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ADVISORY COMMITTEE ON TOXIC SUBSTANCES

ANNUAL REPORT ON THE WORK OF ACDS/ACTS CHEMICAL ESSENTIALS SUBGROUP

Issue

1. Annual report to ACTS members on the activity of its ACDS/ACTS Chemical Essentials subgroup.

Timing

2. Routine

Recommendation

3. That ACTS takes note of the recent activity of The Subgroup.

Background

4. At the July 2003 meeting of ACTS, it was agreed that annual reports from subgroups would be provided at March ACTS meetings.
5. The ACDS/ACTS Chemical Essentials subgroup is a joint subgroup set up to provide technical stakeholder input into the Chemical Essentials project. Members will be aware that Chemical Essentials is a cross government project to develop an on-line guidance tool that provides integrated health, safety and environmental advice on using chemicals in the workplace. ANNEX 1 gives an overview of the proposed system.

Argument

6. The Chemical Essentials project is coming to the end of phase 1 – development of the paper based technical rules upon which the final system will be based. This phase has been funded by money from the Treasury's Invest to Save Budget. The next phase of the project is to convert these paper-based rules to an Internet based system. This will require additional funding.

7. The Chemical Essentials subgroup have met 3 times in the past year:
- July 2003 to discuss progress with the project, in particular, the technical rules for the system, including reports back from safety and environment workshops;
 - September 2003 for technical peer review of the system rules, from which an agreed set of system flow charts was produce;
 - January 2004 to discuss the outputs from phase 1 of the project, including the demonstration system, which was launched at the Chemical Essentials Conference on 27th February 2004. The main system flow charts were also formally agreed at this meeting.

Chemical Essentials Conference 27th February 2004

8. To mark the end of phase 1 of the project a conference was held on 27th February 2004. A wide range of delegates came to hear about the concept of Chemical Essentials and how it fits in with current initiatives. HSC's Chair, Bill Callaghan gave the keynote speech, other speakers gave the Environment Agency, DTI Small Business Service, Trade Union and Industry perspectives. Alistair Hay and Chris Beaton, both members of the Chemical Essentials ACDS/ACTS subgroup, gave the respective trade union and industry talks. In the afternoon delegates got the opportunity to try the demonstration system. There was a very positive response from delegates to both the system concept and the demonstration model.

9. A copy of the demonstration CD-Rom is supplied for members with this paper. The demonstration system is designed to bring the *Chemical Essentials* concept alive and stimulate feedback. It will give you a flavour of how the final system is intended to work and the type of guidance it will produce. The demonstration does this by running through a sequence of pre-set screens in response to input. There are 6 realistic to work through to help you experience some of the main features of the *Chemical Essentials* concept. ANNEX 2 provides instructions for using the demonstration system.

10. We are looking for feedback on the look and feel of the model, ease of use and relevance of the content of the guidance to firms needs and its readability. You can email us with any comments to: chemical.essentials@hse.gsi.gov.uk. There will now be more formal pilot testing of the demonstration model with potential users of final the system.

11. Members should please note that the demonstration model and the guidance it produces are designed to illustrate the *Chemical Essentials* concept only. They are designed solely as a demonstration of the proposed format of the guide and do not at this time purport to be guidance or advice issued by the Health and Safety Executive, the Environment Agency or the Scottish Environment Protection Agency. You should refer to the above authorities to obtain copies of the appropriate guidance.

Action

12. ACTS members are asked to note the information in this paper and to try out and feedback on the demo-CD

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ACTS/16/2004 ANNEX 1

CHEMICAL ESSENTIALS – Practical Advice on Working with Chemicals

An overview of the proposed system

Introduction

Chemical Essentials is a cross government project to develop an on-line guidance tool that provides integrated health, safety and environmental advice on using chemicals in the workplace. The Health and Safety Executive (HSE), the Environment Agency and the Scottish Environment Protection Agency (SEPA) are working together, and have developed the rules for how the proposed system will operate together with a demonstration model to illustrate the concept and show how the final system might work. This document contains an overview of the proposed system.

Background

Independent market research has shown small businesses would welcome integrated health, safety and environmental advice on what they have to do to control chemicals they use. *Chemical Essentials* aims to meet this need. Once developed and freely available on the Internet it will:

- make it easier for small businesses to comply with the law;
- contribute to improved occupational health and safety; and
- reduce harm to the environment.

There are many legal requirements facing the 1.3 million small businesses using chemicals in the workplace. They have to protect the health of employees, guard against fire and explosion risks and comply with environmental legislation on discharges to the air and water and waste disposal. At the minimum they will have to comply with three separate sets of regulations. What they have to do will vary from chemical to chemical and in some cases depend on how the chemical is processed.

Chemical Essentials aims to provide practical integrated advice on managing chemicals tailored to the needs of individual businesses. The goal is to make this freely available on the Internet. The advice will be tailored to the chemical used, how it is being used and how much of it is being used. The system will help firms comply with the main legislative requirements on using chemicals in the workplace.

HSE, the Environment Agency and SEPA have developed a unified system of rules for generating integrated health, safety and environmental advice. A demonstration model, showing six examples, has been developed to illustrate how the eventual system might look and work and the type of guidance it will produce. The next phase is to convert this concept into a live Internet based system. An expert group with representatives from industry, unions,

environmental concerns and independents has provided valuable technical input and peer review.

If you would like to receive a copy of the system rules and technical basis please email at chemical.essentials@hse.gsi.gov.uk

HSE, the Environment Agency and SEPA have other initiatives to help firms manage chemicals; these include free Internet guidance to help small businesses:

- HSE's *COSHH Essentials* (www.coshh-essentials.org.uk) is an Internet tool that helps businesses control health risks from chemicals;
- *NetRegs* (www.netregs.gov.uk), a joint project of The Environment Agency, SEPA and the Environment and Heritage Service, Northern Ireland gives advice about how to comply with environmental law.

Chemical Essentials builds on this work and experience.

The development of the *Chemical Essentials* concept and set of rules has been made possible by a £250,000 award from the Treasury's Invest to Save Budget. This budget exists to facilitate collaborative projects between public service bodies to enable them to improve the services they provide in an innovative and joined up fashion. (For further details on "Invest to Save" see - <http://www.isb.gov.uk>). **Additional funding is now required to convert the rules into an Internet system.**

Who is *Chemical Essentials* designed for and what does it cover?

The *Chemical Essentials* concept would help businesses that work with natural or manufactured chemicals and chemical products. The system and guidance will be written in plain English with minimum technical language. Although aimed mainly at businesses employing fewer than 50 staff, experience with *COSHH Essentials* shows that larger firms and those with specialist expertise also find such guidance useful.

The system will help employers and managers who have responsibilities under health, safety and environmental legislation. It will also be of value to:

- Health, safety and environment professionals;
- Employee health and safety representatives;
- Employees working with the chemicals.

Chemical Essentials will help firms comply with the main requirements of:

- The Control of Substances Hazardous to Health Regulations 2002;
- The Dangerous Substances and Explosive Atmospheres Regulations 2002; and
- Environmental legislation on emissions and waste.

The *Chemical Essentials* guidance will not attempt to cover all aspects of the legislation. It will cover the main practical aspects, backed up by pointers and references to further information on areas not covered. The advice will not cover other workplace health and safety issues, such as noise or manual handling, although it will align with recognised good practice. *Chemical Essentials* focuses on giving advice on commonly used chemicals and products containing chemicals. It will not cover legislation on certain specific hazards such as biohazards, designer explosives, such as fireworks, safety cases required by the Control of Major Accident Hazards (COMAH) Regulations and the application of plant protection products.

How will *Chemical Essentials* work and what will it provide?

Chemical Essentials will be versatile and user friendly. The four routes that can be taken through the system will reflect four different levels of advice. The user will be able to choose which of these options they want to take and be able to return to the start and take a different route if they want. The four options are:

- General advice
- Advice on an activity or process within an industry or services sector - Direct Advice
- Advice tailored to a particular supplied chemical or chemical product – generated by an interactive on-line risk assessment
- A cross checking of storage and use compatibility for a number of chemicals

Figure 1 illustrates the design of the overarching flow and structure.

Explanation of the four main options available

General advice

This relates to the left hand route on the flow diagram. The general advice option will allow the user to view, and select for printing, a range of advice on health, safety and environmental topics involving the handling of chemicals at work. It will provide quick and simple access to advice on protecting health, safe handling and the environment from a single source, although the advice itself will not be presented in an integrated form.

Examples of topics to be covered are:

- Free leaflet guides to the main pieces of legislation
- Basic steps to reduce waste and save costs
- General principles for storing chemicals safely
- Good housekeeping tips for workshops, warehouses and stores used for chemicals
- Advice on health surveillance

Advice on an activity or process within an industry or services sector - Direct Advice

This relates to the far right hand route of the flow diagram and will provide “off-the-peg” advice for certain industry sectors and processes where we can

reliably predict the types of substances and risks involved. This will be done through pre-prepared sheets containing advice on how to control the health, safety and environmental risks. The user will simply need to select their industry or services sector and activity (where these are covered by the system).

This route is the same as the direct route in COSHH Essentials. The current COSHH Essentials advice (which only covers health risks) will be expanded to cover health, safety and environment risks including advice on storage and waste handling. Reference to the Environment Agency NetRegs tool will also be provided in this route.

The advice provided here will be prepared for a whole industry sector process or activity and will provide a kind of “off-the-peg” risk assessment. However, there are certain assumptions made regarding what is being used and how it is used (including the scale of the operation). The user will therefore need to find advice that matches what they do and assess how relevant that advice is to their situation.

Examples of topics covered by this advice will be:

- Hairdressing
- Motor-vehicle repair activities (for example spraying of 2 pack paints containing isocyanates)
- Foundry fume
- Rubber fume and dust
- Craft bakeries - handling of flour.

Advice will also be provided on some natural products and groups of chemicals through this route. Examples of these will include:

- Grain dusts
- Foodstuffs such as milk and orange juice
- Metalworking fluids

A cross-checking of compatibility for a number of chemicals

This relates to the second to right hand route of the flow diagram.

The purpose of this route is to provide a quick facility to check basic compatibility, from a chemical safety perspective, for up to 4 chemicals. The user will have to input the identity, or a key piece of information on each chemical they want considered. The advice will inform the user about potentially dangerous combinations of chemicals, so that the user will know which should be separated for storage purposes and kept apart during use. It will not cover the complexity of reaction hazard risks.

Advice tailored to a particular supplied chemical or chemical product – generated by an interactive on-line risk assessment

This relates to the second to left route on the flow diagram and provides “made-to-measure” risk assessment for individual supplied chemicals or chemical products (containing more than one chemical ingredient). The range of chemicals used in the workplace is immense, as are the range of activities carried out which involve the use of chemicals; we cannot know every

chemical that is used in every operation. It is not therefore possible to provide pre-prepared sheets (“off-the-peg” risk assessments) through the direct advice route for every possible combination and permutation of the use of chemicals across all industry sectors. There will also be instances where the user wants to find out about the use of a particular chemical even though their process or activity may be covered by an “off-the-peg” sheet.

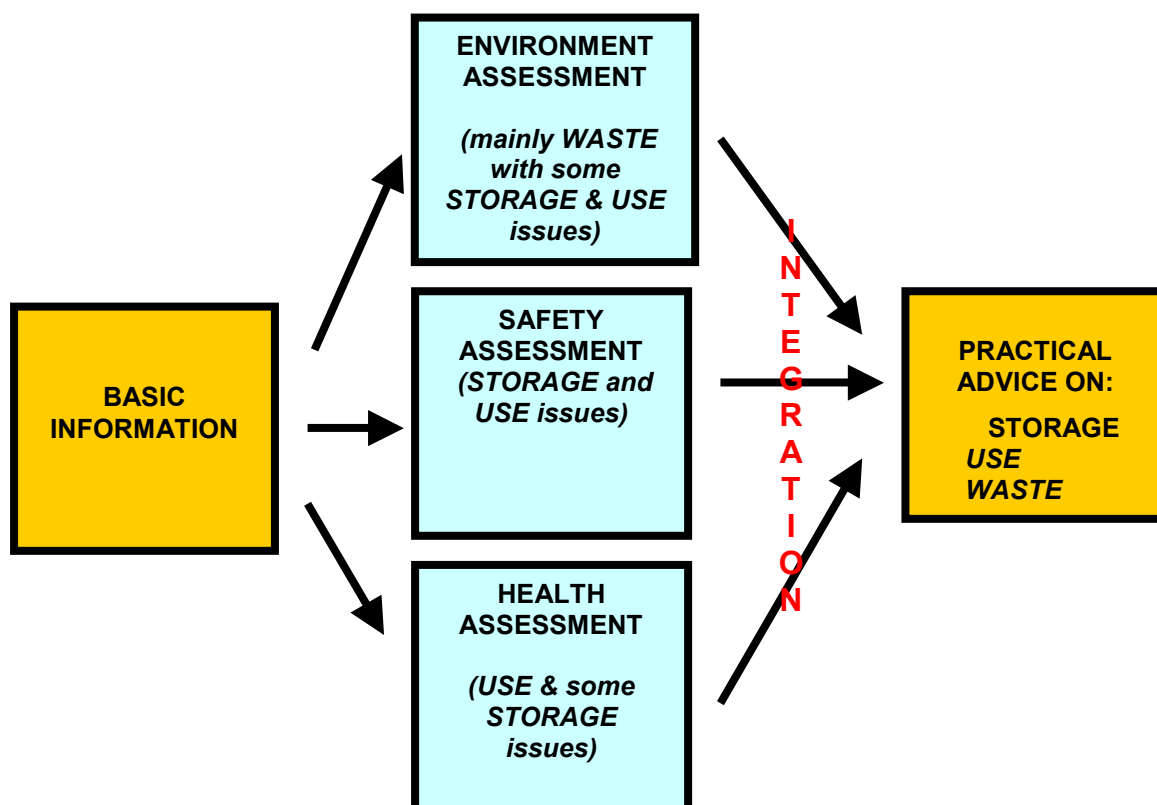
This route of generating advice provides a risk assessment scheme which generates bespoke “made-to-measure” advice, according to certain system rules, which reflects what the user is using, how they are using it and the scale of what they are doing.

How does the interactive “on-line” risk assessment work? – advice tailored to a supplied chemical or chemical product

We have developed a generic risk assessment scheme, which covers health, safety and environmental risks. This has been a major challenge, as it required bringing together three different hazard types and areas of regulation.

The rules for the tailored risk assessment are complex; they contain a series of decision trees that ensure the user gets the appropriate advice. But they will be behind the scenes and not visible to the user. The system is shown schematically in Figure 2 below.

Figure 2 - Schematic representation of *Chemical Essentials* tailored risk assessment



For the system to generate tailored advice it needs to have a set of rules according to:

- what is being used;
- it's hazards;
- how it is being handled;
- the quantity involved;
- what regulation applies;

The system will assign categories that reflect these factors then apply rules to determine the advice. The advice will be provided on:

STORAGE of the chemical, including requirements for isolation/ separation from other types of chemicals, and a flag for chemicals that may attract additional requirements under the COMAH Regulations.

USAGE of the chemical, including measures necessary to control emissions to the environment, for the tasks they are carrying out.

WASTE HANDLING including disposal options, for surplus material and unused and empty containers. Note waste handling advice will only cover chemicals that the user provides information on (ie it will not predict changes to the chemical through for example processing or contamination).

There will be the option of advice in one or more of these three areas of core guidance, tailored to the chemical. In plain English it will set down in bullet points the actions need to be taken and what to avoid. The sheets will follow the same format as the COSHH Essentials control guidance sheet. These will vary in length depending on the guidance required, but normally up to a maximum of four sides of A4.

As well as the core guidance, the user will also have the option of investigating in more depth some additional issues, which will require further user input; the user will be able to establish whether they might fall under the scope of Integrated Pollution Prevention Control (IPPC) or the Solvents Directive and, if so, what they should do. Geographical information will also be available, for example contact points for local regulators and advice on groundwater zones and flood protection areas.

Outline of key steps taken by the user

To minimise what the user has to input *Chemical Essentials* will be supported by a **single chemical database**, for single chemicals (as opposed to products which may be a mixture of many different chemicals). This will contain much of the information about the relevant hazards and properties of the chemical used. ***For the risk assessment process the user will then only need to input the chemical (or some other unique chemical identifier such the Chemical Abstracts Service (CAS) number), what tasks they are carrying out, how much they are using and information on disposal. For solids they will also have to enter the level of dustiness.***

For products – for a mixture of more than one chemical ingredient - a database would be much more complex. Ideally, a products database, containing a list of commonly used products and their associated properties

would also support the system. However, there are so many more difficulties associated with setting up and maintaining such a database that it is not proposed to attempt this for the first version of *Chemical Essentials*. Some environmental legislation imposes requirements on specifically listed chemicals, and so for products there will be the option to input chemical ingredients to check against these.

The basic steps to go through are:

- The user enters details about the chemical they are using. If the system identifies that the chemical is outside the scope of the system, such as an explosive, this will be flagged here.
- If the user wants storage advice they will have to enter information about how the chemical is stored (for example tanks, cylinders, bottles, boxes).
- If the user wants usage advice they will have to input information about the tasks they are doing, the quantities of chemicals involved and the temperature they are working at. Other parameters such as dustiness of solids, flash point and vapour pressure may also be required. The last two will only be required where the chemical is not on the single chemical database.
- The user will then be asked if they want to find out whether IPPC or the solvents directive applies to what they are doing. These are sub-assessments that will involve answering further questions.
- If the user wants advice on how to handle waste, they will have to enter information on the container and waste disposal routes.
- Finally the user gets a summary of the guidance they have generated (with the option to view and/or print and end or go down a different route)

Storage advice

Storage advice will be given in the following areas:

- General good practice advice
- Tailored storage advice relating to the hazard of the chemical, how it is stored and how much is stored.
- Advice on what other types of chemicals they can and cannot be stored with
- Advice on whether COMAH regulations apply
- Additional advice for solvents
- General advice on emergency procedures.

Usage advice

Advice on the use of the chemical will be given in the following areas:

Core guidance

- General good practice advice
- Tailored advice relating to the hazard of the chemical, what tasks are being performed and the scale of its use (how much) and the potential for workers to be exposed to it.
- Advice on what type of abatement measures (such as a filter to clean the air) might be appropriate for the chemical where there is potential for it to be vented outside the workplace

- Additional advice for solvents (including a recommendation to complete the Solvent sub assessment)
- General advice on emergency procedures.

Additional Options

- Advice on whether IPPC applies together with advice on what this means (IPPC sub assessment)
- Advice on whether the Solvents Directive applies together with advice on what this means (Solvents sub assessment)

Waste handling advice

Advice on the use of the chemical will be given in the following core areas:

- General good practice advice (to include waste minimisation and waste hierarchy advice, references to the Envirowise and NetRegs websites)
- Tailored advice on how to handle used/empty containers
- Tailored advice relating to the hazard of the chemical, and it's route of disposal as well advice on whether the user may have "special" or "hazardous" waste under UK and European waste legislation.

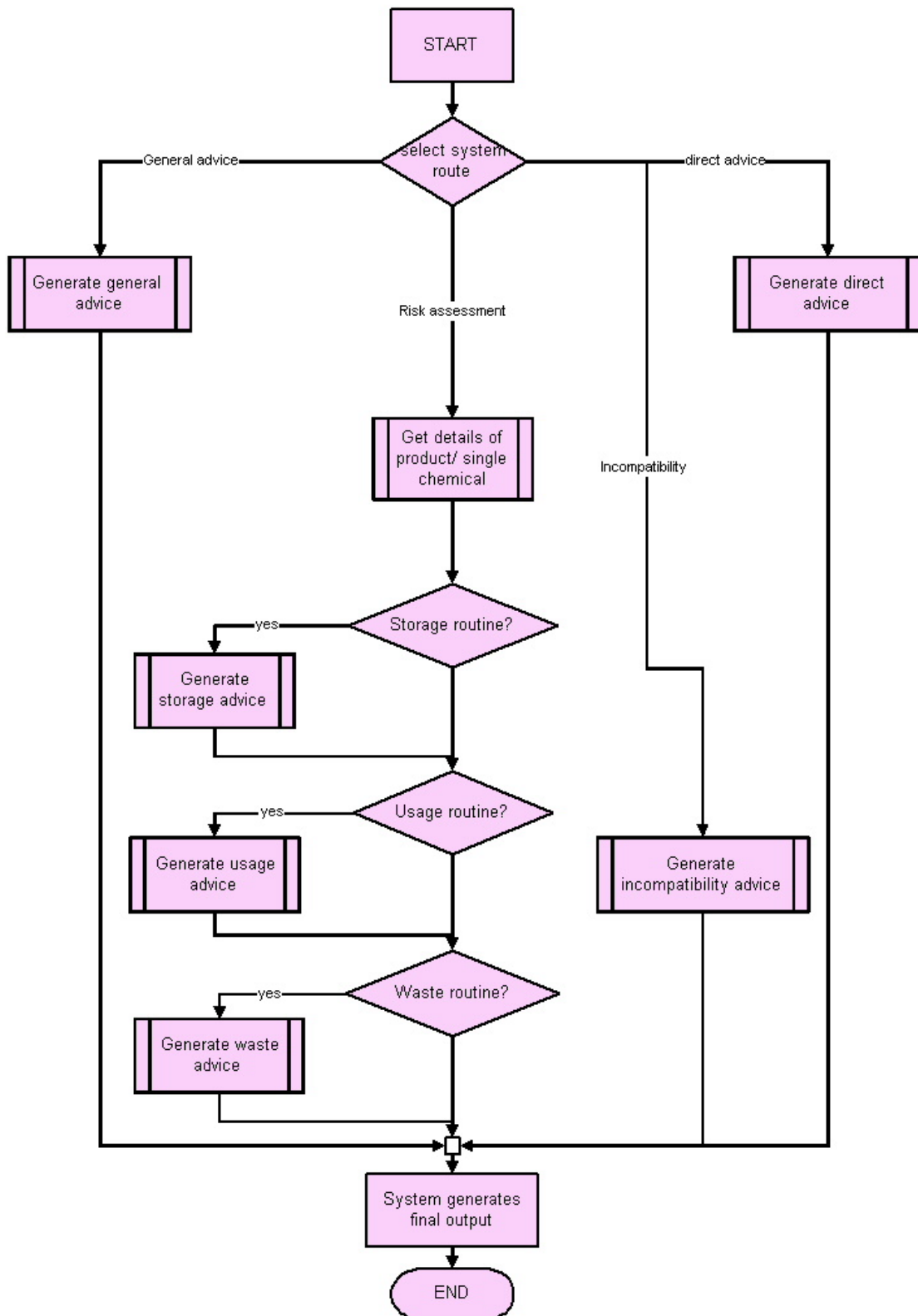
Additional Option

- Facility to find geographical information such as contact details for appropriate regulators and advice on groundwater protection zones and flood risks. This may be done through a reference to the "What's in your backyard" section of the Environment Agency website.

Summary

Independent market research has shown small businesses want integrated health, safety and environmental advice. *Chemical Essentials* will meet this need, once funding has been secured to develop the electronic system and it is freely available on the Internet. It will make it easier for small businesses to comply with the law, contribute to improved occupational health and safety and reduce harm to the environment. *Chemical Essentials* is an excellent example of government departments and agencies working together to produce practical help for industry.

Figure 1: overview of system structure



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Information on the demonstration model and instructions for its use

Introduction

This CD-Rom is a demonstration model of the proposed *Chemical Essentials* system for you to try. It is designed to bring the *Chemical Essentials* concept alive and stimulate feedback from you. It will give you a flavour of how the final system is intended to work and the type of guidance it will produce. The demonstration does this by running through a sequence of pre-set screens in response to input by you. There are 6 realistic examples for you to work through to help you experience some of the main features of the *Chemical Essentials* concept.

We are hoping that you will be able to give us feedback on the look and feel of the model, ease of use and relevance of the content of the guidance to your needs and its readability. You can email any comments to:

chemical.essentials@hse.gsi.gov.uk

Disclaimer

Chemical Essentials is a joint Health and Safety Executive, Environment Agency and Scottish Environment Protection Agency project. This demonstration model and the guidance it produces are designed to illustrate the *Chemical Essentials* concept only. They are designed solely as a demonstration of the proposed format of the guide and do not at this time purport to be guidance or advice issued by the Health and Safety Executive, the Environment Agency or the Scottish Environment Protection Agency. You should refer to the above authorities to obtain copies of the appropriate guidance.

Features of the demonstration model

General -The demonstration is designed to illustrate the proposed overall structure of the website and possible routes the user can take through it. It cannot illustrate all the features or functionality or make behind the scenes calculations of data - there are only certain pathways that are active (inactive pathways are greyed out).

Printing -The demonstration takes you through the 6 scenarios to the end guidance. These are downloadable PDF files, which you can print off.

Options/features not covered –Not all the planned options, pathways and features are included in the demonstration model. In particular:

- the facility to cross check the compatibility of a number of chemicals;
- some of the optional sub assessments (for example the IPPC sub assessment);
- the planned supporting chemical database. This will contain a database of single chemicals and hold most of the data about the chemical the system will need. The user will only need to enter the

chemical name or index number (whichever is preferred). The database will have user-assisted text, which will make it as user-friendly as possible.

General navigation of the demonstration model

The demonstration model has been designed to look and act like a real website. The screen is divided into 3 main sections:

- The main working window, where you will enter data or select options;
- The help window on the right hand side of the screen. This will display help information – including general help and help on the green underlined words in the main working window (click on the word to bring up the help). The help text is written to reflect the real system;
- The top menu bar (of red rectangular buttons)

Additional navigation features are:

- The bottom progress bar. This is colour coded depending on the type of assessment you are doing – the general advice option is beige, the process/ activity option is green and the chemical option is blue.
- Summary tabs – which will appear in the top right hand corner of the main working window. When an assessment in one of the 3 option areas has been completed the corresponding tab is colour filled. You can click on these to get a summary of the guidance you have already created.

Instructions for use

- To start click the red Start button on the top menu of the welcome page.
- Each page will require you to make a choice or input information. Choices that are not allowed are greyed out. Where you have to input data this is set out in the boxes below on the worked examples (help text will also contain the information and sometimes a drop down menu is provided by clicking on the arrow in the right hand side of the input box). In a “real life” situation information on chemical properties will be obtained from the chemical safety data sheet (provided by chemical suppliers).
- In order to proceed to the next page you need to click on the “go” button at the bottom of each page.
- Once you have completed an example, the summary tab (top right hand corner of main window) for that option will be filled in – to view a summary of what you have done, click on the coloured tab.
- Once you have completed an assessment click on the red guidance button on the top menu bar to start another example.

How to get going with the worked examples

The demonstration model will illustrate 3 of the main *Chemical Essentials* options: the general guidance route; the process/activity route (“off the peg risk assessments”); and the chemical risk assessment route (“made to measure “ assessments for supplied chemicals and chemical products). These options will appear when you press the Start button on the main menu bar.

You can do these worked examples in any order – what you select and input will determine the pathway taken.

Scenario 1 - you are looking to start up a small engineering company and want to find out what guidance is available on using chemicals in the workplace

This will illustrate the General guidance pathway – where the user will be able to select a range of guidance on health safety and environmental related guidance.

Information you need for your assessment.

You have to select all three options (in the final system the choice of guidance will be much wider and you will be able to select any number)

Scenario 2 - you are the owner of a garage and want to start spraying cars using isocyanate (2 pack) paints. You want to know what equipment you need and what precautions to take.

This will illustrate the process/activity direct advice pathway – where the user can get “off the peg” assessments related to a process or activity within an industry or service sector.

Information you need for your assessment.

You have to select:

Service sector

Motor vehicle repair and maintenance

Spraying and other paint jobs - Isocyanate from spraying two pack products in a spray/bake booth

The demonstration uses the current eCOSHH Essentials structure. In the final system this structure will be reviewed and the choice of guidance expanded to include some natural products, groups of chemicals and some dusts and fumes.

Scenario 3 - you are the manager of a small engineering company manufacturing metal components. The metal components are subjected to heat treatment in a controlled atmosphere furnace in order to modify their metallurgical properties. This is done by placing the components in a controlled atmosphere furnace, heating them and then cooling them in an atmosphere of nitrogen. You want to know what precautions to take when using nitrogen

This will illustrate the route that allows you to complete an on-line risk assessment for a supplied gas (a single chemical).

Information you need for your assessment.

Nitrogen is a *single chemical* (which means the real system could use the database of chemicals)

The nitrogen is supplied as a compressed gas from cylinders.

The CAS number is 7727-37-9

The UN number for Nitrogen is 1066

You are using nitrogen as a gas

You want storage, usage and waste handling advice

You don't want to carry out IPPC or solvent sub assessment

Scenario 4 - you are the owner of a small company manufacturing and selling wire products. These are coated on a powder coating line. You want to make sure that you are taking appropriate precautions.

This will illustrate the route that allows you to complete an on-line risk assessment for a supplied solid chemical product (made up of a number of chemical ingredients). In this example we have made up a fictitious powder coating product.

Information you need for your assessment

The *Supercover powder coating* is a *chemical product* made up of a number of chemical ingredients (which means the real system could not use the database of chemicals).

You decide not to input all its ingredients

Supercover powder coating is a solid powder

Supercover has the risk phrases – R20/21/22

Supercover has *no* UN number or UN class (type in none)

You want storage, usage and waste handling advice

You store Supercover in 10 Kg drums

Supercover is a fine powder

Powder coating is a type of surface coating

You use approximately 10 Kg per batch

You don't carry out the IPPC or Solvent sub-assessment

You do want advice on disposing of the empty drums and bottles but don't wash waste down the drain

Scenario 5 - you are the health, safety and environment manager in a business who as part of their process buys in 200litre drums of toluene for decanting into bottles and selling on. You want to check what hazards may be associated with toluene and what precautions you need to take.

This will illustrate the route that allows you to complete an on-line risk assessment for a liquid supplied chemical (single chemical).

Information you need for your assessment:

Toluene is a *single chemical* (which means the real system could use the database of chemicals)

Toluene has the CAS number 108-88-3

Toluene is a liquid

Toluene has the UN number 1294

You want storage, usage and waste handling advice

You store toluene in drums and bottles

You are “transferring” at room temperature (25C) using a 200litre drum per batch

You don't carry out the IPPC sub-assessment but do carry out the Solvents sub-assessment – you use 10-15 tonnes of solvent per year, but do not carry out any of the activities listed.

You want advice on disposal of drums and bottles and sometimes do wash spillages to drain (this could be up to a drum full – more than 2Kg)

Scenario 6 -you are the department manager in a pharmaceutical company manufacturing pharmaceuticals containing nitroglycerine. You are currently buying in a 5% nitroglycerine and lactose mixture to make tablets. You are looking into making your own nitroglycerine and lactose mixture using nitroglycerine solution in alcohol with more than 1% but less than 10% nitroglycerine. You know nitroglycerine is an explosive, but are not sure what legal requirements or precautions you need to follow

This will illustrate how the system will deal with an on-line risk assessment of something that is outside the scope of the system

Information you need for your assessment:

Nitroglycerin is a single chemical (which means the real system could use the database of chemicals)

Nitroglycerin solution is a liquid

CAS number 55-63-0

UN number 0144 (UN Class 1: explosive)