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The software is designed to operate upon current, as at the date of purchase, Microsoft Windows operating systems as specified in the installation instructions. It shall not be construed that the software is defective if it should fail to operate upon past or future releases of such operating systems.

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GUIDELINES FOR INSTALLING THE HAZOP Manager V6.0 SOFTWARE

SYSTEM REQUIREMENTS

- The operating system should be Windows 95/98/ME, or Windows NT 4.0/2000/XP/Vista.
- The target computer should have a 133 MHz or higher Pentium-compatible processor, with a 256 colour or greater display capability, and at least an SVGA (800 x 600) screen resolution.
- The minimum memory requirements recommended by Microsoft for each operating platform listed above will be adequate.
- For a stand-alone installation a minimum of 10MB of free disk space should be available.

GENERAL REQUIREMENTS

- **Windows NT, 2000, XP or Vista** - The installation of the program will involve adding driver files to your Windows system, and updating the Windows Registry accordingly. In addition, the software will be installed in the Common Programs Group, thus making it available to all users of the target computer.

The security features implemented within Windows NT, 2000, XP and Vista do not allow ordinary users to undertake such operations.

For this reason, any attempt to run the installation program by a user who is not logged on with full System Administrator privileges will be blocked. Similarly, if later the program needs to be 'Repaired', 'Modified' or 'Removed', a System Administrator must also undertake this task.

- **Local vs. Remote Installation** - As part of the installation procedure the Windows Registry will be automatically updated as mentioned above. The Setup program will update these files for the computer **on which it is currently being run**. Problems may arise, therefore, if a Network Administrator, sitting at a remote computer, attempts to use the setup procedure as a vehicle for just transferring files to a directory on a workstation. The possibility then exists that the system files on that workstation will not be correctly updated, and the HAZOP Manager program will not run. With this in mind,

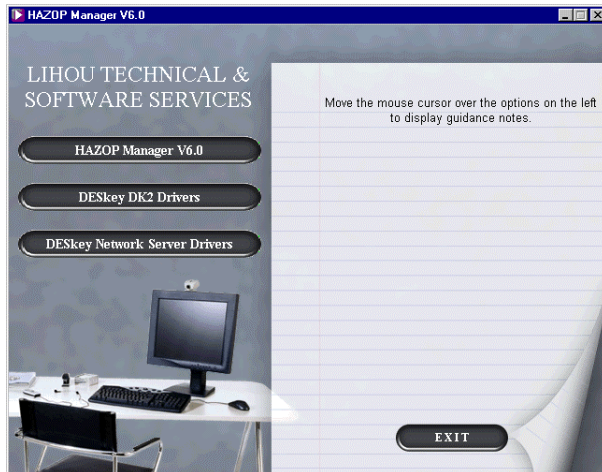
it might be better to undertake installations whilst sitting in front of the target machine.

- **Read-only Windows Directories** - During the installation, the Setup program will need to copy certain files to the target computer's Windows System directory. In some companies, the System directory is made 'read only' to prevent users from altering settings or deleting, adding or amending files or software. If your Windows installation is configured in this manner, then do not proceed with any attempt to install the HAZOP Manager software, as the Setup program will most definitely fail to complete the installation satisfactorily.

If your Windows System directory is locked as explained above, you will need to temporarily remove that lock whilst installing the software. Such a lock can then be re-instated after completing the procedure.

INSTALLING THE SOFTWARE

Place the installation CD in your CD-ROM drive... a menu of installation options as illustrated below should be displayed within approximately 15-20 seconds. If this auto-run facility fails, or is disabled on your computer, refer to the CD label for instructions.



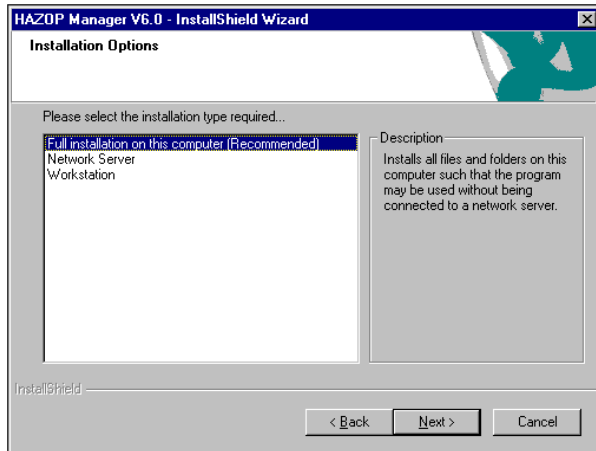
As shown in the illustration on the previous page, there are three options relating to the installation of the software:

- **HAZOP Manager V6.0** - Pressing this button will launch the setup routine for the program's installation. **This option must, of course, be selected for all installations.**
- **DESkey DK2 Drivers** - The software is protected by a DESkey Parallel Port, USB or PCMCIA security device (dongle). Pressing this button will launch the setup routine for installing the necessary drivers and DLLs on the target computer. **This option must be selected for all installations.**
- **DESkey Network Server Drivers** - As mentioned above, the program is protected by a DESkey DK2 device. In most circumstances, this would be plugged directly into the computer currently running the HAZOP Manager program. It is possible, however, to have a DK2 encoded with multiple program licences, such that a single device will permit the simultaneous running of multiple copies of the software (up to the licence count). In this case, the DK2 will need to be plugged into a network server accessible to all workstations on which *both* the program *and* the basic DESkey DK2 drivers in the options above have been installed. Pressing this button will launch the setup routine for installing the necessary licence management software and drivers on the chosen network server. **This option need only be selected in the circumstances described**, and it would essentially be a separate procedure to that carried out for the first two choices above.

For the sake of clarity, the procedures and decisions involved in each of the above three options will be described separately in the sections that follow.

INSTALLING HAZOP Manager V6.0

After the first familiar 'Welcome' screen, the 'Installation Options' window illustrated on the following page will be displayed. It is important to note that the entries in that window regarding 'Network Server' and 'Workstation' are not related in any way to the explanations given above about the location of the DESkey device and its drivers. Rather, these installation options refer to the location of *program* files, and whether you wish them all to be installed on the target computer, or alternatively have them split for administrative purposes between a network server and a workstation.



Installation Options

The recommended course of action when installing the software is to create a 'stand-alone' installation, with all files residing in a read/write directory on the target computer. This is the '**Full Installation**' option in the dialog illustrated above. For each 'Full Installation' you will need to subsequently install the DESkey DK2 Drivers on the computer concerned.

The Setup routine does, however, have the facility to install certain program files (executables and dynamic link libraries) to a network server, such that future updates to such files would only need to be carried out in one location. This is the '**Network Server**' option in the above dialog. The basic DESkey DK2 Drivers should not be installed on this server.

A Network Server installation must be *followed* by one or more '**Workstation**' installations. These will create registry entries and shortcut icons, and copy user files, to each workstation on which the HAZOP Manager program will be used. Following each 'Workstation' installation, you will need to install the DESkey DK2 drivers on that workstation.

If you choose the **Full Installation**, you will subsequently be given the *option* to install certain program files in a read-only folder, and other user files in a folder with full read-write permissions. This is discussed in the section that follows.

Choosing the location of User Files

The program utilises and creates many files that are editable, and which in most circumstances must be accessible to all users of the software. These are, for example, Data files, Keywords, Resources, Headings, Macros, Causes and Failure Rate databases, etc. (hereafter referred to as 'User Files'). It is important that these User Files are stored in a location that has read/write permission for all persons who will be running the program on the target computer. In other words, they should not be located in one individual's personal 'My Documents' folder unless it can be guaranteed that no one else will need access to his or her data files. When performing a 'Workstation' installation, this is the main consideration. However, as mentioned in the previous section, even when performing a 'Full Installation' it is sometimes deemed necessary for the program files (executables and DLLs) to be located in a read only folder on the target computer to prevent inadvertent modification or even deletion. The Setup program will enquire whether the main program directory will be read-only, and if that is the case, request that another location be specified for User files. It is important that you take heed of this enquiry and request... the most common reason for subsequent problems in running the HAZOP Manager software are User Files incorrectly located in read-only directories.

INSTALLING THE DESkey DK2 DRIVERS

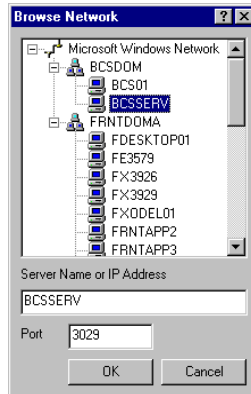
Important – If your DESkey is a USB or PCMCIA device, you should not plug it into the target computer until these drivers have been loaded (this may require a re-boot of the computer). Failure to follow this sequence is likely to result in your Windows operating System loading its own inappropriate drivers, and if that occurs you will be unable to run the HAZOP Manager software. Note that, *after installing the drivers*, if a 'Found New Hardware Wizard' is displayed on the first occasion that the device is plugged into the computer, you should allow Windows to 'Install the software automatically (Recommended)'. *It will not be necessary to re-insert the installation CD-ROM.*

After the first familiar Welcome screen, you will be asked to specify where the DESkey will be located. The options are:

- **This machine**
- **A machine on the network using a DK2 Network Server**

If you select '**This machine**', then the installation will proceed to completion without any further intervention on your part.

If you select ‘**A machine on the network etc...**’, then a further ‘Network Configuration’ dialog will be displayed in which you will be required to name the server to which the DESkey will be fitted, and on which the required server software is, or will be, installed. Press the ‘Add’ button, which will display a further small dialog, then on this latter dialog press the ‘Browse’ button to select from a list of servers as illustrated below.



Having selected the network server, the installation will proceed to completion without further intervention on your part. Note that at a later date you may change to another server by invoking the DESkey Applet within Control Panel, and then following essentially the same procedure as described above.

INSTALLING THE DESkey NETWORK SERVER DRIVERS

Firstly, it is recommended that you do not plug the DESkey into the server until prompted to do so after the software has been installed. This is especially important for USB or PCMCIA devices.

Following the first Welcome screen, the next dialog displayed will ask you to specify the directory (folder) on the server in which the driver and licence management software should be located. You may either accept the default presented, or alternatively press the ‘Browse’ button to select another folder.

After the software has been installed you will be asked whether you wish the service to be started immediately. For a Parallel Port or USB DESkey you may plug the device into the machine and press the ‘Yes’ button. For a PCMCIA device you will need to press ‘No’, and then reboot the server.

Further information regarding the management of a network server installation can be found in the 'DNSrv32V5.pdf' file, which is located in the \DESkey sub-folder on the program's installation CD-ROM. The default password to access the functionality of the 'Network Server Remote Monitor' utility is mentioned on Page 5 of that document. This password should be changed as soon as possible, as all users of the HAZOP Manager program will be able to access this utility on their workstations. This allows them to check who is currently using the software, but it would be undesirable if they could also then use that default password to, for example, abruptly terminate another person's use of the program.

RUNNING THE HAZOP Manager PROGRAM

The software is protected by means of a DESkey DK2 security device. You should ensure that the DESkey software has been installed and that the device is fitted to the appropriate port before attempting to run the program (see the DESkey section on page 10 of this guide). Then click on the Start button on your taskbar, highlight the Programs folder, open (highlight) the HAZOP Manager V6.0 sub-folder, and then click on the 'HAZOP Manager V6.0 Program' entry.

On the first occasion the software is run it will register the Hazop Data File extension (*.hdf) with the Windows system. Thereafter, you may also double click on a data file within Windows Explorer to launch the program.

REPAIRING, MODIFYING OR REMOVING THE PROGRAM

During the setup of the HAZOP Manager program, a 'Change/Remove' facility will have been registered within the Add/Remove Programs icon in the Control Panel. Such a facility will provide an easy method of repairing, modifying or removing the program.

You may choose to 'Repair' the program if, for instance, certain files or Registry entries required by the software have been inadvertently deleted.

The only modification that can be made to the installation is the addition of further dictionaries for the purpose of spell checking in different languages.

The 'Remove' option should only be selected when the entire application is no longer required on the computer concerned.

The following points should be borne in mind:

- If your computer is running Windows NT, 2000, XP or Vista, the repair / modification / removal of the program can only be accomplished by a System Administrator.
- Data files created by you will not be deleted, nor will any other user files created by the software during the normal course of its operation.
- The DESkey drivers will not be automatically uninstalled in case other software on your computer requires a similar device. This will preclude the possibility of such other software suddenly and inexplicably failing to function. However, should you wish to remove these drivers because you are certain that they are no longer required, use the separate entry in Control Panel's Add/Remove Programs list entitled 'DK2 DESkey Drivers'. As mentioned above, a System Administrator will need to accomplish this task.

THE 'DESkey' SOFTWARE PROTECTION DEVICE

Before running the HAZOP Manager program you should ensure that the DESkey software is installed (see the section on DESkey DK2 Driver installation on Page 6) and that the device is fitted to the appropriate hardware port.

When starting the program two messages will be very briefly displayed... 'Checking Security' followed by 'Loading Application'. Providing the conditions described in the above paragraph are fulfilled, the program's main window should then be opened. In the very unlikely event that a problem occurs during this phase of program loading, one of the following error messages will be displayed:

- **DESkey not found. Insert DESkey and restart program.** This indicates that the security software cannot locate the DESkey. Bear in mind that if using a parallel port device, it is possible on some computers to fit the device the wrong way round to the serial port. Note the arrows that indicate which end should be plugged into your computer. Also with such a device, if a printer is attached to the DESkey, it is important that the printer is switched on. Otherwise, electrical power will be drained from the device, causing it to return weak or corrupted data when interrogated by the program.

Another potential reason for this message to be displayed is that your DESkey Driver software is not compatible with your Windows operating system. This could be the case if, having successfully run the program in the past, you have now upgraded to a new version of Windows. If this appears to be the cause of the problem, you will need to contact LTSS for technical assistance.

The final reason for this error to occur is either a malfunctioning computer port or a damaged DESkey. Try running the program, using the same device, on another computer. If the same problem still occurs, contact LTSS.

- **DESkey Device Driver not found. Install and restart program.** Note the different wording to the message above. This indicates that either the required driver software (see Page 6) has not been installed, or the installation of this software has failed. If the latter, you should contact LTSS for technical assistance.

- **Decryption failed. Please check your DESkey.** This could indicate either a malfunctioning device, or a problem with the driver installation. Try un-installing and then re-installing the DESkey drivers, and if the problem persists, contact LTSS.
- **You do not have authorisation to run this program.** This almost certainly indicates that you are attempting to run the program with a DESkey supplied with a previous version of the HAZOP Manager software. You will need to either update the device with the utility software provided for this purpose, or alternatively contact LTSS to order a program upgrade.
- **No Servers could be found.** This message will only be displayed if your DESkey driver installation has been configured to access a multi-user device located remotely on a network server. Almost invariably this will indicate that all program licences are currently in use. However, if this is not the case, either your installation has been set up with incorrect server information, the server software has not been installed, or the device has been removed from the server. Contact your IT Department for assistance.

Note that if the DESkey is removed whilst running the software, the program will display a message asking whether you wish to refit the device. **You should always replace the DESkey.** If you respond in the negative, the program will be abruptly terminated and you will run the risk of damaging your data files.

When using a parallel port DESkey a similar situation can arise if, in the middle of running the program with a printer connected to your computer and switched on, you turn that printer off without first disconnecting it. Because this may cause the device to respond incorrectly for the reasons described on the previous page, the program will believe that it has been removed.

VERY IMPORTANT (Parallel Port DESKeys only) - The instruction manuals included with earlier models of the Iomega ZIP Parallel Port Disk Drive stated that dongles (DESkeys) could safely be used with these drives. Later Iomega instruction manuals now caution against such use. If using a parallel port ZIP Drive (or a similar drive marketed by another manufacturer), it is strongly recommended that the DESkey is fitted to a separate port (i.e. LPT2), or the drive is temporarily removed whilst running the HAZOP Manager program. **Failure to do this could result in severe damage to the DESkey's electronic components.**

THE ACTION RESPONSE UTILITY PROGRAM

In addition to the HAZOP Manager program files, an executable file named ACTRSP.EXE will have been installed on your computer (or network server). You will also note that an icon will have been created in the HAZOP Manager V6.0 program folder that will allow you to run this utility.

If actions are to be distributed by e-mail or on diskette, you will need to include this utility program with the Action Files. It would be utilised by recipients to type their responses, and then subsequently to create Response Files. These latter files would be returned to the Study Secretary, who would use them to automatically update the main study file.

If desired, the Study Leader or Secretary may use this utility to open and scan (but not alter) the contents of the returned Response Files before they are read into the main study data file. However, the icon is also provided so that those persons may familiarise themselves with this utility program's operation before despatching it to third parties. They will then be in a better position to advise and guide the recipients of Action Files as to how best to use this facility to generate their responses.

To assist in this process of familiarisation, a data file named ACTRSP.HDF, together with an Action File entitled 'D Matthews_1.act', will have been installed in the \DATA subdirectory. A brief description of the purpose and content of these files, and the procedure to follow when experimenting with this facility, is given in the 'Other Details' section of ACTRSP.HDF. Opening that file in the normal manner, and reading the above-mentioned section, should give sufficient guidance as to how to proceed. Tutorial 9 also shows how this utility may be used. However, if questions arise that are not covered either in the HAZOP Manager or ACTRSP programs' Help files, please contact us. We would be happy to discuss any point that requires clarification.

As mentioned above, Tutorial 9 within this User Guide explains the procedures for creating Action Files, Response Files, and automatically updating the main study data file.

OPERATING GUIDELINES - The Help System

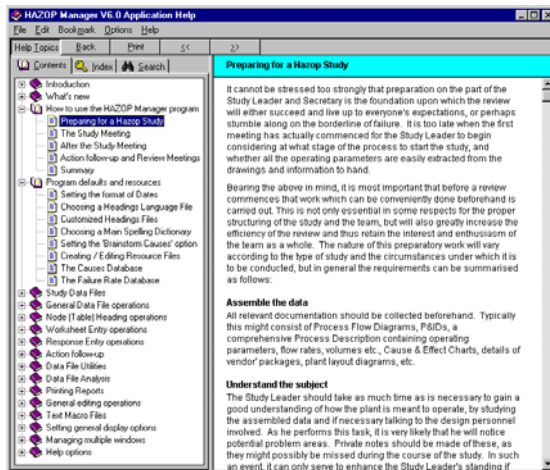
The operating instructions for the HAZOP Manager program are contained in the on-line Help system. For those who are accustomed to having a printed manual, such a statement might induce a sense of unease. However, you should reserve judgement until you get acquainted with the Windows Help engine, which in many ways is far superior to having to refer to printed documentation.

The following sections will explain how you can easily become familiar with the operation of the HAZOP Manager software by using that Help system, and hopefully by the end of this exercise you will feel much more comfortable with the lack of a printed manual.

Before we commence this exploratory exercise, you should start the HAZOP Manager program and wait until the main window is displayed.

Exploring the Help System - The Table of Contents

1. Begin by selecting the Help menu, and the Help Topics option. The window displayed will show the Table of Contents along with the first topic. Each entry in the left-hand pane represents a chapter. Open the third and fourth chapters entitled “How to use the HAZOP Manager program” and “Program defaults and resources” by clicking the plus sign next to their book icons.

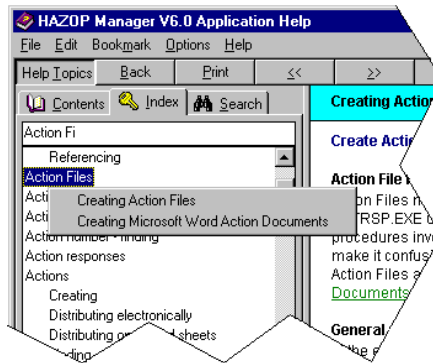


2. Note that each of these chapters is subdivided into pages. Click on “Preparing for a Hazop Study”. The selected topic will appear in the right-hand pane. Take your time to scan the text displayed. There is no need to study these guidelines in detail... at the present time we are getting to know the Help system, rather than learning how to use the program.
3. In the Help window you will notice a section heading “Create a Study Data File”. Click on the green underlined text ‘create a new data file’, and immediately we go to another page in the manual, which explains how this is done.
4. At the bottom of the text on that page is a heading “Data File Options”. Click on the green underlined text ‘Setting Data File Options’ to display an explanation of this procedure.
5. Suppose that we wish to continue our exploratory browsing, but this subject of file options interests us, and we might want to return to it later. Set a bookmark by using the Bookmark menu option. The sequence is menu option Bookmark - Define - OK.
6. Now we want to get back to our original subject of “Preparing for a Hazop Study”. We may do this in two ways. Either press the Back button twice, or click on the “Preparing for a HAZOP Study” in the Contents pane.
7. Let us now immediately use our bookmark. Select Bookmark - 1 Setting Data File Options, and we are back on that topic. Assuming we no longer need to refer to this again, select Bookmark - Define, highlight the relevant entry, and press Delete.
8. In the left hand pane, you will notice that the chapter entitled “Study Data Files” contains three sub-chapters. Open all three so that each individual page is listed.
9. In the third sub-chapter is a page entitled ‘The sections of a Data File’. Go to this page and scan through it. It will give you a good appreciation of how a data file is represented on screen, and the toolbar buttons used to move through the file.
10. If you wish you may explore further through the Help system, opening further chapters, using the green underlined hypertext links, and the Back button.

11. When you have finished exploring in this manner, and assuming that a Help topic is currently displayed, select the Options menu and the Display History Window command. Every page you have visited will be listed, and you need only double click on any one of them to jump again to that page.

Exploring the Help System - The Index

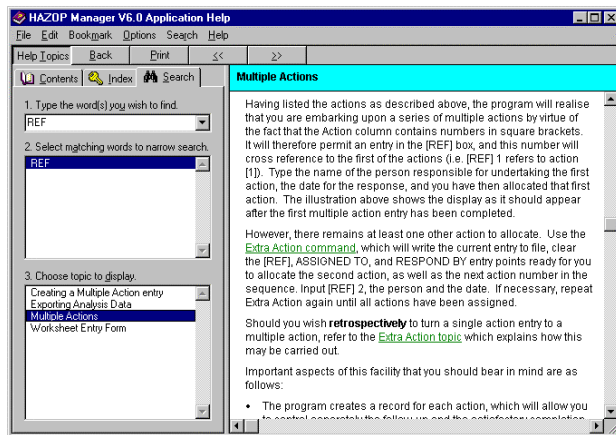
1. If necessary, open the Help system again, then press the Index tab.
2. Earlier in this User Guide, you may remember reading a reference to Action Files. You wish to find out more about these without having to search through every page in the Contents tab.
3. Type 'Action Fi', and the index will scroll automatically to the appropriate section. When you click on the 'Action Files' topic a popup window will indicate that there are two pages concerned with this subject. You may wish to open them both to scan their contents.



4. Type 'Word' in the edit box at the top of the Index. Notice that the topic 'Word-Microsoft ... Action Documents' is scrolled into view, illustrating that you can find an individual topic using different keywords.

Exploring the Help System - The Find facility

1. If necessary, open the Help system again, then press the Contents tab.
2. Open the chapter “Worksheet Entry operations”, and go to the page ‘Worksheet Entry Form’.
3. Note that in the illustration on that page there is an empty box entitled ‘[REF]’. A brief explanation of that entry point is given below the illustration, but let us assume that we fail to notice that explanation. Because the significance of this entry point is not clear, we wish to find out more about it.
4. Click on the Search tab.
5. On the very first occasion you do this, the Windows Help engine will need to create a database. Choose the recommended option of ‘Minimise database size’, and press Finish.



6. Now type ‘REF’ in the edit box (in upper case, as illustrated above). The names of four topics will be displayed. Double click on the ‘Multiple Actions’ topic. The topic displayed explains the significance of the ‘REF’ entry point on the Worksheet Entry form.
7. Try another experiment. You want to know more about Hazop Keywords, and it is a good bet that in a topic covering that subject the word ‘Flow’ will be mentioned. Therefore in the Search tab edit box type that word (i.e. Flow).

8. The list of topic pages displayed all contain the word 'Flow', and amongst them will be the subject that you are interested in, namely the 'Keywords Form'.
9. Note that another page listed is 'Defining relevant Keyword combinations'. Open (double click) that as well to learn more about how this feature may help when applying keywords in a study meeting.

Exploring the Help System - Summary

So far we have been using the Help system much as one would refer to a printed manual, and the increase in flexibility and speed we hope is obvious. The statement made at the beginning of this section, expressing our conviction that you will feel comfortable about the lack of printed instructions, we hope has been justified.

If time permits, you should at least open each chapter in the Contents tab, making a mental note of the page headings. It would be very tedious to fully read each individual page, but by scanning only the topic headings you will obtain a basic appreciation of the facilities that are available within the program. Later, when you wish to undertake some seldom used procedure such as copying an entire entry, you will know that there is a quick way to achieve this because you will remember seeing some time ago a topic heading dealing with that subject. You can then use the features of the Help system to obtain a full explanation of how this operation can be accomplished.

In addition to the methods explored above, there is also of course context sensitive help. Highlight a menu option, and whilst keeping it highlighted, press F1 (don't release the mouse button, or the command itself will be activated). This will display a full explanation of that command. Doing the same with a toolbar button (don't release the mouse button) will achieve a similar result.

When an entry form or dialog box is displayed, pressing F1 will also display help for that section of the program.

TUTORIALS - Introduction

Working on the principle that the first steps into unknown territory are always the most worrisome, the following Tutorials for the HAZOP Manager software are intended to familiarise you with its basic concepts and structure, and at the same time introduce you to some of the features of the program. They will not cover every detail and facility available. Rather, they are intended to make you confident in your ability to use the program, so that you may continue the exploration on your own.


It is assumed that you have a basic appreciation of how a Hazop Review is conducted, and the general format and requirements for recording the results of such a study. If this is not the case, then you should consult beforehand one of the many books and articles on the subject. That is not to say that you will be completely bewildered without such prior understanding... indeed, the following exercises may serve to shed some light on the subject. However, in such circumstances there may well be times during these tutorials that the meaning of a term or the purpose of an instruction may not be completely understandable. If this happens, visit the Help system by pressing F1. If the text displayed does not explain what you need to know, try the Index or Search facilities. Bear in mind, however, that the Help system is primarily aimed at guiding you in the use of the program, not teaching you the general methodology of Hazop Studies.

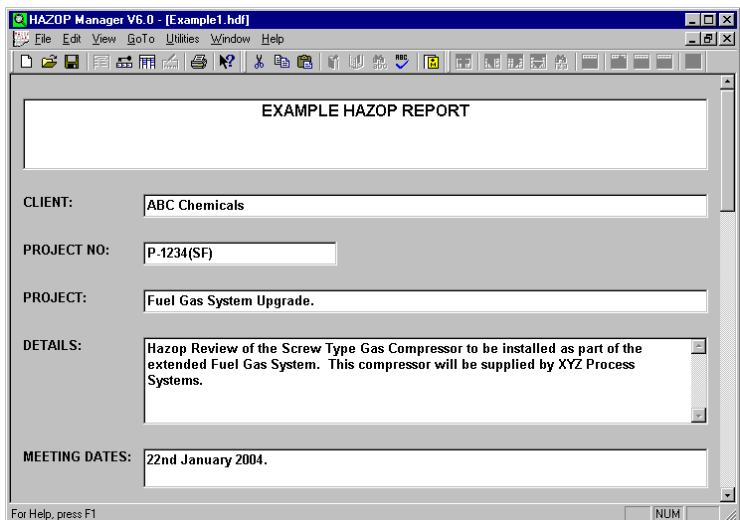
During the course of these tutorials we will employ sample data files named EXAMPLE1 and ACTRSP. These will have been installed with the program in a DATA sub-directory on your hard disk. You will later make additions and modifications to these files. Should you wish to start again with the files in their original state, copies of them will be found in a sub-directory also entitled DATA on the HAZOP Manager Installation CD-ROM. Use Windows Explorer to overwrite the hard disk files with those from the CD. **Always do this when you have finished using the tutorials**, so that any colleague wishing to make use of them in the future will not be confused by the changes you have made.

Should you not have access to the CD-ROM mentioned above, you should instead use Windows Explorer to create a "Copy of EXAMPLE1.HDF" (select the file, right click, select 'Copy', right click and select 'Paste'). At the end of the tutorials you can then delete the original file, and rename the copy 'EXAMPLE1.HDF'. Do the same for the ACTRSP.HDF file.

TUTORIAL 1: The Sections of a Data File

This tutorial presents the five main sections of a data file; Study Details, Keywords and Codes, Entries, Node Headings and finally Action Responses. You will learn how to easily navigate between them. No additions or modifications will be made at this stage.


1. Start the HAZOP Manager program, and wait for the title window to be closed.
2. Position the mouse cursor over the  toolbar button. **Do not click the mouse button.** Note the Tooltip that appears explaining that this is the Open (File) button. If you are unfamiliar with tooltips, try pausing with the mouse cursor on other toolbar buttons.
3. Click on the above File Open toolbar button. A standard File Open dialog will be displayed. Locate and open the EXAMPLE1.HDF entry.
4. The Study Details Form will be displayed. Scroll the form using the mouse and the scroll bar. You will see that the information entered on this form is mostly self-explanatory.

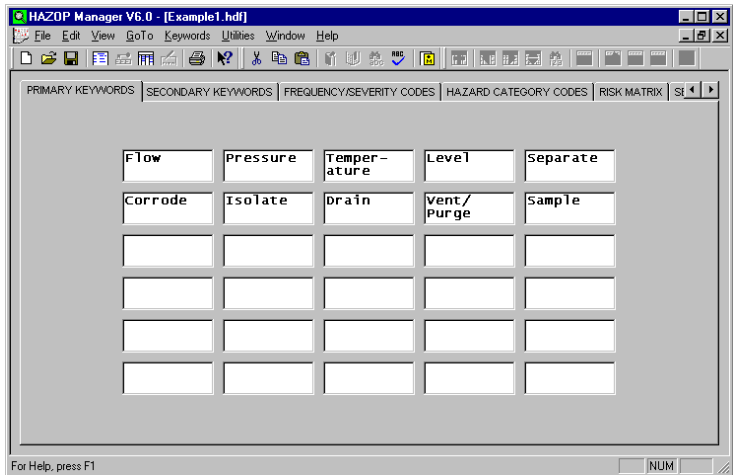


The screenshot shows the HAZOP Manager V6.0 software interface. The window title is "HAZOP Manager V6.0 - [Example1.hdf]". The menu bar includes File, Edit, View, GoTo, Utilities, Window, and Help. The toolbar contains various icons for file operations. The main content area displays "EXAMPLE HAZOP REPORT" and a form with the following fields:


CLIENT:	ABC Chemicals
PROJECT NO:	P-1234(SF)
PROJECT:	Fuel Gas System Upgrade.
DETAILS:	Hazop Review of the Screw Type Gas Compressor to be installed as part of the extended Fuel Gas System. This compressor will be supplied by XYZ Process Systems.
MEETING DATES:	22nd January 2004.

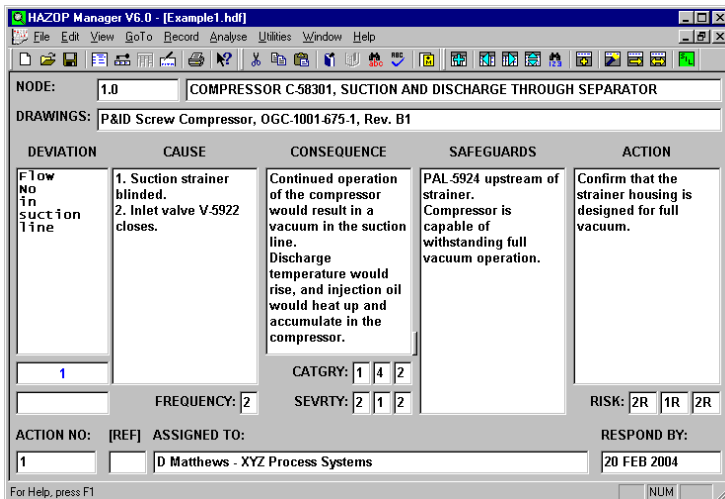
At the bottom left, it says "For Help, press F1". At the bottom right, there is a "NUM" button.

5. Try scrolling the form without the mouse, using instead the Ctrl key with the Up/Down arrow keys.
6. Position the form so that the foot of it is displayed, and Press F1. Read the text displayed, paying particular attention to the section at the end of the Help topic that deals with Action Numbers. Then close the Help system window.
7. Click on the  toolbar button. The Keywords Form will be displayed.



8. View the information entered within each of the six tabs at the top of this form. Press F1, and read about this section of a data file. Note that dependent upon which tab is currently active, the Help window will display different topics when activated. When finished, close the Help system window.
9. Try moving between these two forms (Study Details and Keywords) using the keyboard instead of the mouse. Enter Alt+G ('Go To' menu), followed by D (for 'Details'). Follow this with an Alt+G and then K, and we are back on the Keywords Form.

- Click on the  toolbar button (or Alt+G followed by E). The Entry Form will be displayed, showing the first entry in the file.



HAZOP Manager V6.0 - [Example1.hdf]

File Edit View GoTo Record Analyse Utilities Window Help

NODE: 1.0 COMPRESSOR C-58301, SUCTION AND DISCHARGE THROUGH SEPARATOR

DRAWINGS: P&ID Screw Compressor, OGC-1001-675-1, Rev. B1

DEVIATION	CAUSE	CONSEQUENCE	SAFEGUARDS	ACTION
Flow No in suction line	1. Suction strainer blinded. 2. Inlet valve V-5922 closes.	Continued operation of the compressor would result in a vacuum in the suction line. Discharge temperature would rise, and injection oil would heat up and accumulate in the compressor.	PAL-5924 upstream of strainer. Compressor is capable of withstanding full vacuum operation.	Confirm that the strainer housing is designed for full vacuum.

1

FREQUENCY: 2

SEVRY: 2 1 2

CATGRY: 1 4 2



RISK: 2R 1R 2R


ACTION NO: [REF] ASSIGNED TO: RESPOND BY:

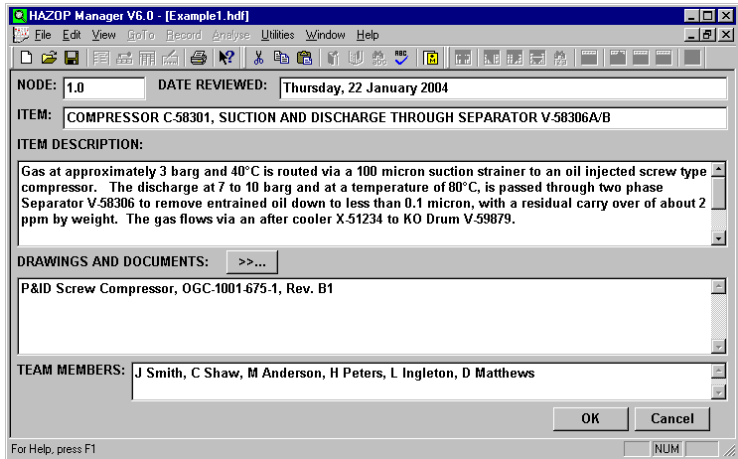
1 [] D Matthews - XYZ Process Systems 20 FEB 2004

For Help, press F1

NUM

- Press F1 and scan the Worksheet Entry Form help topic displayed. When finished, close the Help system window.
- So far the forms we have viewed have been maximised. Click on the appropriate button  in the caption bar to make the form the normal size for a child window within a frame window. The main program window should remain maximised.
- Note that the controls within the entire form have been re-sized, so that there is no need to use scroll bars to view hidden sections. Try re-sizing the form by dragging the sides of its window. Note also, that there is a minimum in both the horizontal and vertical planes below which the program prevents re-sizing.
- Maximise the Entry form again using the appropriate button  on the caption bar.
- With small screens (especially on notebook computers) the text may appear too small to be easily readable. From the View menu, select 'Font Size and Weight', and experiment with different settings until you find a combination that you are happy with.

16. The top two lines on this form show abridged information from the Node Heading. To view the Node Heading in full, either use the  button or double click anywhere on the Node Heading information at the top of the form. Press F1, and scan the topic displayed. When finished, close the Help system window and press Cancel on the Node Heading Form.



HAZOP Manager V6.0 - [Example1.hdf]

File Edit View GoTo Record Analyse Utilities Window Help

NODE: 1.0 DATE REVIEWED: Thursday, 22 January 2004

ITEM: COMPRESSOR C-58301, SUCTION AND DISCHARGE THROUGH SEPARATOR V-58306A/B

ITEM DESCRIPTION:

Gas at approximately 3 barg and 40°C is routed via a 100 micron suction strainer to an oil injected screw type compressor. The discharge at 7 to 10 barg and at a temperature of 80°C, is passed through two phase Separator V-58306 to remove entrained oil down to less than 0.1 micron, with a residual carry over of about 2 ppm by weight. The gas flows via an after cooler X-51234 to KO Drum V-59879.


DRAWINGS AND DOCUMENTS: >>...

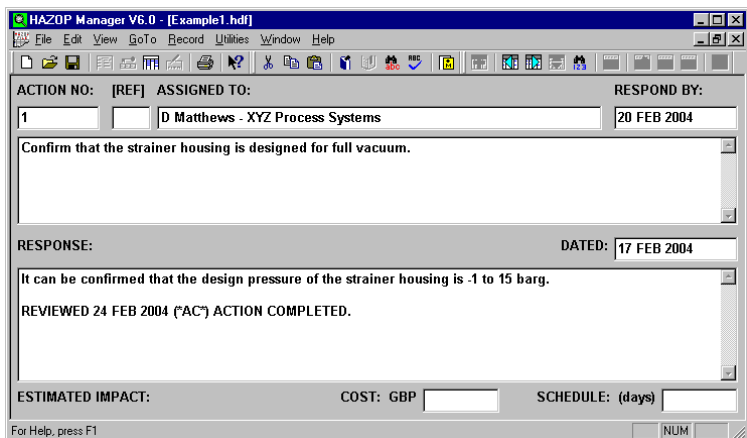
P&ID Screw Compressor, OGC-1001-675-1, Rev. B1

TEAM MEMBERS: J Smith, C Shaw, M Anderson, H Peters, L Ingleton, D Matthews

OK Cancel

For Help, press F1 NUM

17. Click on the  toolbar button. The Action Response Form will be displayed. On it will be recorded the response to the recommended action from D Matthews, and you will see that this response has been reviewed and found to be acceptable.



HAZOP Manager V6.0 - [Example1.hdf]

File Edit View GoTo Record Utilities Window Help

ACTION NO: [REF] ASSIGNED TO: RESPOND BY:

1 [] D Matthews - XYZ Process Systems 20 FEB 2004






Confirm that the strainer housing is designed for full vacuum.

RESPONSE: DATED: 17 FEB 2004

It can be confirmed that the design pressure of the strainer housing is -1 to 15 barg.
REVIEWED 24 FEB 2004 ("AC") ACTION COMPLETED.

ESTIMATED IMPACT: COST: GBP [] SCHEDULE: (days) []

For Help, press F1 NUM

18. Press F1 and scan the Response Entry Form help topic displayed. When finished, close the Help system.
19. At the present time we can view only the Action and Response details. Press the  button to display the entire entry. Then press the  button to display the Node Heading for that entry.
20. Press the Cancel button, followed by the  toolbar button. We are now back on the response we were viewing. From this quick series of mouse clicks you will see how easy it is to view every detail relating to an action without the need to start up extra program modules. (With regard to displaying the Node Heading, even though this doesn't apply to the current response, in some cases you may wish to verify that an operating parameter referred to is indeed accurate).
21. Now navigate back to the Study Details section of the data file using the  and  toolbar buttons.
22. Unless you wish to practice further, you may now close the EXAMPLE1 file (Alt+F then C). Should you have had enough for one session, you may also close down the program (Alt+F then X). Of course, for either or both of these operations you may click on the appropriate buttons on the caption bars.



The above exercise will have introduced you to the methods involved in moving between various sections of a data file. At this stage you should have learnt that there are five main sectors; Study Details, Keywords and Codes, Entries, Node Headings and finally Action Responses. Having read the Help along the way, you will have a grasp of the purpose of each section in terms of the data it contains, and how certain sections relate to one another. You should now feel confident that you could find your way to any sector of the file.

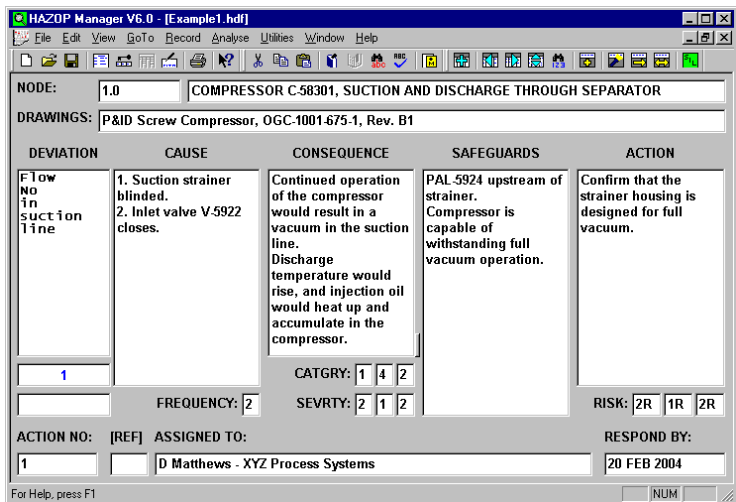
If you wish to practice what we have been doing so far, by all means do so. However, do not make any changes to the file at this stage... we will commence that in Tutorial 5.

In the next Tutorial, we will show ways in which you may navigate through the information contained within various sections of the file.

TUTORIAL 2: Navigating through the Data File

This tutorial will show you some of the many ways that you can navigate through and find information held in various sections of the data file. If you are not familiar with the sections of a data file, you can refer to the previous tutorial.

1. Start the HAZOP Manager program, and wait for the title window to be closed.
2. Click on the File Open toolbar button . A standard File Open dialog will be displayed. Locate and open EXAMPLE1.HDF.
3. Click on the  toolbar button (or Alt+G followed by E). The Entry Form will be displayed, showing the first entry in the file.



The screenshot shows the HAZOP Manager V6.0 interface. The title bar reads "HAZOP Manager V6.0 - [Example1.hdf]". The menu bar includes File, Edit, View, GoTo, Record, Analyse, Utilities, Window, and Help. The toolbar contains various icons for file operations and analysis. The main window displays the following information:

NODE: 1.0 COMPRESSOR C.58301, SUCTION AND DISCHARGE THROUGH SEPARATOR
DRAWINGS: P&ID Screw Compressor, OGC-1001-675-1, Rev. B1



DEVIATION	CAUSE	CONSEQUENCE	SAFEGUARDS	ACTION
Flow No in suction line	1. Suction strainer blinded. 2. Inlet valve V-5922 closes.	Continued operation of the compressor would result in a vacuum in the suction line. Discharge temperature would rise, and injection oil would heat up and accumulate in the compressor.	PAL-5924 upstream of strainer. Compressor is capable of withstanding full vacuum operation.	Confirm that the strainer housing is designed for full vacuum.

1


CATGRY: 1 4 2
FREQUENCY: 2 SEVRTY: 2 1 2
RISK: 2R 1R 2R

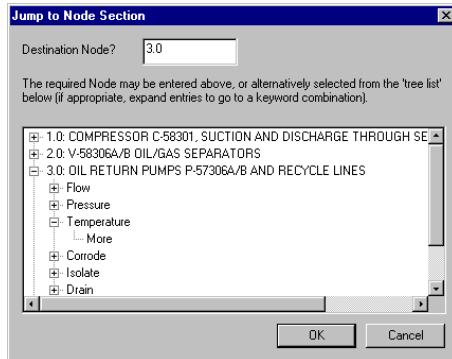
ACTION NO: [REF] ASSIGNED TO: RESPOND BY:
1 [] D Matthews - XYZ Process Systems 20 FEB 2004



For Help, press F1 NUM

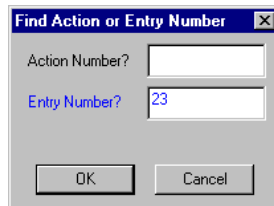
4. Use the  and  buttons to page forwards and backwards through the entries in the data file. Then try using the Ctrl+PgDn and Ctrl+PgUp keys to achieve the same result. As you page through the file, note that from time to time the Node Heading information at the top will change. In other words, each Node contains many entries.
5. Page backwards until you are on the first entry again.



EXAMPLE1 is a relatively small data file. Getting to a specified position within this file by paging through entry-by-entry is tedious enough... imagine what it would be like with a much larger file. With this in mind, we will explore quicker means of traversing through entries.

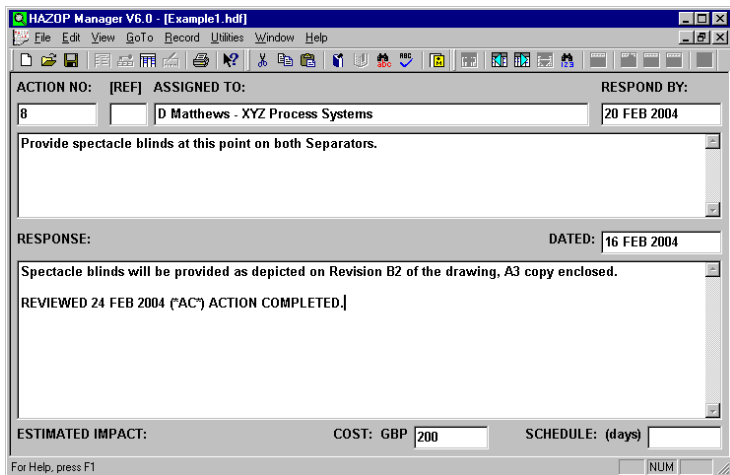
- Click on the  button. Either enter 3.0 in 'Destination Node?' box of the dialog as illustrated below, or select that Node from the displayed list. Press OK, and you will see that we have immediately jumped to the first entry in Node 3.0. Note that, as described in the guidance text, we can also jump to a particular keyword or keyword combination section within the destination Node.






- Click on the  button. Use the Previous and Next buttons on the Heading Form displayed to move from heading to heading. Display the heading for Node 1.0, and press OK. We are back on the first entry again.
- Click on the  button (or Alt+R then F), enter 23 in the Entry Number field of the displayed dialog and press OK. We are now viewing Entry 23.



9. Click on the  button again, and enter 16, but this time in the Action Number field of the displayed dialog. Press OK, and we are now viewing the entry containing Action 16.
10. Use the 'Record' menu, 'Find Action or Entry' option, to go to Action 8.
11. View the Response for this Action by clicking the  toolbar button. The Response for Action 8 will be displayed.



The screenshot shows the HAZOP Manager V6.0 interface. The title bar reads "HAZOP Manager V6.0 - [Example1.hdl]". The menu bar includes File, Edit, View, GoTo, Record, Utilities, Window, and Help. The toolbar contains various icons for navigation and editing. The main form is titled "ACTION NO: [REF] ASSIGNED TO: RESPOND BY:". The "ACTION NO:" field contains "8", "ASSIGNED TO:" contains "D Matthews - XYZ Process Systems", and "RESPOND BY:" contains "20 FEB 2004". Below this is a text area with the instruction "Provide spectacle blinds at this point on both Separators." The "RESPONSE:" section has a "DATED:" field set to "16 FEB 2004" and a text area containing "Spectacle blinds will be provided as depicted on Revision B2 of the drawing, A3 copy enclosed. REVIEWED 24 FEB 2004 (*AC*) ACTION COMPLETED." At the bottom, there are fields for "ESTIMATED IMPACT:", "COST: GBP" (with a value of "200"), and "SCHEDULE: (days)". A "NUM" button is visible in the bottom right corner.

12. In the Response form you may use many of the same techniques for navigation that you have already used when viewing the Entries form. The only difference is that you will be navigating through Actions and their Responses rather than individual Entries. Try it... use the  and  buttons to page backwards and forwards through the Action Responses.
13. Now, select 'Find Action' from the 'Record' menu (Alt+R then F) or press the  toolbar button. In the dialog displayed type 23, and press OK.
14. As you will have discovered, there is no such Action number. Press Cancel, or change the 23 to 16 and press OK.
15. Make a mental note of the way in which the date is displayed in the small box entitled 'DATED:'. We will experiment with date formats in a later exercise.

16. Unless you wish to practice further, you may now close the EXAMPLE1 file (Alt+F then C). Should you have had enough for one session, you may also close down the program (Alt+F then X). Of course, for either or both of these operations you may click on the appropriate buttons on the caption bars.

This exercise will have introduced you to the methods involved in navigating through information held within certain sections of a data file. At this stage you should feel reasonably confident about opening and viewing such a file, knowing with a fair degree of certainty what to expect when you press one of the toolbar buttons or invoke one of the menu options that we have used.

If you wish to practice what we have been doing so far, by all means do so. However, do not make any changes to the file at this stage... we will commence that in Tutorial 5.

TUTORIAL 3: Displaying Additional Data

On some of the forms that we have seen in the previous two tutorials there have been fields or entry boxes that do not always need to be displayed. Conversely, there is also data stored within the file that is by default not displayed in full, and to view such data we need to take positive action. This tutorial will show you how to display and hide data that might, or might not, be necessary for a particular study.

1. Start the HAZOP Manager program, open the EXAMPLE1.HDF file and go to the Entries form. Navigate to Entry 3. You should now be viewing the entry shown below.

The screenshot shows the HAZOP Manager V6.0 interface. The title bar reads "HAZOP Manager V6.0 - [Example1.hdf]". The menu bar includes File, Edit, View, GoTo, Record, Analyse, Utilities, Window, and Help. The toolbar contains various icons for file operations and analysis. The main window displays the following information:

NODE: 1.0 COMPRESSOR C.58301, SUCTION AND DISCHARGE THROUGH SEPARATOR

DRAWINGS: P&ID Screw Compressor, OGC.1001-675-1, Rev. B1

DEVIATION	CAUSE	CONSEQUENCE	SAFEGUARDS	ACTION
Flow No in discharge line	1. Outlet valve V-5927 closes. 2. Spectacle blinds left shut after changeover. 3. 3-way valve V-5502 in incorrect position after changeover. 4. Other block valve/s closed in error.	Compressor deadheaded, leading to overpressure of discharge line.	1. PSHH-5919 trips compressor and injection oil recycle pumps. 2. PRV-5902A/B protects against all causes except No 3. 3. Interlock system for ensuring that V-5502 and either V5503 or V-5504 are always open to the relief valves PRV-5902A/B.	No action required, existing safeguards considered adequate.

3 (Entry Number)

N(P)-- (Note indicator)

FREQUENCY: 3

CATGRY: 2 3

SEVRTY: 1 1

RISK: 2R 2R

ACTION NO: [REF] **ASSIGNED TO:** **RESPOND BY:** dd MMM yyyy

For Help, press F1


2. Notice that, beneath the blue (Entry Number) 3 on the left of the form, there is a field displaying the text "N(P)--". This indicates that a NOTE has been attached to this entry. To view the note, double click the blue text or select 'Note' from the 'Record' menu.

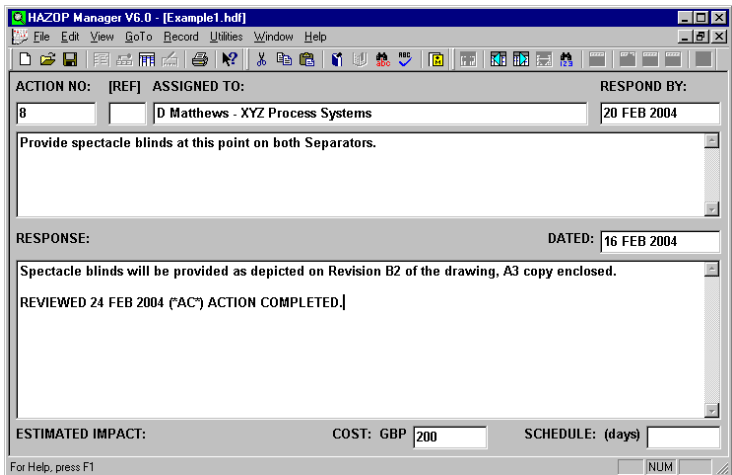
The Notes dialog box has a title bar "Notes" and a close button. It contains a tabbed interface with "NOTE" selected. The text area displays:

Compressor motor is provided with temperature and electrical overload protection.

There is a checkbox labeled "Not to be printed in reports" and an "OK" button.

In the dialog displayed, you will notice three tabs. The first tab stores a general note for the current entry. The second and third tabs are initially 'free', which is to say that they may store any type of information you require. In the case above, the second tab has been labelled 'SIL Analysis'. In a later tutorial, we will show how it is possible to define your own headings for this and many other forms.

3. Whilst the Notes dialog is displayed, press F1 for an explanation of this facility. Close the Help window, and press the OK button to close the Notes dialog.
4. Using the 'View' menu, experiment with toggling the display of Frequency, Severity, Category and Extra Column. Use the Help system to view explanations of these entry points (Hint: you could try hovering the mouse over each menu command and pressing F1).
5. When you have finished reading about these data entry points, ensure that the display of all four is toggled on. If presently hidden, press as necessary Alt+V followed by F, Alt+V then C, Alt+V followed by S, and finally Alt+V then X. Note that the program stores these settings within EXAMPLE1, so that when we next open this data file our choices will be preserved.
6. Navigate to Action 8, and click the  toolbar button to show the response.



The screenshot shows the HAZOP Manager V6.0 software interface. The window title is "HAZOP Manager V6.0 - [Example1.hdf]". The menu bar includes File, Edit, View, GoTo, Record, Utilities, Window, and Help. The toolbar contains various icons for file operations and editing. The main form is divided into several sections:

- ACTION NO:** [REF] []
- ASSIGNED TO:** [D Matthews - XYZ Process Systems]
- RESPOND BY:** [20 FEB 2004]
- Text Area:** Provide spectacle blinds at this point on both Separators.
- RESPONSE:** []
- DATED:** [16 FEB 2004]
- Text Area:** Spectacle blinds will be provided as depicted on Revision B2 of the drawing, A3 copy enclosed.
REVIEWED 24 FEB 2004 ("AC") ACTION COMPLETED.]
- ESTIMATED IMPACT:** []
- COST: GBP** [200]
- SCHEDULE: (days)** []

At the bottom left, it says "For Help, press F1". At the bottom right, there is a "NUM" field.

7. Note that at the foot of the form the estimated cost of the action has been entered. Press F1 to display the Response Form help topic. In the last paragraph there is a hypertext link entitled View Impact. Click on this, read the topic displayed, then close the Help window.
8. You will have read that the default is not to display these Cost and Schedule entry points, unless you have specifically asked for this information to be supplied. For the EXAMPLE1 file, this default has been overridden.
9. Try toggling off the display of these entry points (Alt+V then I), then showing them again.
10. Unless you wish to practice further, you may now close the EXAMPLE1 file (Alt+F then C). Should you have had enough for one session, you may also close down the program (Alt+F then X). Of course, for either or both of these operations you may click on the appropriate buttons on the caption bars.

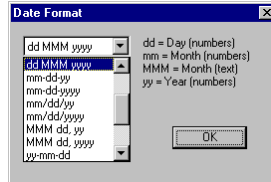
The above exercise will have introduced you to some of the data that it is not always necessary to view, and shown you how to hide and display it as you may require. Having completed the first three tutorials, you will now be feeling confident enough to navigate through and view all of the information in a data file. In the next two tutorials, we will learn how to set program and file defaults, and then start making basic entries.

If you wish to practice what we have been doing so far, by all means do so. However, do not make any changes to the file at this stage... we will commence that in Tutorial 5.

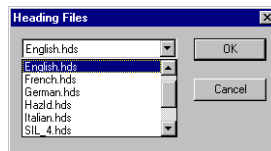
TUTORIAL 4: Setting Program Defaults

In this exercise we will experiment with setting some program defaults.

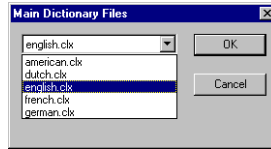
1. If necessary, start the HAZOP Manager program, and wait for the title window to close.
2. From the 'Set Defaults' menu, choose the 'Date Format' option.



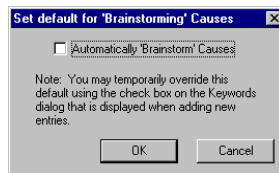
3. The combo box displayed shows the date formats available, with the currently selected one being highlighted. Solely for the purpose of experimentation, make a note of the default format, then change it and press OK.
4. From the 'Set Defaults' menu, choose the 'Headings File' option. The combo box displayed lists various language files... English, German, Dutch, French, Italian and Spanish. Press F1 to invoke the Help system and scan the topic displayed. Close the Help window.



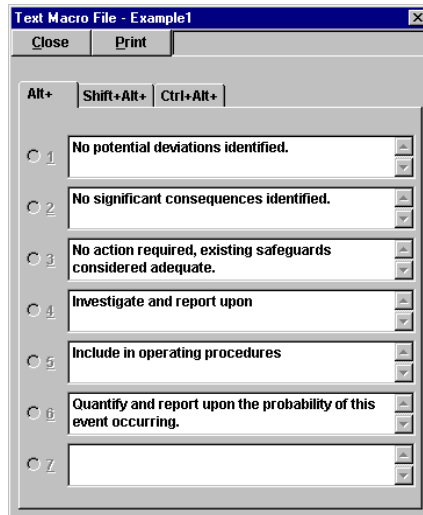
5. According to the country in which you are located, change if necessary the default language, and press OK.
6. From the 'Set Defaults' menu, choose the 'Main Spelling Dictionary' option. The combo box displayed lists dictionaries for various languages... English, American, German, Dutch and French (whichever are installed). Press F1 to invoke the Help system and scan the topic displayed. Close the Help window.




7. According to the language in which studies are to be recorded, change if necessary the default dictionary file, and press OK.
8. From the 'Set Defaults' menu, choose the 'Brainstorm Causes' option. Press F1 to invoke the Help system and scan the topic displayed and also the link that describes the method of Brainstorming Causes. Close the Help system and Cancel the Brainstorm Causes dialog.



9. From the 'Utilities' menu select the 'Edit Macro File' command. Open the EXAMPLE1.MAC file.
10. The Text Macro dialog displayed will contain three tabs. Click on each to display the phrases contained under each tab.







11. Whilst the Macro dialog is displayed, press F1. Scan the topic, paying particular attention to the discussion regarding the various ways in which the phrases may be automatically entered into your data file.
12. When finished, close the Help system window, and then press the Close button on the dialog. Note that by 'editing' this macro file we have effectively loaded it into memory ready for use. To make these phrases available without editing, we would use instead the 'Utilities' menu 'Load Macros' command.
13. Now open the EXAMPLE1 data file. However, on this occasion don't use the File Open command as we have previously done. Instead, press the Alt+F keys and then stop. Note the listing of the file in the popup menu with a l against it. Press l and our file is opened without the need to select it from a standard File Open dialog. This file list will always contain the last four files that you have worked with, and it is the easiest way to open a data file.
14. Go to the Entries form by using the  toolbar button.
15. From the 'File' menu select the 'Change Headings' option. The combo box displayed is the same as the one we saw in Step 4 above. Select the GERMAN.HDS file, press OK, and view the result.
16. Open the combo box again (Alt+F then H) and then press F1. Read the topic displayed. On the last line use the hypertext link to the Customized Headings File topic to scan that as well. When finished, close the Help system window.
17. Select ENGLISH.HDS from the list and press OK.
18. Note that the date in the 'Respond By' field (bottom right hand corner of the Entries window) is now displayed in the format you chose in Step 3 of this exercise.
19. Now close the EXAMPLE1 file and reset the Date Format (Alt+S then D) to its original value.
20. Unless you wish to continue experimenting with Defaults, you may close down the program.

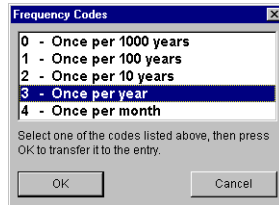
The above exercise will have shown you how to set some basic program defaults, and you will have seen the effect of changing Headings and Date Formats. In the next tutorial we will start entering new data into the file.

TUTORIAL 5: Adding Entries / Multiple Actions / Renumbering

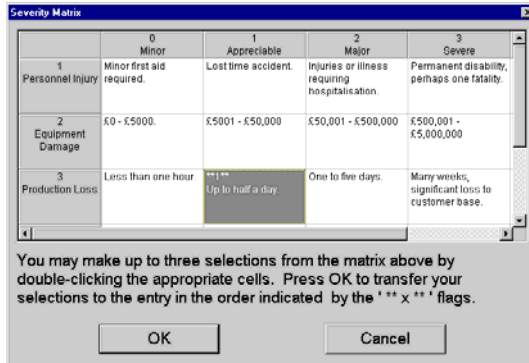
In this exercise, we will be creating new entries in our data file

1. If necessary, start the HAZOP Manager program, and wait for the title window to close.
2. Open the EXAMPLE1 data file; go to the Entries form by using the  toolbar button; then jump to Node 3.0 using the  toolbar button.
3. From the 'Edit' menu, choose 'Load Macros' and open Example1.mac. In order to use text macros, you don't have to view the Macros window, but should you want to, you can do so by pressing the  button.
4. We will now add an entry to Node 3.0. Press the  toolbar button. **This is the one with the turquoise (blue) plus sign.** Note the difference and the placement of this button compared to that containing the yellow plus sign. The button with the turquoise sign is grouped with those for Previous and Next entry, whereas the one with the yellow plus sign (for adding a new Node Heading) is grouped with those relating to moving from Node to Node.
5. The Primary Keywords dialog will be displayed. Before we actually select a keyword, experiment with the various means by which this can be achieved. Type the letter 'p', followed by 'l' and then 'd' (if two keywords begin with the same letter, typing that letter twice will highlight the second one). Then try typing '01', followed by '05'. At any stage during these key operations we could have pressed <Enter> to transfer the word into the DEVIATION column.
6. The final method of selecting a keyword is by the use of the mouse. Double click on the word 'Isolate'.
7. The Secondary Keywords will be displayed. You will note that most keywords are displayed in a red font. Press F1, select the hypertext link for Add Entry, and towards the middle of that topic page you will see another hypertext link entitled Defining relevant Keywords. Click on that link to read an explanation of why, and how, such combinations may be defined. When finished, close the Help window and select the 'No' keyword.

8. Type in the CAUSE column “Spectacle blinds fitted upstream of pump suction isolation valves”.
9. In the FREQUENCY box, enter ‘3’ or right-click and choose ‘3 – Once per year’ from the list that is displayed (note the tooltips that appear if you pause the mouse over either this input box or its descriptor)



10. Type in the CONSEQUENCE column “Unable to swing blinds for maintenance of standby pump without shutting down system”.
11. In the first CATGRY box input a ‘3’, and in the first SEVRTY box input a ‘1’. This indicates that the consequences entail an Appreciable Production Loss. Alternatively, right-click in either box to show the Severity Matrix (press F1 at this point for guidance on how to use the Severity Matrix), double-click the cell that indicates Appreciable Production Loss (‘Up to half a day’) and press OK.



12. Tab across to the ACTION column, and type “Relocate spectacle blinds inboard of pump isolation valves”.

13. Tab to the ASSIGNED TO column. Then press Shift+Alt+4 (all three keys together).
14. The name “D Matthews - XYZ Process Systems” will have been automatically typed into our ASSIGNED TO box. Tab forward to the RESPOND BY entry point, and type, in the indicated format, the date 20 FEB 2004 (all in digits if necessary).

HAZOP Manager V6.0 - [Example1.hdf]

File Edit View GoTo Record Analyse Utilities Window Help

Node: 3.0 OIL RETURN PUMPS P.57306/A/B AND RECYCLE LINES

Drawings: P&ID Screw Compressor, OGC-1001-675-1, Rev. B1

DEVIATION	CAUSE	CONSEQUENCE	SAFEGUARDS	ACTION
Isolate No	Spectacle blinds fitted upstream of pump suction isolation valves.	Unable to swing blinds for maintenance of standby pump without shutting down system.		Relocate spectacle blinds inboard of pump isolation valves.

60

FREQUENCY: 3

CATGRY: 3

SEVRTY: 1

RISK: 2R



ACTION NO: [REF] ASSIGNED TO: RESPOND BY:


21 [] D Matthews - XYZ Process Systems 20 FEB 2004

For Help, press F1

NUM

15. We have now completed our first entry. Make a mental note of the Entry Number (it should be 60)... we will need that number in Step 18 below. Page forward once to the next entry in the data file. This will state that no potential isolation problems were identified, which is now incorrect. We need to change the ‘Isolate All’ keywords to ‘Isolate Remainder’.
16. There are two methods for altering keywords on an entry that has already been recorded. Firstly you may use Alt+R then K. Try this, and then immediately press the Cancel button. Secondly, you may double click in the DEVIATION column. Do so, and the same dialog that was displayed a moment ago appears again.
17. We want to retain the word Isolate, so press OK. Then select ‘Remainder’ and press OK again.

18. Now purely to illustrate two facilities that may well be of use in your studies, type a new sentence in the CAUSE column “See Entry 60.” Highlight the number 60, then select from the ‘Edit’ menu the option ‘Mark reference...’ ‘...to Entry number’. After pressing OK on the explanatory dialog displayed, the end result should be “See Entry 60TM”.
19. We will need to return to this entry later in the tutorial. Set a bookmark for it by pressing the  toolbar button (or enter Alt+E then B). Accept the default description of “NODE 3.0, Isolate Remainder”, and press OK.
20. The next entry we make will be a multiple action entry. Before we do, press F1, click on the Help Topics button, and use the Index to locate the Multiple Actions topic. Read this topic to gain an understanding about when and how you would create such entries, then close the Help window.
21. Press the  button (or Alt+R then A), and select ‘Flow’ followed by ‘Less’.
22. Type in the CAUSE column “Discharge filter partially blinded” and allocate the Frequency code 2 (likely to occur approximately every ten years). Under CONSEQUENCE type “Inadequate lubrication results in compressor damage”.
23. Because this consequence will result in both Major Equipment Damage as well as Major Production Loss, we want to create two pairs of CATGRY/SEVRTY codes. Right-click in any of the CATGRY or SEVRTY boxes to show the Severity Matrix.



The Severity Matrix dialog box displays a grid with the following data:

	0 Minor	1 Appreciable	2 Major	3 Severe
1 Personnel Injury	Minor first aid required.	Lost time accident.	Injuries or illness requiring hospitalisation.	Permanent disability, perhaps one fatality.
2 Equipment Damage	£0 - £5000.	£5001 - £50,000	**1** £50,001 - £500,000	£500,001 - £5,000,000
3 Production Loss	Less than one hour.	Up to half a day.	**2** One to five days.	Many weeks, significant loss to customer base.

You may make up to three selections from the matrix above by double-clicking the appropriate cells. Press OK to transfer your selections to the entry in the order indicated by the ' ** x ** ' flags.

OK Cancel

24. Double-click the cell corresponding to Major Equipment Damage such that ‘**1**’ appears in the cell. Next, double-click the cell corresponding to Major Production Loss such that ‘**2**’ appears in the cell. Now, click OK.
25. Page back one entry. Note that from Isolate we are now automatically in the Flow Less section of Node 3.0. Copy on to the clipboard all the text in the SAFEGUARDS column, which should commence “TAH-5925 alarm ...”. Page forward again to our incomplete entry, and paste that text into the SAFEGUARDS column. To the last item add the text “... flow, but with a common filter this would be ineffective”.
26. In the ACTION column type “[1] Provide separate filters in the discharge of both pumps, each fitted with a dP indicator and local alarm”. Then on the next line type “[2]” followed by a space. From our Text Macro file invoke the macro “Include in operating procedures”, and finish off by adding “the action to take upon initiation of such an alarm” (the macro can be invoked by pressing Alt+5).
27. Tab forward, and notice that we now stop on the [REF] entry position. Type ‘1’, and allocate this action to D Matthews (using our macros, Shift+Alt+4), with a RESPOND BY date of 20 FEB 2004. The completed entry should appear as follows:

HAZOP Manager V6.0 - [Example1.hdf]

File Edit View GoTo Record Analyse Utilities Window Help

NODE: 3.0 OIL RETURN PUMPS P-57306A/B AND RECYCLE LINES

DRAWINGS: P&ID Screw Compressor, OGC-1001.675-1, Rev. B1

DEVIATION	CAUSE	CONSEQUENCE	SAFEGUARDS	ACTION
Flow Less	Discharge filter partially blinded.	Inadequate lubrication results in compressor damage.	TAH-5925 alarm at 95°C. TAHH-5926 trips system at 100°C (refer also to Action 4**). YAAH-5937 vibration trip. Auto start of standby pump to increase flow, but with a common filter this would be ineffective.	[1] Provide separate filters in the discharge of both pumps, each fitted with a dP indicator and local alarm. [2] Include in operating procedures the action to take upon initiation of such an alarm.

61

CATGRY: 2 3

FREQUENCY: 2

SEVRTY: 2 2


RISK: 2R 2R

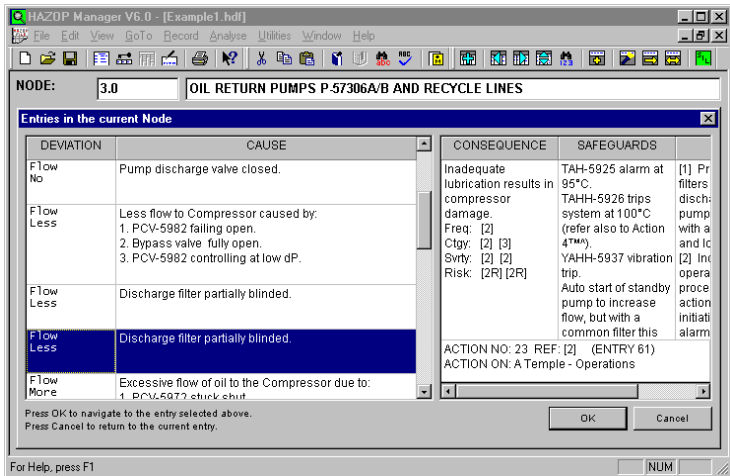
ACTION NO: [REF] ASSIGNED TO: RESPOND BY:

22 1 D Matthews - XYZ Process Systems 20 FEB 2004



For Help, press: F1

NUM

28. Now from the 'Record' menu select the 'Extra Action' command (Alt+R then X). Type '2' in the [REF] box, and allocate this second action to "A Temple - Operations" (macro Shift+Alt+3), with a RESPOND BY date of 19 MAR 2004.
29. Press the  toolbar button, and the dialog illustrated below will be displayed. This facility allows you review (but not edit) multiple entries within a Node by scrolling them vertically. Press F1 to display the relevant Help topic, which lists some of the situations in which you will find this feature useful. Close the Help window.



30. Using the scroll bar in the left-hand pane, display the first entry in the Node, and then highlight it by clicking on it with the mouse. Note the Action Number in the right-hand pane... it should be 14.
31. Using the 'down' arrow key (on your keyboard), highlight each of the remaining entries in turn, noting the Action numbers as they are displayed. The sequence should be 14, 15, 22, 23, 16, 17, and finally 21. Close the dialog by pressing the Cancel button.
32. From the 'Help' menu select the 'Help Topics' command, and using the Index, locate the Renumber - Actions topic. Read the text displayed, then close the Help system.
33. We will now re-order the Action Number sequence. From the 'Utilities' menu select 'Renumber...' then select the '...Actions' command. Respond Yes to the message regarding a back-up file. In the dialog displayed, accept the default value of '1' and press

- 'Renumber'. Page through the entries in Node 3.0 again, and you will see that the Action Numbers are now in sequence.
34. Repeat Steps 29 to 31, but on this occasion pay attention to the Entry Numbers. They are also out of sequence. To correct this, from the 'Utilities' menu select 'Renumber...' then select the '...Entries' command. Respond Yes to the message regarding a back-up file. In the dialog displayed, accept the default value of '1' and press 'Renumber'. Page through the entries in Node 3.0 again, and you will see that the Entry Numbers are now in sequence.
 35. You should now be on Entry number 47, the last entry in Node 3.0 (if not, use the  button to jump to that entry).
 36. You will remember that we referenced Entry 60 in Step 18, and set a bookmark in our file in Step 19. Return to that bookmark using the  toolbar button. Highlight "Node 3.0, Isolate Remainder" and press OK. You will see that the reference has been automatically updated to the number '44', and you can verify the accuracy of this by paging back once to the previously referenced entry that we created in Steps 4 to 14.



You have now completed the tutorial dealing with basic data entry. This is the part of the program with which you should become most familiar, as it is these operations that will need to be carried out during a Study meeting.

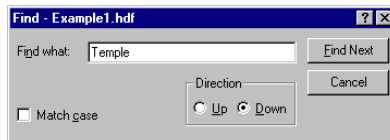
If time permits, you should now make some further entries of your own. However, before you do, first go to Node 4.0, so that these additional entries will be recorded under that Node. **This is important, because the next tutorial will assume that Nodes 1.0, 2.0 and 3.0 contain the entries as they are at present**, with no additional practice entries interspersed.



In addition, you may well have noticed during the previous tutorials that when opening the EXAMPLE1 data file, another file entitled 'DON'T INPUT ENTRIES LIKE THIS' was in the same folder. Now that you are familiar with basic data entry, you should open this latter file and view its contents. As its name suggests, it contains examples of both the incorrect, and then the correct, method of recording multiple Causes for the same keyword combination (e.g. Flow No). As this file is provided purely for the purpose of illustrating certain important concepts, you should not alter or experiment with its contents.

TUTORIAL 6: Find/Replace and Data File Analysis

This tutorial consists of two simple exercises in finding and replacing text, followed by selecting records from the EXAMPLE1 data file and printing an analysis tabulation. You should, if possible, ensure that your computer is connected to a printer.

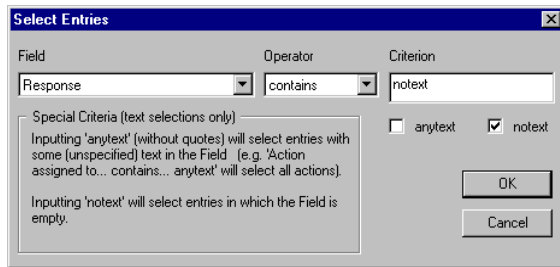
1. If necessary, start the HAZOP Manager program and open the EXAMPLE1 data file. Go to the Entries form by using the  toolbar button. Ensure that you are on the first entry in the file (if the file has just been opened, you will be positioned on the first entry).
2. We will now undertake a very simple exercise in finding (and replacing) text within our data file. Assume that at the end of the study meeting our attention is belatedly drawn to the fact that the name 'A Temple', which we have been inputting into the 'ASSIGNED TO' box, should in fact be 'A Templar'. Rather than paging through the entire file to find and correct each error, we will use the 'Find text' facility to speed up this operation.
3. Click on the  toolbar button (or input Alt+E then F). The 'Find - Example1.hdf' dialog will be displayed. In the 'Find what' edit box, input 'Temple' (without the quotes).



4. Click on the 'Find Next' button, and the first occurrence of the name will be highlighted.
5. Manually edit 'Temple' to 'Templar'. Then highlight the edited name and press Ctrl+C to copy it to the clipboard (ensure that only the name is highlighted, not including the space before and/or after). Instead of Ctrl+C we could instead use the  toolbar button.
6. Now press the 'Find Next' button again, and automatically insert the correct name by immediately pressing Ctrl+V or using the  toolbar button. Repeat this operation until you get the message

“Searched to last entry”. Then press the Cancel button on the Find dialog.

7. In the above short exercise we have simply corrected a series of errors in our data file. We now turn to a potentially much more useful and powerful facility, that of analysing the data within that file.
8. Input Alt+A, then S. The ‘Select Entries’ dialog is displayed.
9. Drop down the ‘Field’ list box and select the ‘Response’ entry towards the end of the list. Similarly select the ‘contains’ entry from the ‘Operator’ list box. Finally select the ‘notext’ option. The result should appear as illustrated below.



10. From the description of ‘Special Criteria’ given on the dialog, you will see that we are selecting all entries for which a Response has not been received. Press the OK button on the ‘Select Entries’ dialog. The program will advise you that six entries have been selected. You will note that the entry screen also turns to green. This indicates we are now dealing with a sub-set of our data file (i.e. only the six entries selected).
11. If you page through to the last three of those six entries, you will see that they are the ones we created in Tutorial 5.
12. We now wish to produce a report listing those six entries. From the ‘Analyse’ menu, choose the ‘Print selection’ option. In the list box displayed, highlight both the ‘Action’ and ‘Action number, person, and date for response’ entries. Press OK.
13. In the Print Option dialog that is displayed, select a printer font if necessary (this will only be required if the message ‘Please select’ is displayed against the Current Printer Font section).
14. Before printing, we wish to preview our report. Tick the ‘2-Print Preview’ option on the Print dialog, and then press OK.

15. Depending upon the font selected, there is likely to be only one report page to preview. Use the 'Zoom In' button and the scroll bars to get a closer view. Then press the 'Close' button to return to our data file.
16. If your computer is attached to a printer, you may if you wish print that one page analysis report. Repeat Step 12, but ensure that the Print Preview option is unchecked. Then press OK to send the report to the printer. In a real action follow-up situation you may wish to use this report, or a similar tabulation, to contact those persons involved to remind them that they need to return their responses.
17. Finally, restore access to your full data file by selecting the 'Analyse' menu, and then the 'Undo all selections' option. You can now page through the entire file rather than just the six selected entries, and the screen reverts to its normal background colour.
18. In the steps above you have employed the analysis facility within the program in a somewhat contrived situation. This facility is potentially so useful that it might be as well to spend a short time becoming more familiar with its features.
19. Display the Help Topics (Alt+H then H), and using the Search tab, locate all topics containing the word 'Analysing'. Go to the topic entitled 'Analysing your Data file' paying particular attention to the section at the foot of the page entitled 'Potential uses', using the hypertext jumps and the 'Back' button as necessary. You should also visit the 'Exporting Analysis Data' topic.

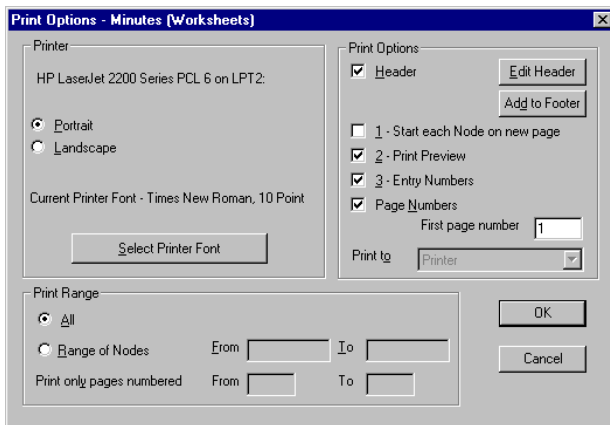
The above short analysis exercise has served as an introduction to this feature of the program. As mentioned, it has been somewhat contrived, as the EXAMPLE1 file is relatively small. In addition, this file contains data applicable to a late stage in a Hazop Study, when many responses have been received and a series of review meetings carried out.

Notwithstanding the above limitations, you should now feel reasonably confident in your ability to extract information and operate upon a sub-set of your data file. You may, of course, conduct further exercises of your own to experiment with different Fields, Operators, and Criteria. However, the point to bear in mind is that this facility, which is so simple to use, can significantly ease the burden of controlling action follow-up and reporting.

TUTORIAL 7: Printing Reports

In this exercise you will print the type of reports that need to be produced at the end of a study meeting. If possible, you should ensure that a printer is attached to your computer.

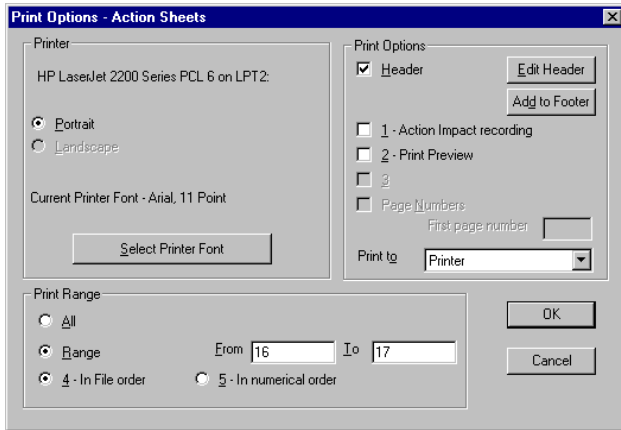
1. If necessary, start the HAZOP Manager program, and wait for the title window to close. Open the EXAMPLE1 data file.
2. From the 'File' menu, select 'Print Minutes (Worksheets)'.
3. The 'Print Options - Minutes (Worksheets)' dialog will be displayed. Press F1 to display the help topic that will explain the function of the various options contained within this dialog. When you have finished reading the displayed topic, close the Help window.



4. Select the printer font if necessary. Select the 'Header' option; if a message is displayed stating "Incomplete Header details ...", press the 'Edit Header' button, input your company's name in the displayed dialog, and press OK. Select the 'Page Numbers' option. Other selections in the Printer and Print Options groups can be left in their default state.
5. We will initially preview our entire report. Check the '2-Print Preview' option, and then press OK.

6. In the preview window use the 'Zoom In', 'Next Page' and 'Prev Page' buttons to scan our report. When finished, press the 'Close' button to return to our data file.
7. **If Microsoft Word is installed on your computer**, you may export the report you have just previewed to a Word document. Otherwise, continue at Step 13.
8. From the 'File' menu, choose 'Print Minutes (Worksheets)' again.
9. In the print options dialog, select the 'Page Numbers' option.
10. Drop down the 'Print to' list box, and select the 'Word (automated)' entry. Press the OK button.
11. Microsoft Word will be started, and you will be able to watch as the data in your file is transferred to a new document. When the operation has been completed, you may page through this document in the normal manner. In an actual study situation, such a file could be made read-only (i.e. password protected) and then either posted onto your network or e-mailed to interested parties.
12. Close Microsoft Word. You may save the Word document if you wish to scan it again when you have finished this tutorial. (For more information on exporting reports to Microsoft Word, you should read the Help topics 'Automatically Creating Reports in Microsoft Word' and 'Exporting Reports to Microsoft Word'.)
13. **If a printer is attached to your computer**, you may now actually print some partial reports. Otherwise, you will need to utilise the Print Preview option instead. From the 'File' menu, select 'Print Minutes (Worksheets)' again. In the print options dialog, select the 'Page Numbers' option. However, on this occasion instead of accepting the default of 1, enter 12 in the 'First page number' box.
14. You will be printing only Node 3.0, in which you made some entries in Tutorial 5. Click on the 'Range' radio button, and type '3.0' (without the quotes) in both the 'From' and 'To' boxes. Press OK.
15. Retrieve the report from the printer and scan the pages produced. Note the new entries mentioned above, which should have Action Numbers 16, 17, and 20. Note also how multiple actions 16 and 17 have been printed.
16. To print the Action Sheets for those new entries, from the 'File' menu, choose the 'Print Action Sheets' command.

17. Select the printer font if necessary. Leave other options at their default, but in the Print Range area of the dialog, click on the 'Range' radio button and type 16 in the 'From' box and 17 in the 'To' box as shown below. Press OK.





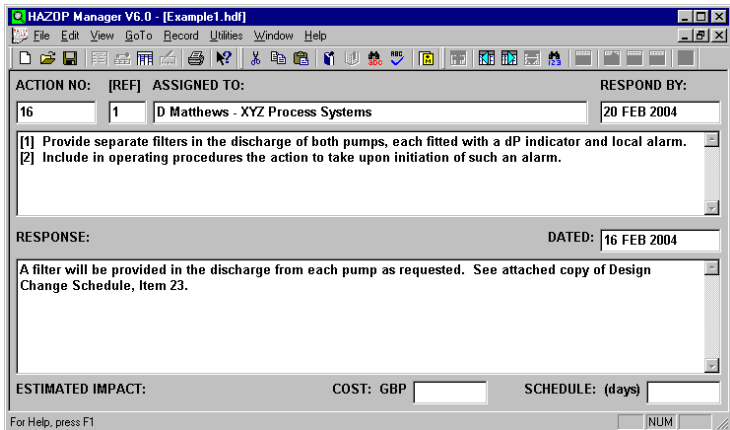
18. Select the 'Print Action Sheets' option again. Click the 'Range' button, and type 20 in both the 'From' and 'To' boxes. Press OK.
19. Retrieve the three Action Sheets from the printer, and scan the format of these pages. In normal circumstances, of course, these would be forwarded to the persons concerned.
20. Using the same procedure as in Step 18 above, print the sheet for Action 18.
21. Action 18 has had a response returned, and this has been recorded in the file. This response has been reviewed, and further action was requested. Note the difference in format between the other sheets and that just printed for 18... especially the RESPOND BY box at the top of the page, and the provision of a new box for a FURTHER RESPONSE.

In this short exercise you have experimented with print previewing, exporting a report to Word, and printing one Node and a few Action Sheets. For the most part you have left print options set at their defaults. It would be as well, therefore, to explore those other options not previously utilised, such as Landscape printing for Worksheets, the printing of additional page footer text ('Add to Footer' button), and so on.

TUTORIAL 8: Action Response Input and Review




This short exercise will deal with the input of Action Responses, and in part mimic the procedure that will be undertaken for response review meetings. As before, you should ensure that a printer is attached to your computer; if not, you will need to print preview your Action Sheets instead.

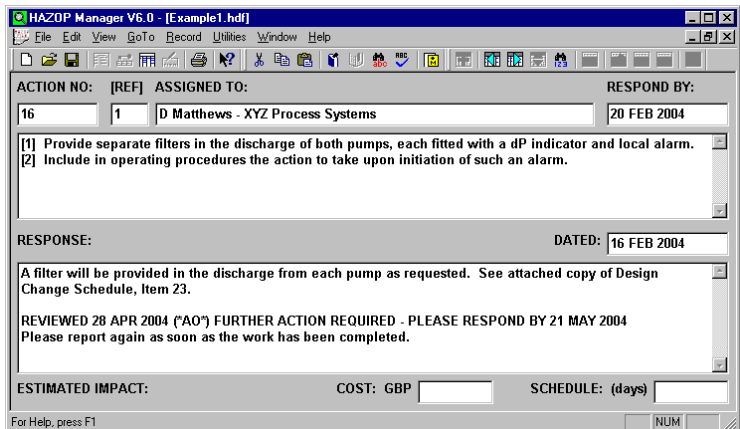
1. If necessary, start the HAZOP Manager program, and wait for the title window to close. Open the EXAMPLE1 data file, and go to the Entries form by using the  toolbar button.
2. You will be inputting responses for Actions 16, 17 and 20 which you created in Tutorial 5, and for which you printed Action Sheets in Tutorial 7. Locate, therefore, the entry for Action 16 using the 'Find Action or Entry' command on the 'Record' menu (Alt+R then F), and then press the  toolbar button to display the Response form.
3. Type the date 16 FEB 2004, followed by the response "A filter will be provided in the discharge from each pump as requested. See attached copy of Design Change Schedule, Item 23".




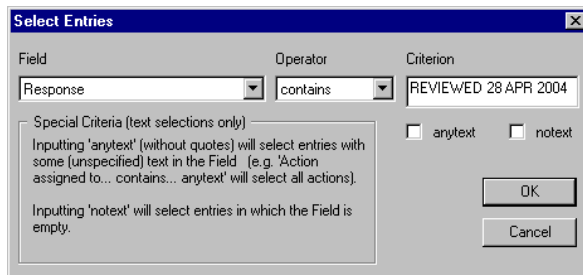
The screenshot shows the HAZOP Manager V6.0 software interface. The title bar reads "HAZOP Manager V6.0 - [Example1.hdf]". The menu bar includes File, Edit, View, GoTo, Record, Utilities, Window, and Help. The toolbar contains various icons for file operations and navigation. The main form is titled "ACTION NO: [REF] ASSIGNED TO: RESPOND BY:". The "ACTION NO:" field contains "16", the "REF" field contains "1", and the "ASSIGNED TO:" field contains "D Matthews - XYZ Process Systems". The "RESPOND BY:" field contains "20 FEB 2004". Below this, there are two numbered items: "[1] Provide separate filters in the discharge of both pumps, each fitted with a dP indicator and local alarm." and "[2] Include in operating procedures the action to take upon initiation of such an alarm." The "RESPONSE:" field is empty, and the "DATED:" field contains "16 FEB 2004". Below the response field, there is a text area containing the response: "A filter will be provided in the discharge from each pump as requested. See attached copy of Design Change Schedule, Item 23." At the bottom of the form, there are fields for "ESTIMATED IMPACT:", "COST: GBP", and "SCHEDULE: (days)". The status bar at the bottom left says "For Help, press F1" and the bottom right has a "NUM" button.

4. Page forward to the next action (number 17), type the date 08 MAR 2004, and then the response "Alarm response included in Section 5.3 of Operating Manual, copy of paragraph enclosed".

5. Now either page forward to Action 20, or alternatively locate it using the  button on the toolbar. Type the date 19 FEB 2004, followed by the response “Drawing amended, A3 copy attached”.
6. We now have some responses to review. To prepare ourselves for this rather contrived review of only three responses, we need to load the appropriate text macro file.
7. From the ‘Edit’ menu select the ‘Load Macros’ command, and load the REVIEW.MAC file listed in the displayed dialog.
8. Immediately display the macro file, either with the key combination Alt+M, or alternatively by pressing the  toolbar button.
9. The first two macros will probably commence (unless previously altered) with the phrase “REVIEWED 27 APR 2004 etc”. Alter the day of the month in both of these macros to “28”, then press the Close button (**not** the  button on the caption bar... if that button is used, the changes made above **will not be saved**).
10. Display the response to Action 16. Position the caret (cursor) on the line below the response, which we entered in Step 3 above, and auto-type the second macro (press Alt+2). On the following line type “Please report again as soon as the work has been completed” (you may use the text macro keys Alt+5). The result should appear as shown in the illustration below.



11. Page forward to Action 17, and on the line below the response, invoke the first macro (press Alt+1).
12. Locate Action 20, and do the same as in the previous step.
13. Our review has resulted in two responses being accepted (Actions 17 and 20), with a further response being necessary for Action 16. We need, therefore, to print a new Action Sheet for 16. We could, of course, do that in the same manner as was employed in Tutorial 7. However, if there were many such sheets to print, printing them one at a time would be a very cumbersome process. We will therefore adopt a more efficient approach.
14. Return to the Entry form using the  toolbar button. From the 'Analyse' menu choose the 'Select' command. With the Field set to 'Response' and the Operator set to 'contains', position the caret in the Criterion box and press Alt+1. Now carefully use the Backspace key to delete all the text that follows the year 2004. The result should appear as illustrated below. Press the OK button.





15. Three entries should have been selected. Select again (ALT+A, then S) with the Field set to 'Response', the Operator set to 'excludes', and this time type the text '(*AC*)' (without the quotes). Here, we are asking for all actions that have not been completed; those that have been completed would contain the (*AC*) flag. Press OK.
16. Action 16 only should have been selected. Choose the 'Print Selection' command from the 'Analyse' menu, and check the 'Print Action sheets' button on the dialog displayed. Press OK.
17. The 'Print Options - Action Sheets' dialog will be displayed. Press OK.

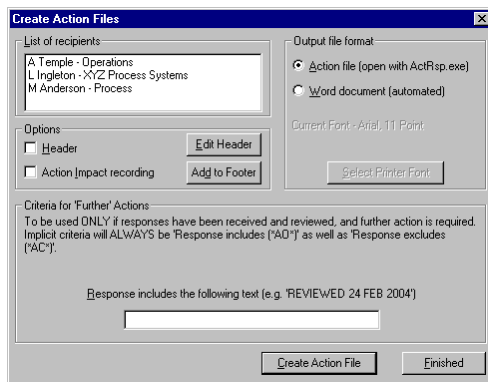
18. We now have the Action Sheet ready for forwarding to D Matthews. Reinststate our full file with the 'Undo all selections' command from the Analyse menu.

This short tutorial is only an introduction to the subject of action follow-up. Further explanation and guidance is given in the Help system, particularly in the 'Action follow-up and Review Meetings' and the 'Review Meetings and Further Actions' topics. You should read these to gain a more comprehensive understanding of the methods that you can adopt.

TUTORIAL 9: The Action Response Utility Program

Having learnt how to print and distribute Action Sheets in Tutorial 7, and how to manually input and review responses in Tutorial 8, we will now explore the methods you can use to distribute actions electronically. Before proceeding, read the section in this guide entitled “THE ACTION RESPONSE UTILITY PROGRAM”, which will give you some background information on the procedures that follow.

1. If necessary, start the HAZOP Manager program, and wait for the title window to close. Instead of using the EXAMPLE1 data file, for this exercise you should open the **ACTRSP.HDF** data file. Then use the  toolbar button to go to the Entries section.
2. Press the  toolbar button to display the Response section of the first entry, which has an action assigned to D Matthews. You will note that it contains the text “(*TTAF*) Transferred to D MATTHEWS_1.ACT (23 JAN 2004)”. This indicates that this action has already been transferred to an Action File.
3. Page forward to the next action, which was assigned to M Anderson. There is no text in this response, so this action has not yet been output to an Action File. If you continue to page forward, you will note that all of D Matthews’ actions have been dealt with, but files still need to be created for the other three persons to whom actions were assigned.



Create Action Files

List of recipients:

- A Temple - Operations
- L Ingleton - XYZ Process Systems
- M Anderson - Process

Options:

Header Edit Header

Action (Impact recording) Add to Footer

Output file format:

Action file (open with ActRsp.exe)

Word document (automated)

Current Font: Arial, 11 Point


Select Printer Font

Criteria for Further Actions

To be used ONLY if responses have been received and reviewed, and further action is required. Implicit criteria will ALWAYS be 'Response includes (*AD*)' as well as 'Response excludes (*AD*)'.

Response includes the following text (e.g. REVIEWED 24 FEB 2004)

Create Action File Finished




4. From the 'File' menu, select the 'Create Action Files' command. The 'Create Action Files' dialog will be displayed as illustrated on the previous page.
5. In the 'List of recipients', highlight 'A Temple - Operations'. Then press the 'Create Action File' button.
6. A standard Windows File Save As dialog will be displayed. Type 'A Temple_1' (i.e. the first file for A Temple) in the 'File name' box, and then press the Save button.
7. A message will be displayed advising you that seven actions have been added to A Temple's file. Press the OK button to clear this message. Then repeat Steps 5 and 6 for both L Ingleton and M Anderson, naming their files 'L Ingleton_1' and 'M Anderson_1' respectively. Finally, press the 'Finished' button.
8. We now have four Action Files. One had already been created, and the other three you have just generated. You will now need to switch programs in order to see how the recipients of those files will input and return their responses.
9. On your Taskbar press the Start button, highlight the Programs folder, then the HAZOP Manager V6.0 sub-folder, and finally click on the 'Action Response Utility Program' icon.
10. If this is the first time this program has been run on your computer, a message will be displayed advising you that the program's Help file will be automatically opened, and inviting you to scan its contents. This Help file has been deliberately kept short, and hopefully simple to understand, with all topics on a single page. You should take the time, either now or at a later date, to read and assimilate the information therein.
11. On the Action Response Utility Program click on the  toolbar button, and locate and open the 'M Anderson_1.act' file you created in Step 7 above (it is almost certainly in the \DATA sub-directory).
12. Scroll down to the Response section of the displayed Action 2 sheet, and type the text "A CCR low pressure alarm will be provided from PC-4916. See attached copy of Design Change Schedule, Item 2". The result should appear as illustrated on the following page.

HAZOP STUDY ACTION AND RESPONSE SHEET

ACTION ON: M Anderson - Process		RESPOND BY: 20 FEB 2004
ACTION NO: 2	MEETING DATES: Thursday, 22 January 2004	
DRAWINGS AND DOCUMENTS: P&ID Screw Compressor, OGC-1001-675-1, Rev. B1		
ITEM: COMPRESSOR C-58301, SUCTION AND DISCHARGE THROUGH SEPARATOR V-58306A/B	(Hazop Node 1.0)	
CAUSE: Compressor capacity control malfunction.	(Flow More)	
CONSEQUENCE: Reduced pressure in V-40123 upstream, resulting in low NPSH to Pump P-4098 taking suction from that vessel, with possible cavitation and damage.	HAZARD CATEGORY: [2] RISK: [2R]	
SAFEGUARDS: PAL-4845 on the local panel.		
ACTION: Provide a Central Control Room low pressure alarm from pressure controller PC-4916.		
RESPONSE: A CCR low pressure alarm will be provided from PC-4916. See attached copy of Design Change Schedule, Item 2.		

Ready NUM

13. From the 'Response' menu, select 'Mark for return to Secretary'. The sheet will turn yellow, indicating that the response is ready for return.
14. Page forward once to Action 9, and type, in its response section, the text "The requirement for a gas detector is being discussed by Safety Department. No conclusion has yet been reached". As before, mark this response for return to the Secretary.
15. Two responses have been input. Assuming that M Anderson cannot reply at this time to the other actions assigned to him, we will now create an interim Response File. From the 'File' menu, select the 'Create Response File' option. In the standard File Save As dialog displayed, accept the suggested 'M Anderson_1a.rsp' filename and press the Save button. You will be advised that the response file has been created, and the relevant Action Sheets will turn to green.


16. If you wish you can now open that Response file to scan its contents. Press the  toolbar button, and in the File Open dialog's 'Files of type' list box, select 'Response files (*.rsp)'. Open your file in the normal manner. When finished, either exit (close) the Action Response Utility program, or re-open the Action File 'M Anderson_1.act'. **This is important**, because if the 'M Anderson_1a.rsp' Response File remains open, access to it will be denied when later reading it into the main data file in Step 18 below.
17. Now switch back to the HAZOP Manager program, and from the 'File' menu, select the 'Read Response File' option. Accept the advisory message regarding the desirability of having a backup of your data file by pressing the Yes button.
18. From the File Open dialog displayed, select 'M Anderson_1a.rsp', and press the Open button. You will be advised when the response update has been completed.
19. Finally, use the  and (if necessary) the  toolbar buttons to visit the response sections of Actions 2 and 9. You will see that as indicated above, the response text has indeed been automatically transferred from the Response file to the data file.

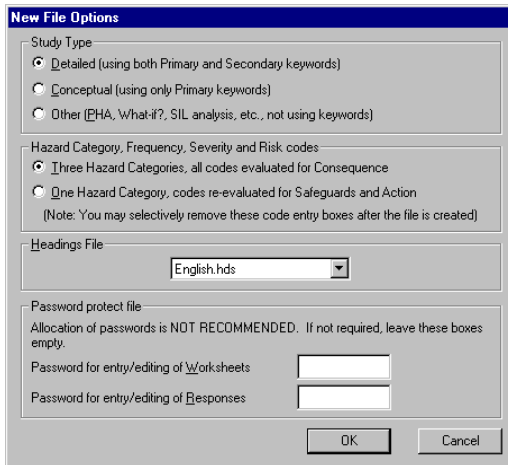
From the above exercise you will have gained an appreciation of how easy it is to distribute actions electronically, and to update your data file with the returned responses. The potential increase in efficiency for a large study would be significant. However, if you intend to use this facility, you must invest the time to understand it fully. Comprehensive instructions are included in both the HAZOP Manager and Action Response Utility programs' Help files.

Note that if you wish to repeat this exercise, you will need to overwrite the ACTRSP.HDF file from the copy located on the installation CD. Otherwise, the "(*TTAF*) Transferred to etc..." text within that data file will prevent you from creating further Action Files (the 'List of recipients' box in Step 5 above will be empty).

TUTORIAL 10: Creating a Data File and Multiple Windows

In this tutorial we will experiment with the procedures that would be used when setting up a data file prior to the start of a review. As there would initially be a significant amount of typing involved in setting up a new study, to reduce this we will be copying and pasting information from EXAMPLE1 into our new file. To achieve this we will have both files open at the same time, and while this is not the primary objective of this tutorial, it would be as well to get used to this potentially useful facility. We will also be printing, so if possible ensure that a printer is attached to your computer.

1. If necessary, start the HAZOP Manager program, and wait for the title window to close. From the 'File' menu, select 'New' (ALT+F then N), or press the  button on the toolbar.
2. In the 'Create new Study Data File' dialog displayed, name the file 'NewStudy', then press the Create button. The following dialog will appear.



New File Options

Study Type

- Detailed (using both Primary and Secondary keywords)
- Conceptual (using only Primary keywords)
- Other (PHA, What-if?, SIL analysis, etc., not using keywords)

Hazard Category, Frequency, Severity and Risk codes

- Three Hazard Categories, all codes evaluated for Consequence
- One Hazard Category, codes re-evaluated for Safeguards and Action

(Note: You may selectively remove these code entry boxes after the file is created)

Headings File

English.hds

Password protect file

Allocation of passwords is NOT RECOMMENDED. If not required, leave these boxes empty.

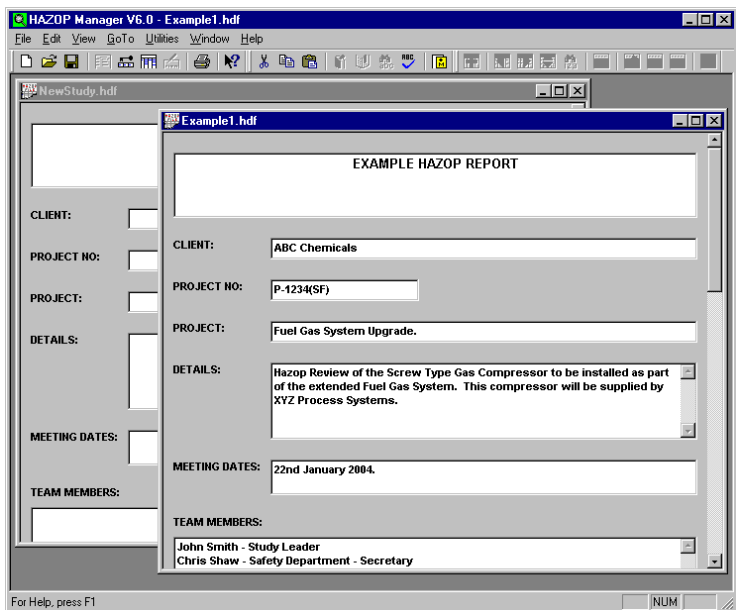
Password for entry/editing of Worksheets:



Password for entry/editing of Responses:





OK Cancel


3. Press F1 to display Help on these File Options. Once you have finished reading the help topic, close the Help window. Ensure that the options are set as illustrated above, i.e. Detailed Study, Three Hazard Categories and an English Headings file, then press OK.

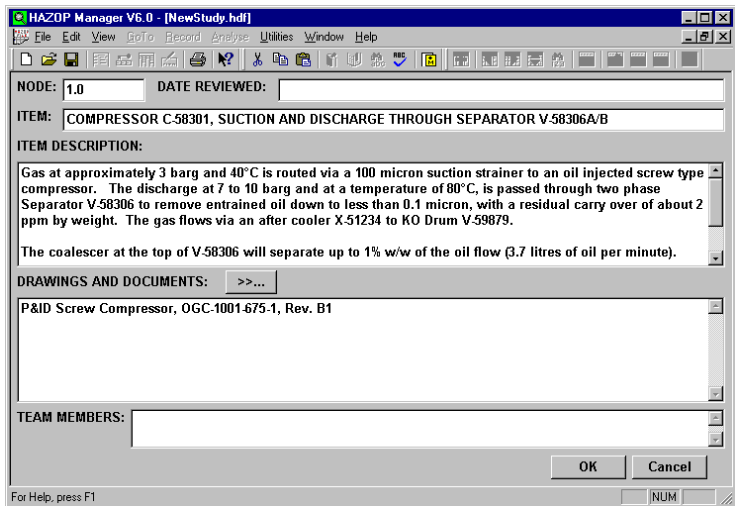
4. We should now be viewing an empty Study Details form. As indicated earlier, we are going to save time by copying some of the information from our EXAMPLE1 file. So, open the EXAMPLE1 file (without closing down NewStudy.hdf).
5. We now have two files open, but can only see one at the moment. To switch back and forth between the files, click on the appropriate file name in the 'Window' menu. To show both files at the same time, choose 'Cascade' from the 'Window' menu.
6. Both files should now be shown in the main program window. Rearrange them as in the illustration below (important... the input boxes for both files should never be totally obscured, whichever file is currently in the foreground).




7. Highlight the text 'EXAMPLE HAZOP REPORT' in the EXAMPLE1 file, then copy it either by pressing the  button on the toolbar or typing CTRL+C.
8. Now, place the caret (cursor) in the corresponding field in the NewStudy.hdf window and paste the copied text either by pressing the  button on the toolbar or typing CTRL+V.

9. We can also move data around using 'Drag and Drop'. If you are unfamiliar with the technique of dragging and dropping, find the 'Drag and Drop editing' section of the Help file. Once you have read the topic, close the Help window.
10. Highlight the text 'ABC Chemicals' in EXAMPLE1 then drag it to the CLIENT: field in our new file (left-click with the mouse on the highlighted text, then move the mouse whilst holding the left button down). Don't release mouse button just yet! We want to copy, rather than move the text, so press CTRL on your keyboard before releasing the button (note the '+' sign that appears).
11. Repeat steps 7 and 8 (or just 10, if you prefer to 'drag and drop') for each field on the Study Details form until you get to ACTIONS and ENTRIES. Leave these numeric fields as they are.
12. Maximise the NewStudy file using the  button on its caption bar, then go to the Keywords form by using the  toolbar button (or Alt+G then K).
13. We now see an empty Keywords section. From the 'Keywords' menu, choose the 'Load' option. Select the 'Detailed Study.kys' file, and press OK. The information on each of the tabs in the Keywords section of our file will now have been input automatically.
14. To gain a fuller appreciation of this feature, press the context help  toolbar button, and with the help cursor select the 'Load' option just used. When you have completed reading the topic, close the Help window.
15. Go to the Entry form. We will now practice the creation of new Node Headings, ready for the 'forthcoming study'.
16. Press the  toolbar button (with the **yellow** plus sign, grouped with the other buttons for Node Heading operations).
17. Type '1.0' in the NODE REF box (without the quotes), and 'COMPRESSOR C-58301, SUCTION AND DISCHARGE THROUGH SEPARATOR V-58306A/B' in the ITEM box (also without the quotes').

18. If you like, you can copy the rest of the information from our existing Node 1.0 in the EXAMPLE1 data file. Switch to the EXAMPLE1 data file by clicking on that file name in the 'Window' menu. Go to Entries and bring up the Heading information for Node 1.0 (try clicking the  toolbar button).
19. Copy and paste, as described earlier, data from the Node 1.0 Heading in EXAMPLE1 to the Node 1.0 heading in our new file (use the 'Window' menu to switch between the files).
20. When you have finished, switch back to the EXAMPLE1 data file and close it. Your screen should look like the one illustrated below.



21. Press OK. You will now have returned to the Entries form and should see that the  button on the toolbar is now available. It was previously disabled because we had no Nodes in which to add Entries.
22. To illustrate one final point, create another new Node by selecting 'New Heading' from the 'Record' menu (ALT+R then H).
23. Type 2.0 in the NODE REF box then tab forward through to DRAWINGS AND DOCUMENTS and press F9. Note that the text from the heading on which we were located before commencing this operation has been repeated.

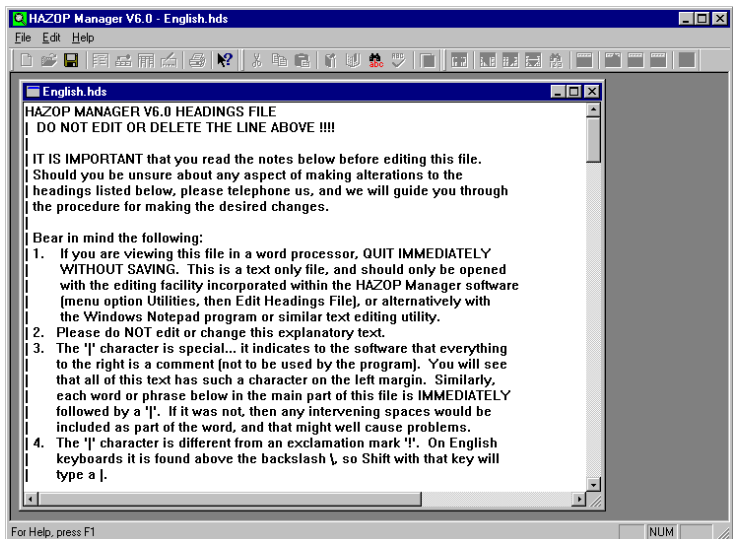
24. Type any sensible text in both the ITEM and ITEM DESCRIPTION, then press OK.
25. Finally, we will print an Agenda. By now you should be familiar enough with printing operations to accomplish this without any detailed instructions (the command can be invoked with Alt+F then G). However, when the 'Print Options - Agenda' dialog is displayed, you should press F1 and scan the displayed topic.

The subject of planning for a study meeting and setting up a data file is described in the 'Preparing for a Hazop Study' Help topic. This outlines not only the software operations involved, but also discusses the overall requirements such as assembling data, marking up drawings, etc. If you have not previously organised a study, then this topic should prove useful in that it will help you to approach the task in a logical and structured manner.

TUTORIAL 11: Alternative Data File Types / Headings Files

In this tutorial we will be creating a data file suitable for a general Risk Assessment study. As the default headings are unlikely to be suitable for such a study, we will instead produce our own customised headings file. Whilst we are creating a new type of data file (i.e. different from the usual detailed Hazop Study layout), we will also take the opportunity to utilise an 'Alternative Risk Assessment' method. The data file we create will be used in the next tutorial, so it is important to complete this exercise before progressing to the next.

1. If necessary, start the HAZOP Manager program, and wait for the title window to close.
2. From the 'Utilities' menu, select 'Edit Headings File' (ALT+U then H).
3. From the standard dialog displayed, open the 'English.hds' file. A window similar to the one below will be displayed.





4. Press F1 to display the Help file, and read the section on Customised Headings Files. Close the Help window, then read the introductory text in the 'English.hds' file before progressing.

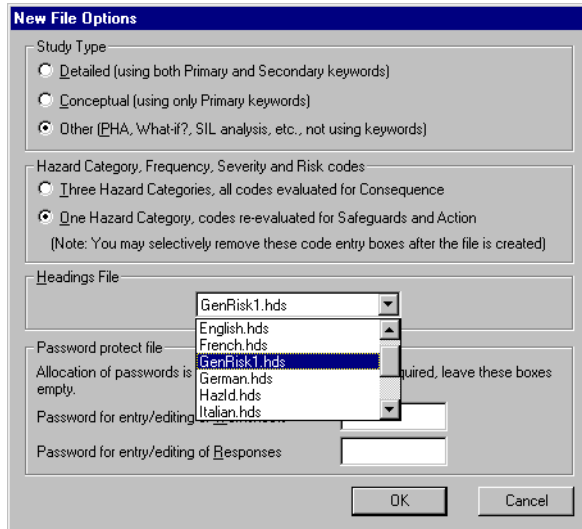
5. Because we don't wish our modifications to be saved in the default headings file, from the 'File' menu, choose 'Save As...' and name the file 'GenRisk1' (**this step is important... do it now**, because it is easy to forget if perhaps you are later prompted to save when closing the file).
6. Following the introductory text at the beginning of the file are the headings themselves. The first one we need to modify is the 'DEVIATION' heading. Scroll down the file until you see the word DEVIATION followed by a pipe '|' symbol. Change 'DEVIATION' to 'AREA FOR CONCERN' (without the quotes). Make sure the pipe symbol is still present.
7. Immediately below this line is the 'Deviation' heading (note the difference in type-case). This also needs to be modified. Change the word 'Deviation' to 'Area for Concern' (without the quotes). Make sure the pipe symbol is still present. This part of the file should appear as shown below:

...


Entry Number	Analysis window
AREA FOR CONCERN	Entry window - Print Tables, Analysis
Area for Concern	Analysis window
CAUSE	Entry window - Print Tables, etc...

...

8. Now, locate the heading 'NODE' and replace it with 'PLANT SECTION'. Replace 'Hazop Node' with 'Plant Section'. Replace 'Node Number and Item' with 'Plant Section and Item'. (Hint: Use 'Find' from the 'Edit' menu to locate these headings).
9. Save the modified Headings file using the 'Save' option from the 'File' menu, or by pressing the  button on the toolbar. Then, close the headings file.
10. Now we need to create a new data file that will incorporate the modified headings that we have just generated. From the 'File' menu, select 'New' (ALT+F then N), or press the  button on the toolbar.
11. In the 'Create new Study Data File' dialog, name the file 'GenRisk1', then press the Create button. The 'New File Options' dialog will be displayed.








12. In this dialog, select the 'Other' Study Type option, the 'One Hazard Category' option and, from the Headings File list, select GenRisk1.hds. This operation is illustrated above.
13. Press F1 to display Help for this dialog, and using the green hyperlink, navigate to the 'Alternative Risk Assessment Methods' topic. Once you have read this, close the Help system and press OK to create the file.
14. At the top of the Study Details section displayed, type in the title 'GENERAL RISK ASSESSMENT REPORT'. Leave the rest of the fields blank to save time.
15. Go to the Keywords section of the file (ALT+G then K), and load the 'HazId Study.kys' keywords file (ALT+K then L).
16. Go to the Entries section of the file (ALT+G then E). Notice that, rather than DEVIATION being the first column, it is now called AREA FOR CONCERN. Similarly, where we used to see the heading 'NODE', we now see 'PLANT SECTION'. This is a result of us using our modified headings file. Notice also that because we chose the 'One Hazard Category' Risk Assessment method when we created the file, Frequencies and Severities appear beneath the Consequence, Safeguards and Action columns.

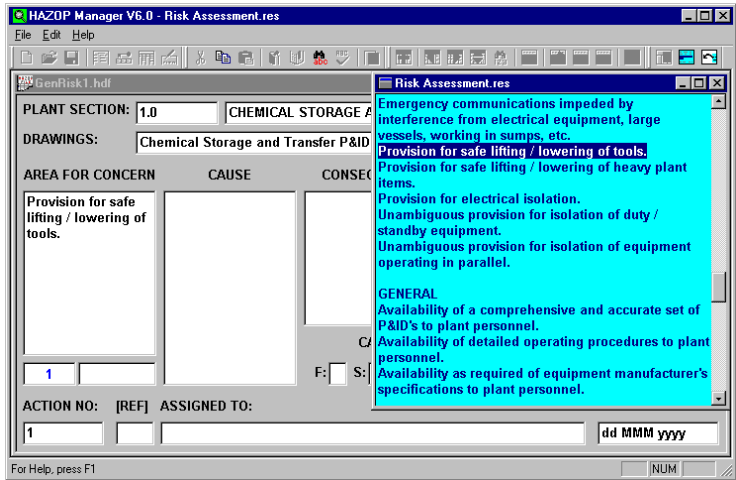
17. Before we can start entering our study data, we must first create at least one Node, so press the  button on the toolbar to bring up the New Heading form.
18. In the PLANT SECTION field, type '1.0', in the ITEM field type 'CHEMICAL STORAGE AND TRANSFER', and in the DRAWINGS AND DOCUMENTS field type 'Chemical Storage and Transfer P&ID 060-33-T-D0002, Rev 3'. Press OK to save the new heading to the file.

Having selected the 'Other' study type option, and having modified and loaded the GenRisk1 headings file, in this exercise you have produced a data file that is formatted for the recording of a General Risk Assessment. Armed with this basic understanding that choosing different file layout options and modifying headings files can be used to accommodate a range of different reviews, you will now be able to create customised data files for differing types of study.

TUTORIAL 12: Resource Files / Alternative Risk Assessment

In this tutorial we will be using a Resource file to help with a General Risk Assessment Study. In addition to this, an alternative risk assessment method will be demonstrated. We will need to use the data file created in Tutorial 11, so if you have not yet completed that tutorial, please do so before commencing this exercise.

1. If necessary, start the HAZOP Manager program, and wait for the title window to close.
2. Before we start creating entries, select the 'Edit Resource File' option from the 'Utilities' menu and Open the 'Risk Assessment.res' file. Press F1 and read the help topic displayed. When finished, close the Help window and then close 'Risk Assessment.res'.
3. Open the GenRisk1.hdf data file and navigate to the Entries form.
4. From the 'View' menu, select 'Resource File', and in the standard dialog displayed, open 'Risk Assessment.res' again.
5. 'Risk Assessment.res' will now appear in a blue window on top of the current entry. Notice also, the new buttons that have been added to the right-hand end of the toolbar . These will be used to transfer data from the Resource file to the current entry. Click anywhere on the data file window and press the  button to add a new entry.
6. Press the  button on the toolbar to display the Resource file again. Then, either from the 'Edit' menu or by right-clicking with the mouse in the Resource file, select the 'Find' option.
7. In the 'Find' dialog, type in 'tools' (without the quotes) and press the 'Find Next' button. Once the word 'tools' has been located, press Cancel.
8. We should now be looking at the sentence 'Provision for safe lifting / lowering of tools'. To transfer this sentence to the entry, press the  toolbar button to select the current paragraph, followed by the  toolbar button to transfer the paragraph to the entry. This operation is illustrated on the next page.



9. In the CAUSE column, type 'Requirement for operator to carry tools whilst descending and ascending to/from sump'.
10. In the CONSEQUENCE column, type 'Potential for operator to fall (only one free hand to grip ladder)'.
11. Tab to the CATGRY field and type '1' to represent Personnel Injury.
12. Tab to the F (Frequency) field, right-click to display Frequency Codes and select '3 – Once per year'.
13. Tab to the S (Severity) field and type '2' to represent a Major consequence. Note that the 'R' (Risk) value has been automatically assessed and input by the program based on the values contained in the Risk Matrix (Keywords view). Remember, that you could have right-clicked in either the CATGRY or S field to view the Severity Matrix, from which you could have selected your codes.
14. In the SAFEGUARDS column, type 'None'.
15. Because the safeguards neither alter severity nor frequency, duplicate the previous Frequency (3) and Severity (2) in the appropriate fields below the SAFEGUARDS column.
16. In the ACTION column, type 'Fit an intermediate shelf on which tools can be placed before ascending / descending ladder'.

17. As this would serve to reduce the frequency of falls by the operator, but not the severity of a fall, in the F (Frequency) field below the ACTION column, type '1' and in the S (Severity) field below the ACTION column, type '2' (as before). Notice that the risk has been recalculated based on the likely benefit of completing the action.
18. In the ASSIGNED TO field, type 'A Davies, Mechanical Engineering', and ask that the Action Response be completed by 20 FEB 2004. The completed entry should be similar to that which is illustrated below.

HAZOP Manager V6.0 - GenRisk1.hdf

File Edit View GoTo Record Analyse Utilities Window Help

GenRisk1.hdf

PLANT SECTION: 1.0 CHEMICAL STORAGE AND TRANSFER

DRAWINGS: Chemical Storage and Transfer P&ID 060-33-T-D0002, Rev 3

AREA FOR CONCERN	CAUSE	CONSEQUENCE	SAFEGUARDS	ACTION
Provision for safe lifting / lowering of tools.	Requirement for operator to carry tools whilst descending and ascending to/from sump.	Potential for operator to fall (only one free hand to grip ladder).	None.	Fit an intermediate shelf on which tools can be placed before ascending / descending ladder.





CATGRY: 1

F:3 S:2 R:3R F:3 S:2 R:3R F:1 S:2 R:1R

ACTION NO: [REF] ASSIGNED TO: RESPOND BY:

1 [] A Davies, Mechanical Engineering 20 FEB 2004

For Help, press F1 NUM

19. Press the  button to add another record, then press the  button on the toolbar to display the Resource file again.
20. Three paragraphs below the one we just transferred is the following sentence 'Unambiguous provision for isolation of duty / standby equipment'. Put the caret (cursor) anywhere in this sentence and press the  toolbar button to select the paragraph followed by the  toolbar button to transfer the paragraph to the entry.
21. In the CAUSE column, type 'To provide redundancy, both local panels can run either the duty or standby pump'.
22. In the CONSEQUENCE column, type 'Electrical isolation not achieved due to operator misunderstanding. Potential injury during maintenance'.

23. Tab to the CATGRY field and right-click to bring up the Severity Matrix. Double click to select the cell that contains the text 'Injuries or illness requiring hospitalisation'. Press OK in the Severity Matrix so that the Hazard Category and Severity codes can be transferred to the entry.
24. In the F (Frequency) field, right-click to display Frequency Codes and select '3 – Once per year'.
25. In the SAFEGUARDS column, type 'General maintenance procedures require verification of electrical isolation'.
26. The effect of the safeguards is to reduce the frequency of this sequence of events, so in the F (Frequency) field below the SAFEGUARDS column, type '2' and in the S (Severity) field below the SAFEGUARDS column, type '2'.
27. In the ACTION column, type 'Include in procedures details for ensuring electrical isolation of these particular pumps/panels'.
28. Since this would serve to reduce the frequency of this hazardous event, but not the severity, in the F (Frequency) field below the ACTION column, type '1' and in the S (Severity) field below the ACTION column, type '2' (as before).
29. In the ASSIGNED TO field, type 'L Burrows, Operations', and ask that the Action Response be completed by 19 MAR 2004.

In this tutorial we have employed an alternative Risk Assessment method, and used a Resource file to prompt input and also to save time in typing the 'Areas for Concern'. The potential applications for Resource files are many. It is up to you to consider when and how best you can use them. You can, of course create your own Resource files either in a plain text editor such as Windows Notepad (remembering that it must have the file extension ".res"), or preferably in HAZOP Manager's special utility which can be found by selecting 'New Resource File' from the 'Utilities' menu in the HAZOP Manager program's main window.

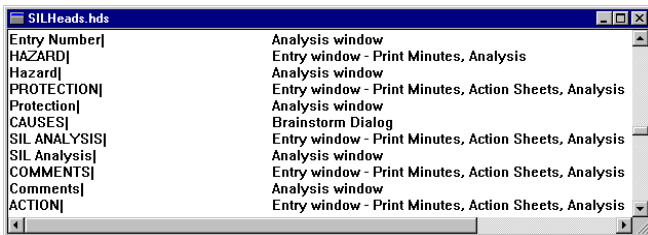
TUTORIAL 13: SIL Analysis




In this tutorial we will briefly explore SIL Analysis. This will involve modifying a headings file, looking at a resource file and creating a data file, as well as some data entry. You will need some knowledge of these steps, so it would be just as well if you have completed the previous tutorials.


1. If necessary, start the HAZOP Manager program, and wait for the title window to close.
2. From the 'Utilities' menu, select 'Edit Headings File' (ALT+U then H).
3. From the standard dialog displayed, open the 'English.hds' file.
4. As we don't want our modifications to be saved in the default headings file, from the 'File' menu, choose 'Save As...' and name the file 'SILHeads'.
5. Find the following headings and modify them with the text indicated below:

Change	DEVIATION	to	HAZARD
	Deviation	to	Hazard
	CAUSE	to	PROTECTION
	Cause	to	Protection
	CONSEQUENCE	to	SIL ANALYSIS
	Consequence	to	SIL Analysis
	SAFEGUARDS	to	COMMENTS
	Safeguards	to	Comments

The section of the file that you have modified should appear as illustrated below.



6. Save the modified Headings file using the 'Save' option from the 'File' menu, or by pressing the  button on the toolbar. Then, close the headings file.
7. Now, let us look at one of the resource files used during SIL Analysis. From the 'Utilities' menu, select 'Edit Resource File', and choose 'SIL-C.res' from the dialog displayed.
8. You should see a text file containing guidance on how to choose Consequence categories during SIL Analysis. You could edit this file to take account of your company's specific guidelines. However, that is not part of this exercise, so simply close the 'SIL-C.res' file.
9. Create a new data file (CTRL+N) called 'SIL Analysis1.hdf'.
10. In the 'New File Options' dialog, select the 'Other' study type and select 'SILHeads.hds' (not to be confused with 'SIL_4.hds' or 'SIL_5.hds') from the list of available Headings Files. Press OK to create the file.
11. At the top of the Study Details section displayed, type in the title 'SIL ANALYSIS REPORT'. Leave the rest of the fields blank to save time.
12. Go straight to the Entries section of the file (ALT+G then E). Notice the new column headings that have been loaded from our SILHeads file.
13. We don't need Frequencies, Categories and Severities for this type of study, so we should hide them. To do this, click on the 'View' menu and uncheck Frequency, Category and Severity.
14. Before we can start entering our analysis, we must first create a Node; so press the  button on the toolbar to bring up the New Heading form.
15. In the NODE field, type '1.0', in the ITEM field type 'GAS CONDITIONING SYSTEMS', and in the DRAWINGS AND DOCUMENTS field type 'P&ID Glycol Contactor 345-A3-568-RT, Rev D'. Press OK to save the new Node heading to the file.
16. Press the  button to add a new record. Then, in the HAZARD column, type 'High pressure gas breakthrough from contactor to Regeneration Systems, caused by LCV-456 sticking open'.

17. In the PROTECTION column, type 'LAL-457, LALL-458'.
18. Tab to the SIL ANALYSIS column, and either press the  toolbar button, or select 'SIL Analysis' from the 'Record' menu (ALT+R then L). The following dialog will be displayed.

19. Press F1 to view the Help system's entry about SIL Analysis. Once you have read this topic, close the Help system. Click on the 'Consequence' dropdown list and select Cc, to represent a considerable financial loss.
20. Occupancy is not relevant in terms of Financial Loss, so choose N/A from the Occupancy list.
21. Tab to the Probability list and select Pa, then select W2 from the Demand Rate List.
22. The SIL is then calculated by the Program and appears in the SIL field at the bottom of the dialog. To transfer this analysis to the current entry, press OK.
23. Now, tab to the comments field and type the following text 'Financial Loss assumed as the major concern. Significant aspect would be penalties incurred because of inability to supply'.
24. Finally, let us assign an Action to 'F Smith – Control & Instrumentation' to 'Confirm that the SIF meets the criteria for a SIL 2 application'. Ask that she responds by '20 FEB 2004'.

25. Your completed entry should appear as illustrated below.

The screenshot shows the HAZOP Manager V6.0 interface. The title bar reads 'HAZOP Manager V6.0 - [SIL Analysis1.hdf]'. The menu bar includes File, Edit, View, GoTo, Record, Analyse, Utilities, Window, and Help. The toolbar contains various icons for file operations and analysis tools. The main window displays the following information:

NODE: 1.0 GAS CONDITIONING SYSTEMS
DRAWINGS: P&ID Glycol Contactor 345.A3-568-RT, Rev D

HAZARD	PROTECTION	SIL ANALYSIS	COMMENTS	ACTION
High pressure gas breakthrough from Contactor to Regeneration Systems, caused by LCV 456 sticking open.	LAL 457, LALL 458.	Consequence (C) = Cc; Occupancy (F) = N/A; Probability (P) = Pa; Demand Rate (W) = W2; SIL = 2 (PFD <1E-2 to >=1E-3).	Financial Loss assumed as the major concern. Significant aspect would be penalties incurred because of inability to supply.	Confirm that the SIF meets the criteria for a SIL 2 application.

Below the table, there is a small grid with the number '1' in the first cell. At the bottom, the 'ACTION NO:' is '1', 'ASSIGNED TO:' is 'F Smith - Control & Instrumentation', and 'RESPOND BY:' is '20 FEB 2004'. A status bar at the bottom left says 'For Help, press F1' and a button labeled 'NUM' is on the right.

By choosing to create our data file with the 'Other' Study Type and attaching to it our modified headings, we have created a file suitable for recording a SIL Analysis. For an alternative set of suggested headings for SIL Analysis, you could refer to the Help system. You should by now have an understanding of the flexibility that modifying headings files can provide in terms of the numerous types of study that can be carried out using HAZOP Manager software.

TUTORIALS - Summary

With the series of tutorials in the previous pages you will have used the more significant features and facilities within the HAZOP Manager program. More importantly, we trust that you will now be confident enough to explore and practice on your own, not only the operations already covered, but those which have not even been touched upon.

During the course of the exercises, on many occasions you will have seen menu options that have not so far been used, and perhaps wondered what their purpose was and how they actually operated. Now is the time to find out, because it is important to know how you can get the most out of the software. Such information might prove to be extremely useful if, for example, in the middle of a study meeting you need to copy a series of entries from one Node to another (Utilities - Copy Entry!).

Remember that there are two sources of Help. The on-line variety provided by the Help system you have already extensively used, and by now you should be able to locate any subject covered within that system. However, if a search of the Help file does not produce the answer you are seeking, you may always telephone, fax or e-mail us with your query. We cannot promise that we will always solve the problem. However, experience has shown that sometimes seemingly intractable predicaments can be resolved by the application of what could be considered a devious and undocumented sequence of operations.

Finally, do not forget to use Windows Explorer to overwrite the hard disk EXAMPLE1.HDF and ACTRSP.HDF files with those from the DATA sub-directory on the HAZOP Manager Installation CD-ROM. If necessary, delete also the Action and Response Files created in Tutorial 9. In this way any colleague wishing to use the tutorials will not be confused by the changes you have made.