
HAZOP+ V2.0 Technical Specification

Platform

Runs under Windows 95, 98, Me, NT, 2000 & XP. Recommended memory requirements 32 Mb+

General

- Advanced interface for the rapid development of Hazop studies.
- User configurable study and actions sheets allowing the implementation of different Hazop study methodologies
- Project wizard to assist in the creation of the Hazop study.
- Logical arrangement of input data sheets guiding the user through the Hazop development process in a step-by-step manner.
- User definable parameters and guide words allowing creation of unlimited numbers of deviations.
- Unlimited numbers of risk ranking matrices.
- Advanced reporting facilities including report wizard.
- Comprehensive copy and paste facilities.
- Unlimited undo and redo.
- All settings (window position, splitter bar position, grid column widths etc etc) saved between sessions.

Summary

- Fields for company, description, equipment location, equipment description.
- Select Hazop manager from personnel data.

Personnel

- Unlimited number of personnel.
- Fields for name, address, phone, e-mail.

Sessions

- Unlimited number of sessions.

- Fields for session name, location, date and time.
- Select chairman and secretary from personnel data.
- Create list of participants from personnel data.

Items

- Unlimited number of items
- Fields for item name, P&ID reference, drawing number and design intent.
- Revision number and date updated when item deviation(s) are modified in study.

Study and Action Headings

- Select any number of headings from the user customisable library or add custom headings.
- Select any number of headings from the user customisable library or add custom headings.
- Headings may be of type text, date, float or integer.
- Change order of headings in study or actions sheets

Guide Words and Parameters

- Select any number of guide words and parameters from the user customisable library to create unlimited numbers of deviations.
- Select which parameters apply to which items.
- Select which guide words apply to which parameters.
- Change the order in which guide words and parameters appear in study sheet.

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Risk Ranking

- Create any number of risk ranking matrices.
- Select any text type study heading to use as the dependent heading (output) of a risk ranking matrix.
- User can define default values per dependent study heading for the risk matrix values.
- Select any number of text type study headings to use as the independent headings (inputs) of a risk ranking matrix.
- User can define up to six values per independent study heading.
- Risk ranking values may be set to 'critical', automatically generating an action in the study sheet when selected.
- Study headings associated with a matrix are colour (user defined) coded in the study sheet.
- The study sheet is automatically updated (user definable) when the risk ranking matrices are modified.

Study Sheet

- Spreadsheet style layout for rapid entry of text.
- Resizeable rows and columns.
- Use either tree control or combo boxes to select item, parameter and guide word (deviation) combinations.
- Study records automatically added to current session. User selectable option to allow editing of study records associated with previous sessions.
- Deviations to be completed are marked in the tree control.
- Add and edit actions directly from the study sheet.
- Find text in either visible sheet or all records.
- Bookmarks to allow the user to rapidly move between study records.
- Spell check on selected column, visible sheet or all records.

Actions Sheet

- Spreadsheet style layout for rapid entry of text.
- Resizeable rows and columns.
- Edit existing actions and add new actions linked to actions created in the study sheet.
- Find text in either visible sheet or all records.
- Bookmarks to allow the user to rapidly move between action records.
- Spell check on selected column, visible sheet or all records.

Report Wizard

- Allows the user to easily create new reports with the query automatically selected based on the currently visible data sheet.
- Select page layout including paper size, orientation, units and margins.
- Select query and fields.
- Select sorting and filtering on selected fields.
- Easily create text boxes containing date, report name, page number page count, selected field minimum, maximum, average and more... Text boxes can be positioned in header or footer.

Reporting

- Provides the capability for users to create their own text, graph or diagram reports, or allows them to use the standard reports supplied with the Isograph software products
- Reports are based on querying data contained in a Microsoft Access database. This database is generated automatically by the associated software product
- Reports use built-in queries defined by the associated software product. Text reports may also be based on SQL queries defined by the user
- Query wizard to assist in creation of custom SQL queries
- Supports all the paper sizes associated with the default printer

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Reporting (continued)

- Interactive layout of reports, even when in print preview mode
 - Layout operations include moving, resizing and alignment. These operations may be optionally snapped to the user defined grid
 - Header, footer, text boxes and pictures allow user to create sophisticated report layouts
 - Macros allow user to include report generator automatically generated text in the header, footer and text boxes. Macros include the date, time, page count, page number, report name, average field value, minimum field value, maximum field value, and sum of a field value.
 - All text objects (header, footer, text boxes and text report headings and data) may have the following attributes assigned: font and size, foreground, background and border colour, indents, justification, border width and position, and line spacing
 - Unlimited undo and redo of all design functions
 - Copy and paste of text boxes and pictures between reports
 - Graph report chart types include: 2-D line, bar, area and scatter, 3-D surface, bar, pie, scatter, tape and log/log and log/linear
 - Filtering and sorting on one or more fields in text reports. Filtering operations include equals, between, like, in, not equal to, less than, greater than, less than or equal to and greater than or equal to.
 - The report explorer allows the user to copy and paste existing reports, and to create a folder structure to contain reports.
 - Reports can be exported to the clipboard or to file in RTF textbox, RTF table, tab delimited, comma separated or user specified delimiter formats
- Export data to Excel 95, 97 and 2000, Access 95, 97 and 2000, and various text formats.
 - Import personnel data from Excel 95, 97 and 2000, Access 95, 97 and 2000, and various text formats.

Import/Export

- Import HazopPlus V1.1 databases

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Introduction

The Hazard and Operability (Hazop) study is a widely used formal technique for examining potential safety and operational problems associated with a system. A Hazop study is usually carried out by a team, headed by a chairman and a secretary, who have experience both in the use of the Hazop technique and the system under investigation. The technique was originally developed for the study of chemical process plant but it is now used in a wide range of industries.

The Hazop+ software was designed as an aid to the Hazop team by providing an easy method of customising, recording, managing and reporting the study.

Hazop+ can also be used with similar hazard identification techniques.

The main features of Hazop+ can be described under the following headings

Setup and Customisation

The user can input general information about the Hazop study, the system under investigation and the study participants. The user can add to the standard lists of guidewords and parameters to customise the study for a particular type of system. The study and action data sheets through which the study information is entered can also be customised. When the Hazop study information has been entered it can then be filtered, sorted and reported using the report wizard.

Summary Data Sheet

The *Summary* data sheet allows the user to enter general information describing the Hazop study. This includes: a description of the study, selecting the Hazop manager, the equipment description and the equipment location.

The screenshot shows the Hazop+ software interface for the Summary Data Sheet. The window title is "Hazop+ - [Summary: Untitled - Library: Default]". The menu bar includes File, Edit, Library, View, Tools, Window, and Help. The toolbar contains various icons for file operations and editing. The main area is divided into a left sidebar and a main content area. The sidebar has icons and labels for Summary, Personnel, Sessions, Items, Study Headings, and Action Headings. The main content area has several input fields: Company (Isochem Ltd), Hazop Manager (<Not Selected>), Hazop Description (Preliminary study), Equipment Location (Site 4, Pennine Road, Westhampton), and Equipment Description (Methanator Plant). At the bottom right, there are buttons for Category: STANDARD, CAPS, and INS.

Summary Data Sheet

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Personnel Data Sheet

The *Personnel* data sheet allows the user to enter information describing the personnel associated with the Hazop study. This includes: their name, address, e-mail address, phone numbers and a general comments field.

The screenshot shows the 'Personnel' data sheet in the Hazop+ software. The window title is 'Hazop+ - [Personnel: Untitled - Library: Default]'. The menu bar includes File, Edit, Library, View, Tools, Window, and Help. The toolbar contains various icons for file operations and editing. On the left, a vertical navigation pane shows icons for Summary, Personnel, Sessions, Items, Study Headings, and Action Headings. The main area is divided into two panes. The left pane has a table with columns 'Company' and 'First Name', containing one entry: '<New Rec...'. The right pane contains a form with the following fields: Company (text box with '<New Record>'), Title (text box), Middle Initial(s) (text box), First Name (text box), Surname (text box), Job Title (text box), Qualifications (text box), Department (text box), Address 1 (text box), Address 2 (text box), Address 3 (text box), Address 4 (text box), Address 5 (text box), Address 6 (text box), and Phone (text box). At the bottom right, there are buttons for 'Category: STANDARD', 'CAPS', and 'INS'.

Sessions Data Sheet

The *Sessions* data sheet allows the user to enter information describing the Hazop study sessions. This includes: the session name, date and time, chairman, location, description and participants.

The screenshot shows the 'Sessions' data sheet in the Hazop+ software. The window title is 'Hazop+ - [Sessions: Untitled - Library: Default]'. The menu bar includes File, Edit, Library, View, Tools, Window, and Help. The toolbar contains various icons for file operations and editing. On the left, a vertical navigation pane shows icons for Summary, Personnel, Sessions, Items, Study Headings, Action Headings, and Guide Words and Parameters. The main area is divided into two panes. The left pane has a table with columns 'Title' and 'Date', containing one entry: '<New Record>' and '05-Jul-02 00:00:00'. The right pane contains a form with the following fields: Name (text box with '<New Record>'), Chairman (text box with '<Not Selected>' and a dropdown arrow), Secretary (text box with '<Not Selected>' and a dropdown arrow), Date (text box with '05-Jul-02' and a dropdown arrow), Time (text box with '00:00:00' and a dropdown arrow), Location (text box), Description (text box), and Participants (table with columns 'Company', 'Initials', and 'Surname'). At the bottom right, there are buttons for '+', 'X', 'Category: STANDARD', 'CAPS', and 'INS'.

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Items Data Sheet

The *Items* data sheet allows the user to enter information describing the items associated with the Hazop study. This includes: the item name, P&ID reference, drawing number, description and design intent.

The screenshot shows the 'Hazop+ - [Items: Untitled - Library: Default]' window. The interface includes a menu bar (File, Edit, Library, View, Tools, Window, Help), a toolbar, and a sidebar with navigation options: Summary, Personnel, Sessions, Items, Study Headings, and Action Headings. The main area is divided into two panes. The left pane, titled 'P&ID Reference' and 'Drawing No', contains a table with one entry: '<New Record>'. The right pane contains input fields for 'Name' (set to '<New Record>'), 'P&ID Reference', 'Drawing No', 'Description', and 'Design Intent'. At the bottom, there are fields for 'Revision No' (0) and 'Revision Date' (05-Jul-02 16:28:41), and a 'Category' dropdown set to 'STANDARD'.

Study Headings Data Sheet

The *Study Headings* data sheet allows the user to select the study headings to be used in the *Study* data sheet. Each study heading corresponds to a column in the *Study* data sheet grid. The caption for the *Study* data sheet grid column is either the study heading name or the key value, depending on the *View-Headings As Key* menu option setting.

The screenshot shows the 'Hazop+ - [Study Headings: C:\Products\HazOp\V200\Examples\Example.haz - Library: Default]' window. The interface includes a menu bar (File, Edit, Library, View, Tools, Window, Help), a toolbar, and a sidebar with navigation options: Summary, Personnel, Sessions, Items, Study Headings, Action Headings, Guide Words and Parameters, and Risk. The main area is divided into two panes. The left pane, titled 'Library Study Headings', contains a table with columns 'Name', 'Type', and 'Key'. The right pane, titled 'Selected Study Headings', contains a table with columns 'Name', 'Type', and 'Key'. Below the tables, there is a section for adding a custom heading with fields for 'Name', 'Type' (set to 'Text'), and 'Key'.

Name	Type	Key
Comments	Text	COI

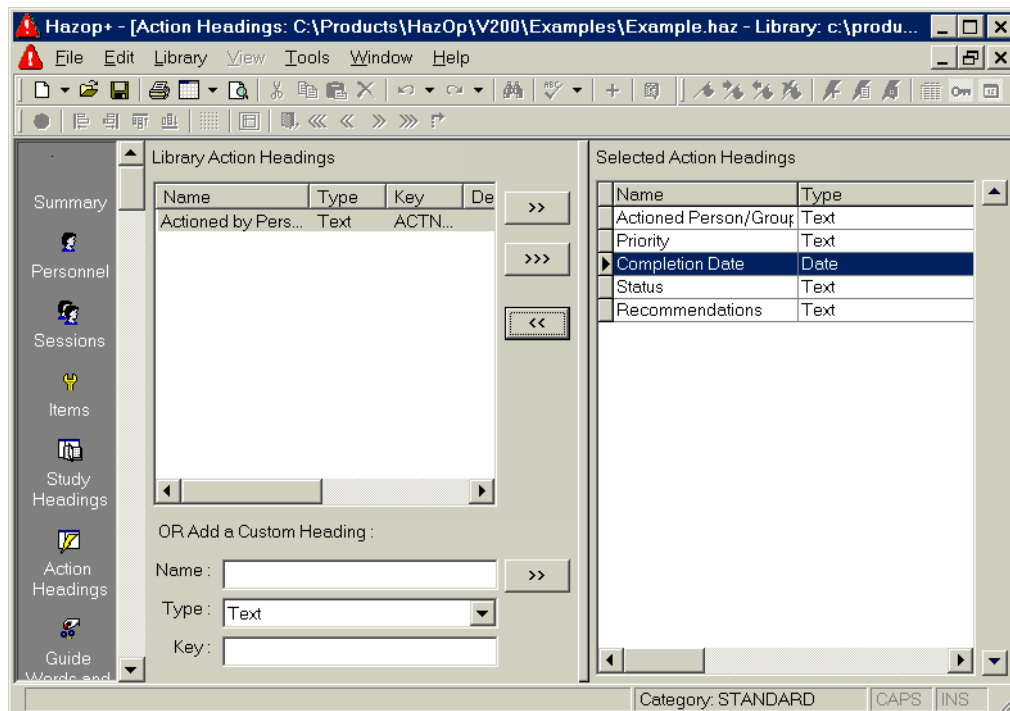
Name	Type	Key
Cause	Text	CAU
Consequence	Text	Cons
Safeguards/Checks	Text	SafeG
Safety Ranking	Text	SR
Severity	Text	SEV
Likelihood	Text	LIKE
Cost Ranking	Text	CR
Cost	Text	CST
Frequency	Text	FREQ

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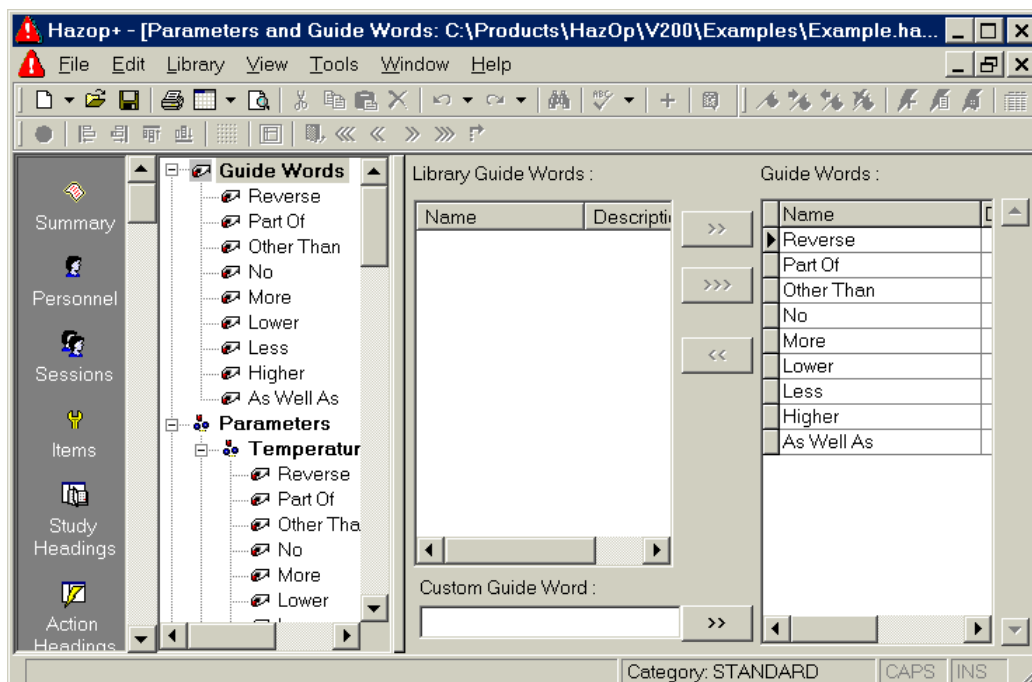
Action Headings Data Sheet

The *Action Headings* data sheet allows the user to select the action headings to be used in the *Actions* data sheet. Each action heading corresponds to a column in the *Actions* data sheet grid. The caption for the *Actions* data sheet grid column is either the action heading name or the key value, depending on the *View-Headings As Key* menu option setting.



Guide Words Data Sheet

The *Guide Words* data sheet allows the user to select the guide words to be used in the *Study* data sheet. Guide words are displayed in the *Study* data sheet tree control as child nodes of their associated parameters, and also in the guide words drop-down list when an associated parameter is selected.

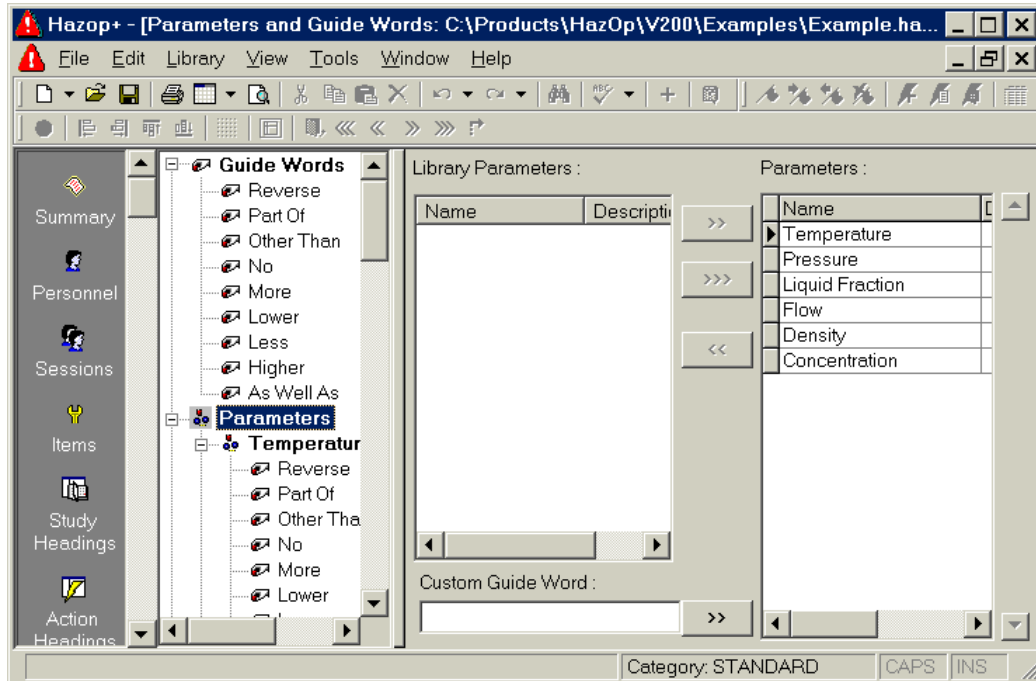


Parameters Data Sheet

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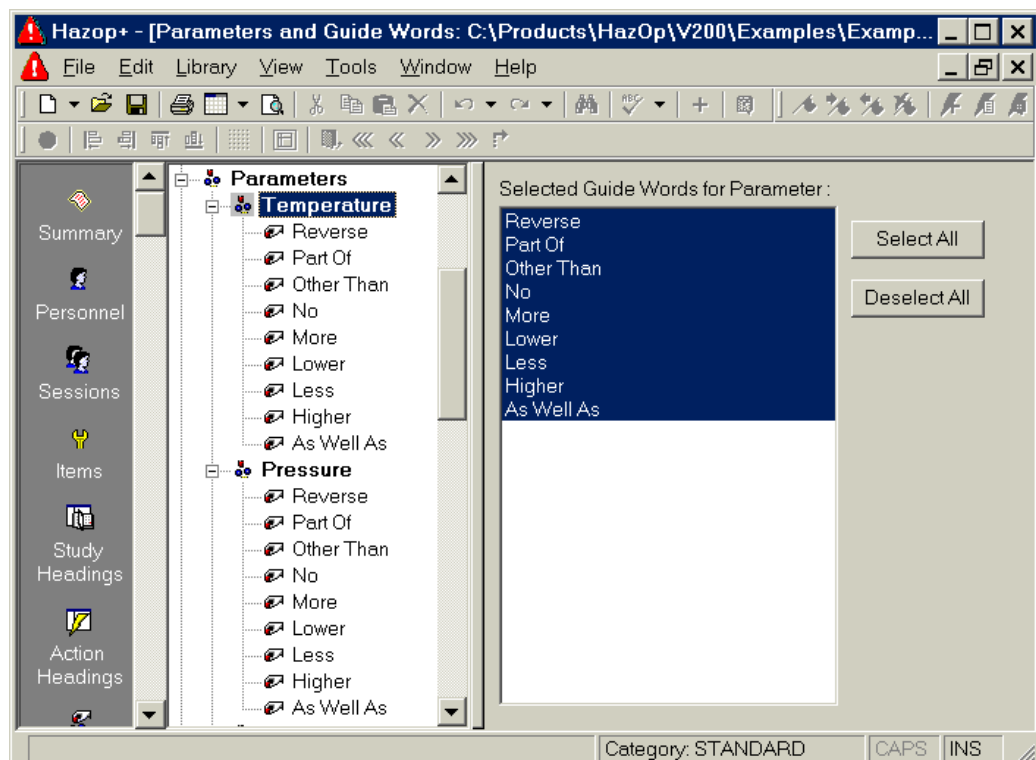
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The *Parameters* data sheet allows the user to select the parameters to be used in the *Study* data sheet. Parameters are displayed in the *Study* data sheet tree control as child nodes of their associated items, and also in the parameters drop-down list when an associated item is selected.



Parameter Guide Words Data Sheet

The *Parameter Guide Words* data sheet allows the user to select the guide words associated with each of the parameters defined for the Hazop study. Guide words are displayed in the *Study* data sheet tree control as child nodes of their associated parameters, and also in the guide words drop-down list when an associated parameter is selected.

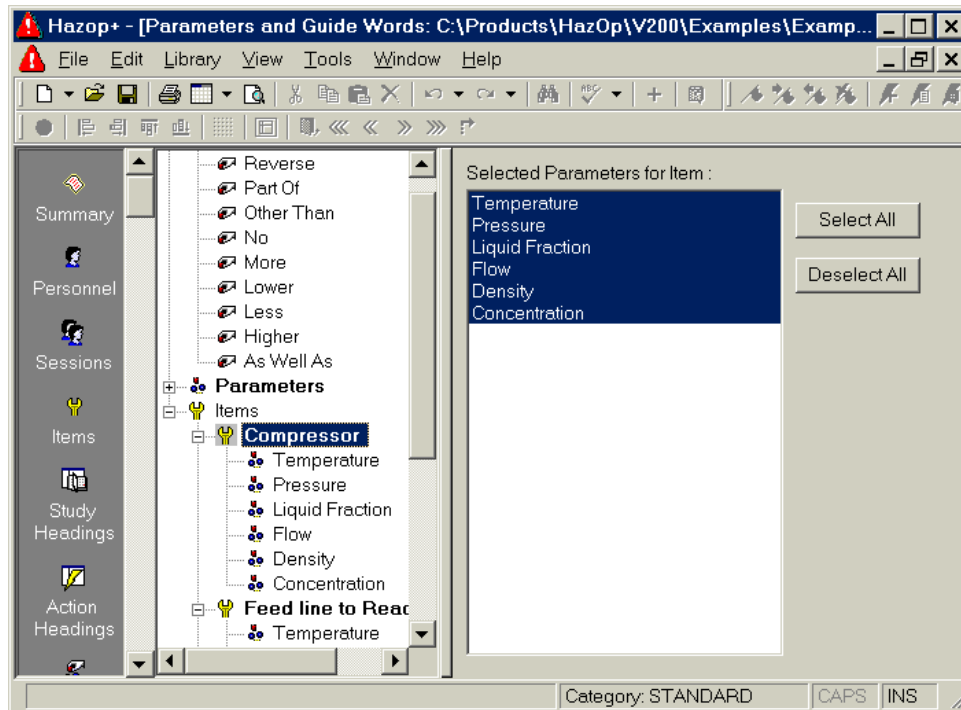


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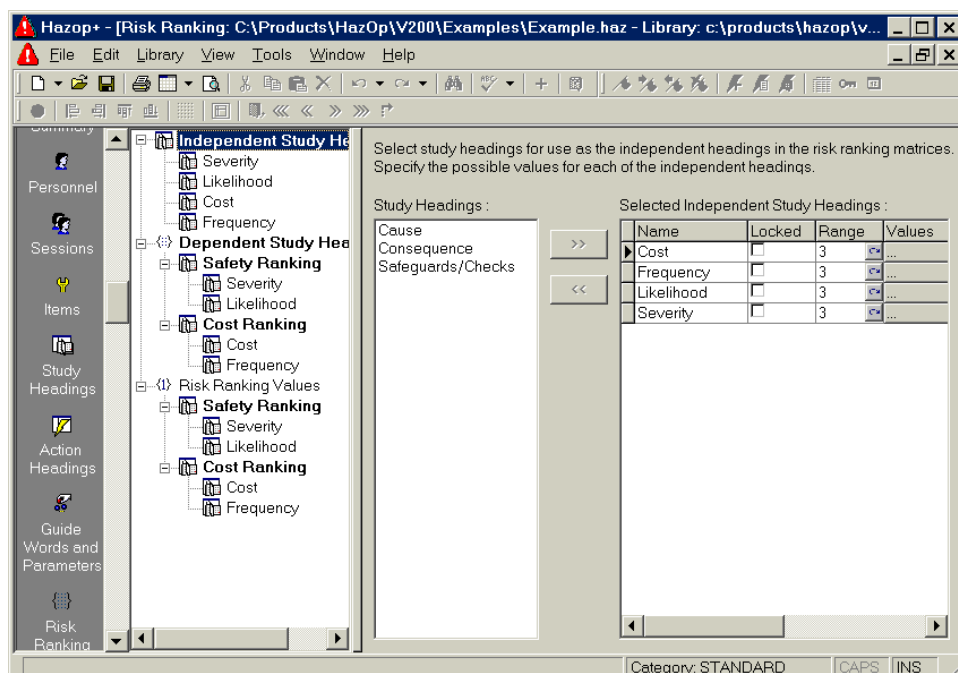
Item Parameters Data Sheet

The *Item Parameters* data sheet allows the user to select the parameters associated with each of the items defined for the Hazop study. Parameters are displayed in the *Study* data sheet tree control as child nodes of their associated items, and also in the parameters drop-down list when an associated item is selected.



Risk Ranking Independent Study Headings Data Sheet

The *Risk Ranking Independent Study Headings* data sheet allows the user to select any number of text type study headings for use as the independent study heading in a risk ranking matrix. Each of the independent study headings has a range of values associated with it. For each of these heading values (combined with any other independent study heading values associated with the risk ranking matrix) risk ranking values must be entered into any risk ranking matrix using this heading.

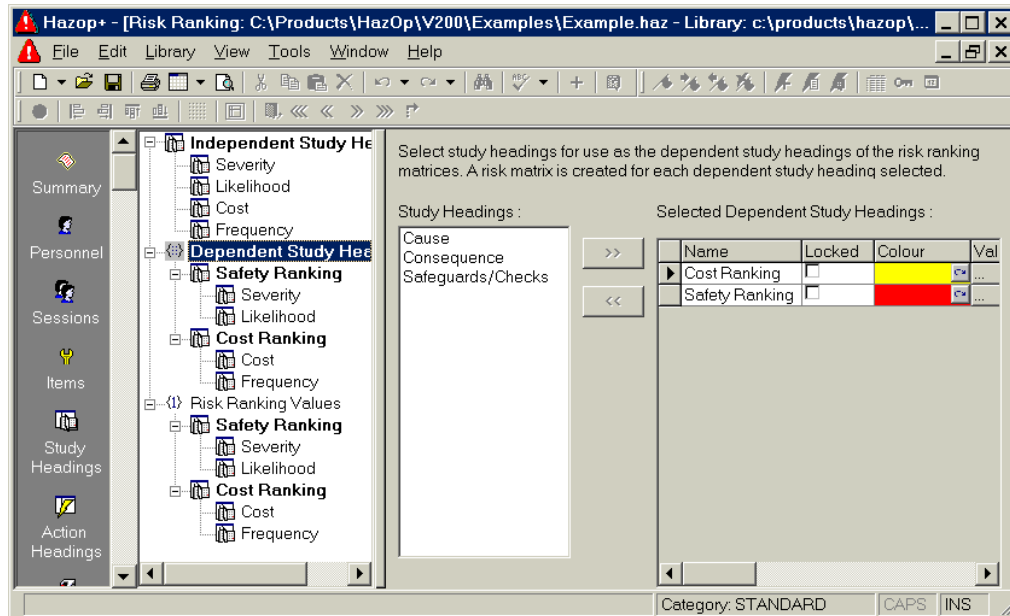


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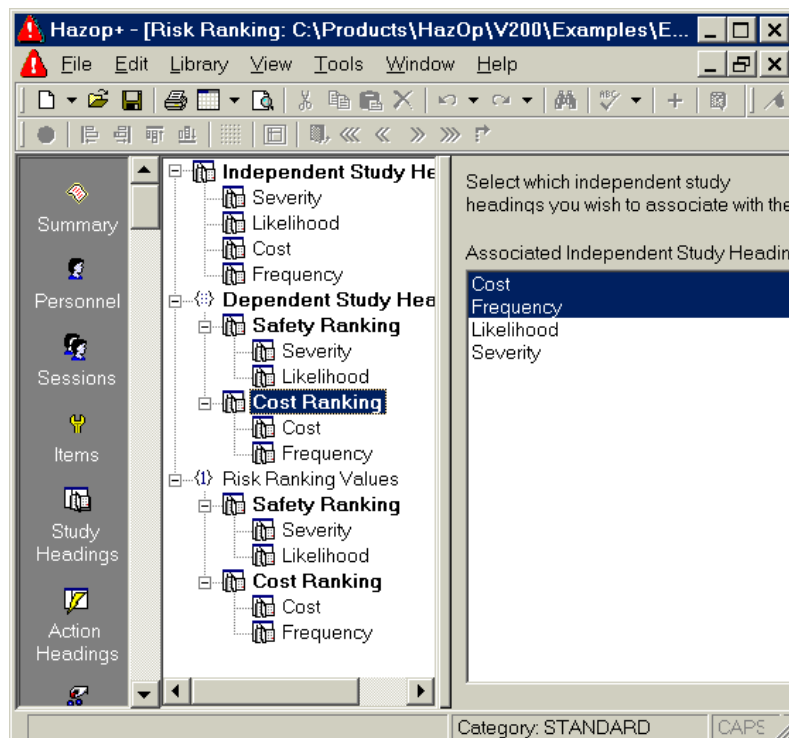
Risk Ranking Dependent Study Headings Data Sheet

The *Risk Ranking Dependent Study Headings* data sheet allows the user to select any number of text type study headings for use as the dependent study headings. Each dependent study heading selected creates a risk ranking matrix. Each dependent study heading has a set of values associated with it. By default these are I, A and N (short for Intolerable, Acceptable and Negligible) . These are suggested values for use in the risk ranking values, other values may also be entered apart from these.



Risk Ranking Association Data Sheet

The *Risk Ranking Association* data sheet allows the user to create to associate one or more independent study headings with a dependent study heading. Each dependent study heading selected creates a risk ranking matrix and each associated independent study heading corresponds to a column in the risk ranking matrix.

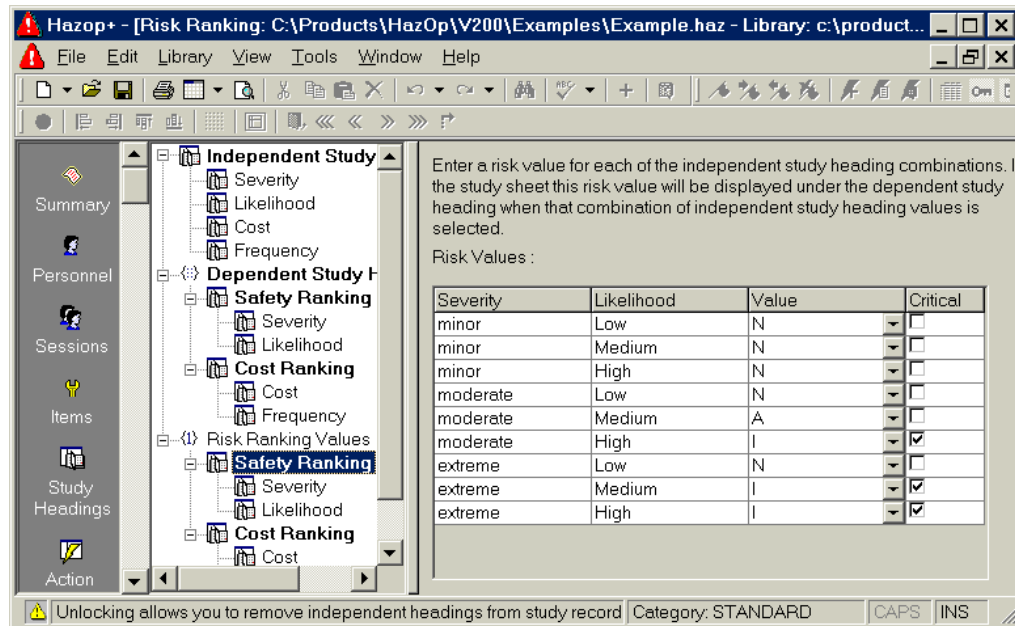


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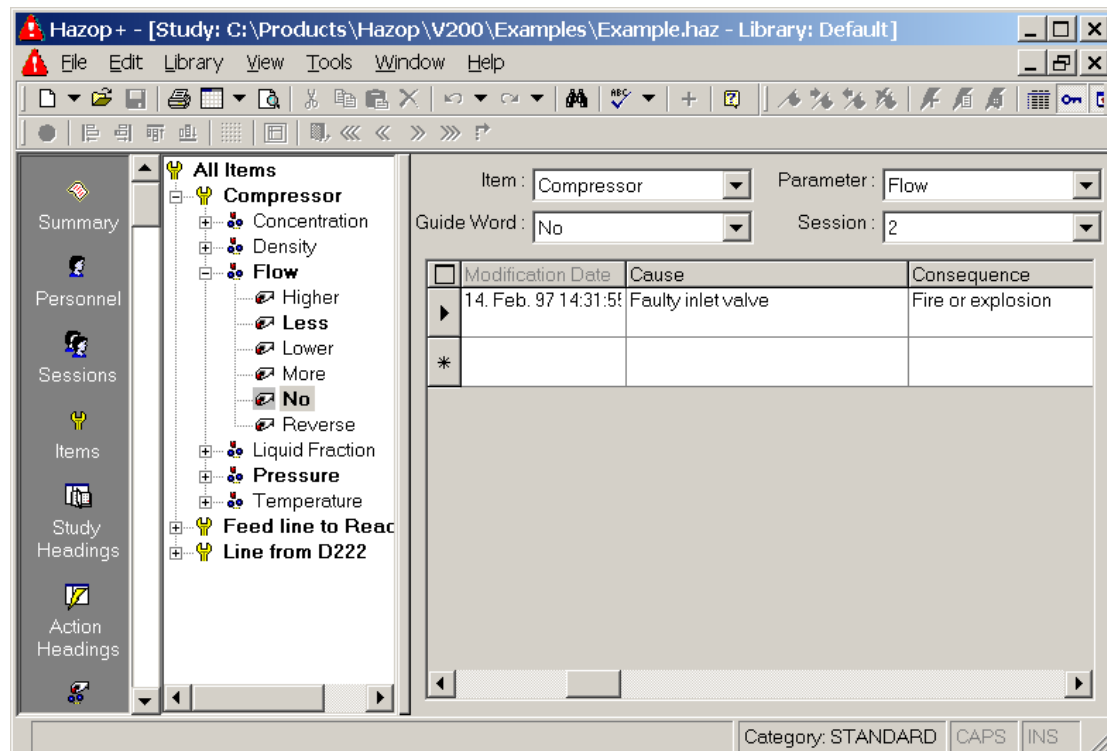
Risk Ranking Values Data Sheet

The *Risk Ranking Value* data sheet allows the user to set the values of all the independent study heading value combinations in each of the risk ranking matrices.



Study Data Sheet

The details of the Hazop study are entered into the Hazop+ study data sheet designed in the setup and customisation phase. In cases where problems are identified which cannot be resolved during the study session then actions are allocated to individuals or groups which are documented in the Hazop+ action data sheet. The Hazop study may include risk ranking in which the likelihood and consequence of an event are linked to a measure of risk by a user defined table.



Study Data Sheet - Normal View

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Study	Action	Cause	Consequence	Safeguards	Safety Ranking	Severity	Likelihood	Cost Ranking	Cost	Frequency
8	5	Faulty inlet valve	Fire or explosion	Gas detection system	I	extreme	Medium	A	medium	moderate
*										

Study Data Sheet - Study Grid Maximised

Action Data Sheet

The actions which are assigned during Hazop study sessions are documented in the action sheet. Further, linked, actions can also be added to existing actions.

Next	Pre	Study	Modification Date	Actioned	Prior	Completo	Status	Recommendations
0	0	1	09. Jul. 02 15:45:07	Maintenance Group F McKenna	F	1	01. Jan. 02	Complete
0	0	2	09. Jul. 02 15:45:12	Maintenance Group F McKenna	F	4	12. Jan. 02	Outstanding
0	0	3	09. Jul. 02 15:45:16	Process engineering D Crabtree	D	2	01. Feb. 02	Outstanding
0	0	4	09. Jul. 02 15:45:22	Technical Director	D	3	13. Feb. 02	Outstanding
0	0	8	09. Jul. 02 15:45:55	Process engineering D Crabtree	D	2	01. Mrz. 02	Complete
0	0	6	09. Jul. 02 15:45:58	Technical Director	D	3	04. Jan. 02	Outstanding
0	0	5	09. Jul. 02 15:46:00	Maintenance Group F McKenna	F	4	07. Feb. 02	Complete
0	0	7	09. Jul. 02 15:46:05	Maintenance Group F McKenna	F	1	22. Feb. 02	Complete

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Report Generator

At any time in the Hazop study Hazop+ can be used to selectively display the study information and prepare customised reports for printing. This powerful feature gives the user great flexibility to examine and report on the important information generated during a study.

The screenshot shows the Hazop+ software interface with a report titled "Actions". The report is displayed in a window titled "Hazop+ - [Report - Actions]". The interface includes a menu bar (File, Edit, Select, Layout, Preview, View, Window, Help) and a toolbar with various icons. The report content is as follows:

Date: 03.12.2002 Report Name: Actions

Previous ID	Next ID	Study ID	Modification Date	Actioned Person/Group	Priority	Completion Date	Status
0	0	1	08.07.2002 15:45:07	Maintenance Group F Mckenna	1	01.01.2002	Complete
0	0	2	08.07.2002 15:45:12	Maintenance Group F Mckenna	4	12.01.2002	Outstanding
0	0	3	08.07.2002 15:45:16	Process engineering P Crabtree	2	01.02.2002	Outstanding
0	0	4	08.07.2002 15:45:22	Technical Director	3	13.02.2002	Outstanding
0	0	8	08.07.2002 15:45:55	Process engineering P Crabtree	2	01.03.2002	Complete
0	0	6	08.07.2002 15:45:58	Technical Director	3	04.01.2002	Outstanding
0	0	5	08.07.2002 15:46:00	Maintenance Group F Mckenna	4	07.02.2002	Complete
0	0	7	08.07.2002 15:46:05	Maintenance Group F Mckenna	1	22.02.2002	Complete

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