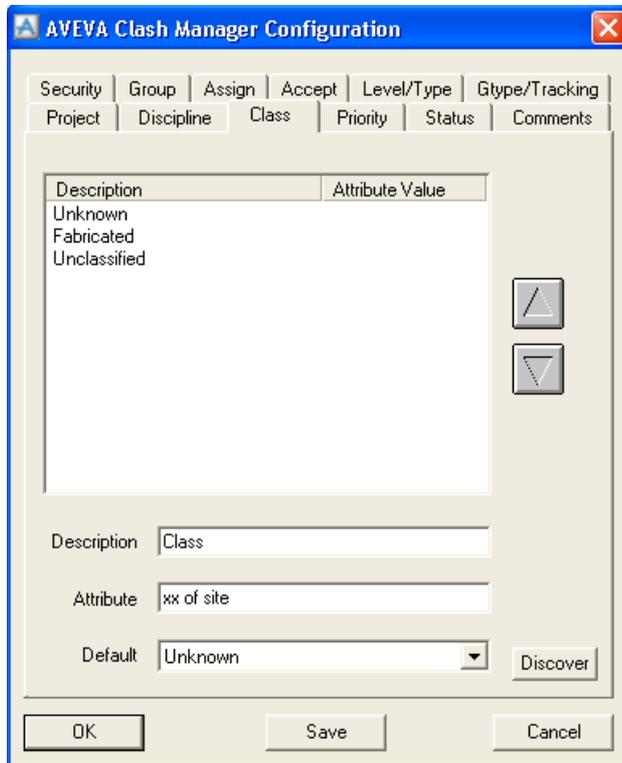
1. The Assignment Rules are applied. The first rule in which all Rule Expressions evaluate true is used to determine the owner discipline.
2. If no Assignment Rule is satisfied, the Classes of the elements are checked. If the Classes are different, the element with the higher class determines the owner discipline. (The illustration shows this test disabled, because the checkbox is unchecked.)
3. If the Classes are the same, if the Priorities of the clashing elements are different, the element with the higher priority determines the owner discipline. (The illustration shows this test disabled, because the checkbox is unchecked).

- If the Priorities are the same, the Element Disciplines are checked. If the Disciplines are different, the default discipline, typically 'UNALLOCATED' becomes the owner discipline. Otherwise, the discipline common to both elements becomes the owner.

Note: It is useful to apply the tests, even if the discipline of both clashing elements is the same, because the owner discipline highlighted in the Clash Report may well represent the element that must be moved to resolve the clash, based on the relative priorities or classes of the elements.

5.14.4 Class

This tab is for specifying Classes that are used in auto-acceptance and auto-assign-to-discipline rules for clash ownership. The tab is also used to set the Classes in the 'Order' they are to be considered, when the relative importance of the class of each element within a clash is the subject of an automatic acceptance or assignment process.



The tab enables the values of a OUTFITTING attribute to be associated with the values of the Ship Model Management class attribute for the purpose of automatic assignment of a class to a clash.

Note: This configuration is separate from the 'Project Defined Field' configuration at the Project Tab.

The pane at the top of the tab enables a particular Ship Model Management Class **Description** and its **Attribute Value** to be selected. A **Popup Menu** is available (mouse right-click) with options of **Edit**, **Add**, **Delete** and **Set Default**. This is used to edit an existing class, add a new class, remove an existing class, or set an existing class as default. The description is user-defined, the attribute value must match the OUTFITTING attribute value for the particular class.

The associated **Up** and **Down** buttons are for rearranging the 'Order' of the classes, from top to bottom. The least important class is at the top; the most important at the bottom. From a pair of clashing elements, the auto-assignment process selects the discipline of the less important element to be the owner of the clash, that is, the element with the class that is nearer to the top of the list.

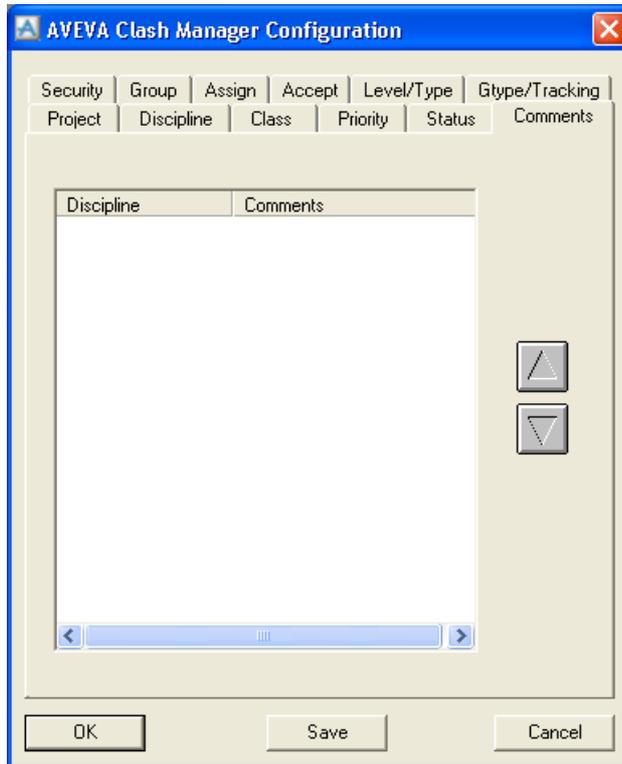
The **Description** field is for specifying the text to appear as the report column header for the attribute values.

The **Attribute** box enables the OUTFITTING attribute associated with the selected class attribute value to be specified. Clash Manager will search for the attribute on the clashing item, and if not found there, will search the owning hierarchy for it. If **Not Used** is selected, the CLASS attribute does not appear in the Clash Manager GUI. Note that CLASS is designed to produce a modest number of look-up records, when a value is used as a wildcard. An attribute, such as a NAME that would return a large number of values should not be used.

The **Discover** button automatically produces a list of class descriptions and attributes that are applicable to elements in clashes that have been discovered by Clash Manager. Each Description of the various classes is formed by a concatenation of the OUTFITTING attribute name followed by the particular attribute value. For example, for an attribute 'type' and a value BEND, the description is 'type BEND'. Each listed attribute value is available as a Regular Expression wildcard (see [Notes on Wildcards](#)) for use in assignment and acceptance rules. The values are preceded by ^ and followed by \$ to ensure that only complete strings are matched, for example, ^BEND\$.

5.14.5 Comments

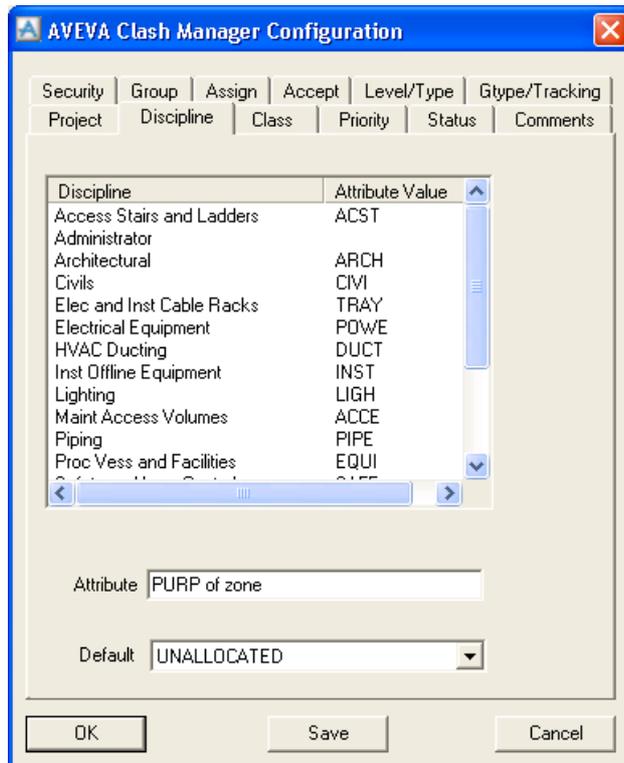
This tab is for specifying the pre-defined comments that can be assigned to a clash, by use of the **Quick Comment** button on the 'Clash Group Properties' form.



The pane on the tab displays **Comments** associated with a particular **Discipline**. A **Popup Menu** is available (mouse right-click) with options of **Add**, **Edit** and **Delete**. This is used to add a new comment, edit an existing comment, or remove an existing comment. The associated **Up** and **Down** buttons are for rearranging the sequence of comments.

5.14.6 Discipline

This tab is concerned with associating the values of a selected OUTFITTING attribute with the values of Ship Model Management discipline attributes for the purpose of automatic assignment of an owner discipline to a clash. Displayed data is directly provided by PE Workbench, except in the case of Stand Alone Clash Manager.



The pane at the top of the tab displays the list of Disciplines and their attribute values and, except for Stand Alone Clash Manager, are read-only. For Stand Alone Clash Manager, a **Popup Menu** is available (mouse right-click) with options to **Add**, **Edit**, **Delete** and **Set as Default**. This is used to add a new discipline, edit an existing discipline, remove an existing discipline and automatically set a discipline as default. Using this menu, the user creates the list of Disciplines and their attributes that Clash Manager can match with the values of the specified OUTFITTING attribute.

It is necessary to tell Clash Manager how to identify a discipline from a clashing element's attributes or its owner's attributes. The **Attribute** box enables the user to do this by specifying the particular attribute that, when evaluated, matches one of the attribute values shown in the right-hand column in the discipline table. For example, an :MMSDISC value of 'P' would normally correspond to the 'P' set as the attribute of discipline 'Piping'. Clash Manager will search for the attribute on the clashing item, and if not found there, will search the owning hierarchy for it.

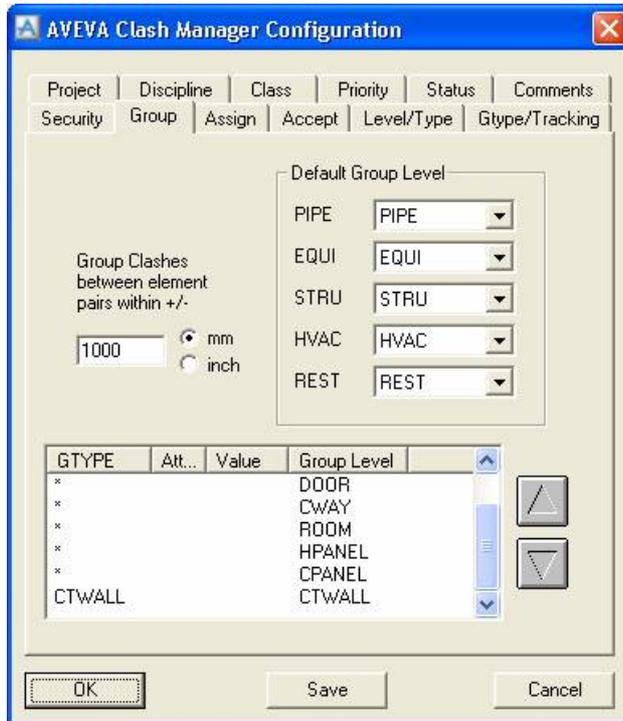
Note: If **Not Used** is selected, the attribute does not appear in the Clash Manager GUI, but the default discipline will be UNALLOCATED, unless set otherwise, by the drop-down list.

If a match is found then that discipline is associated with the clashing element, otherwise the clash is assigned to a default discipline selected from the **Default** drop-down list. If a clashing element does not match any of the specified values then it is set to a special discipline called 'UNALLOCATED'.

Note: This configuration is separate from the 'Project Defined Field' configuration at the Project Tab.

5.14.7 Group

Many clashes may exist between pairs of significant elements. The clashes exist at lower levels in the hierarchy, that is at the primitive level. These low level clashes may be grouped together and selected for viewing, reporting and approval as a single entity, namely, as a clash group.



This tab is for specifying aspects of clash groups, and the level in the hierarchy at which the clashes are reported.

The items on the tab are as follows:

The **Group Clashes between element pairs within +/-** field and associated **mm/inch** dimension radio group are for specifying the proximity of primitive clashes to be reported as a group. Because the specified values are 'plus or minus', the coordinate dimensions of the volume in which the clashes are considered to be a group are each twice the stated value. The default setting for the group distance between element pairs is 100mm, but it is common practice to have this value changed to 2000mm to make the clash grouping more effective. The decision to change the distance should be done only in consultation with the project discipline lead designers. The distance setting can be changed at any time during the project life cycle, but the clash groups must then be recomputed. Making fundamental changes to the group settings mid-project is not a recommended practice.

The **Default Group Level** dropdown lists are used to specify the level in the hierarchy at which the clashes are grouped within the appropriate discipline. For example, clashes within a pipe, may be reported at primitive level, at the branch level or at the pipe level. The defaults are PIPE-PIPE, EQUI-EQUI, STRU-SCTN, HVAC-HVAC, REST-REST and normally these are used. Clashes in other disciplines such as Hull and Room Design do not default to single levels and are handled by Group Rules described below.

The pane at the bottom of the tab is for specifying exceptions to the default group levels. The exceptions are defined under headings of **GTYPE**, **Attribute**, **Value** and **Group Level**. A **Popup Menu** is available (mouse right-click) with options of **Add**, **Edit** and **Delete**, used to add a new GTYPE and details, edit an existing GTYPE details, or remove an existing record. **Up** and **Down** buttons at the right-hand side of the pane are used to position the highlighted record in the list and hence determine its priority.

Note: Before you can select a GTYPE that is not at a group level, you must first make it a Controlled GTYPE (Refer to [Gtype/Tracking](#)).

A recommended exception to the default group levels concerns modelling of service supports. In this case, although clashes are grouped by default at SCTN level for steelwork, for support steelwork the group should be at STRU level, as this is typically the owning level in the hierarchy for a support. To achieve this, the entry is: a **GTYPE** of ZONE, with **Attribute** PURP, **Value** SUPP and **Group Level** STRU.

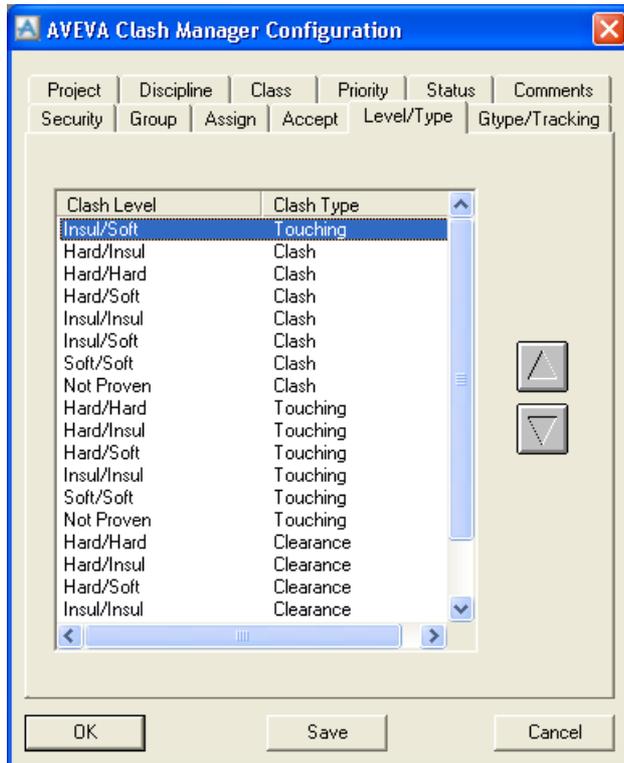
A Group Rule with **GTYPE** * will allow clashes to be grouped at the level of any type entered under **Group Level**. For example, to group clashes with Hull objects at any of HPANEL, CPANEL, BLEVEL or BBLOCK, create four rules with entries as: **GTYPE** *, **Attribute** and **Value** left blank, **Group Level** HPANEL in the first rule, **Group Level** CPANEL in the second rule, and so on.

Other examples for Cableway and Room Design objects are shown in the picture above. The entry with **GTYPE** * and **Group Level** CWAY will group all clashes below cableways to the owning cableway. The entry with **GTYPE** * and **Group Level** ROOM will group all clashes below rooms to the owning room. The entry with **GTYPE** CTWALL and **Group Level** CTWALL will group clashes with constant thickness walls at that level, but note that clashes with CTWALL objects below ROOM objects will be grouped at ROOM level due to the earlier rule.

Contiguous Group Rules with identical expressions are combined and tested at each level so that if given groups contain one another, the lowest in the hierarchy is used. A Group Rule with a specific GTYPE or with different expressions will end that combining process (but may begin another).

5.14.8 Level/Type

This tab is for specifying the relative order of clash level/type combinations. The order is used to compute the worst case clash of a Group.



The Types can be 'Clash', 'Touching' or 'Clearance'.

The Levels can be 'Hard/Hard', 'Hard/Insulation', 'Hard/Soft', 'Insulation/Insulation', 'Insulation/Soft', 'Soft/Soft', and 'Not Proven'.

The names and purposes of the items on the tab are as follows:

Pane listing level/type combinations under **Clash Level** and **Clash Type**

Note: There is no popup menu available for modification of the pane contents. The selected level/type combination can be moved up or down the list by means of the Up or Down button.

Up and Down

For setting the sequence of Level/Type combinations, as displayed in the pane and hence the order of worst case selection. The worst case is at the top of the list. Generally, there is no need to redefine the default order.

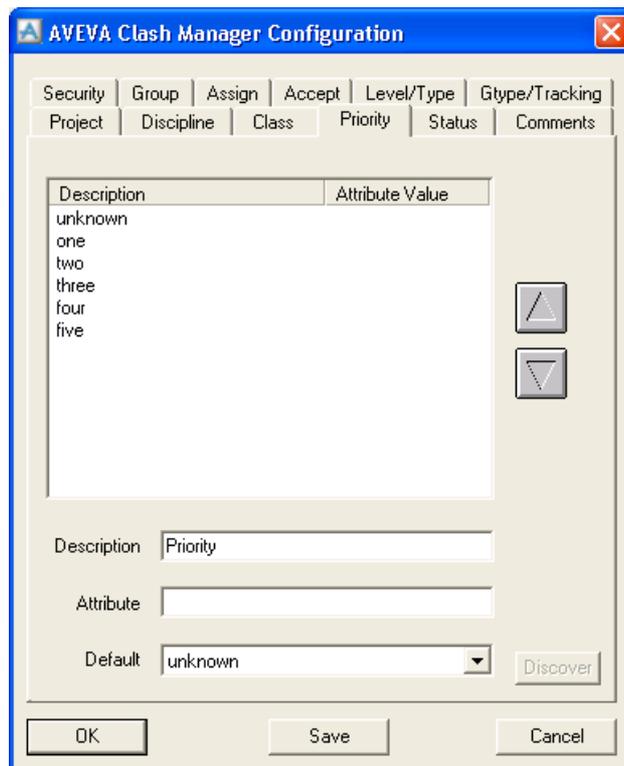
Note: For brevity, Clash Level is abbreviated in the Clash Reports as follows:

Abbreviation	Clash Level Description
HH	Hard/Hard
HI	Hard/Insulation (or Insulation/Hard)
HS	Hard/Soft (or Soft/Hard)
II	Insulation/Insulation
IS	Insulation/Soft (or Soft/Insulation)

SS	Soft/Soft
NP	Not Proven

5.14.9 Priority

This tab is for specifying Priorities that are used in auto-acceptance and auto-assign-to-discipline rules for clash ownership. The tab is also used to set the Priorities in the 'Order' they are to be considered, when the priority of each element within a clash is the subject of an automatic acceptance or assignment process.



The tab enables the values of a OUTFITTING attribute to be associated with the values of the Ship Model Management priority attribute for the purpose of automatic assignment of a priority to a clash.

Note: This configuration is separate from the 'Project Defined Field' configuration at the Project Tab.

The pane at the top of the tab enables a particular Priority **Description** and its **Attribute Value** to be selected. A **Popup Menu** is available (mouse right-click) with options of **Add, Editing, Delete**. This is used to add a new priority, edit an existing priority, or remove an existing priority. The description is user-defined, the attribute value must match the OUTFITTING attribute value for the particular priority.

The associated **Up** and **Down** buttons are for rearranging the 'Order' of the priorities, from top to bottom. The least important priority is at the top; the most important at the bottom. From a pair of clashing elements, the auto-assignment process selects the discipline of the

less important element to be the owner of the clash, that is, the element with the priority that is nearer to the top of the list.

The **Description** field is for specifying the text to appear as the report column header for the attribute values.

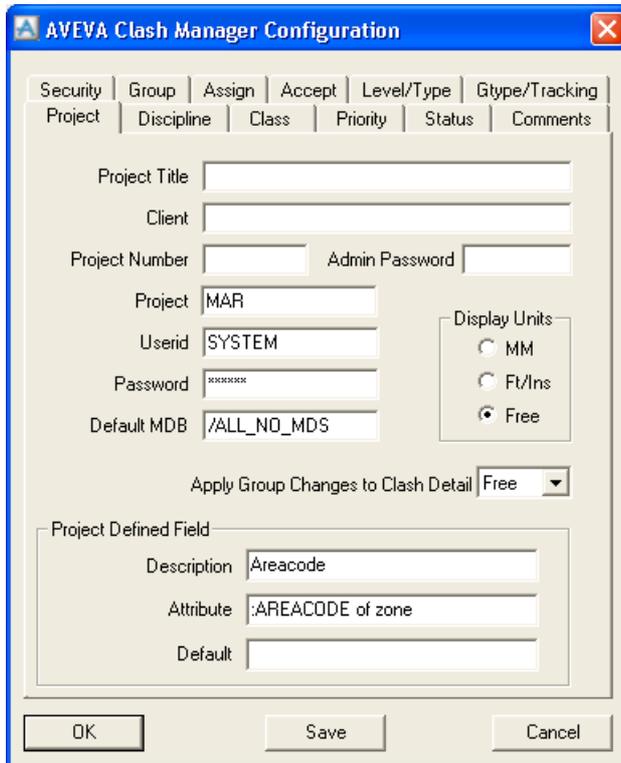
The **Attribute** box enables the OUTFITTING priority attribute to be selected. Clash Manager will search for the attribute on the clashing item, and if not found there, will search the owning hierarchy for it. If **Not Used** is selected, the PRIORITY attribute does not appear in the Clash Manager GUI. Note that PRIORITY is designed to produce a modest number of look-up records, when a value is used as a wildcard. An attribute, such as a NAME that would return a large number of values should not be used.

The **Discover** button automatically produces a list of priority descriptions and attributes that are applicable to elements in clashes that have been discovered by Clash Manager. Each Description of the various priorities is formed by a concatenation of the OUTFITTING attribute name followed by the particular attribute value. For example, for an attribute 'priority' and a value 10, the description is 'priority 10'. Each listed attribute value is available as a Regular Expression wildcard (see [Notes on Wildcards](#)) for use in assignment and acceptance rules. The attribute values are preceded by ^ and followed by \$ to ensure that only complete strings are matched, for example, ^10\$.

Following operation of the **Discover** button to determine all available values, the resultant data can be edited to give acceptable ranges of priorities. For example, returned priorities with values of ^10\$ through ^19\$ could be edited to a single description 'Low Priority' with a value ^1[0-9]\$.

5.14.10 Project

This tab is for entry of project-wide details.



The **Project Title**, **Client**, **Project Number**, **Project**, **Userid**, **Password** and **Default MDB** fields at the top of the tab are for entry of those project details. Except in the case of Stand Alone Clash Manager, they are read-only, as they are configured in PE Workbench. (Modification of the settings is at the PE workbench Project Administration form.)

For Standalone Clash Manager, the above fields are available for entry of the relevant project data. An additional field **Admin Password** is available for entry of the password required by non-administrative users to access the Clash Manager Configuration form. When Clash Manager opens the configuration form it also starts a background Data Access Routines process. This DARS process enables Clash Manager to directly interact with the associated project during configuration setup. This allows Clash Manager to process and test assignment, acceptance and other rules that are configured. The project login data and MDB defined on the form is the used by Clash Manager during DARS entry.

Note: Each clash set has its own MDB definition used for entry during a clash set run.

The **Display Units** section allows the user to select the Units in which the values are to be displayed in Clash Manager.

The **Apply Group Changes to Clash Detail** dropdown list enables the Administrator to specify the policy for the project. The selection made here determines whether or not the user can use the facility on the 'Clash Manager Options' form to choose whether or not group changes are applied to clash details within a group. The options of the dropdown list are:

- Always** - group changes are always applied and the user cannot change the policy
- Never** - group changes are never applied and the user cannot change the policy
- Free** - the user can choose whether or not group changes are applied.

The items in the **Project Defined Field** box are for selecting an attribute, the value of which is to be added to the clash report for each clashing item. This additional data is useful for filtering and sorting purposes in the main body of the report.

The **Attribute Name** field is for specifying the name of the attribute, e.g. AREA. Clash Manager will search for the attribute on the clashing item, and if not found there, will search the owning hierarchy for it.

The **Description** field is for entering the attribute value that appears in the Clash Report.

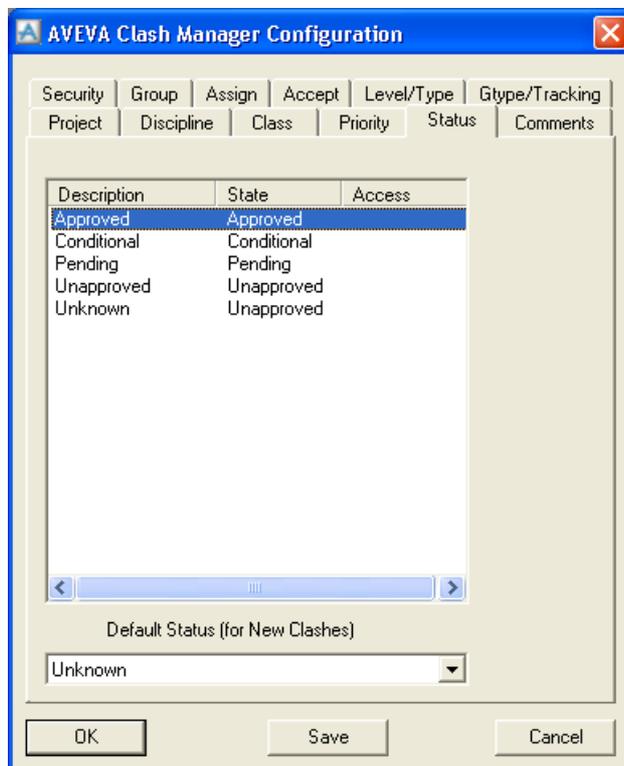
The **Default** field is for specifying a default value for the attribute if the OUTFITTING attribute is not set.

An example of how an attribute can be used is as follows. Many companies use 'PURPose' as the **Attribute Name** and the **Zone** radio button selected for capturing the description of a ZONE's content over and above the naming convention. The ZONE is named with the Piping Specification PSPE and the **Attribute Name** 'PURPose' is given a **Description** 'PROC' for Process Piping and 'UTIL' for Utility Piping. Clash Manager then allows the user to filter the clash report based on these values.

Note: The Class, Discipline and Priority tabs have groups of items similar to those in the Project Defined Field box and which have similar functionality.

5.14.11 Status

This tab displays a listing of the standard status and enables user-defined status to be entered within the list. It also enables a restriction to be placed on who can update a clash from or to particular status.



The tab also specifies the default status to be allocated to new clashes that do not satisfy auto-acceptance rules.

The standard status cannot be removed, and sequence in which they are displayed signifies their order of priority, when 'worst case' clash details are evaluated by the system. The sequence cannot be changed, but user-defined status can be inserted into the list.

The pane at the top of the tab displays the various Status details under **Description**, **State** and **Access**. A **Popup Menu** is available (mouse right-click) with options of **Add**, **Edit**, **Delete** and **Set Default**.

For standard status, the **Description** and **State** entries are identical, namely, Unknown, Unapproved, Pending, Conditional and Approved, and are read-only. The standard status values are explained below:

- **Unknown** - an initial or default status applied to new clashes if none of the automatic acceptance rules are triggered (the default status for a clash can be configured and is described later)
- **Unapproved** - the clash has not been reviewed and remains as a valid or outstanding clash for the project
- **Pending** - this status is used to indicate that the clash is currently under review by the design teams
- **Conditional** - this status is used to indicate that the clash has been reviewed and resolved in the OUTFITTING DESIGN model. This also implies that following the next clash run this clash will no longer appear in the clash report. For reporting purposes this status implies a resolved clash.
- **Approved** - this status is used to indicate that the clash has been reviewed and is considered acceptable by the design team. The clash will continue to be reported in subsequent clash runs but its approved status will remain with the clashing items throughout the remainder of the project lifecycle. In Model Management terms if an element has only 'Approved' clash status in the database then it is considered 'Clash Free'.

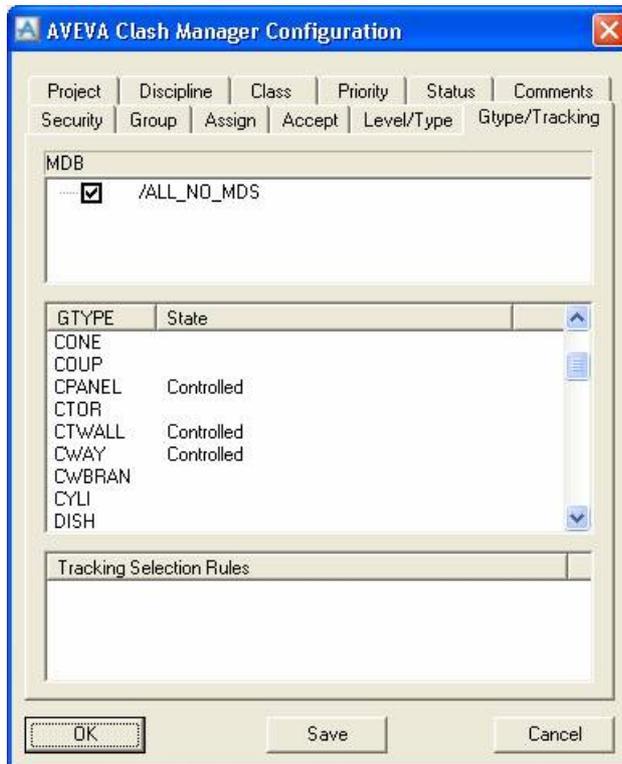
For user-defined status, the **Description** can be any text; the **State** must represent a standard status.

The **Access** defines who can apply the particular status to a clash or change a clash from the particular status to another. This access restriction is in addition to any set at the Security tab. Access can be set to a discipline, in which case, only a user who has supervisor rights to that discipline can change the status. The alternative access settings are blank or 'Any', both of which signify that there is no access restriction, other than that set at the Security tab.

The **Default Status (for New Clashes)** dropdown list is for specifying the status to be applied to new clashes that are not automatically accepted.

5.14.12 Gtype/Tracking

This tab enables the administrator to specify which MDBs and controlled GTYPEs are to be included in a Track Changes operation. Additionally, the tab provides facilities for specifying Tracking Selection Rules that further restrict the range of controlled GTYPEs to be included in the operation.



MDBs

At the top of the tab, a pane called **MDB** displays a listing of the MDBs defined in Clash Manager. Against each MDB is a checkbox, which is checked by default when the MDB is first defined. As required, the administrator can un-check a checkbox to remove the particular MDB from the Track Changes operation.

Controlled GTYPE

In the middle of the tab, a pane displays a listing under headings of **GTYPE** and **State**. The listing is used to present a list of available GTYPEs and to enable certain of them to be made Controlled or Uncontrolled. (Only a Controlled GTYPE is the subject of a Track Changes operation.)

Except in the case of Standalone Clash Manager, a range of controlled GTYPEs is predefined in PE Workbench. These predefined GTYPEs appear in the list and cannot be made uncontrolled or deleted at this form. Also, GTYPEs that are Group Level Elements (see the Group tab) and certain others that may be group level elements, such as ZONE, are always controlled and cannot be made uncontrolled or deleted at this form.

Further GTYPEs can be added at this form and these can be made controlled or uncontrolled, or deleted, as required. A popup menu is available for this purpose. Its options are as follows:

Add	For adding another GTYPE immediately below the currently selected GTYPE. Leads to an in-place edit window at which the GTYPE can be entered. (Note that the Esc key can be used to abort the entry in the in-place window.)
Control	Makes the selected GTYPE controlled or uncontrolled
Delete	Removes the selected GTYPE from the list.

Examples for hull, room design and cable way objects are shown in the picture above, with CPANEL, CTWALL and CWAY made Controlled GTYPEs.

Note: You must first make a GTYPE Controlled before you can select it in a Group Rule (Refer to [Group](#)).

Tracking Selection Rules

At the bottom of the tab, a pane is available for specifying rules that further restrict the range of GTYPEs to be included in the Track Changes operation. For the syntax of the Tracking Selection Rules refer to [Notes on Element Rule Syntax](#).

Note: A DB (and its hierarchy, that is, sites, zones, pipes, branches, etc) may be included in many MDBs. For example, Site 12 (through the inclusion of containing DBs) may be visible in two MDBs:

```
MDB1 /site1, /site12
MDB2 /site2, /site12.
```

Each Site and everything below it will exist in a single DB [name clashes are not impossible, two sites with the same name may exist in different DBs, but only one would be generally accessible through its name when included in the same MDB]. All branches of a PIPE would be in a single DB, but that DB and thus the PIPE may be visible through more than one MDB.

Clash Manager can combine MDBs and in the process may encounter duplicates, in which case Selection Rules may return other starting points in the hierarchy, for example, a list of ZONES.

It is important that the Selection Rules, when evaluated, return a list of unique items.

A popup menu is available. The options and their purposes are as follows:

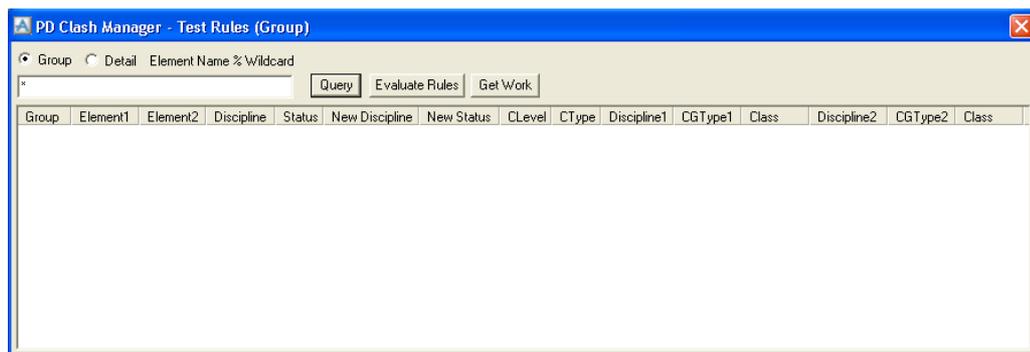
Add	For adding items or expressions to the particular list. Leads to an in-place edit window, at which the item or expression can be entered. (Note that the Esc key can be used to abort the entry in in-place windows.)
Edit	For editing the selected expression. Leads to an in-place edit window, at which the expression can be edited.
Browse	For adding elements derived from the OUTFITTING hierarchy. Leads to the 'Browse Model' form

- Delete** Deletes the selected item from the list. (The item is not deleted from the model.)
- Evaluate** Evaluates the selection rules for each of the checked MDBs. Leads to the 'Evaluate' form, which displays a consolidated listing of the results. In the absence of any rules, the form displays a list of all SITES in each of the checked MDBs.

Note: Double-clicking a GTYPE name leads to the 'Browse Model' form. Double-clicking on an expression leads to the in-place edit window.

5.15 Test Rules Form

This form is for testing Assignment and Acceptance rules before they are applied to the whole model by the Recomputation process. The form enables a subset of existing clash records to be selected in order to display what would happen if the current rules were applied to the 3D model. The form is intended to aid configuration; it does NOT allow the evaluated status or discipline of the selected clash records to be saved.



A group of elements at the top of the form enables the user to select the clash groups or details and then apply the new rules to them. The main area of the form is occupied by tabulated records showing the results of the selection and evaluation.

The elements at the top of the form and their purposes are:

- Group / Detail** radio group and **Element Name % Wildcard** For selection of the subset of clash records. The radio group is for selection of whether clash groups or details are to be tested. The entry in the field determines the range of clashing elements. Oracle style wildcards are used (see [Notes on Wildcards](#)).
- Query** Interrogates the 3D model and displays records of the clash groups or details that match the entry in the 'Element Name % Wildcard' field.
- Evaluate Rules** Applies the new rules to the displayed records and shows the new owner disciplines and status.
- Get Work** Resets the current MDB, and makes available changes to the model after a 'SaveWork'.

The tabulated records show, for each clash group or clash detail that satisfies the selection criteria, information under the following headings:

Group	The group identification. Populated after Query.
Index (clash details only)	Clash identification number. Populated after Query.
Element 1	First element of the clash. Populated after Query.
Element 2	Second element of the clash. Populated after Query.
Discipline	Owner discipline according to existing rules. Populated after Query.
Status	Status according to existing rules. Populated after Query.
New Discipline	Blank after Query. Populated after rule evaluation. Shows owner discipline as assigned by the new rules. The name of the rule is shown for NEW clashes only.
New Status	Blank after Query. Populated after rule evaluation. Shows the status as applied by the new acceptance rules. The name of the rule is shown for NEW clashes only.
CLevel	Populated after Query. Shows the clash level.
CType	Populated after Query. Shows the clash type.
Discipline 1	Discipline of first element. Populated after Query.
Discipline 2	Discipline of second element. Populated after Query.
Remarks	Blank after Query. Populated after rule evaluation. Shows a narrative description of the clashing elements.

A popup menu is available from the tabulated records. The options and their purposes are as follows:

Query	Interrogates the 3D model and displays records of the clash groups or details that match the entry in the 'Element Name % Wildcard' field.
Evaluate Rules	Applies the new rules to the displayed records and shows the new owner disciplines and status.
Get Work	Resets the current MDB, and makes available changes to the model after a 'SaveWork'.
Properties	Available only when a record is selected. Leads to the 'Clash Manager - Clashing Elements - Properties' form, which displays values of all attributes that may be involved in the setting of discipline or status of the elements in the selected record.

The procedure for using the form is firstly to select clash group or detail and enter an element name and wildcard to represent elements that will be affected by the updated rules. Initiate the Query and then check the displayed records to ensure that they represent the required typical elements. If they do not, re-enter element and wildcard details and re-query the data. When the records are as required, apply the new rules and check whether the results are as required. If the OUTFITTING Model has recently been changed, use the 'Get

Work' feature and repeat the evaluation. Close the form by clicking on the X at the top right-hand corner. Take action at the 'Clash Manager - Configuration' form to correct or implement the new rules, as appropriate.

5.16 Clashing Elements - Properties Form

This form provides the administrator with all data necessary to analyze the effects of all attributes that may be involved in the automatic setting of owner discipline and/or status of a pair of clashing elements. The particular elements are selected at the 'Clash Manager - Test Rules' form.

Attribute	Element1	Element2
:MDSNotePos		
:MDSNudgeDist		0.000000
:MDSPackRef		
:MDSPad		unset
:MDSRotated		FALSE
:MDSRotDir		
:MDSsref		
:MDSStop		unset
:MDSStop2		unset
:MDSsuppType		unset
:MDSwasher		FALSE
:MDStrimmer		FALSE
:MDSVprmMto		TRUE
*** Project Attributes ***		
:MMSDISC	PIPE	PIPE
Class		
*** Rules Attributes ***		
@discipline	PIPING	PIPING
@type	CLA	CLA
comment of spref		unset

The information is in three-column tabulated records, headed Attribute, Element1 and Element2, which respectively show the name of an attribute, its value for element1 and/or its value for element2.

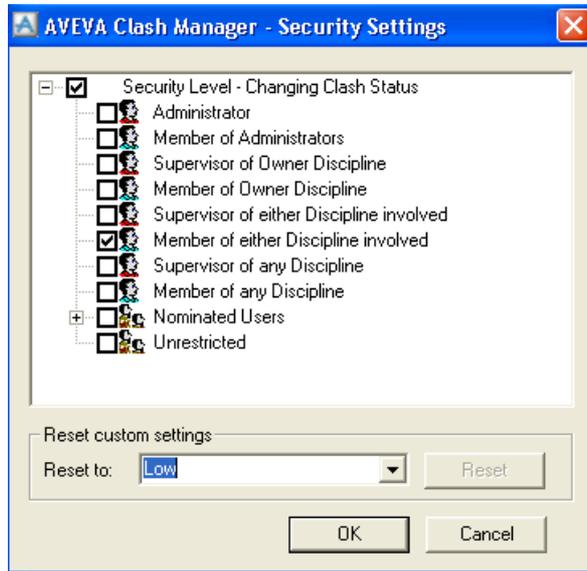
The upper section of the table displays standard OUTFITTING attributes and User-defined attributes.

The next section, headed 'Project Attributes' displays the project-defined fields, such as Discipline, Class and Priority, and the level in the hierarchy where the attribute occurs.

The lower section, headed 'Rules Attributes' displays a consolidated list of the attributes from ALL rules that affect the clashing elements. The rules may not be involved in every instance. The attributes may not exist on the clashing elements themselves, in which case they exist on elements in the hierarchy above them.

5.17 Security Settings Form

This form is accessed from the Security Tab of the Clash Manager - Configuration form. It enables the user to specify custom (user-defined) settings that can take the place of the pre-defined settings for a particular Security Level (see [Access Rights](#)).



The elements of the form and their purposes are:

Pane displaying a tree of checkboxes	<p>Top checkbox labelled with the Security Level</p> <p>Eight checkboxes labelled with combinations of member, supervisor and discipline</p> <p>Checkbox labelled Nominated Users</p> <p>Bottom checkbox labelled Unrestricted</p>	<p>To show which security level being customized. The checkbox is always checked.</p> <p>These are initially populated as for the settings currently in use. The administrator can select (tick) and deselect (clear) the checkboxes to reflect the customized minimum requirements for a user who is allowed to perform tasks at the particular Security Level.</p> <p>This checkbox can be selected in addition to any selected above. When the checkbox is ticked, a branch of checkboxes labelled with user names is displayed.</p> <p>Ticking a checkbox in the branch, unconditionally allows the particular user to perform tasks at the particular Security Level.</p> <p>Leaving a checkbox blank, bars the user from performing the tasks.</p> <p>When this checkbox is checked, any user can perform tasks at the particular Security Level.</p>
Reset Custom Settings	Reset to:	For selecting the appropriate state, when the custom settings are to be reset to pre-defined settings.
Reset		For resetting the customized settings to the pre-defined settings for the State selected in the dropdown list.

OK

Saves any changes and closes the form

Cancel

Ignores any changes and closes the form

6 Entry Information

6.1 Notes on Wildcards

Clash Manager uses two different styles of wildcards:

- In the configuration, standard Regular Expression syntax is used exclusively.
- In the GUI filters, Oracle/SQLServer style wildcards ("%" and "_") are used exclusively.

6.1.1 Regular Expression Summary

Value	Meaning
^	Matches the start of a line
\$	Matches the end of a line
.	Matches any character
*	Matches zero or more occurrences of the previous expression
[string]	Matches any one of the characters listed in string

In addition to the standard Regular Expression syntax there is a simple NOT operator <!>. If the exclamation mark is the first character of the Regular Expression, the rule evaluates TRUE if the expression fails.

6.1.2 Examples of Regular Expression Syntax

Example Expression	Matches	Result of Example Expression
^[AB]305\$	A string beginning with 'A' or 'B' and ending with '305'	A305 or B305
[AB]305	A string containing 'A' or 'B' followed by '305'	IBMA 305 HAL or PQR B305 LMN
!TEMP45	Any string that does NOT contain 'TEMP45'	/THIS/string/Matches

^/S45/.*/ TEMP45\$	A string beginning /S45 and ending with TEMP45	/S45/ABCanythinggoeshere 345/TEMP45
!/S45	Any string that does not begin with /S45	

6.1.3 Oracle/SQLServer Wildcard Summary

Value	Meaning
%	Any number of characters of any value
_	Each underscore represents a single character of any value

6.1.4 Examples of Oracle/SQLServer Wildcard Syntax

Example Expression	Matches
%pipe%	Any string of any number of characters that contains 'pipe'
pipe_	Any string that starts 'pipe' and ends with a single character

6.2 Notes on Rules and Rule Expressions

Rule expressions are used in the syntax of Rules used for the evaluation of:

- the automatic assignment of clashes to disciplines
and
- the automatic acceptance and status definition of clashes.

6.2.1 Expression Components

Each expression consists of an **Element**, an **Attribute** and a **Value**.

Keywords are used for Elements and can be used for Attributes and Values. All keywords are prefixed by '@'.

Element keywords may be:

- **@general** which refers to the 'clash',
- **@element-1** which refers to one of the clashing elements,
- **@element-2** which refers to the other element.

Note: No particular order is implied and there is no relationship to the elements 1 & 2 shown on the Clash Report.

Attribute may be a **Keyword** related to the Item, or may be any **OUTFITTING Attribute**, for example SHOP, or NAME etc

Value may be selected from a list-of-values related to the given attribute, or a **Regular Expression**, (Refer to [Notes on Wildcards](#)) or a **Keyword** (Refer to [Expression Syntax](#)).

Note: The rules are formed by logical 'AND' operators between the expressions. There is no facility for logical 'OR' operators.

6.2.2 Expression Syntax

Element	Attribute	Value
@element-1 @element-2	Assignment & Acceptance Rules	
	@class (field name is project defined)	A Defined Class
	@priority (field name is project defined)	A Defined priority
	@areacode (field name is project defined)	Regular expression
	@discipline	A defined discipline
	Any OUTFITTING attribute eg NAME	<p>Regular expression or keyword @element-2 or @element-1 which evaluates true if the given attribute has the same value as element-1 or element-2 respectively, or one of the keywords listed below.</p> <p>Expression can include one of the comparison operators > >= < <= together with a value, and will evaluate true if the condition is met for the given attribute value.</p> <p>Other keywords may be (where N is 1 or 2):</p> <ul style="list-style-type: none"> @ref-of-element-N replaced with the reference of the clashing element, @ref-of-owner-ele-N replaced with the reference of the owner of the element, @first replaced with the first member of the clashing element @first+n replaced with the nth member of the clashing element, e.g. @first+1 @last replaced with the last member of the clashing element @last-n replaced with nth from last member, e.g. @last-1
	@gtype	A GTYPE selected from list. (This list originates from the Clash Manager Configuration form - Gtype/Tracking tab.)

@general	Assignment & Acceptance Rules	
	@status	A defined status
	@level	Clash Level, one of HH, HS, HI, II, IS, SS, NP selected from a drop-down list
	@type	Clash Type, one of CL ash, CL Earence, TOU ch selected from a drop-down list
	Assignment Rules	
	@setDiscipline	Keyword @element-1 or @element-2. The owner discipline is set to that of element-1 or element-2 respectively.

6.2.3 Examples of Rules and their Syntax

Rule evaluates true if NAME of element 1 is same as element 2

Element	Attribute	Value
@element-1	NAME	@element-2

Rule evaluates true if the name of either element contains the text 'TEMP'

Element	Attribute	Value
@element-1	NAME	TEMP

Rule evaluates true if name of either element begins with the text '/S/TEMP'

Element	Attribute	Value
@element-1	NAME	^/S/TEMP

Rule evaluates true if name of either element does not begin with the text '/S/TEMP'

Element	Attribute	Value
@element-1	NAME	!/S/TEMP

Rule evaluates true if name of neither element begins with the text '/S/TEMP'

Element	Attribute	Value
@element-1	NAME	!/S/TEMP
@element-2	NAME	!/S?TEMP

Rule evaluates true if either element is PIPING and type of clash is TOUching

Element	Attribute	Value
@element-1	@discipline	PIPING
@general	@type	TOU

Rule evaluates true if one element is PIPING, the other STRUCTURAL, the name of the STRUCTURAL item contains the text TEMP and type of clash is TOUching

Element	Attribute	Value
@element-1	@discipline	PIPING
@general	@type	TOU
@element-2	@discipline	STRUCTURAL
@element-2	NAME	TEMP

Rule evaluates true if both elements are STRUCTURAL, the GTYPE of a clashing element is PANEL and the type of clash is TOUching

Element	Attribute	Value
@element-1	@discipline	STRUCTURAL
@general	@type	TOU
@element-2	@discipline	STRUCTURAL
@element-1	@gtype	PANE

Rule evaluates true if both elements have values of UDA :LSIZE that meet their respective conditions.

Element	Attribute	Value
@element-1	:LSIZE	> 1500
@general	:LSIZE	< 100

Rule evaluates true for a clash between a nozzle and a flange as second last member of a connected branch.

Element	Attribute	Value
@element-1	@gtype	FLAN
@element-1	tref of owner	@ef-of-element-2
@element-1	sequence	@last-1
@element-2	cref	@ref-of-owner-ele-1
@element-2	@gtype	NOZZ

Rule evaluates true for a clash between a nozzle and a flange as second member of a connected branch..

Element	Attribute	Value
@element-1	@gtype	FLAN
@element-1	href of owner	@ef-of-element-2

@element-1	sequence	@first+1
@element-2	cref	@ref-of-owner-ele-1
@element-2	@gtype	NOZZ

6.3 Notes on Element Rule Syntax

The syntax for elements and their attributes discussed here applies to the items and expressions in the

- Obstruction, Check and Exclude lists on the 'Clash Manager - Clash Set Data' form and to the
- Tracking Selection Rules entered at the Gtype/Tracking tab of the Clash Manager Configuration Form.

The syntax can be:

<elementName>

OR

<gtype> ::= BRAN|SUBE|STRU|FRMW|SUBS|PIPE|EQUI|SITE|REST|HVAC|ZONE

OR

<expression> [and <expression>]...

where:

<expression> ::= <expressionStyleA> | <expressionStyleB>

where:

<expressionStyleA> ::= <attribute> [OF <gtype>|<eleName>] [NOT] <op> <value>

<expressionStyleB> ::= <attribute> [NOT] <op> <value> [OF <gtype>|<eleName>]

where:

<attribute> ::= *PDMS Element Attribute or UDA*

<op> ::= eq | ne | gt | lt | = | != | < > | < | like

<value> ::= [<quote>] *string* [<quote>] | *numeric* | <inches> | <wildcard>

where:

<quote> ::= <singleQuote:'> | <verticalBar:|>

<inches> ::= *numeric*"

<wildcard> ::= *regular expression*

OR

<discardwildcard> ::= !<wildcard>

where:

<wildcard> ::= *regular expression*

Note: For Regular Expression syntax, refer to [Notes on Wildcards](#).
 Strings must be quoted if they would otherwise be confused with a keyword eg a <GTYPE> or <OP> etc
 The <discardwildcard>'s are applied after all other expressions, they have the effect of discarding or removing items from the list.

6.3.1 Examples

name of zone like ^/STRU	returns ZONE names beginning "/STRU"
site	returns all SITES
zone	returns all ZONES
bore of pipe gt 100	returns PIPEs with bore > 100mm
bore gt 100 of pipe	returns PIPEs with bore > 100mm
bore gt 4" of pipe	returns PIPEs with bore > 4 inches
bore gt 100 and :pdmsarea like 15A of pipe	returns PIPEs with bore > 100mm and :PDMSAREA contains 15A
bore gt 100 and :pdmsarea = 15A of pipe and name of site like ^/STRU	returns PIPEs with bore > 100mm and :PDMSAREA equals 15A which are under a SITE whose name begins "/STRU"
name of pipe like 'PIPE'	syntax error if 'PIPE' is not quoted (would otherwise be an unexpected GTYPE)
name of pipe like /PIPE	/PIPE does not need to be quoted, it will not be confused with a GTYPE
name of pipe not like 'PIPE'	returns all pipes whose name does not contain 'PIPE'
!PIPE	removes from the resulting list, <u>any</u> name containing the text 'PIPE'
Note that name of pipe not like 'PIPE' and !PIPE are very different, the former ADDs to the resulting List, the latter only removes items from the List.	
name of bblock like .* and name of blevel like ACC	returns all blevels whose names contain "ACC" below all bblocks
Note that for default Group Level element types (ZONE, PIPE, HVAC, BRAN, EQUI, SUBE, SUBS, FRMW, SBFR, SCTN, REST, HANG), the expression can use this type alone. Other types require sub-expressions which reference each prior level in order to locate the element. In the above example an expression such as "name of blevel like ACC" alone would not provide enough information and would generate an "Incomplete expression" error message.	

The List may only contain consistent element types. For example a SITE may not be added to the List if it already contains ZONES. Note however that items below the level defined for Grouping Clashes will be elevated to that Group Level. For example if clashes in a pipe are configured to be grouped at the PIPE level, any expression which would return a BRANch or a component will in fact return a (single) PIPE. The *Evaluate* option may be used on any of

the Obstruction/Exclude or Check lists to display what *would* be used when the Clash Set is run.

Default units are mm, inches may be used but the inch symbol, a double quote (") **MUST** be specified. An alphanumeric string ending with a double quote must itself be quoted if it is to be evaluated against a string. For example: `:mystringatt = |4"|` of pipe.

7 Model Management Wizard

When the Model Management Wizard is executed, by running MMWizard.bat, a series of screens guide the administrator through the steps to be taken. Details for each of the options are given below.

The Model Management Wizard performs some administration tasks applicable to all Model Management products. These are available on the General tab. It also performs other tasks specific to Clash Manager. These are available on the Clash Manager tab. The Model Management Wizard provides basic backup facilities for Clash Manager databases. Details of options not relevant to Clash Manager are not covered here.

Use of the Model Management Wizard is largely self-explanatory. The first screen sets out the functions performed by the Wizard and introduces the available options, selectable from the second screen

The main menu of the Model Management Wizard looks like this:



The options available are:

- | | |
|--|--|
| <i>Project Maintenance</i> | Allows the user to maintain a project |
| <i>Create Standalone Clash Manager Project</i> | Creates a Standalone Clash Manager project |
| <i>Password Encryption</i> | Allows automated Logins to be used |

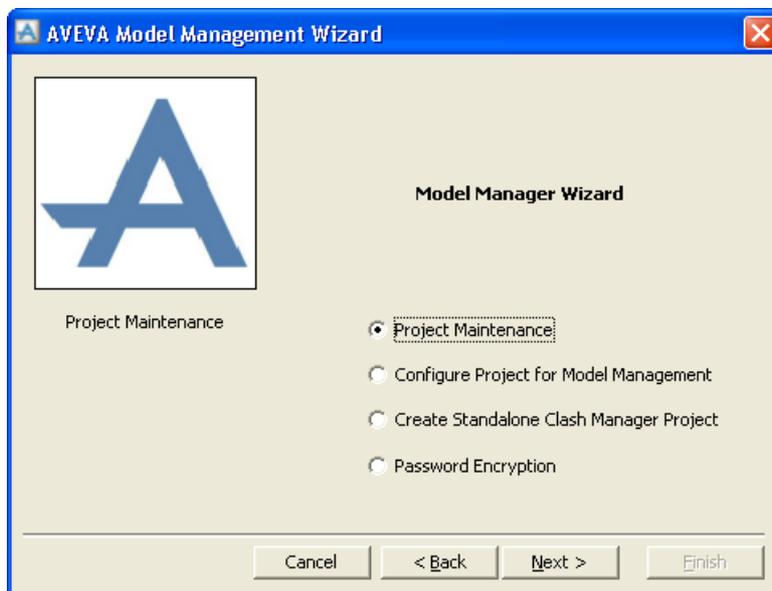
Before you can use Model Management products on a OUTFITTING project you must first create a Model Management configuration file for the project.

You use the Model Management Wizard to create or update the Model Management configuration file for a project. New configuration files must be based on an existing configuration file (e.g. from another project or the sample configuration file supplied).

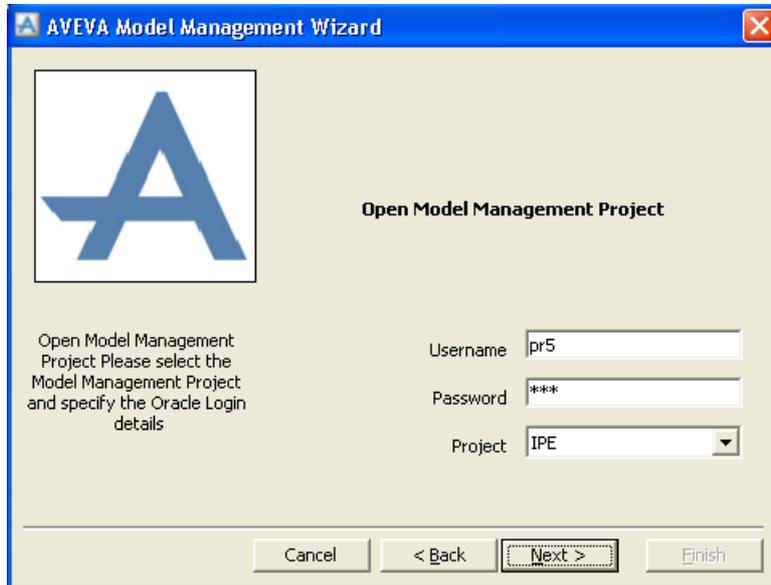
As well as using the Model Management Wizard to configure a project for Model Management, before Clash Manager or Deliverable Manager can be used some product-specific additions to the Oracle database are required.

The administrator will need to run the Wizard again to perform the necessary operations.

7.1 Project Maintenance

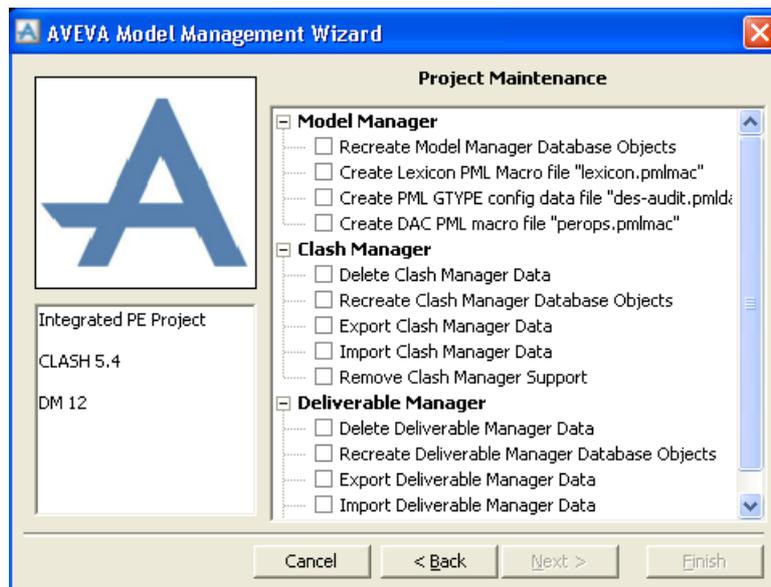


If you select the **Project Maintenance** option the Wizard presents you with the **Open Model Management Project** form, which allows you to select a project to maintain:



Select a project name from the **Project** drop-down list, and enter a valid username and password in the appropriate fields. Click the **Next** button to continue, the **Back** button to step back a stage or the **Cancel** button to cancel.

The Wizard then presents you with the **Project Maintenance** screen:



The menu on the right is sensitive to the options that apply to the project you have selected - for different projects this menu may contain different options. The area on the left contains information specific to the project.

7.1.1 Clash Manager Options

The Model Management Wizard is also responsible for configuring the Oracle database that is used by Clash Manager. This Oracle database can either be used solely for Clash Manager, or it can be one already used by PE Workbench and thus provides integrated AVEVA product capability.

The Model Management Wizard provides options to add Clash Manager support to an existing PE project, to create a new standalone Clash Manager project or to migrate Clash Manager version 4 configuration data to Clash Manager version 5 format thus enabling users to upgrade and take advantage of the additional functionality in version 5.

The Model Management Wizard also provides facilities that assist an Administrator in managing Clash Manager customisation and data. In particular after an Administrator has customised one project the customisation can be copied to another project using the Export and Import options provided.

The options available in this menu depend on how the project is set up. The sets of options available are:

Set 1	Set 2	Set 3
Upgrade Clash Manager Database	Delete Clash Manager Data	Add Clash Manager Support
Remove Clash Manager Support	Recreate Clash Manager Database Objects	
	Import Clash Manager Data	
	Export Clash Manager Data	
	Remove Clash Manager Support	

The option sets are mutually exclusive; i.e. you will get Set 1, or Set 2, or Set 3.

- **Remove Clash Manager Support**

This option removes all Clash Manager tables and views from the Oracle Database and removes related database packages and procedures. The space used in Oracle is freed. The procedure cannot be undone; it would be necessary to add Clash Manager Support and configure the project again to use Clash Manager after applying this option. An Export is recommended before executing this option.

- **Delete Clash Manager Data**

This option removes Clash Manager report data from the project, but retains Clash Manager configuration. It performs the same function as the **Delete All Clash Data, including Comments and History** button on the Clash Manager Options form. The clash set definitions, check list, obstruction list are retained, but can be deleted manually.

The clash history is deleted. Remaining data is truncated to recover unused space in the Oracle Table Space. However, unlike **Delete All Clash Data, including Comments and History**, the Clash Index counters can optionally be reset to zero.

The procedure cannot be undone.

- **Recreate Clash Manager Database Objects**

This option recreates the internal oracle Grants and Synonyms that allow Clash Manager users to read and modify clash data. This option will need to be run if new tables are added to the oracle database as part of a new release of Model Management (refer to the Release Notes delivered with each product release) or if new tables are added to the PE Workbench database as part of a new release of PE Workbench.

- **Import Clash Manager Data and Export Clash Manager Data**

These options are provided to help administrators manage customisation and project data. Customised setup can be copied from one project to another using an Export from the original project as Import to a new project. Export/Import also provides a basic backup facility for administrators with limited Oracle Administration experience. Experienced Oracle Administrators will probably prefer to use the more flexible, but more complex, backup facilities provided as an integral part of Oracle.

After the Import/Export option has been selected, the administrator will be asked to enter the Oracle Username and Password for the relevant project and specify whether Import or Export is required.

The Export process creates a file of exported information. The Model Management Wizard suggests what filename should be used, but the administrator is able to override the name and location. By default only customisation information is exported, but a full data export can be selected.

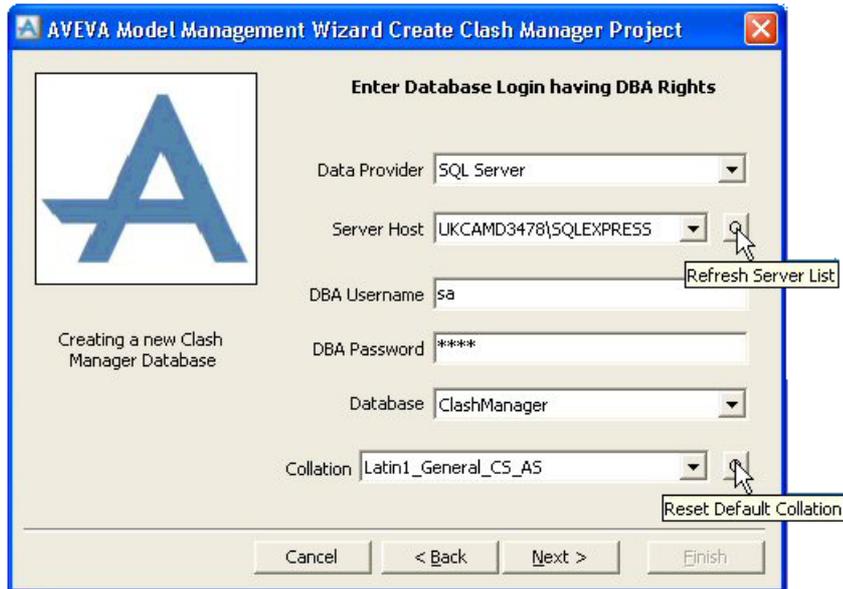
The Import process reads a file of exported information. The administrator is asked to Browse and select a file created by the Model Management Wizard's Clash Manager Export option. The administrator is able to select which parts of the customisation from the Export file are to be imported into the receiving project. If any conflicts between the information to be imported and existing configuration and customisation in the receiving project are detected the administrator will be asked to resolve these.

7.2 Create Standalone Clash Manager Project

When selecting the **Create Standalone Clash Manager Project** option from the **Model Manager Wizard** screen the **Enter Database Login having DBA Rights** screen is displayed. Select from the **Data Provider** dropdown menu either Oracle or SQL Server.

7.2.1 SQL Server

When selecting the SQL Server option from the Data Provider dropdown menu the form shown is displayed:



The administrator will have to select the Server Host (the server list can be refreshed by clicking the button to the right), enter the DBA Username and Password, and select a Database and Collation (which must be Case Insensitive - click the button to the right to reset the Default Collation).

Select the **Next** button to display the **Projects Details** form. This form and all subsequent forms are common to both the Oracle and SQL Server options. Refer to [Oracle and SQL Server](#)

7.2.2 Oracle

When selecting the Oracle option from the Data Provider dropdown menu the form shown is displayed.

The screenshot shows a dialog box titled "AVEVA Model Management Wizard Create Clash Manager Project". On the left is the AVEVA logo and the text "Creating a new Clash Manager Database". The main area is titled "Enter Database Login having DBA Rights" and contains the following fields:

- Data Provider: Oracle (dropdown menu)
- DBA Username: system (text input)
- DBA Password: ***** (password input)
- Connect String: ora3478 (text input)

At the bottom are buttons for "Cancel", "< Back", "Next >", and "Finish".

The administrator will have to enter the DBA Username and Password, and the Connect String.

Select **Next** to display the **Select Oracle TABLESPACES** form.

The screenshot shows a dialog box titled "AVEVA Model Management Wizard Create Standalone Clash Manage...". On the left is the AVEVA logo. The main area is titled "Select Oracle TABLESPACES" and contains the following fields:

- Default Tablespace: PR5_DATA (dropdown menu)
- INDEX Tablespace: PR5_INDX (dropdown menu)
- TEMP Tablespace: TEMP (dropdown menu)

At the bottom are buttons for "Cancel", "< Back", "Next >", and "Finish".

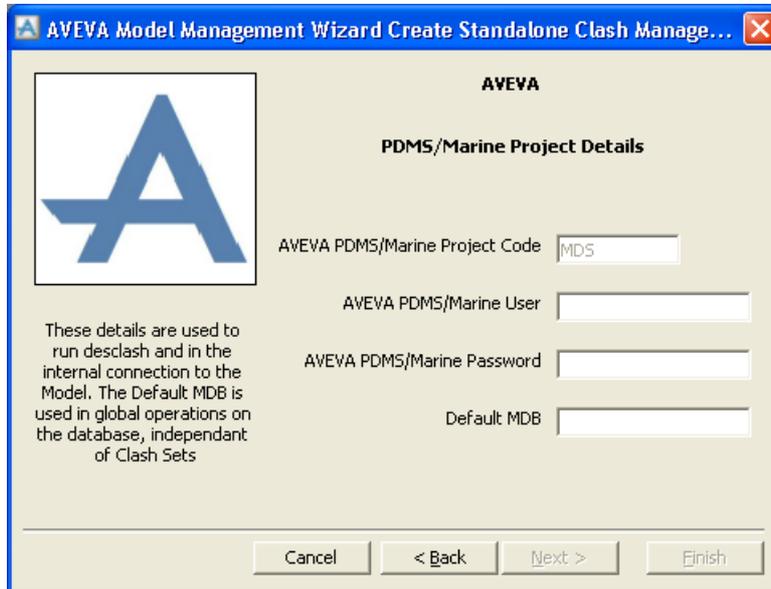
The administrator will have to enter the Default Tablespace, INDEX Tablespace and a TEMP Tablespace.

Select the **Next** button to display the **Project Details** form.

This form and all subsequent forms are common to both the Oracle and SQL Server option. Refer to [Oracle and SQL Server](#).

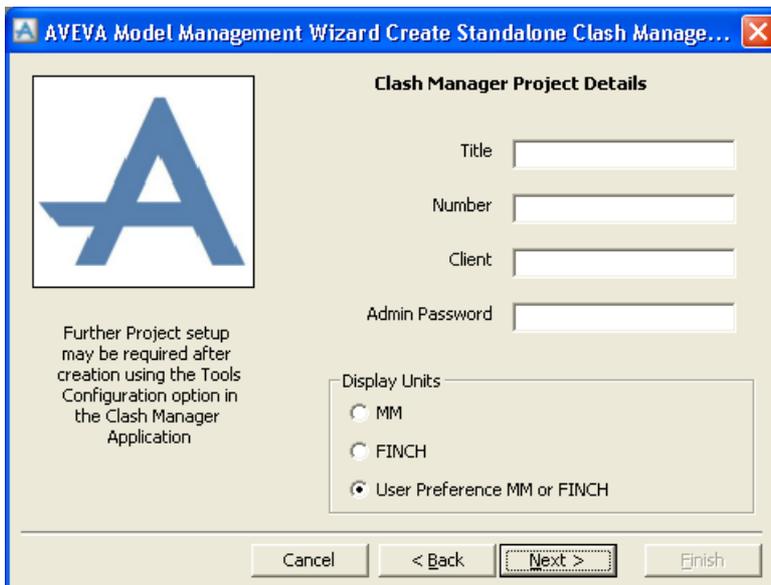
7.2.3 Oracle and SQL Server

The administrator will then need to enter the Project Code, Username and Password and specify a Default MDB.

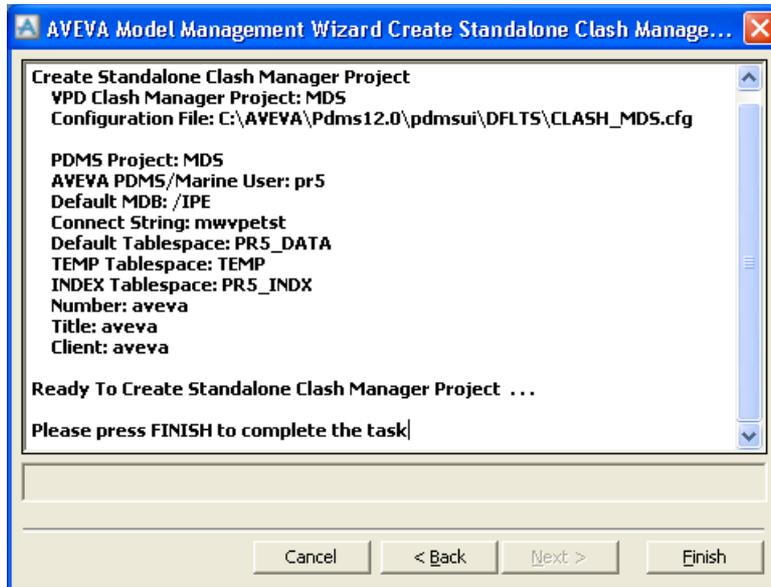


Select the **Next** button to display the Clash Manager **Project Details** form.

The administrator will have to enter a Title, Number, Client name and an Admin Password for the Clash Manager project.



Select the **Next** button.



The Wizard displays the information about both the projects, giving the administrator the opportunity to cancel the process. If the administrator continues, remarks on the progress are displayed until it is completed.

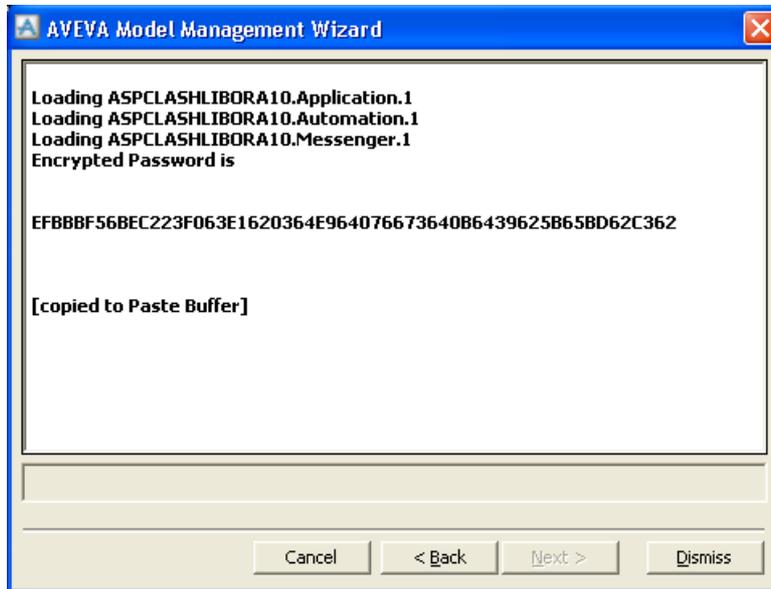
7.3 Password Encryption

If you select the **Password Encryption** option the Wizard presents you with the **Copy Encrypted Password to Paste Buffer** form, which prompts you to enter a password.



Encrypted passwords held in the Model Management configuration file enable automated logins. The password must agree with the password for the nominated USERID in the

underlying database system. If that password is changed, a corresponding change must be made to the configuration file. The Model Management Wizard provides the required password encryption. When running the Model Management Wizard the administrator merely selects this option and enters the password twice.



This encrypted password is automatically copied into the Paste Buffer and can be pasted into the DATABASE section of the {project}.cfg file. For example:

```
[DATABASE]
CONNECT-STRING | ipe
USERID | mms
PASSWORD | DCBA3B02A6A174C1648F7461524374F963ED6227963
```

8 Performance Hints

8.1 Large Transactions - Worst Case Update Threshold

The setting of the **Worst Case Update Threshold** is entered at the Clash Manager Options form. The value of the setting has a significant effect on the performance of the system. There is a large performance degradation if the setting is too low; a performance gain if the setting is correct. The principles are as follows.

Clash Manager holds information regarding the worst case clash status of a design element. This information is used in MOM and is shown as the clash status of an item e.g. PIPE, STRU, FRMW and holds the clash-free status of the controlled item. The software has two ways of updating this status as a result of the user, or a clash run, changing the clash status of an item. The first method (Single Update method) involves processing an individual clash element, searching the database for the worst case and updating the element clash status accordingly. This single element processing is quick for single clashes, but its speed of processing is directly proportional to the number of clashes to be processed. So if you were to use this method to process, for example, 1000 clashes, it would take approximately 1000 times longer. The second method (Global Update method) used by the software involves a Global clash worst case process and is designed to work with ALL of the clashes in the database. As this involves processing large amounts of data the software utilises more sophisticated processing methods to speed things up. The second method is used at the end of every clash run to determine the worst case clash status for all elements in the database.

The 'Worst Case Update Threshold' value allows the user to determine when this more efficient Global update is triggered, rather than using the single update method, which would be very slow for large numbers of selected clashes in the clash groups grid. So, in summary, this setting value will trigger the Global update for ALL clashes in the database rather than using the single clash element processing method.

The value to set for this threshold is based on the volume of data in the clash tables and the speed of your system. It is recommended that timing tests are carried out to determine the optimum value.

If you prefer not to use the Global Update method, set the Threshold to a very large value so that the system never reaches the trigger point and works on the single clash-by-clash method.

8.2 Number in Clash History

When selecting Clash History Count at the Clash Manager Options form, bear in mind that the greater the number of runs in the clash history, the slower the system performs.

8.3 Changing Clash Status of Multiple Clash Groups

To improve the performance of the system when updating the clash status of multiple clash groups, ensure that, at the Clash Manager Options form, the **Auto View** and **Auto Display Clash Detail** options are set to OFF (false).

8.4 Clash Manager Functions

Three functions of the Clash Manager can be implemented by the **MMSCMD** operating system command line interface. The functions are:

- Running a Clash Set
- Track Changes
- Loading a Desclash Report File.

The functions can be set to take place automatically, for example, overnight. The facility is intended to be used by administrators.

8.4.1 General Syntax

The syntax is:

```
Mmscmd <userid> <password> <connectString> <project>
<configFile> <logfile> -clash <clash options>
```

Where:

<userid>	is the Oracle userid of the PE project
<password>	is the Oracle password of the PE project
<connectString>	is the connect string to the Oracle instance hosting the PE project
<project>	is the OUTFITTING project related to PE project. It must correspond with the configuration file project details.
<configFile>	is the Model Object Manager configuration file
<logfile>	is the path of the file to which start/finish messages are logged. It may include symbols #date# and #time#.
-clash	is the command to specify clash management
-<clash options>	See below, under Clash Options

8.4.2 Clash Options

These are arguments for the clash command that determine the functions to be performed. The arguments and equivalent functions are as follows:

```
set <set_number> "<comments>"           Running a clash set
```

```
trackChanges "<comments>"           Track changes
loadFile <set_number> "<comments>"   Loading a Desclash Report File
<clashFileName>[-L]
```

8.4.3 Running a Clash Set

The complete process, using MMSCMD, is identical to performing the task manually using the standard GUI. Indeed, during the run, the standard RUN CLASH SET GUI is displayed enabling, for example, the run to be cancelled.

The desclash module of design is run with the Check List, Obstruction List and Exclude Lists derived from the nominated clash set. Defined Gap and Clearance, Bcheck options, etc, are also included.

A separate desclash report file is generated for each Check List item. The generated desclash Report File(s) are loaded into the Clash Manager database.

Acceptance and Assignment rules are applied to new clashes to automatically set Clash Status and Discipline ownership.

In the final phase, after all desclash Report File(s) are loaded, Clash Group Level Type Worst cases are set, Garbage Collection is performed (including removing unwanted historical data which is configured as part of the Clash Set definition) and lastly Element worst case Clash States are set.

Note that the required OUTFITTING environment must be set prior to executing the software with this option, for example by calling evars.bat from the installed folder.

Note: It is common practice to schedule smaller clash sets to run overnight during the project working week and an overall clash set to run each weekend. Also, it is recommended that only one batch of clash sets is run at a time, otherwise contention for access to clash records can occur.

Syntax

The syntax is:

```
Mmscmd <userid> <password> <connectString> <project>
<configFile> <logfile> -clash set <set_number> "<comments>"
```

Example

```
call c:\Aveva\pdms12.0\evars.bat c:\Aveva\pdms12.0
rem following command line shown on several lines for clarity
c:\Aveva\ModelManagement12.0\mmscmd enr1 secret van1 sam
c:\Aveva\projects\sam\samdfmts\sam.cfg
c:\MMS\logfiles\log.txt -clash set 1 "run clash set 1"
```

8.4.4 Track Changes

This process saves the current discipline/status counts from which future changes may be tracked. This has the effect of adding another point in the history displayed on the clash summary chart shown on the Clash Manager form. "NEW" clashes are tracked from that point.

The equivalent process can be initiated by the **Track Changes** button on the Clash Manager Options form - Advanced tab.

That is no requirement to set OUTFITTING environment variables prior to using this option.

Syntax

The syntax is:

```
Mmscmd <userid> <password> <connectString> <project>  
<configFile> <logfile> -clash trackChanges "<comments>"
```

Example

```
call c:\Aveva\pdms12.0\evars.bat c:\Aveva\pdms12.0  
rem following command line shown on several lines for clarity  
c:\Aveva\ModelManagement12.0\mmscmd enr1 secret van1 sam  
c:\Aveva\projects\sam\samdfmts\sam.cfg  
c:\MMS\logfiles\log.txt -clash trackchanges "AFD"
```

8.4.5 Loading a Desclash Report File

This process enables a desclash report to be loaded directly into the Clash Manager database, without re-running the Clash Set. It may be used, if following a lengthy desclash run, the normal loading process is interrupted.

The equivalent process can be initiated by the **Load Clash File** button on the Clash Manager Options form - 'Advanced tab.

Note that only desclash report files created by OUTFITTING running Clash Manager should be loaded using this option.

Phase two of the loading process may be omitted (by using the -L option). Phase two comprises Setting Clash Group Level Type Worst cases, Garbage Collection (including removing unwanted historical data, configured as part of the Clash Set definition) and finally Updating Element worst case Clash State. This option may be used when loading several files, but the last execution should not include the option, since it is most important that Phase two of the loading process is executed.

Note that the required OUTFITTING environment must be set prior to executing the software with this option, for example by calling evars.bat from the OUTFITTING installed folder.

Syntax

The syntax is:

```
Mmscmd <userid> <password> <connectString> <project>  
<configFile> <logfile> -clash loadFile <set_number>  
"<comments>" <clashFileName> [-L]
```

Example

```
call c:\Aveva\pdms12.0\evars.bat c:\Aveva\pdms12.0  
rem following command line shown on several lines for clarity  
c:\Aveva\ModelManagement12.0\mmscmd enr1 secret van1 sam  
c:\Aveva\projects\sam\samdfmts\sam.cfg  
c:\MMS\logfiles\log.txt -clash loadfile 1 "clash set1"  
C:\Temp\pclam_SAM_cadusr_1\pclam_0001.OUT
```

8.4.6 Running Clash Manager Options in Batch or Unattended Mode

The windows command AT can be used to run the options in batch or unattended mode.

Commands to run MMSCMD should be placed in a command file, for example in a file called c:\MMS\proj\TrackC.bat

Note that the required OUTFITTING environment must be set prior to executing the software with this option, for example by calling evars.bat from the OUTFITTING installed folder.

Example

```
set USERNAME=pf
set LM_LICENSE_FILE=744@pc357
call c:\Aveva\pdms12.0\evars.bat c:\Aveva\pdms12.0
rem following command line shown on several lines for clarity
c:\Aveva\ModelManagement12.0\mmscmd enr1 secret van1 sam
c:\Aveva\projects\sam\samdfmts\sam.cfg
c:\MMS\logfiles\log.txt -clash trackchanges "interium"
```

An example of how the AT command may be executed is:

```
AT 20:30 /interactive /every:Su cmd /c c:\MMS\proj\TrackC.bat
```

This runs the Track Changes function every Sunday evening at 20:30.

Note: As an alternative to the AT command, clash set batch runs can be scheduled using the Windows 'Scheduled Tasks' GUI.

9 Implementing Clash Manager on an Existing Project

9.1 Introduction

This topic describes the key activities that are typically employed on a OUTFITTING project utilizing Clash Manager to report and resolve modeling interferences. Two types of user carry out these activities: administrators and project discipline designers. The following text describes the responsibilities of each user and provides guidance for a 'best practice' implementation of Clash Manager onto a small, medium or large OUTFITTING DESIGN project.

9.2 Discipline Designer Role

Depending on the size and scope of the project you first need to decide what role the discipline designers take in the clash resolution process. There are typically three approaches that can be taken:

- All discipline designers have access to the Clash Manager reports and are responsible for ensuring the clash free status of their part of the model. This approach is most suitable for medium to large projects where a large clash data set is anticipated and requires frequent review by all designers on a regular basis.
- Discipline leads or a small number of nominated discipline designers are given access to the Clash Manager reports. These users are responsible for ensuring the clash free status of their discipline's part of the model. This approach is most suitable for small to medium projects where a small team of users can adequately manage and review the Clash Manager reports on a regular basis.
- An overall clash coordinator is responsible for *all* clashes on the project and is tasked to review the Clash Manager reports and perform clash resolution in consultation with discipline designers. This approach is most suitable for small projects where only a small clash data set is anticipated and can be easily handled by one person on a part time basis.

The options described above are for guidance only but represent the typical approaches taken by existing users in the deployment of Clash Manager. You may decide to adopt one of the above approaches directly or formulate your own solution to match your specific project requirements.

9.3 Clash Manager Configuration

Before Clash Manager can be used on a project it is necessary to perform some basic configuration tasks. The focus of these tasks is to produce a structured and organized presentation of the clash data so that it can be easily evaluated for decisions to be taken on how to manage the clashes. The following notes are divided into two sections; one

describes [Basic Configuration](#) tasks for small to medium sized OUTFITTING projects and the other covers [Advanced Configuration](#) of the application for larger OUTFITTING projects.

9.3.1 User Settings

Clash Manager stores all configuration settings described here in the Oracle database. Additionally, individual User settings are stored locally on the user's computer in either registry or xml files. The items stored are described below.

- **Settings.xml**

Stored in user's windows profile under

`%APPDATA%\AVEVA\Model Management\ Project Settings\{project code}`

- where `%APPDATA%` is the location the user's Application Data is stored. This may not necessarily be on the user's local machine if the user has a 'roaming' windows profile.

e.g. `C:\Documents and Settings\{user name}\Application Data\AVEVA\Model Management\Project Settings\{project code}\settings.xml`

Used by Model Object Manager to store column display settings and named filter settings. Older versions of Clash Manager created a copy of this file for consistency with Model Object Manager, but no Clash Manager settings were stored.

- **ClashManagerSettings.xml**

Stored in user's windows profile under

`%APPDATA%\AVEVA\Model Management\ Project Settings\{project code}`

e.g. `C:\Documents and Settings\{user name}\Application Data\AVEVA\Model Management\Project Settings\{project code}\ClashManager Settings.xml`

Used by Clash Manager to store user filter settings, including named filters. Retained on exit from Clash Manager.

- **Registry**

Stores the current Clash Manager window sizes and positions. Retained on exit from Clash Manager.

9.3.2 Basic Configuration

To access the Clash Manager Configuration form select **Tool>Settings** to display the Clash Manager Option form. Select the Clash Manager **Configuration** button. The Clash Manager Configuration will be displayed.

Clash Manager required the following configuration tasks to be completed regardless of the project size:

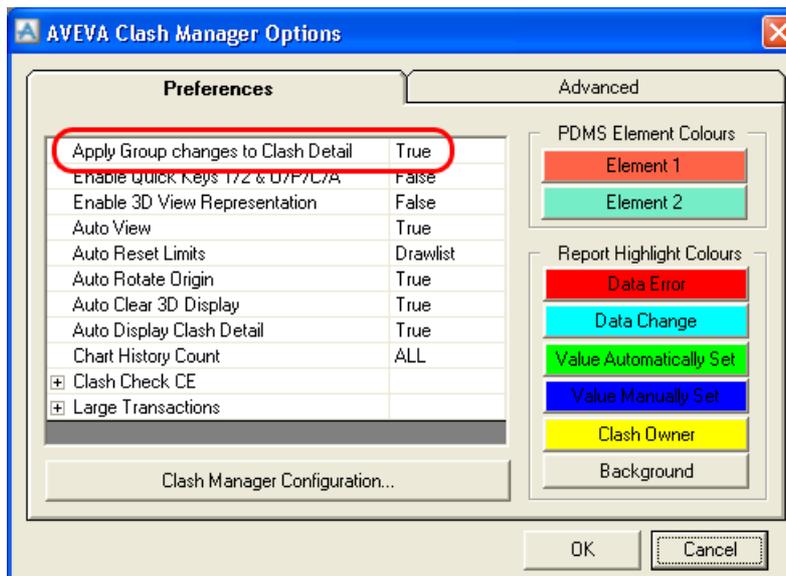
- [Project](#)
- [Discipline](#)
- [Security](#)
- [Group](#)
- [Assign](#)

9.3.3 Advanced Configuration

In addition to the Basic Configuration tasks, for medium to large projects it is recommended that Clash Manager is set up to automate as much of the administration and coordination of clash processing as possible. To achieve this the following configuration tasks need to be completed:

- [Class](#)
 - [Accept](#)
 - [Priority](#)
 - [Status](#)
 - [Comments](#)
 - [Level/Type](#)
 - [Gtype/Tracking](#)
- **User Preferences**

For both the basic and advanced configurations it is also necessary to consider how the discipline users and clash coordinators interact with the Clash Manager reports. The **Preferences** tab on the Clash Manager **Options** form contains an important setting for how clash group changes are handled:



It is strongly recommended to have this preference set to **True** to make sure all changes made to a clash group automatically cascade down to all associated clash details. This removes problems where, for example, a clash group may be approved and its clash details remain unapproved.

9.3.4 Using Clash Manager with the Laser Model Interface

When used in conjunction with the Laser Model Interface, Clash Manager employs a range of methods to highlight clashes with laser models. The result will depend on the functionality that has been implemented by the laser model vendor, but can include showing an outline box around the cell of the laser model that contains the clash, showing the portion of the

laser model within that cell in a higher visual density than the surrounding region, and highlighting the content of that cell.

Clash Manager will automatically initialise a connection to the laser model driver via the macro `des-pclam-lmi-init.pmlmac` which is provided in the Model Manager `pdmsui/dfits` folder for local customisation to suit the laser model software installed at the client site. LMI initialisation is invoked by Clash Manager during a background Desclash run when an XCELL is encountered in the obstruction list, and also on first encountering an XCELL during viewing of clash groups in the interactive Design session.

The same macro can also be used to set the Desclash run to test with Cells or ExactGeometry. The ExactGeometry setting will generate more accurate (and thus fewer) clashes, but at the expense of increased runtime. The ExactGeometry option may not be supported by any particular laser model software vendor.

Please note that laser models are not supported in OUTFITTING prior to version 11.6.SP2.

Users' attention is drawn to the implications for licensing of the laser model software when using Clash Manager. If an interactive Design session and a background Desclash session occur simultaneously there is the potential for Clash Manager to request two concurrent laser model connections.

9.4 Clash Manager Workflow

This section describes the typical workflow for Clash Manager implemented on any size of project. The workflow processes are divided into five main activities:

- [Initial Configuration and Setup](#)
- [Clash Set Execution](#)
- [Engineering Clash Resolution](#)
- [Clash Reporting, Audit and Recomputation](#)
- Clash database audit and recomputation

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