Let's Take a PEEK at PEAC-WMD v.5

A Good Example of Working Entries List and Threat Matrix

by S. Bruce King

Example of Using the PEAC-WMD Application

Most of the previous examples of how information is displayed in the PEAC-WMD application that have been included in the First Responder newsletter have dealt primarily with the display of chemical properties and scenarios where a hazardous material has been released and how the PEAC-WMD tool can provide exclusion zones to protect personnel and the public.

This month we thought a change was needed and felt that with the recent release of the new PEAC-WMD Version 5 that some discussion of how a few of those features might be used would interest our readers. Specifically, we're going to review the **Working Entries List** and **Threat Matrix** features or facilities and an example of how they can help the user accomplish their mission.

For a list of chemicals we'll use in our example, we've selected a fictional group. We've provided the UN# and CAS# along with the name. We certainly wouldn't expect all of these chemicals to be found at a single facility, perhaps several at a single location but not all. We've used some of these chemicals in previous examples in past newsletter articles and we've noted after the name which month's newsletter that chemical was used as an example. If the reader wants to review that issue it's easy to access the previous newsletters and select the article.

Table 1 – Chemicals used in the example

Item#	Chemical Name	UN#	CAS#	In previous article
1	Anhydrous Ammonia	1005	7664-41-7	June 2003
2	Bromine trifluoride	1746	7787-71-5	
3	Chlorine	1017	7782-50-5	August 2004
4	Diborane	1911	19287-45-7	September 2003
5	Ethylene oxide	1040	75-21-8	April 2003
6	Gasoline	1203	8006-61-9	
7	Anhydrous Hydrogen Chloride	1050	7647-01-0	June 2002
8	Anhydrous Hydrogen Fluoride	1052	7664-39-3	August 2002
9	Ethyl Methyl Ketone	1193	78-93-3	
10	Methyl Bromide	1062	74-83-9	November 2003
11	Phosgene	1076	75-44-5	December 2003

For most of the figures used in this example, we'll be using the Windows version of the PEAC-MWD application.

The first task is to select the chemicals from the PEAC-WMD application and add them to the **Working Entries List**. This is an easy process as demonstrated in the following discussion.

First be sure the current **Working Entries List** is clear of any other entries. To display the current **Working Entries List**, click on the **Tools** option from the menu bar (Figure 1). If the **Clear Working Entries List** selection is muted, then there is no current **Working Entries List**. If the selection is not muted, then the current list can either be saved or the user can clear the list when prompted.

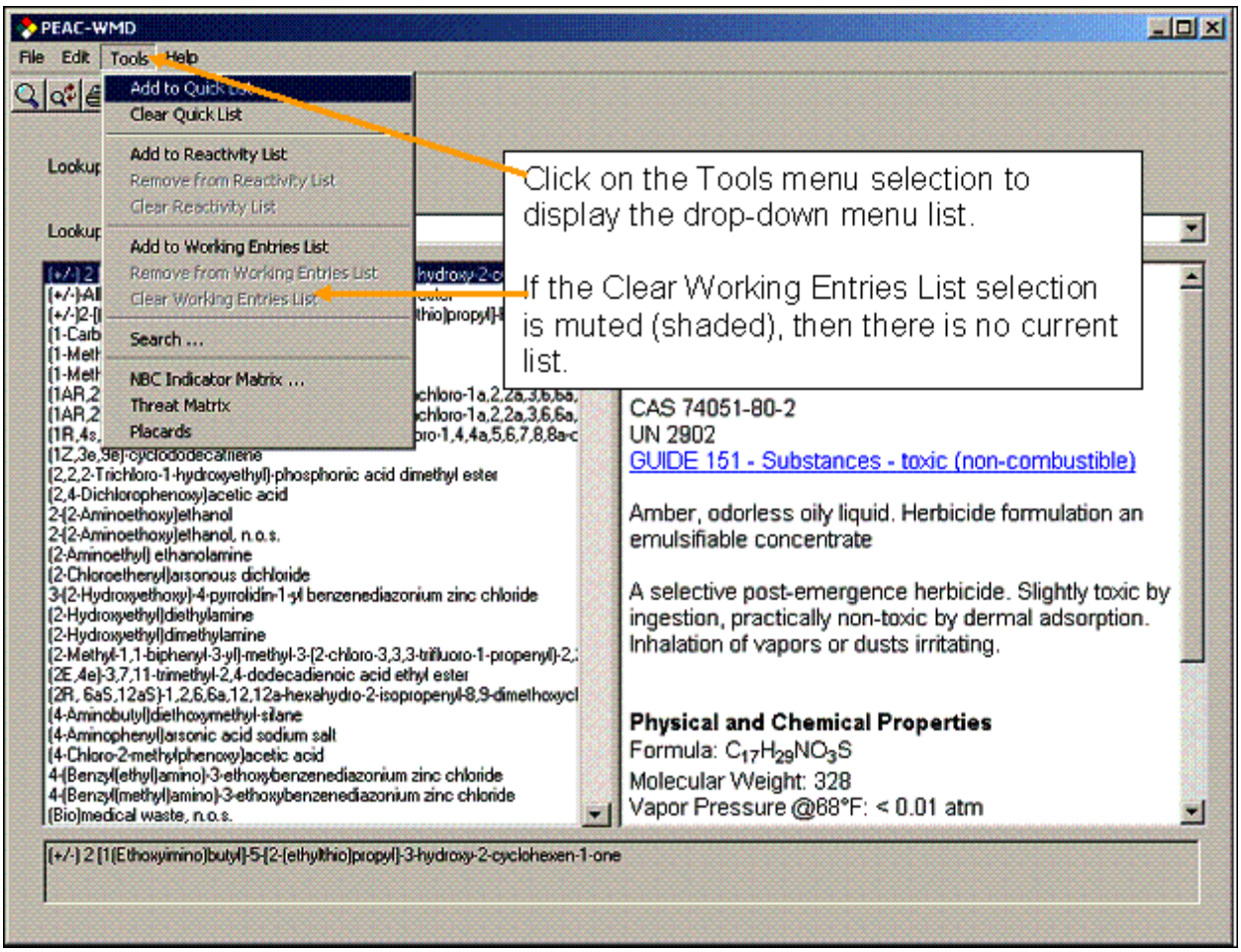


Figure 1 – Clearing the current Working Entries List

Next, find the chemical by name or UN# or CAS# in the PEAC-WMD application as shown in Figures 2-4. In Figure 2, the chemical is selected by name, Figure 3 the Lookup By is specified for UN Number, and in Figure 4 the Lookup By mode is the CAS Number.

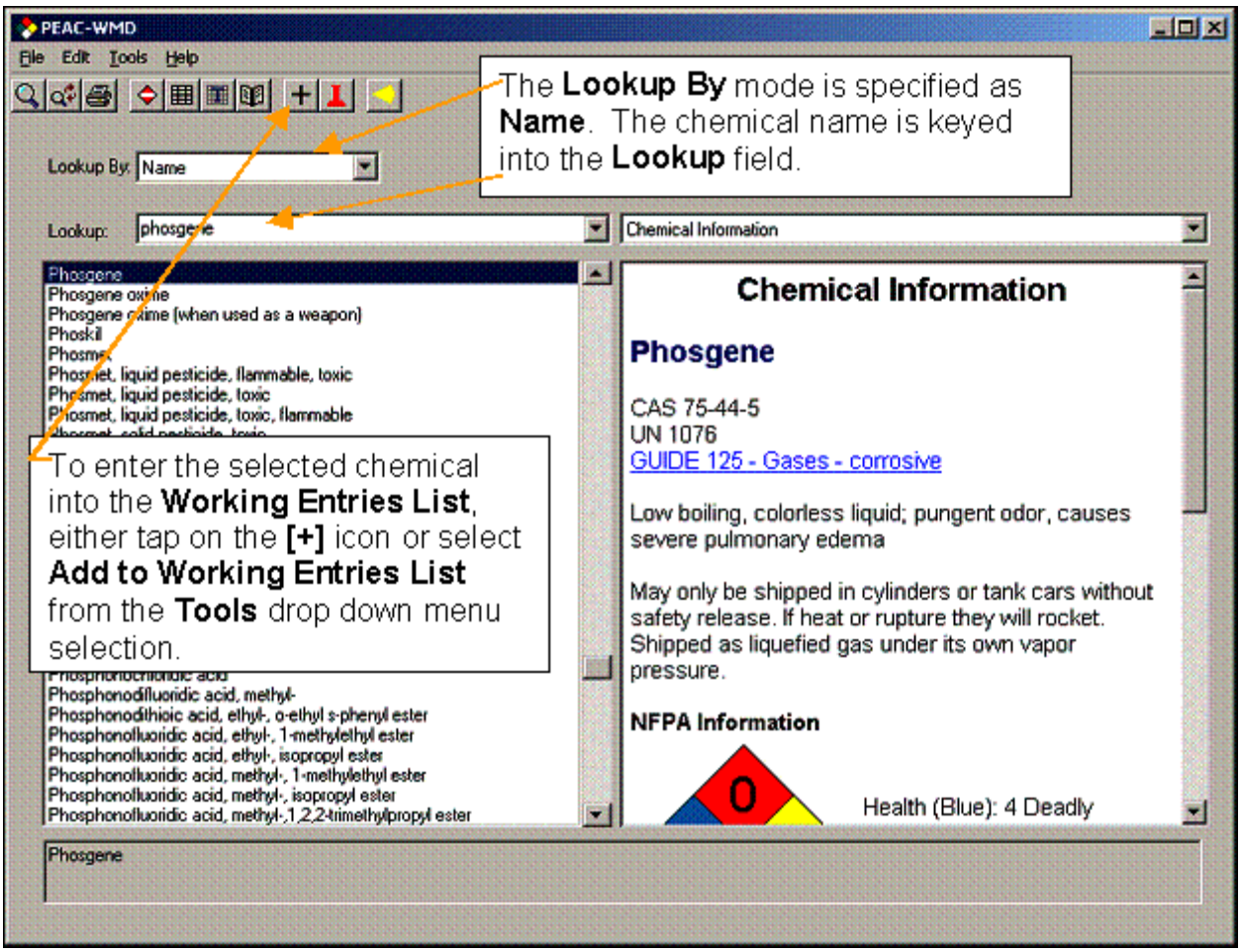


Figure 2 – Adding a chemical to the Working Entries List by using the Name mode

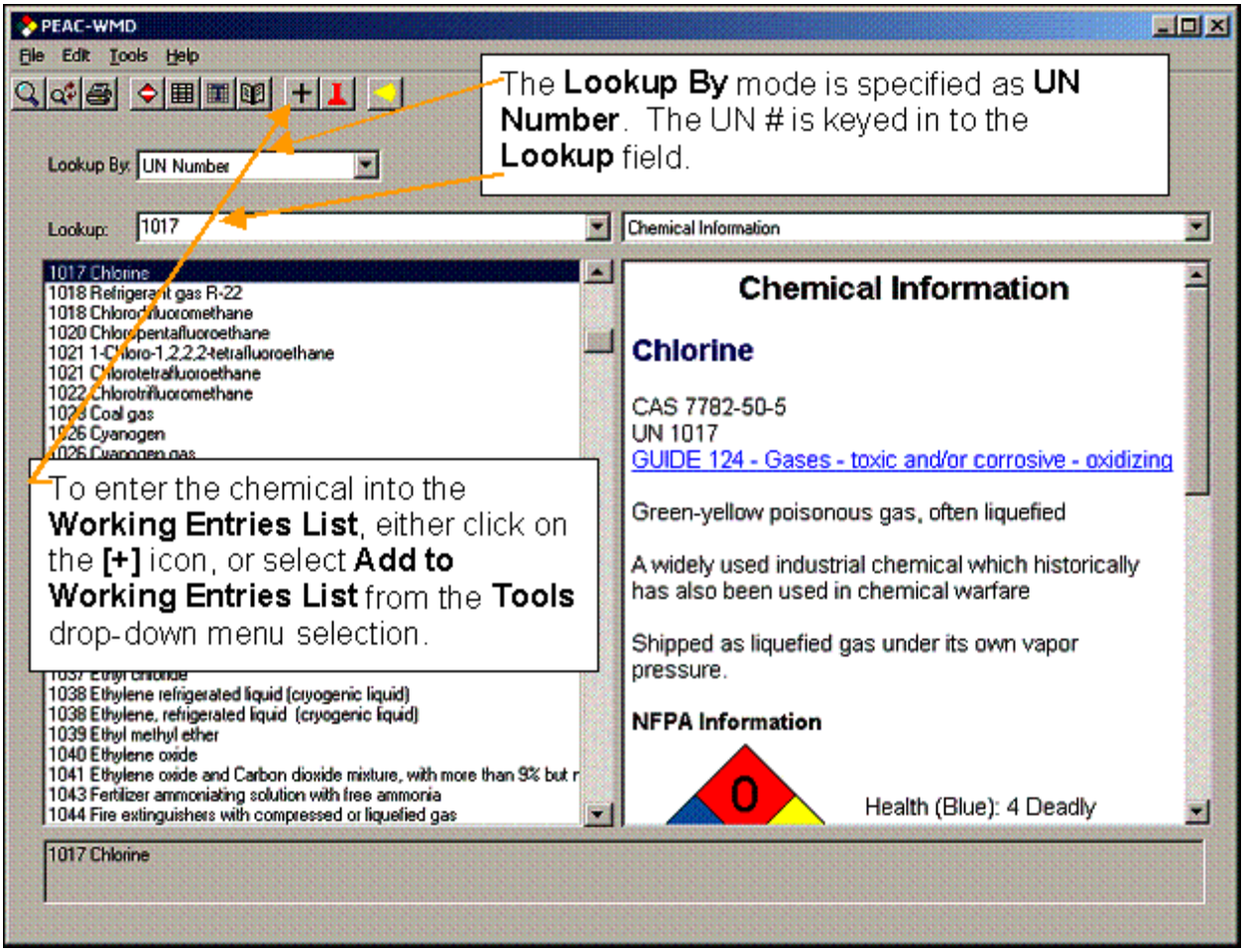


Figure 3 – Adding a chemical to the Working Entries List by using the UN Number mode

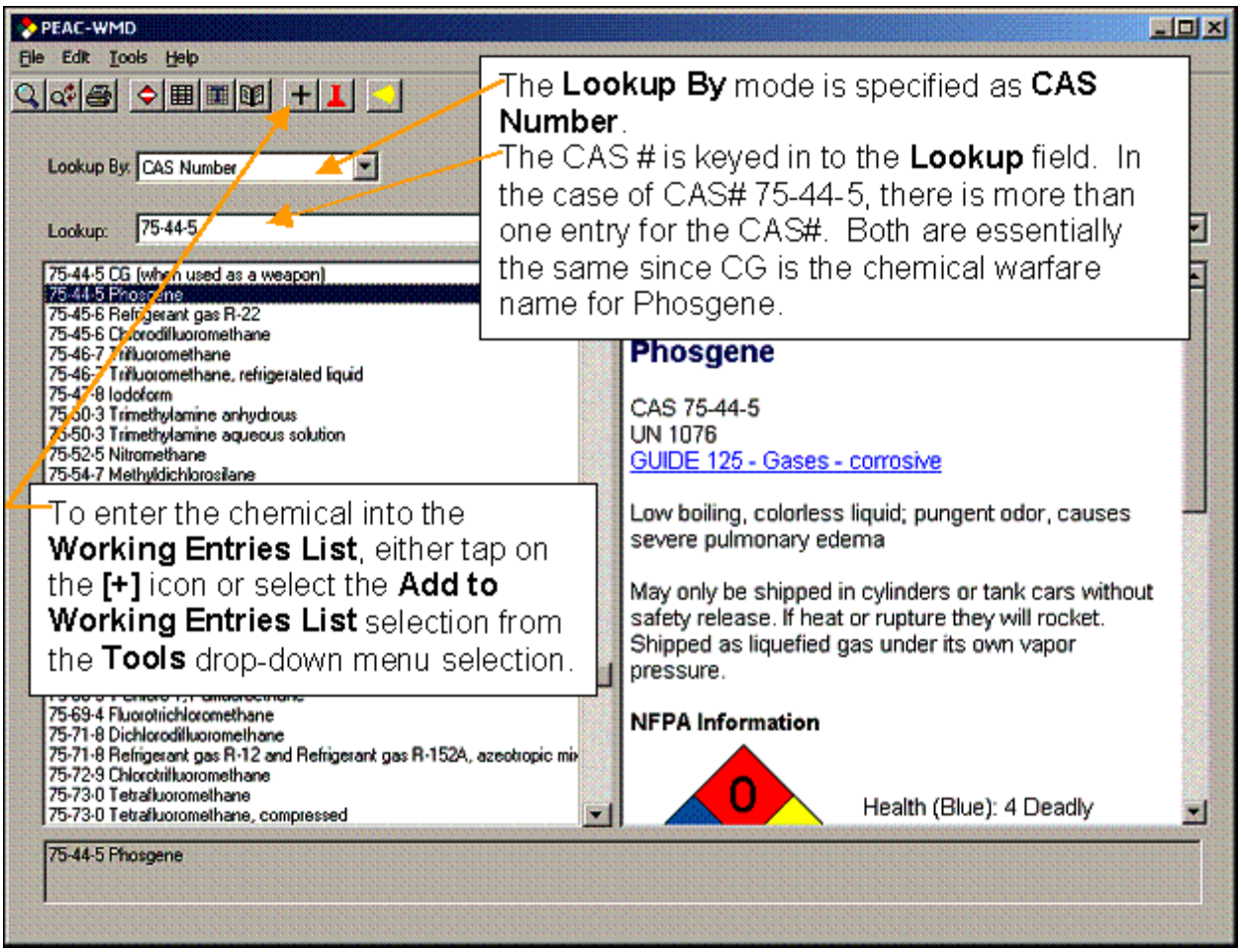


Figure 4 – Adding a chemical to the Working Entries List by using the CAS Number mode

Using these various described methods, each chemical is selected and added to the **Working Entries List**. The new dynamically generated list can be displayed by selecting **Working Entries** from the drop-down list displayed by clicking on the selections display arrow at the right end of the **Lookup By** field, Figure 5.

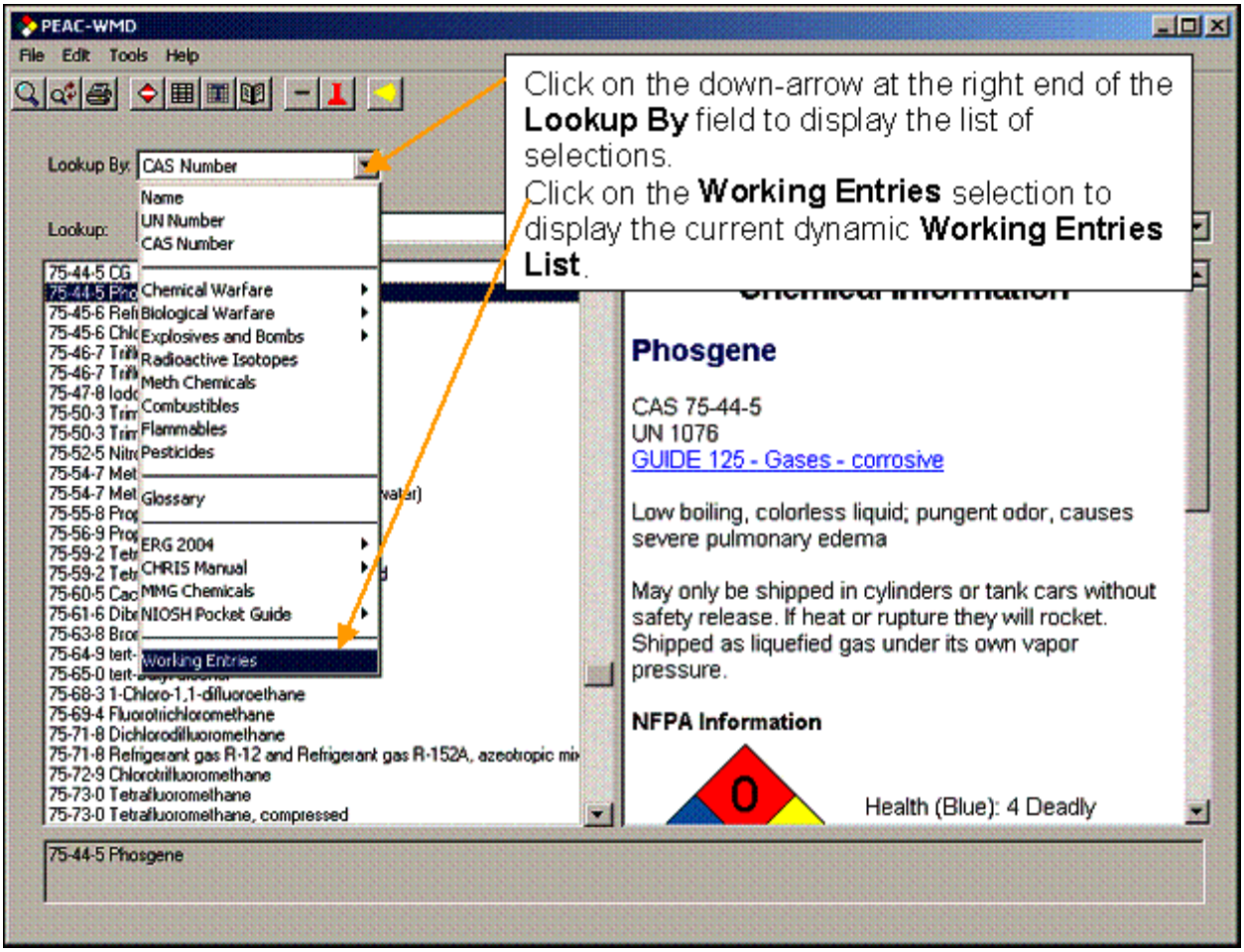


Figure 5 – To display the current Working Entries List

For the eleven chemicals in our list shown above, a screen similar to Figure 6 should be displayed after selecting the **Working Entries** selection from the drop-down list.

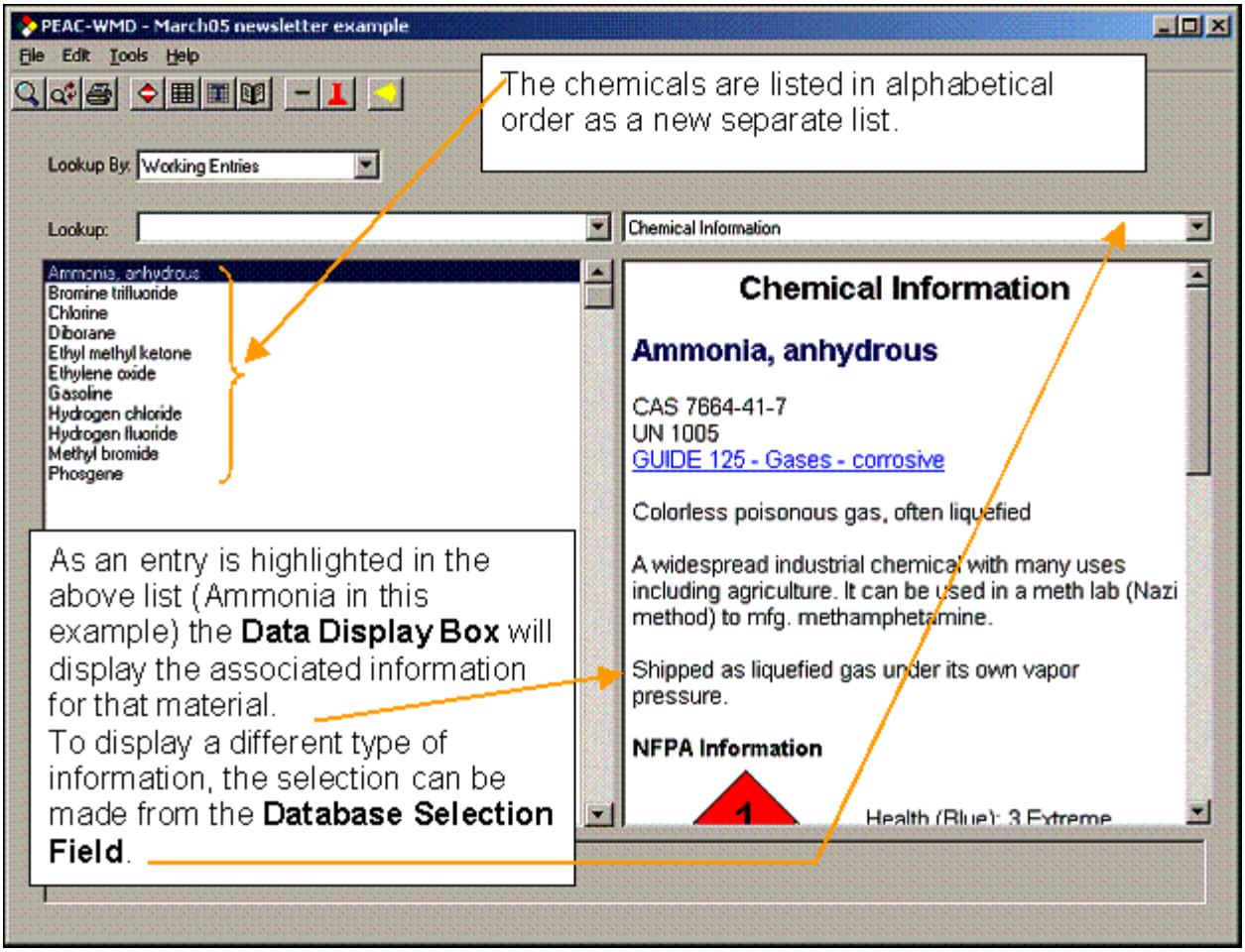


Figure 6 – The Working Entries List displayed

Now the user has a small definable subset of the PEAC-WMD database to work with. The list can be reduced in size, simply by highlighting an entry and clicking on the **[-]** icon at the top of the screen or by selecting **Remove from Working Entries List** from the **Tools** menu selection. By the same token, a user can easily add a chemical to the current Working Entries List. This can be completed using one of the **Lookup By** methods described earlier. When the user returns to displaying the Working Entries List, the new chemical(s) should be displayed.

The user now has access to all the information contained in the PEAC-WMD database or its computational features for this short list of selected chemicals. An immediate and obvious advantage is now the list of hazardous materials to view and assess is very short and a lot easier to keep track of what is being viewed and dealt with at any point in time.

Now to demonstrate some other advantages using the **Working Entries List**, we'll assume this is the list of chemicals potentially involved in an incident. To assess the situation and develop a response plan, we first need to decide which chemical(s) are going to be the major concern. A quick way to assess a group of chemicals is to display the **Threat Matrix** posed by the current **Working Entries List**. This is really easy to do by clicking on the Threat Matrix icon **[**  **]** at the top of the screen or by clicking on the **Threat Matrix** selection from the **Tools** menu drop-down list of selections. To display the **Data Display Box** in the **Full Screen** mode, click on the **Zoom or Full Screen icon [**  **]**. A screen similar to that shown in Figure 7 will be displayed.

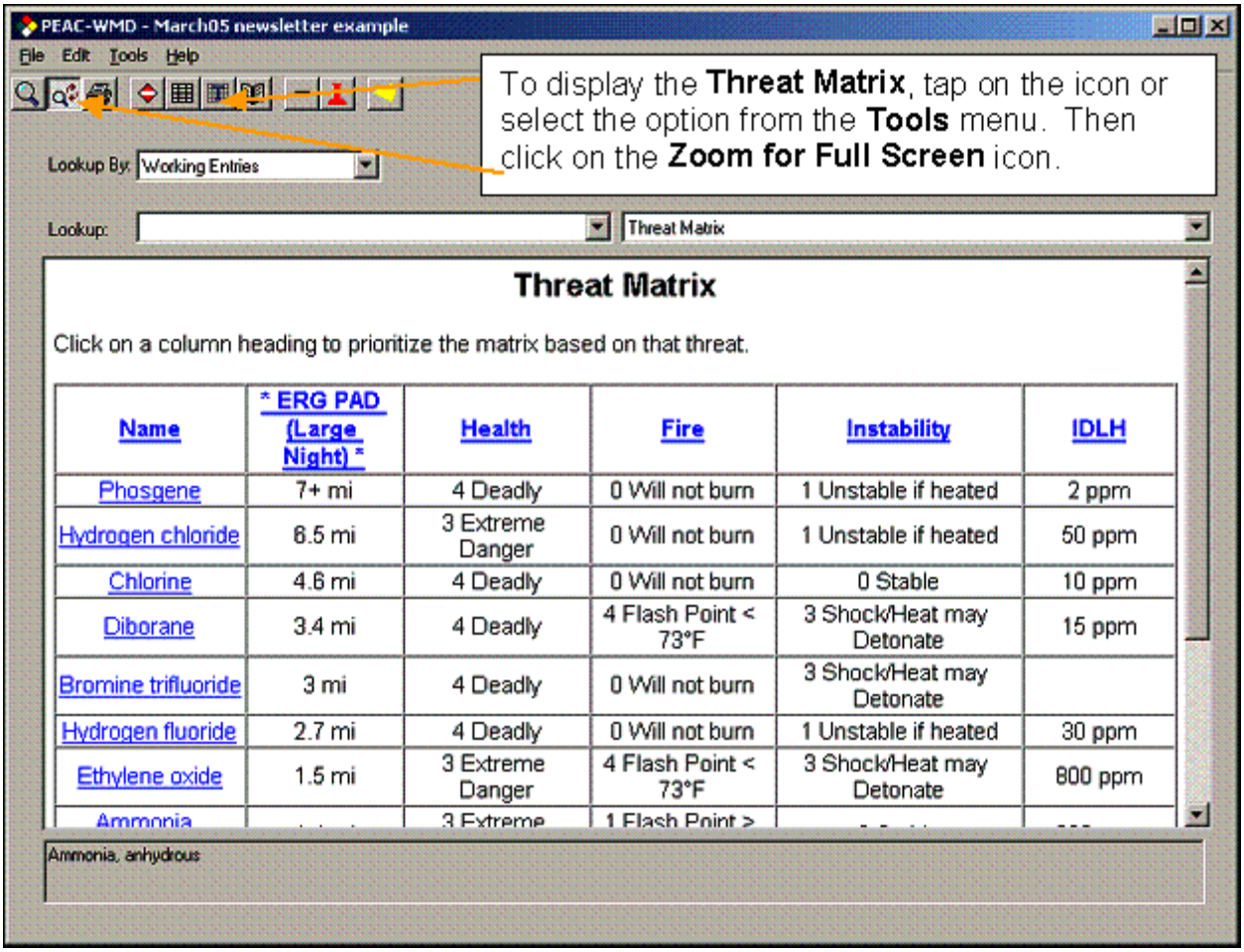
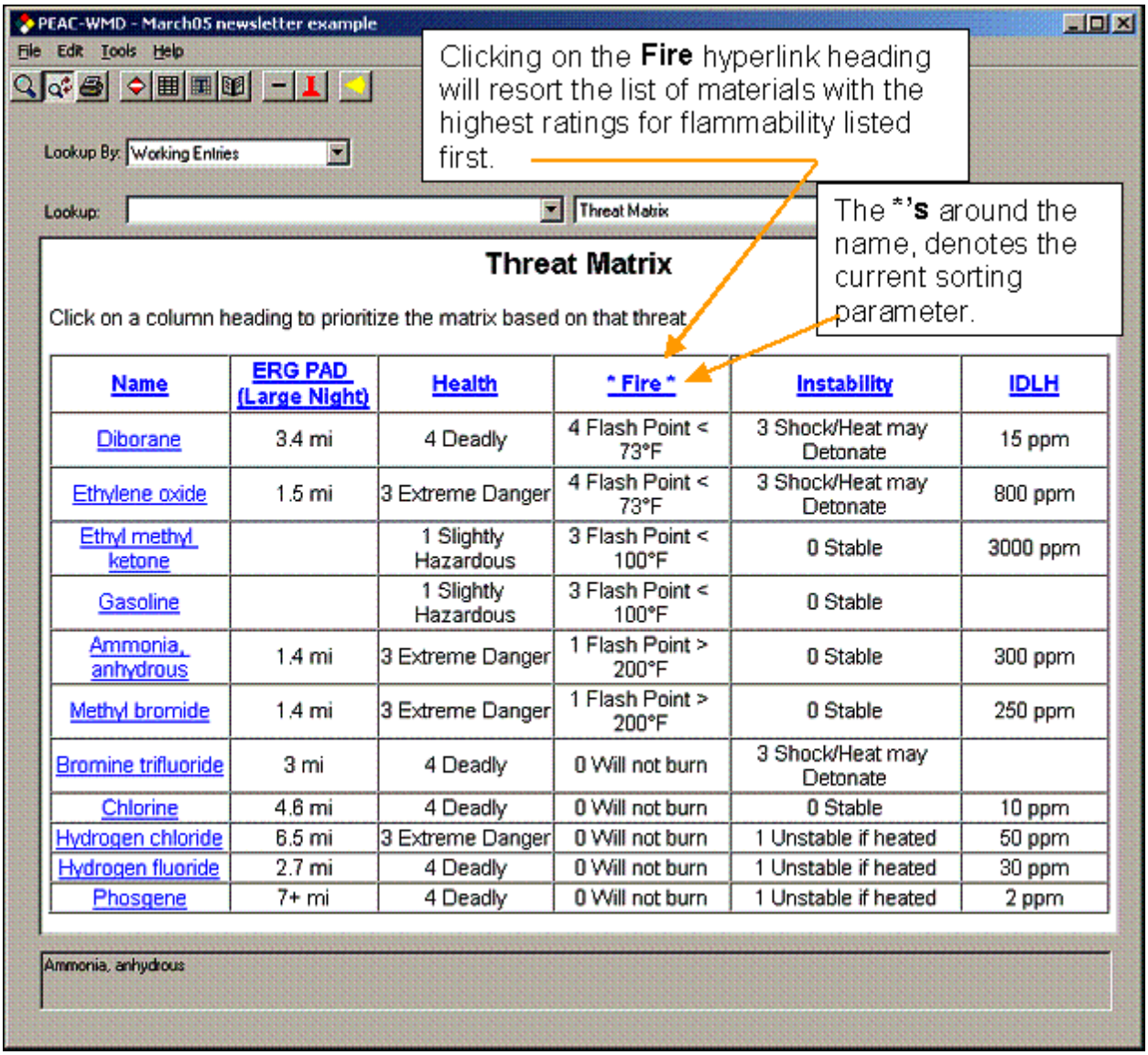


Figure 7 – Displaying the Threat Matrix in the Full Screen mode

The benefit of the **Threat Matrix** is the utilization of the NFPA 704 Hazard Classification System, which is the information displayed in the HAZMAT diamond shown on the individual Chemical Information screens, along with the IDLH value and the ERG PAD distance all on one line for the user to view. Now the user has data and ratings that rank a substance with respect to toxicity, flammability, and stability. The concept is to give the user a "thumbnail" hazard representation of a chemical, very much what the NFPA 704 system does, that is displayed all on one line that can be compared with the other chemicals that are involved in the incident.

An added feature of the **Threat Matrix** is the user can resort the list by simply clicking on the hyperlink at the top of any column. For instance, if there is a fire or potential for fire, then those materials that have the highest flammability rating would be of major concern. For our fictional list of chemicals, the user can click on the **Fire** hyperlink on the **Threat Matrix** display and the list is resorted with the materials displayed with the highest rating first in descending order, Figure 8. The column title with the *'s surrounding the name is the current sorting parameter.



Name	ERG PAD (Large Night)	Health	* Fire *	Instability	IDLH
Diborane	3.4 mi	4 Deadly	4 Flash Point < 73°F	3 Shock/Heat may Detonate	15 ppm
Ethylene oxide	1.5 mi	3 Extreme Danger	4 Flash Point < 73°F	3 Shock/Heat may Detonate	800 ppm
Ethyl methyl ketone		1 Slightly Hazardous	3 Flash Point < 100°F	0 Stable	3000 ppm
Gasoline		1 Slightly Hazardous	3 Flash Point < 100°F	0 Stable	
Ammonia, anhydrous	1.4 mi	3 Extreme Danger	1 Flash Point > 200°F	0 Stable	300 ppm
Methyl bromide	1.4 mi	3 Extreme Danger	1 Flash Point > 200°F	0 Stable	250 ppm
Bromine trifluoride	3 mi	4 Deadly	0 Will not burn	3 Shock/Heat may Detonate	
Chlorine	4.6 mi	4 Deadly	0 Will not burn	0 Stable	10 ppm
Hydrogen chloride	6.5 mi	3 Extreme Danger	0 Will not burn	1 Unstable if heated	50 ppm
Hydrogen fluoride	2.7 mi	4 Deadly	0 Will not burn	1 Unstable if heated	30 ppm
Phosgene	7+ mi	4 Deadly	0 Will not burn	1 Unstable if heated	2 ppm

Figure 8 – Resorting the Threat Matrix for a specific parameter

If the user sorts the list and then wants to view a specific entry to display additional information on that material, the user simply clicks on the hyperlink of the name in the left column. If the user wants to view specific information on Ethyl Methyl Ketone, a simple click on the name in the left column will display a screen as shown in Figure 9. Once displaying the Ethyl Methyl Ketone entry, the user can elect to display different types of information indexed to this chemical by changing the **Database Selection** as needed.

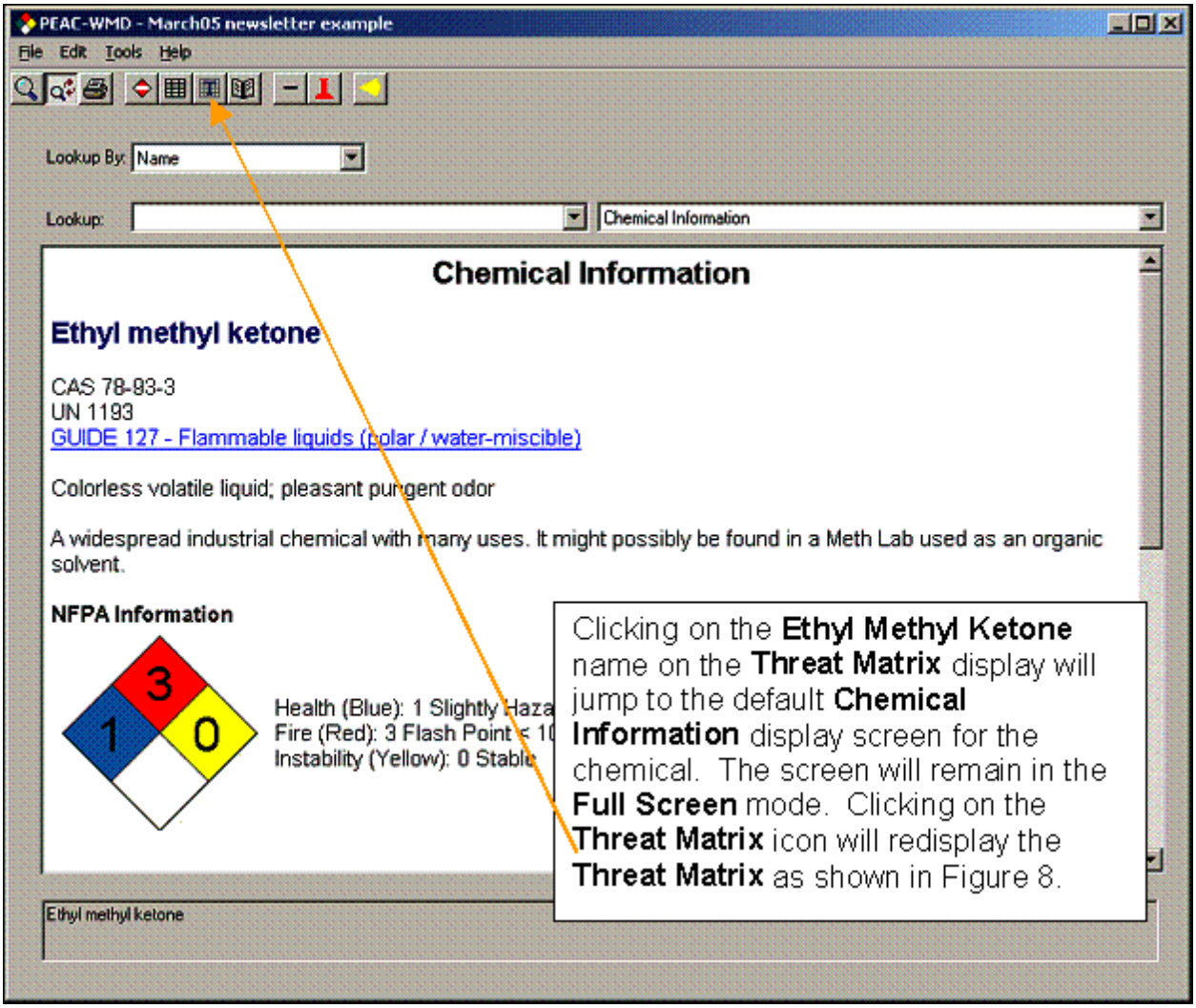


Figure 9 – Using a hyperlink to display information on a specific chemical

Another benefit of the **Working Entries List** is the easy access to information for each of the chemicals by simply stepping through the list of entries. An example will help to explain the idea. If a Safety Officer needs to review information from the **NIOSH Pocket Guide** for each of these chemicals the user can return to the split screen display as shown in Figure 10 and select **NIOSH Pocket Guide** in the **Database Selection** field.

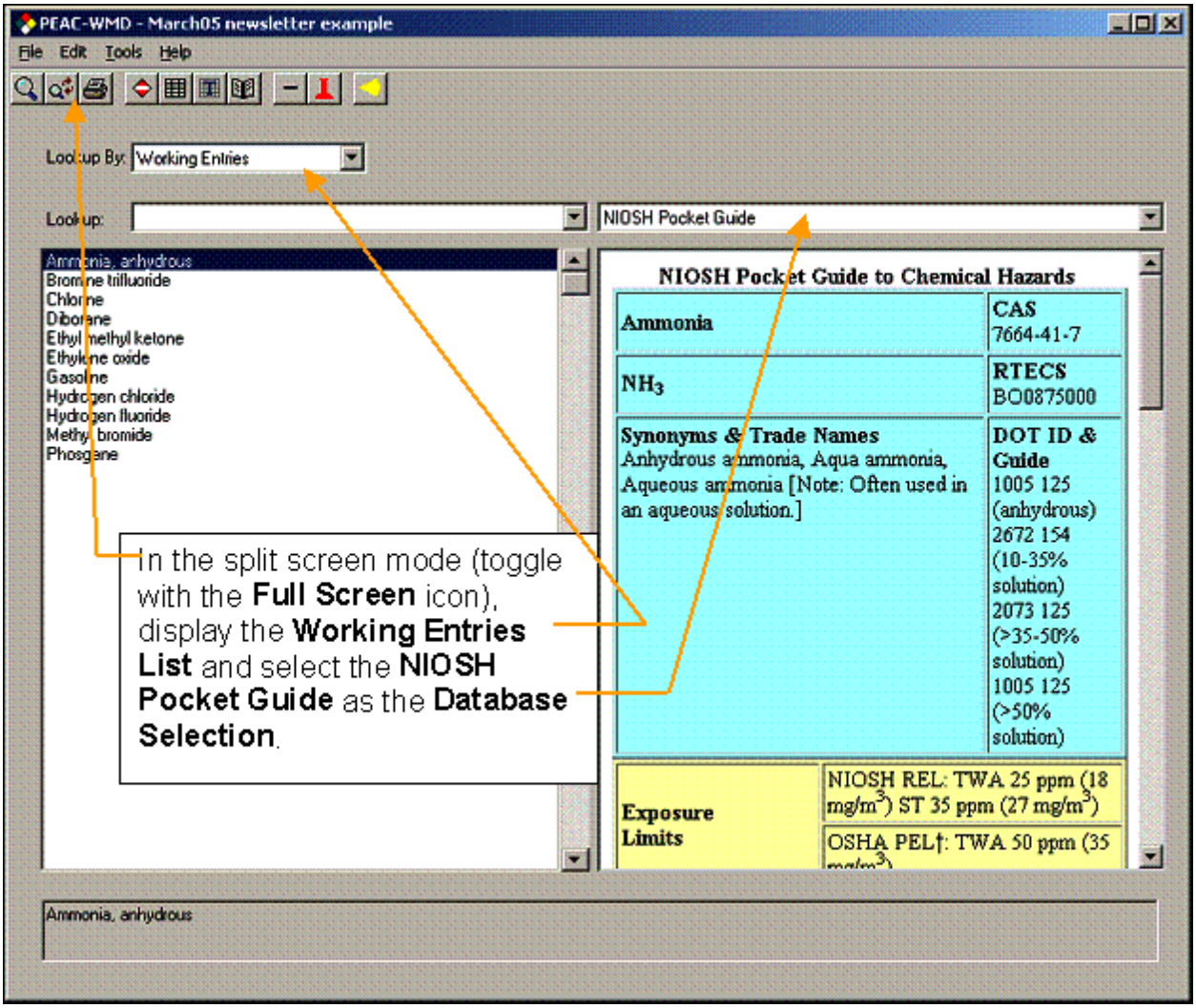


Figure 10 – Display in the split screen mode the Working Entries List and select a Database Selection

Now as each separate entries is highlighted, Ammonia to Bromine trifluoride to Chlorine to …, the PEAC-WMD tool will display the **NIOSH Pocket Guide** information screen if there is an entry in the **NIOSH** for the selected material. This provides the user a quick access to a specific resource or type of information for those chemicals in the **Working Entries List**.

Perhaps the greatest benefit of the **Working Entries List** is the ability to create, save, modify and recall at a later date a **Working Entries List**. To save a list, simply click on the **File** menu selection and click on the **Save As** selection, Figure 11. A standard Windows **Save As** screen will appear and the user provides a name to store the names for later access, Figure 12.

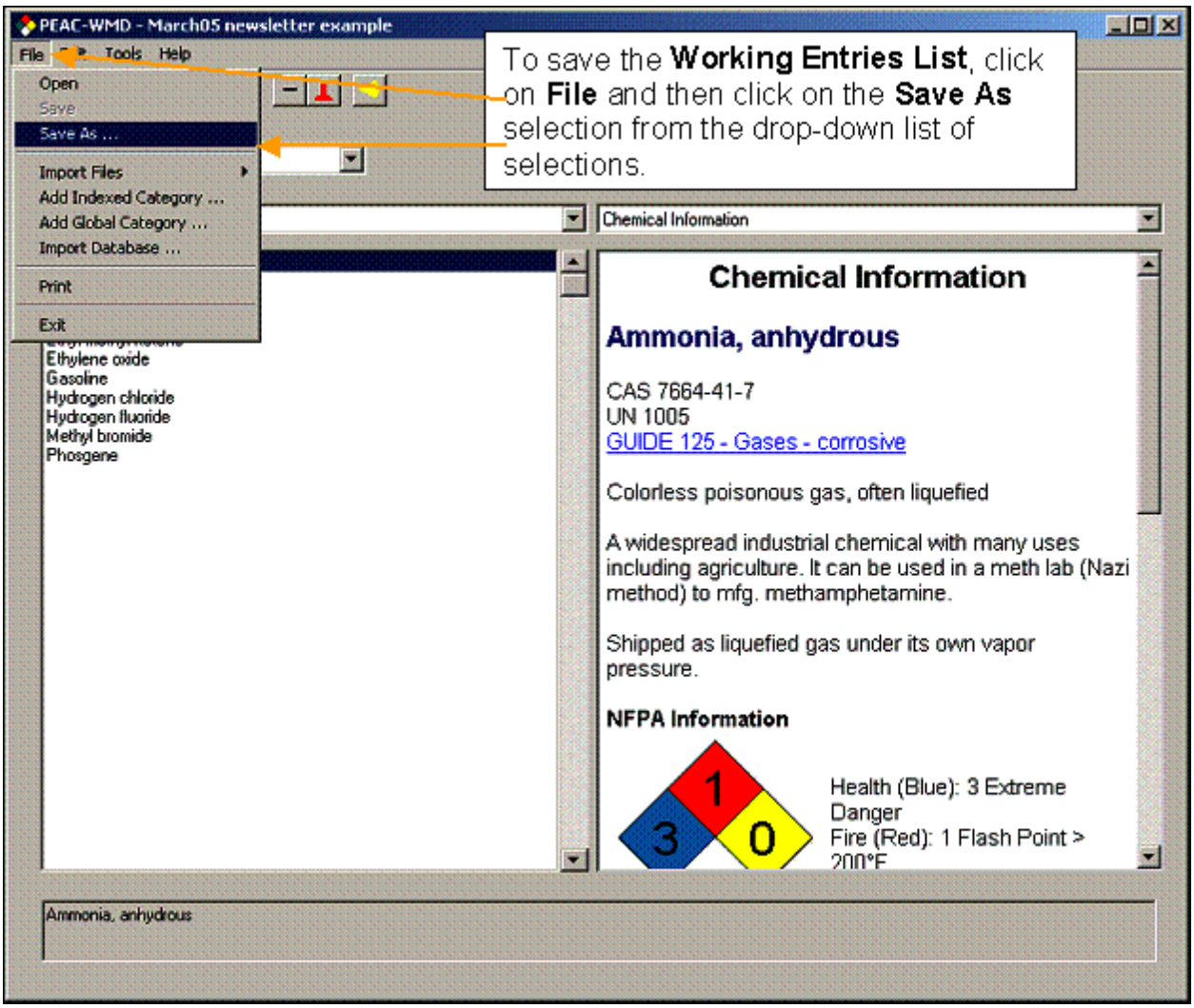


Figure 11 – Saving a Working Entries List

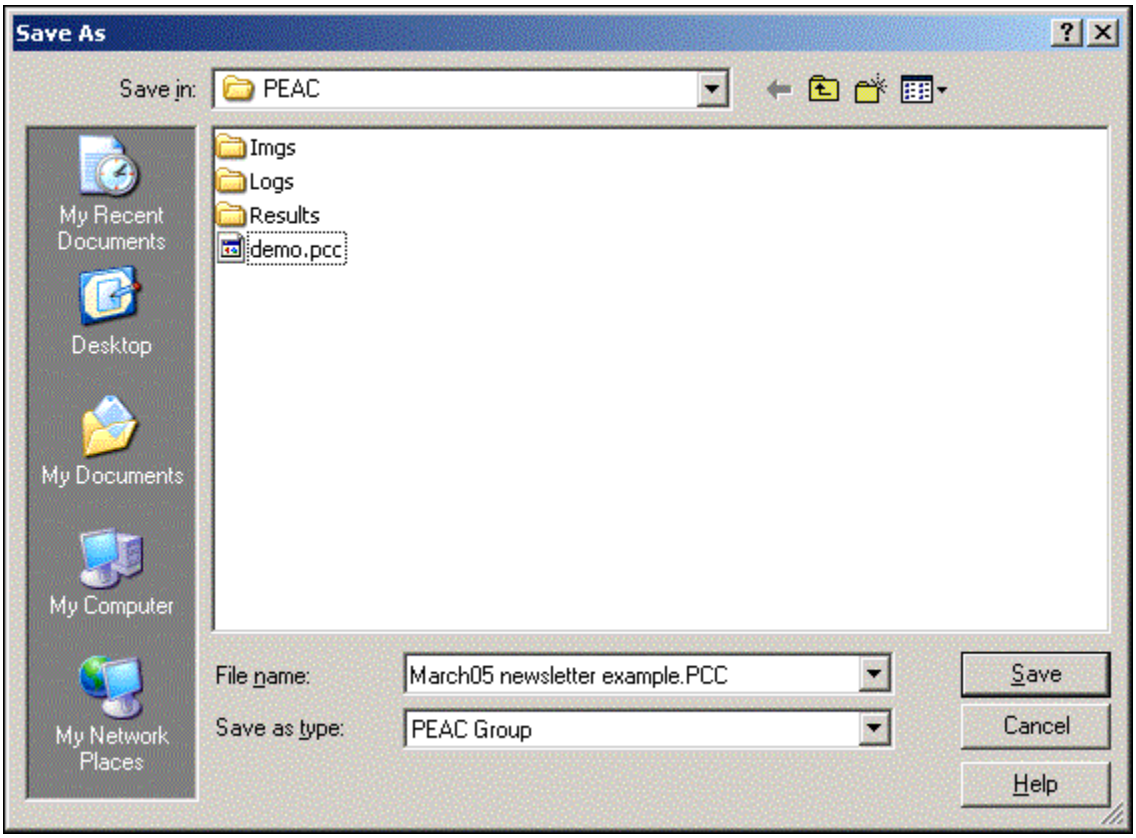


Figure 12 – Entering a name for the saved Working Entries List

In this example the name “March05 newsletter example.PPC” is used. The beauty of the PEAC-WMD application is the user can decide on the name that meets their needs, e.g., location of an incident, location of a facility, date of an incident, the choice is up to the user. The only limitation is the Windows naming conventions that restrict certain characters from being used.

Here are some examples of how this facility can help a user. The user can retain the list of chemicals during an inspection at a facility or building, and quickly recall for display the list if there is an incident at that location in the future. During an incident a user can create a **Working Entries List** to simplify the process of accessing information and when the incident is finished the list is saved for later retrieval to assist in report generation and debriefing.

To open a saved Working Entries List, simply click on the **File** menu selection and click on the **Open** selection, Figure 13. A standard Windows **File Open** screen will appear and the user selects a file to open, navigating to the folder where the file has been saved, Figure 14.

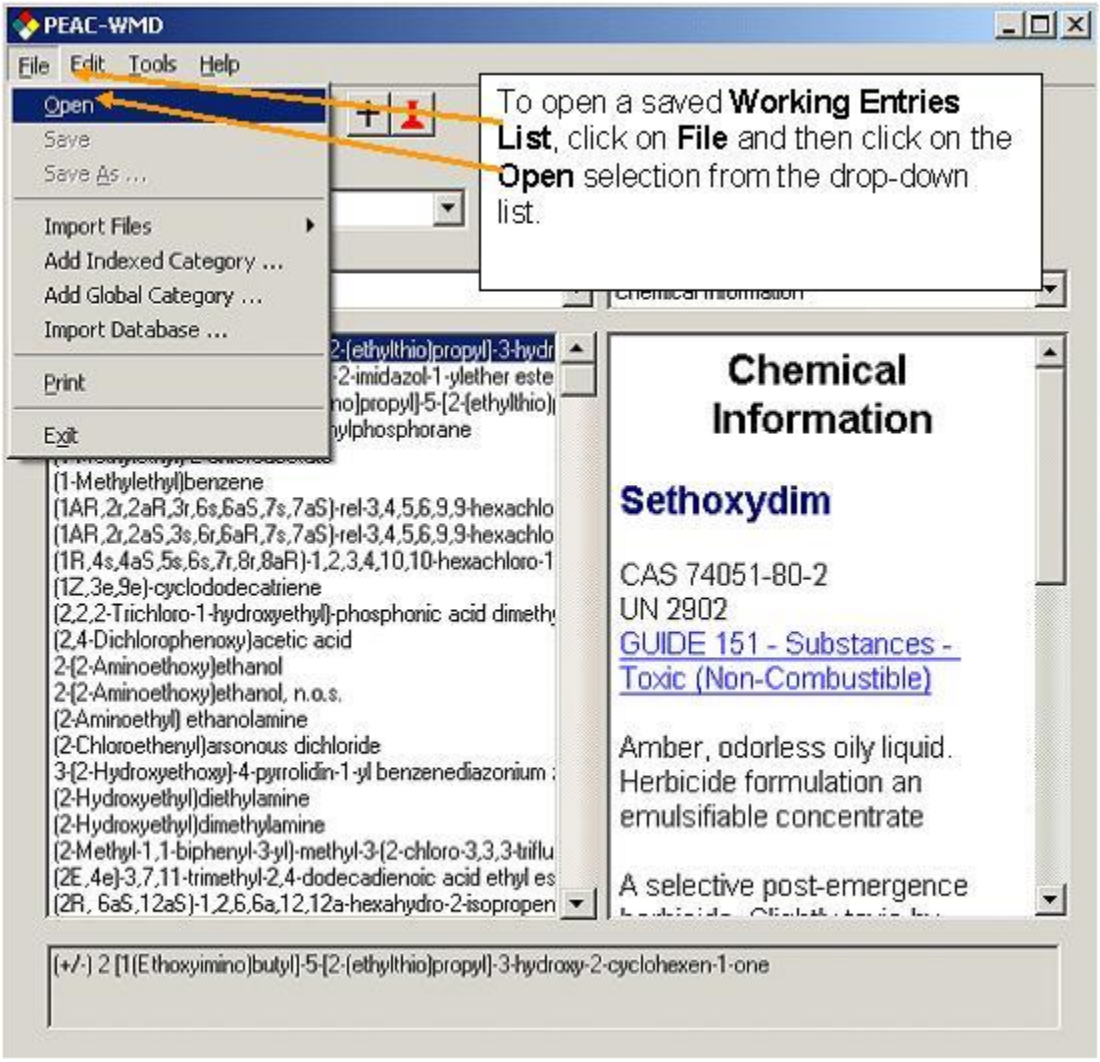


Figure 13 - Opening a saved Working Entries List

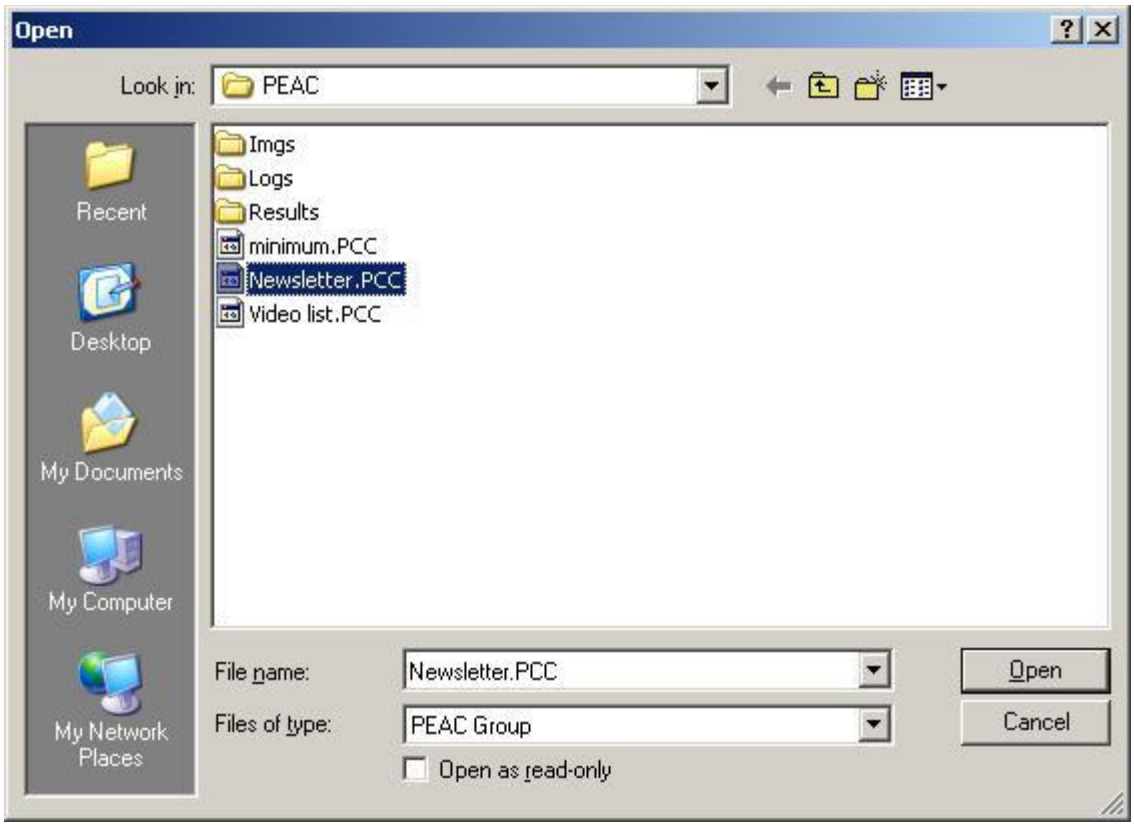


Figure 14 – Selecting a saved Working Entries List

If readers have other ideas of how to use the **Working Entries List** or the **Threat Matrix** feel free to drop us an email or give us a call, and we'll pass them along to other users in a future newsletter.