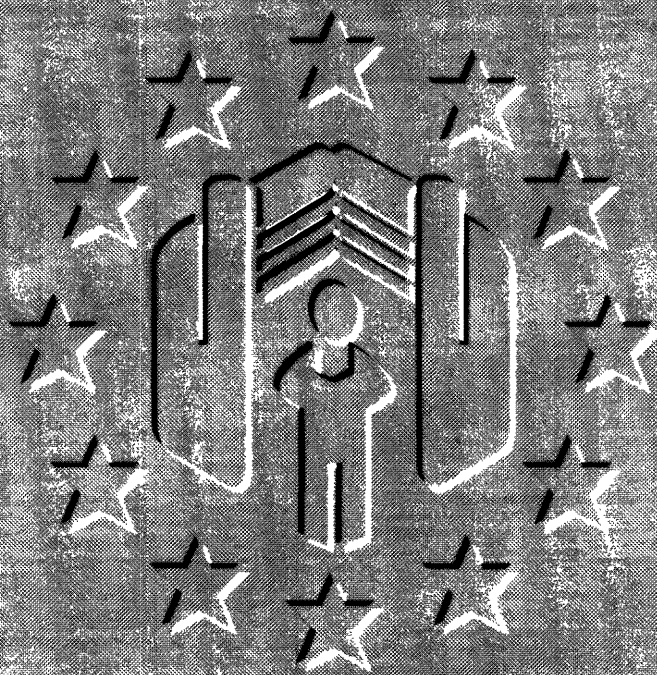




COMMISSION
OF THE EUROPEAN COMMUNITIES

The availability of occupational exposure data in the European Community



Health and safety

**The availability
of occupational exposure data
in the European Community**

Health and safety series

Commission of the European Communities

health and safety

The availability of occupational exposure data in the European Community

Martine H.P. Smith. Deborah C. Glass

The University of Birmingham
Institute of Occupational Health

for the Commission of the European Communities
L-2920 Luxembourg

Directorate-General
Employment, Industrial Relations and Social Affairs

1993

EUR 14378 EN

**Published by the
COMMISSION OF THE EUROPEAN COMMUNITIES
Directorate-General XIII
Information Technologies and Industries, and Telecommunications
L-2920 Luxembourg**

LEGAL NOTICE

Neither the Commission of the European Communities nor any person acting on behalf of the Commission is responsible for the use which might be made of the following information

Cataloguing data can be found at the end of this publication

Luxembourg: Office for Official Publications of the European Communities, 1993

ISBN 92-826-4331-X

© ECSC-EEC-EAEC, Brussels • Luxembourg, 1993

Printed in Belgium

CONTENTS

| | Page |
|---|-------------|
| SUMMARY | IX |
| 1. INTRODUCTION | 1 |
| 1.1 Scope of the Study | 1 |
| 1.2 What is Meant by Occupational Exposure Data | 1 |
| 1.3 Background to this Research Project | 2 |
| 1.3.1 Sources of Occupational Exposure Data | 2 |
| 1.3.2 Reasons for Data Collection | 5 |
| 1.3.3 Extrapolation to other Workplaces | 6 |
| 1.4 Difference between Databases and Databanks | 6 |
| 1.5 Where are Occupational Exposure Data Kept? | 6 |
| 1.6 European Foundation Survey | 8 |
| 1.7 First Meeting of Product and Exposure Registers | 10 |
| 2. THE STUDY | 13 |
| 2.1 The Protocol | 13 |
| 2.2 Methodology | 13 |
| 2.2.1 Organisations Surveyed | 13 |
| 2.2.2 Questionnaires | 14 |
| 2.3 Results | 16 |
| 2.3.1 Returns for the First Survey | 16 |
| 2.3.2 Organisations with Occupational Exposure Data - First Survey | 18 |
| 2.3.3 Types of Organisation | 20 |
| 2.3.4 Form of Occupational Exposure Data | 22 |
| 2.3.5 Why are Occupational Exposure Data Collected? | 22 |
| 2.3.6 What Airborne Contaminants are Monitored and what Data are Collected? | 24 |
| 2.3.7 Who has contributed to the Databanks of Occupational Exposure? | 24 |

| | | |
|------------|--|-----------|
| 2.4 | Computerised Systems | 25 |
| 2.4.1 | Types of Organisations holding holding Computerised Data | 25 |
| 2.4.2 | Reasons for Monitoring Occupational Exposures | 27 |
| 2.4.3 | Extent of the Data | 28 |
| 2.4.4 | Access to the Data | 29 |
| 2.4.5 | Quality Control | 31 |
| 2.5 | Details of the Computerised Systems | 32 |
| 2.5.1 | Hardware | 32 |
| 2.5.2 | Software | 33 |
| 2.5.3 | Proformas | 34 |
| 3. | DISCUSSION | 35 |
| 3.1 | All Data Holders | 35 |
| 3.1.1 | Questionnaire Returns | 35 |
| 3.1.2 | Number of Organisations holding Occupational Exposure Data | 35 |
| 3.1.3 | Type of Organisation holding Occupational Exposure Data | 35 |
| 3.1.4 | Form of Occupational Exposure Data | 35 |
| 3.1.5 | Why is Data Collected? | 35 |
| 3.1.6 | What is Monitored? | 36 |
| 3.2 | Computerised Occupational Exposure Data | 36 |
| 3.2.1 | Holders of Occupational Exposure Data | 36 |
| 3.2.2 | Quality Control over Occupational Exposure Data | 36 |
| 3.2.3 | Access to the Data | 36 |
| 3.2.4 | Computers, Hardware and Software | 37 |
| 3.3 | Future Developments | 37 |
| 3.3.1 | Pooling Data | 37 |
| 3.3.2 | Standard Proformas and Sampling Methods | 37 |
| 3.3.3 | Standard Coding Procedures | 38 |
| 3.3.4 | Uniform Hardware and Software | 38 |
| 3.3.5 | Proposed New Computer Databanks | 38 |
| 3.3.6 | The Way Forward | 38 |

| | | |
|------------|---|-----------|
| 4. | DESCRIPTION OF SOURCES OF OCCUPATIONAL EXPOSURE DATA | 39 |
| 4.1 | Belgium | 40 |
| 4.2 | Denmark | 43 |
| 4.3 | France | 45 |
| 4.4 | Germany | 50 |
| 4.5 | Greece | 54 |
| 4.6 | Italy | 55 |
| 4.7 | Spain | 56 |
| 4.8 | The Netherlands | 57 |
| 4.9 | United Kingdom | 59 |
| | References | 77 |
| | Appendices | |
| Appendix 1 | Initial Questionnaire Survey | 81 |
| Appendix 2 | Second Questionnaire - Computer System | 85 |
| Appendix 3 | Description of Existing Databases | 89 |
| Appendix 4 | Environmental Monitoring Data proforma HSE/BOHS | 93 |
| Appendix 5 | IBM technical report | 97 |
| Appendix 6 | COLCHIC proformas | 115 |
| Appendix 7 | BIA proformas | 119 |
| Appendix 8 | Exxon Entry proforma | 125 |
| Appendix 9 | Texaco proforma | 129 |

SUMMARY

1. The report reviews the need for access to occupational exposure data.
2. The report describes a study undertaken to identify sources of occupational exposure data in the European Community.
3. The report describes the form of the exposure data resources that were identified.
4. Section 4 of the document is intended as a stand-alone section describing the forty-one computerised databanks of occupational exposure data that were identified.

1. The Need for Access to Occupational Exposure Data

"In the European Community, the question of health and safety at work affects some 138 million people and their immediate relatives."¹ Legislation in the European Community seeks to improve health and safety at work. The European Community's Council Directive 88/642/EEC² of 16 December 1988 seeks the establishment of occupational exposure limits for substances in order to limit the contamination of the air at the workplace. More recently Council Directive 89/391/EEC of 12 June 1989 concerns the introduction of measures to encourage improvements in the safety and health of workers at work, aimed at comprehensive coverage of workers' health and safety.

Criteria Documents have been prepared to set health-based occupational exposure limits for airborne substances. During preparation of the Criteria Documents, various sources of occupational exposure data for airborne substances were used. It soon became clear that for many substances, there is a lack of available occupational exposure data for the purpose of setting health-based occupational exposure limits. Especially lacking are reports of commonly encountered airborne concentrations of the substances in question during normal working practices. Well-known bibliographic and reference database sources exist which may be accessed using up-to-date computer technology. These databases contain extracts from the peer-reviewed literature but data are limited. There are other databases which may be accessed which would provide information on the current national occupational exposure limits prevailing e.g., ECDIN. None of these sources, however, contain all available data which could be used to set better informed standards.

¹ According to the Director-General for Employment, Industrial Relations and Social Affairs of the Commission of European Communities, M. Jean Degimbe (1990).

² Amending 80/1107/EEC on the protection of workers from the risks related to exposure to chemical, physical and biological agents at work

Occupational exposure data are generated and collected by organisations which undertake monitoring of the working environment. Measurements of airborne substances are collected, for example, to demonstrate compliance with national legislation, or for routine exposure monitoring or for epidemiological research. As a rule, such data has been kept in a paper form or more recently on computer. The data may be organised into a database or databank. More often than not the data are not available to the general public, or even to government agencies or scientific researchers.

2. A Study undertaken to Identify Sources of Occupational Exposure Data in the European Community.

Some 635 organisations were approached within the European Community who were considered to represent industry, occupational hygiene consultancies, trade associations and government bodies including those engaged in national standard setting. They were asked to complete a questionnaire on exposure data. If computerised data was held, a further questionnaire was sent to gather details about the computer systems used.

Of these 222 organisations, less than one fifth of the organisations approached, indicated that they generated and held occupational exposure data. From these respondents, 41 organisations have been identified as holders of data in some form of computerised system.

3. Description of the Form of the Exposure Data Resources Identified.

This report highlights the different sources and forms of occupational exposure data which are available. The form in which the data are held is born out of the individual needs of the organisation and thus vary a great deal. It is hoped that this report will generate discussion between current holders of data and between those organisations which hope to computerise data. This discussion has already started under the auspices of the European Foundation. Data collection proformas have been exchanged but harmonisation of, for example, sampling methods is needed before data can be freely exchanged. Although existing databases may not be changed, new ones are being initiated and these at least could be harmonised or may 'learn' from the existing ones.

4. Description of the Forty-one Computerised Databanks of Occupational Exposure Data.

Section 4 of this report gives the name and address of the organisations holding computerised banks of occupational exposure data together with contact name and telephone and facsimile numbers, where available. It briefly outlines the work undertaken by the organisation and gives an indication of the amount of information contained within the system i.e. on how many substances data are being collected. Where available, details of the hardware and software of the system are given. Several organisations have indicated a willingness to submit anonymous data to a standard setting body, but may be reluctant to do so without qualifying the data, by giving the context in which the data was collected.

1. INTRODUCTION

1.1 Scope of the Study

Harmonisation in the area of health and safety at work in the European Community has led to the Workplace Directive (89/391/EEC). Prior to this, Council Directive 88/642/EEC was passed with the expectation that exposure to hazardous substances at work should be controlled to similar standards across the Community. Criteria Documents have been prepared to set health-based limits for occupational exposure to airborne substances. Occupational exposure data are needed as part of these documents.

Occupational exposure data may be used in two distinct ways in the setting of occupational exposure limits by an expert committee:

- (a) In the standard setting of health-based standards (standards based entirely on scientific and medical evidence and not on the cost of achieving that concentration or on practicability of achieving that level of control of exposure or even ability to measure the concentration), sufficient hygiene data needs to be collected to verify with reasonable certainty the levels at which harmful effects have occurred in workers, and also to establish the concentrations below which the known health effects do not occur under normal circumstances.
- (b) If the standards are intended for compliance or enforcement as well as being health-based, then sufficient and reliable hygiene data must be obtained which represents the whole spectrum of use of that substance in industry. This will enable the expert committee to take into account any special difficulty that compliance may have in any particular sector of industry.

The expert committee must thus decide exactly the purpose of the limit value they are setting so that the hygiene data required may match their needs.

This research sets out to identify where and how such data are held in Europe, where the data are held as a computerised bank and whether such data can be made available to assist in the standard setting process.

1.2 What is Meant by Occupational Exposure Data

Exposure to excessive amounts of substances at work can lead to ill health. The extent of exposure is usually assessed by measuring the airborne concentration of substances in the breathing zone of exposed workers. These are known as personal samples. The measured amount can then be compared with legal or quasi-legal occupational exposure limits. Static samples are also taken in the workplace but these may not be representative of any particular worker's exposure. The other routes of entry to the body are, of course, not assessed by these measurements (ingestion, inoculation and through the skin).

1.3 Background to this Research Project

1.3.1 Sources of Occupational Exposure Data

In 1990, the Institute of Occupational Health (IOH) at the University of Birmingham, was commissioned to prepare three Criteria Documents for the European Commission. These documents were to review the current scientific knowledge on specific substances to allow a group of experts to set health-based exposure limits for the European Community. The three substances were hydrogen selenide, monochloroethane and ethanalamine. As part of the survey of published data, the IOH searched databases and the peer-reviewed literature for data on occupational exposure. Very limited occupational exposure data were available for the three materials. Occupational Exposure Standard Setting Authorities (approximately 25) were contacted in many countries world-wide and this resulted in a trawl of some further information.

Some commercial companies were contacted and a small amount of data were available from them. Tracing the producer of the chemical is usually a simpler task than tracing the (generally larger) number of users. Exposure data from both the producer and user companies, however, would be of interest. Essentially what was being sought was any data which would give typical airborne exposure concentrations that might reasonably be encountered where that substance was being used in as wide range a range of its applications as possible.

Although the Scientific Expert Group (SEG) was not setting levels based on practicability, it was felt that the EC Criteria Documents should contain such information so that the SEG could view the limit value in a wider context. Two further documents were prepared in 1991 for methyl formate and triethylamine.

As can be seen from Table 1, some data were available from peer-reviewed literature but information was also held on databases which are not normally publicly accessible.

A summary of the types of exposure data that were obtained and considered useful for the five Criteria Documents and the sources of the data are shown in Table 1.

Table 1 Sources of Exposure Data for Five Criteria Documents

| Substance | Type of sample (Numbers of samples are not given where the source document was unclear) | Source | Type of communication |
|---|---|--|------------------------------|
| Hydrogen Selenide <i>Shackleton et al</i> 1990 | 34 personal | Arbejdsmiljøinstituttet | Personal communication # |
| | 13 personal | Arbejdsmiljøinstituttet | Personal communication # |
| | 2 personal | Finnish Institute of Occupational Health | Personal communication # |
| | Area samples | Brakhnova (1987) | Peer-review literature |
| | Area samples | Fthenakis <i>et al</i> (1988) | Peer-review literature |
| Ethanolamine <i>Binks et al</i> 1990 | Area samples | Schaefer 1964 | Peer-review literature |
| | ?personal or static | Sideron & Timofievskaya 1979 | Peer-review literature |
| | ?personal or static | Paustovskaya 1987 (a) | Peer-review literature |
| | personal | Paustovskaya 1987 (b) | Peer-review literature |
| | 20 personal | Korolenko 1984 | Peer-review literature |
| | 2 personal | Apol & Cone 1983 | NIOSH HHE* |
| | 1 personal | Stephenson 1986 | NIOSH HHE* |
| | 3 personal | Finnish Institute of Occupational Health | Personal communication # |
| Monochloroethane <i>Smillie et al</i> 1990 | 67 personal | Bosatra 1990 | Personal communication |
| | 20 personal | Ringenburg 1983 | NIOSH HHE* |
| | 5 personal | Johnson & Anderson 1982 | NIOSH HHE* |
| | 230 personal or static | Troshina 1966 | Peer-review literature |

NIOSH HHE* = NIOSH Health Hazard Evaluation
= Data obtained from a databank

| Substance | Type of sample (Numbers of samples are not given where the source document was unclear) | Source | Type of communication |
|--|---|----------------------------------|---|
| Methyl Formate Smillie <i>et al</i> 1991 | ?personal or static | Westberg & Nayström 1988 | Unpublished data cited by standard setting body |
| | 6 personal and static | UK National Exposure Database | Personal communication # |
| | static | Sedlák <i>et al</i> 1988 | Peer-review literature |
| Triethylamine Smillie <i>et al</i> 1991 | 2 personal | Toeniskoetter 1987 | Peer-review literature |
| | 90 personal | Akesson <i>et al</i> 1986 | Peer-review literature |
| | 4 personal & static | Rivera 1975 | NIOSH HHE* |
| | 15 personal | Kominskyeral 1987 | NIOSH HHE* |
| | 6 personal | Apol 1982 | NIOSH HHE* |
| | static | Lee 1991 | Personal communication from industry |
| | 7 personal & static | UK National Exposure Database | Personal communication # |
| | 5 personal | Rosenberg 1984 | Text book |
| | 11 personal | Gorman & Slovin 1980 | NIOSH HHE* |
| | Personal & static | Burroughs & Thomassino 1976 | NIOSH HHE* |
| | 12 personal 6 area | Hervin & Handke 1985 | NIOSH HHE* |
| | 1 static | McGlothin 1981 | NIOSH HHE* |
| | 2 personal 2 static | Pryor 1981 | NIOSH HHE* |
| | personal (21 workplaces) | Hansen <i>et al</i> 1987 | Peer-review literature |
| | static | Putilina & Jaryn-Agaeva 1981 | Peer-review literature |
| static | Sukhanov <i>et al</i> 1987 | Peer-review literature | |

NIOSH HHE* = NIOSH Health Hazard Evaluation

= Data obtained from a databank

As a separate exercise, the Institute of Occupational Health has been preparing a similar Criteria Document for the United Kingdom's Health and Safety Executive (HSE) on Foundry Fume. This document reviews exposures to foundry pollutants over the years. A great deal of data have been published on the different foundry pollutants, but exposure-related epidemiology is very poorly reported. In addition to published data, some data have been identified which are held as paper records at the foundry where measurements were made. Other data were held by a foundry trade association. It is known that some larger industrial concerns have computerised their exposure data and that computerised data-handling packages are available. The use of such packages has increased in the UK since the Control of Substances Hazardous to Health Regulations (COSHH Regs) 1988. It was thought that exposure data might be made available for standard-setting bodies by such companies and trade associations. Paper records, however, are time-consuming to search, so computerised records would be more useful on a routine basis.

It is clear that data are available from other non-published sources but the points of access to the data were unclear.

1.3.2 Reasons for Data Collection

Exposures that appear in the literature are collected for a variety of reasons. Health Hazard Evaluation (HHE) surveys in the United States of America are carried out by the National Institute for Occupational Safety and Health (NIOSH), usually as a result of worker complaint(s). Likewise, exposures in the peer-reviewed literature are reported for a variety of reasons. These reasons are not always addressed in the paper although it may be inferred from the context. In some cases this is because there are health problems and/or exposures are particularly high so that publication acts as a warning to other industries or companies.

What often cannot be gauged is whether the exposures that are reported are representative of the 'normal' conditions in that industry or that process, or whether a particularly highly-exposed workplace has been measured. In addition, it is common practice in occupational hygiene to carry out compliance monitoring, i.e. to measure the exposure of the most highly-exposed group during worst conditions e.g. during periods of maximal production when ventilation is minimal. This group and period are usually identified during a walk-through survey and by discussion with management and/or the workforce. The rationale is that if this group are exposed to concentrations below the relevant occupational exposure limits, then the remaining workers whose exposure has not been measured, will also be in compliance. This reduces the time and money that must be expended on exposure monitoring.

1.3.3 Extrapolation to other Workplaces

Epidemiological surveys are included in the EC Criteria Documents as one of the most valuable sources of information for the standard-setting process. Very few of these surveys have occupational exposure data included in them. Data from other workplaces must thus be used in the risk assessment.

For acute health effects such as the 'blue halo' visual effects experienced by workers exposed to triethylamine e.g. in core making in foundries, exposure measurements can be directly related to the health effects experienced at the time. Most health effects resulting from occupational exposures, however, occur as a result of repeated exposure to relatively low levels of pollutants i.e. long-term exposure. In these cases, it is important to be able to link exposure concentrations to a particular type of industrial process and have some confidence that the exposures reported are typical of that industry at that period. As much occupational disease occurs as a result of exposures which took place many years ago and conditions have changed, serial measurements of exposure in typical workplaces would be ideal. These kind of data have not been found in the literature for the five materials for which EC Criteria Documents were prepared.

1.4 Difference between Databases and Databanks

Various definitions of 'database' and 'databank' have been formulated. One dictionary definition of a database is "a store of a large amount of information, especially in the form that can be handled by a computer" (McLeod and Hanks 1982). A more extended definition may be: 'Collections of numeric data and/or textual information (databases) that are processed by publishers and other organisations in computer-readable form for electronic publishing of printed materials and/or electronic distribution' (Cuadra/Elsevier 1987). According to Pantry (1985): "A database is a collection of machine-readable data, often many thousands of references, which is made publicly available for on-line retrieval purposes. ...". The emphasis of the last definition of database seems to be on 'publicly available'. A databank, however, is a specialised form of a database. Pantry (1985) states that "...Another type of database contains primarily numeric data. These are sometimes known as databanks ...". In this study, we were primarily interested in databanks on occupational exposure data. A summary of existing databases may be found in Appendix 3.

1.5 Where are Occupational Exposure Data Kept?

Exposure measurements have been made for some industries, particularly the primary producers e.g. mining and chemical manufacture. It is generally agreed however, that there is a lack of monitoring data for a number of activities in a wide variety of industry sectors. The problem of the lack of exposure data was already highlighted in 1986 by Vanhoorne (Parmeggiani *et al* 1986). The overall lack of measurements is compounded by the fact that much of the data are not published, and hence not publicly available, and by poor reporting of some of the measurements that are published, which does not allow assessment of their significance.

Six main sources of Occupational Exposure Data have been identified, these are:

1. The peer-reviewed literature
2. Company's own data
3. Trade Association's data
4. Governmental organisations including enforcement bodies
5. Universities and other research bodies
6. Occupational Hygiene Consultancies

These categories are not mutually exclusive. For example, NIOSH is a research body within a governmental organisation - the Department of Health Education and Welfare. The Danish Institute of Occupational Health, Arbejdstilsynet - Arbejds miljøinstituttet, is primarily a research organisation which has an exposure databank with data on exposures gathered by workplace inspectors. The six broad groupings help to show where data can be accessed.

1. The peer-reviewed literature

This is the traditional resource for published data of all kinds. Exposure data can be accessed from abstracting services. These are traditionally hard copy but nowadays are also available as databases on-line or as a Compact Disk Read Only Memory (CD-ROM). These include CHEM ABS, NIOSHTIC, HSELINE and CISDOC. These can be searched by using key words such as the chemical name (e.g. 'ethanolamine') and other words e.g. 'exposure'. These databases scan a selection of the occupational health and safety literature.

Exposure data may be found in journals not covered by these abstracting services. These may be accessed in the normal way by following up references from the papers which are identified. By definition, therefore, published data is available.

2. Company's own data

Many companies collect occupational exposure data usually for compliance purposes and occasionally for epidemiology. The data may be computerised or held as paper records. The data are sometimes published in the peer-reviewed literature, but it is more usually only contained in internal reports. These data are not normally publicly available.

3. Trade Associations' data

Trade Associations may provide an occupational exposure monitoring service for their member companies, particularly the smaller ones. These organisations sometimes collate and publish anonymous data but such data are usually available only to member companies. Exposure data are usually considered confidential to the association and the company concerned.

4. Governmental organisations including enforcement bodies

Labour Inspectorates sometimes carry out monitoring and may have access to exposure data from companies but these are not normally published. NIOSH, for example, publish their Health Hazard Evaluations and these are abstracted on NIOSHTIC. The United Kingdom's Health and Safety Executive occasionally publish results but this is not usual e.g. exposure to anaesthetic gases or toxicity reviews for some substances.

5. Universities and other research bodies

Organisations which carry out occupational health and hygiene research may take exposure measurements. Some of these will be published in the peer-reviewed literature, usually in an anonymous form. Other research may be confidential to the organisation that commissioned the research. Indeed, access to company or industry premises for the purpose of air monitoring may only be agreed if the results remain confidential.

6. Occupational hygiene Consultancy Organisations

These organisations carry out hygiene surveys on a fee for service basis. It is normal for the report to be confidential to the client. Results are unlikely to be published without specific client agreement.

1.6 **European Foundation Survey**

The overall aim of the project which the European Foundation for the Improvement of Living and Working Conditions³ undertook during the first six months of 1990, was to locate and describe existing "monitoring instruments or systems" in the European Community concerned with the improvement of health and safety at work. The terms instruments and systems are used in the European Foundation document to describe the way in which information is collected. Various useful systems at national level were identified and a

³ The European Foundation is located in Dublin, Republic of Ireland. See reference 21 for the titles of the working papers which provide a more detailed description of each system.

catalogue was compiled containing descriptive summaries of different monitoring systems available. Working papers are also available which provide a more detailed description of each of the systems.

The Foundation sought to include as many systems as possible in order to be fully representative. Initially the aim was to incorporate monitoring systems which surveyed both working conditions and aspects of the health of workers. Very few systems met these strict requirements, therefore systems were included which deal only with some aspects of *inter alia* working conditions, tools, products, substances and systems providing information on health aspects related to work. Thus there are descriptions of systems and instruments included in the catalogue which are concerned with accident statistics, working hours, statistics on working and non-working populations, mortality surveys, construction and timber industries' working conditions - just to mention a few.

Details are given of the 113 systems which monitor the working conditions relating to health and safety which exist in the various European Community member countries (this information is available as a working paper WP/91/16/EN). The number of systems identified in each member state are shown in table 2:

Table 2 Number of Systems Monitoring Working Conditions relating to Health and Safety in the EC

| EC Country | Total |
|----------------|------------|
| Belgium | 4 |
| Denmark | 17 |
| France | 9 |
| Germany | 13 |
| Greece | 2 |
| Ireland | 3 |
| Italy | 16 |
| Luxembourg | 2 |
| Netherlands | 6 |
| Portugal | 9 |
| Spain | 20 |
| United Kingdom | 12 |
| Total | 113 |

These 113 monitoring health and safety systems were summarised by the European Foundation using a general overview or matrix for each European Community country⁴. Six general indicators were used for the classification

⁴ Throughout this report European Community countries will be referred to using the following abbreviations:
 Belgium - B; Denmark - DK; France - F; Germany - D; Greece - GR; Ireland - IRL;
 Italy - I; Luxembourg - L; The Netherlands - NL; Portugal - P; Spain - E;
 United Kingdom - GB; European and International organisations are referred to as E/I.

system. Table 3 describes the number of systems providing information in each country.

Table 3: Number of Systems by EC Country Possessing Information

| Workplace | Hazards | Workload or requirements | Working time | Organisation of work | Health and work incapacity | Country |
|-----------|---------|--------------------------|--------------|----------------------|----------------------------|---------|
| 2 | 2 | - | 2 | 2 | 2 | B |
| 16 | 11 | 8 | 5 | 6 | 10 | DK |
| 9 | 4 | 1 | 2 | 2 | 4 | F |
| 5 | 3 | 2 | 3 | 4 | 6 | D |
| 2 | - | - | - | - | 2 | GR |
| 3 | - | - | - | - | 3 | IRL |
| 9 | 7 | 2 | 2 | 1 | 8 | I |
| 2 | 2 | - | - | - | 2 | L |
| 6 | 2 | 1 | 3 | 1 | 5 | NL |
| 9 | 2 | 3 | 3 | 3 | 4 | P |
| 18 | 17 | 5 | 14 | 6 | 16 | E |
| 9 | 2 | - | - | - | 8 | GB |

Databases and databanks⁵ directly concerned with occupational exposures were included in the catalogue. Some are more fully described in Section 4 at the end of this report.

1.7 First Meeting of Product and Exposure Registers

At the instigation of the European Foundation, the first meeting of Product and Exposure Registers was held in Copenhagen in August 1991. It brought together organisations from within the European Community and Scandinavia which have product and/or exposure registers. The objective was to further collaboration and allow for an exchange of ideas between the respective database/databank holders.

Occupational exposure database holders were invited from Germany, the United Kingdom, France and Denmark (Italy was also represented but the OCCALL database does not contain detailed exposure data from air monitoring and thus is not relevant here). These organisations were uncovered by the research which the European Foundation carried out in the first six months of 1990 (discussed above). Each database holder was invited to describe and discuss the structure and nature of the database, the origin of the data and who has access to it. There was general agreement that the demands of the organisation (which currently owns and generates the database) would dictate the nature and format of the data (now and in the future) - highlighting that databases are set up to serve particular purposes.

⁵ ATABAS (Denmark); COLCHIC (France); MEGA DOK (Germany); and NEDB (United Kingdom).

At the conclusion of the meeting, it was recognised that the meeting had been a useful forum for the discussion of collective experiences and organisations which were contemplating setting up databases would perhaps be able to avoid similar pitfalls.

It was felt that further meetings would be useful to compare data collection proformas and explore what collaboration would be possible. Other possible areas for further discussion were: which hardware and software packages have been selected, coding methodology e.g. job codes, harmonising sampling methodology, quality control on data collection.



2. THE STUDY

2.1 The Protocol

The research took place over a six-month period and was to establish what occupational exposure data was available in the European Community for standard setting purposes. The detailed objectives were as follows:

1. Write to all national and regional occupational health regulatory authorities (including standard setting bodies), all occupational health/industrial toxicology research institutes/educational establishments, and all professional associations representing occupational hygienists in each member state of the European Community to establish the location of any databanks of occupational exposure monitoring data which would be available for standard setting purposes.
2. To carry out a questionnaire survey of the owners of computerised databanks to collect information detailed below:
 - i. The reason for setting up the databank, aims of the owner.
 - ii. The source(s) of the data.
 - iii. Why the data was generated, compliance, epidemiology etc.
 - iv. What quality control there is over the data.
 - v. What industries and time periods are covered.
 - vi. What circumstantial detail is recorded about the circumstances of the monitoring.
 - vii. What search fields are used.
 - viii. How the data is outputted.
 - ix. Who has access to the data and for what purpose.
 - x. How much the databank cost to set up and to maintain.
 - xi. What hardware and software is used.
 - xii. Whether the databanks can be compared e.g. whether they have a similar job classification scheme.

2.2 Methodology

2.2.1 Organisations Surveyed

In order to establish the location of sources of occupational exposure monitoring data, 635 organisations in the member countries of the European Community were surveyed. Organisations included those currently involved in setting national standards; occupational medicine/health research institutes based at universities and independent organisations; industrial and trade associations representing member companies; professional and learned societies; trade unions representing worker and worker interests; and European and International organisations such as the ILO Occupational Safety and Health. These organisations were selected from International and European directories [Leigh 1986; Adams 1989; Williams 1978; Commission of European Communities (1989); INRS (1980); Parmeggiani (ed) (1987); ILO (1991); Millard (1988) and Union of International Organisations (1989)].

Professional associations and societies representing occupational hygienists working in the field were contacted. Access to individual membership lists was restricted, however, but where details were provided (in the United Kingdom and Germany) these were followed up. Other avenues such as an invitation to submit an advertisement in the Dutch occupational hygiene association newsletter could not be pursued, but time did not allow.

Many companies (manufacturing and service industries) carry out occupational exposure monitoring. A number of large companies, in terms of turnover and number of employees, were selected from the latest edition of *Europe's 15,000 Largest Companies* (ELC International 1990). The branches of the major petro-chemical, manufacturing, pharmaceutical, automobile manufacturers in the member countries of the European Community were approached.

International and European organisations representing manufacturing industry, trade associations, trade unions etc. at a European and International level were included in the study (such as European professional and trade associations and international federations representing workers in various sectors). These organisations made up 4% of the total number of organisations approached.

2.2.2 Questionnaires

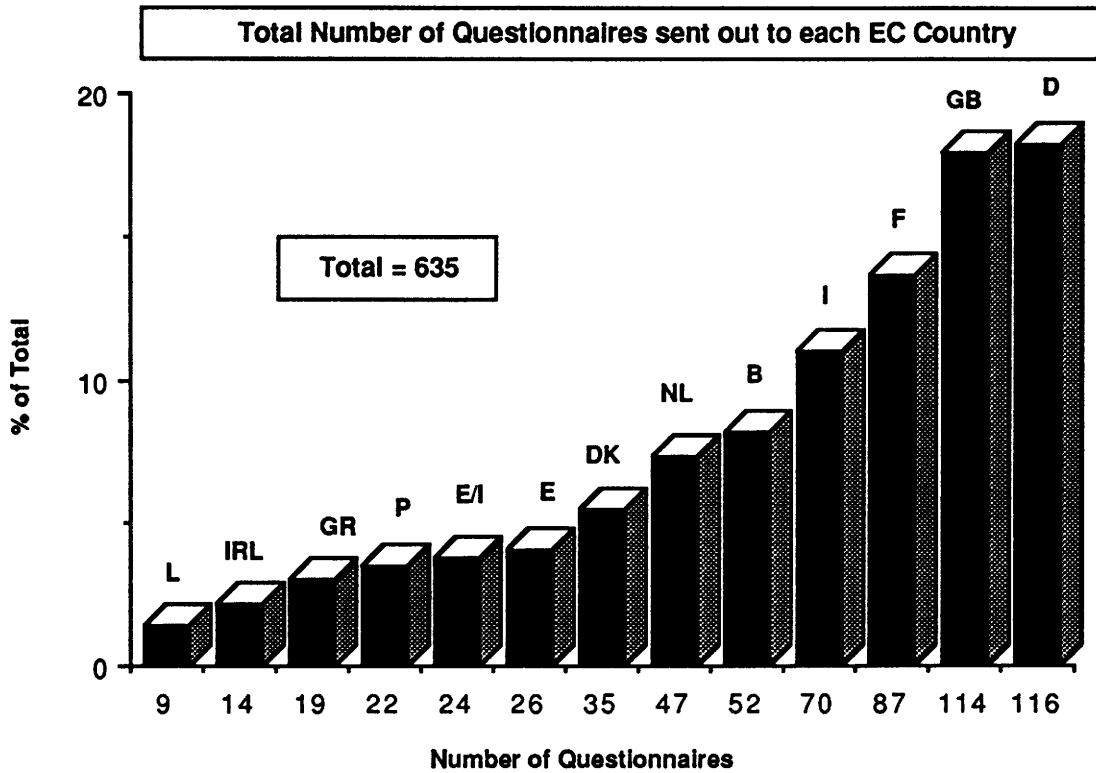
A questionnaire survey was carried out to determine the existence of occupational exposure sources. The initial questionnaire (appendix 1) was piloted in the United Kingdom with the health research unit of the British Rubber Manufacturers' Association, a Trade Association which undertakes research and occupational hygiene surveys and is involved in the standard setting process.

The questionnaire was then sent to 635 organisations within the European Community member states. Each organisation received an explanatory letter in the language of their country and/or organisation together with an English questionnaire. The request was to complete the questionnaire in English, if possible. This facilitated standardisation of the study.

A second questionnaire (appendix 2) was sent to those organisations who indicated that they possessed occupational exposure data in a computerised form. More detailed information was sought regarding the system employed such as hardware and software, field names or proforma entries etc.

A total of 635 questionnaires were dispatched. Figure 1 below illustrates the number of questionnaires sent to organisations in each European Community member country

Figure 1



Key

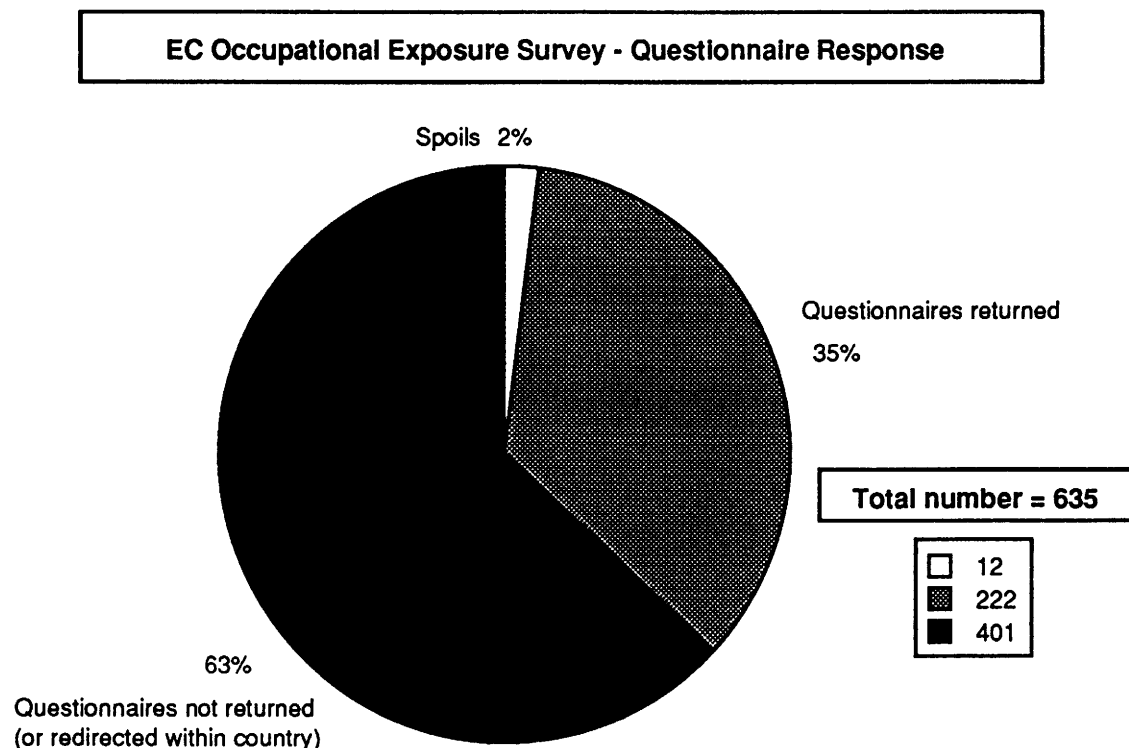
- | | | |
|-------------|-----------------------------|----------------------|
| B: Belgium | E/I: European/International | I: Italy |
| D: Germany | F: France | IRL: Rep. of Ireland |
| DK: Denmark | GB: United Kingdom | L: Luxembourg |
| E: Spain | GR: Greece | NL: Netherlands |
| | | P: Portugal |

2.3 Results

2.3.1 Returns for the First Survey

The response to the first questionnaire survey is described in figure 2. 35% or 222 of the 635 organisations surveyed completed and returned the questionnaire. 2% or 12 questionnaires were returned where organisations had moved or were no longer operating. These are counted as spoils. A number of organisations passed their questionnaire on to what they considered to be the relevant governmental body concerned with the collection and retention of occupational exposure data within their country. (This was especially true in Germany and France.)⁶ These questionnaires were not retrievable and consequently these numbers are not reflected in the totals given above.

Figure 2



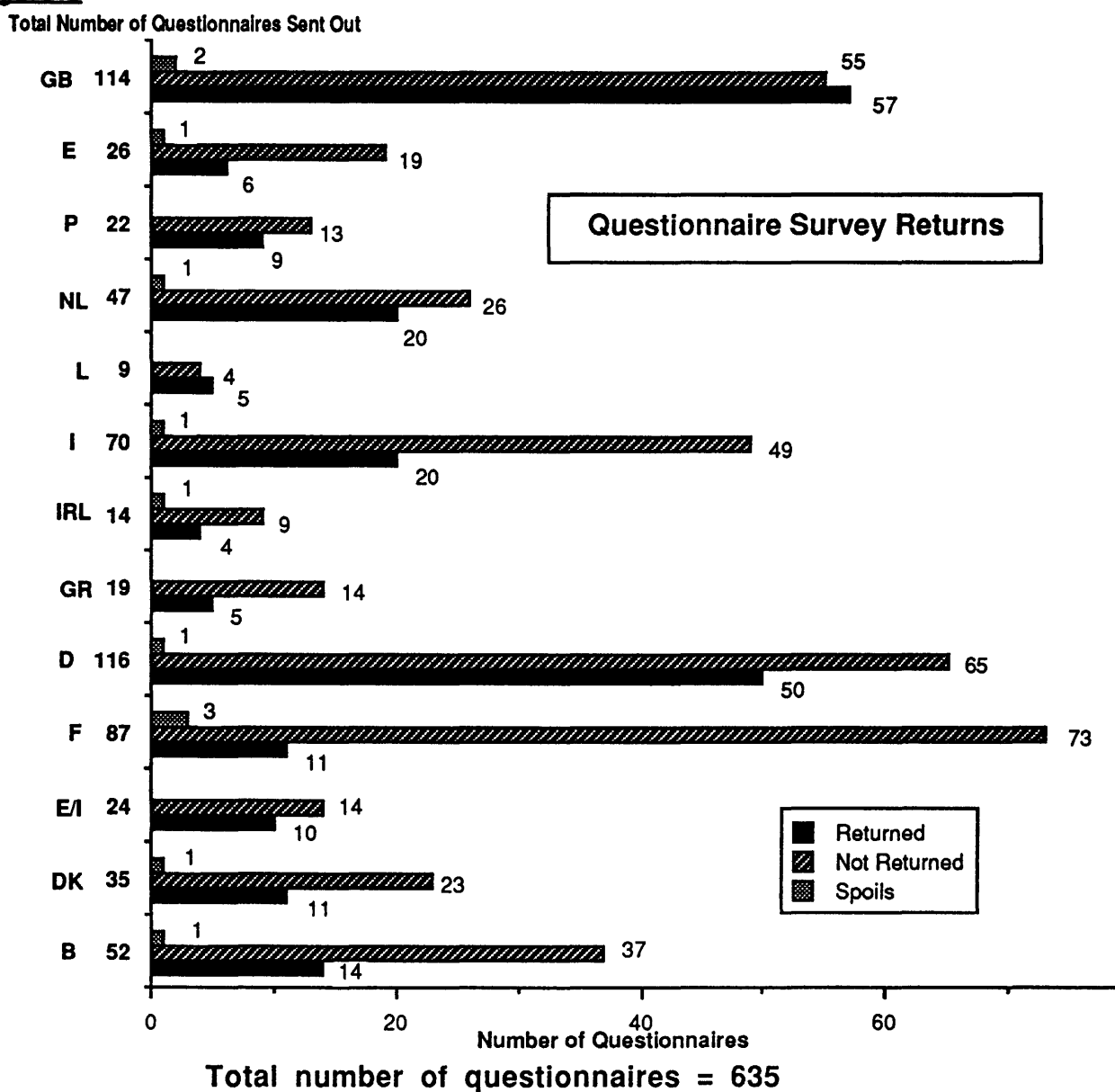
An attempt was made to cast the initial net as wide as possible. No lists of occupational hygienists were identified from Italy, Luxembourg, Spain, Portugal, Denmark, France, Greece, Belgium, Republic of Ireland. However, individuals were identified from personal communication or from membership of the International Occupational Hygiene Association. The trade union organisations approached provided selected lists who were approached but no unions indicated that they kept an exposure databank. A few organisations indicated

⁶ Personal communications. Mr B Carton of INRS (France) and Mr K Meffert (BIA, Germany) both of whom indicated that they had received between 5 and 8 questionnaires each. Unfortunately it is not possible to establish which organisations sent the questionnaire on.

that the company policy was not to participate in this kind of survey and one company referred all enquiries to their head office in an EFTA country which did not respond.

The number of questionnaires returned, those not returned and the spoils are graphically described in figure 3:

Figure 3



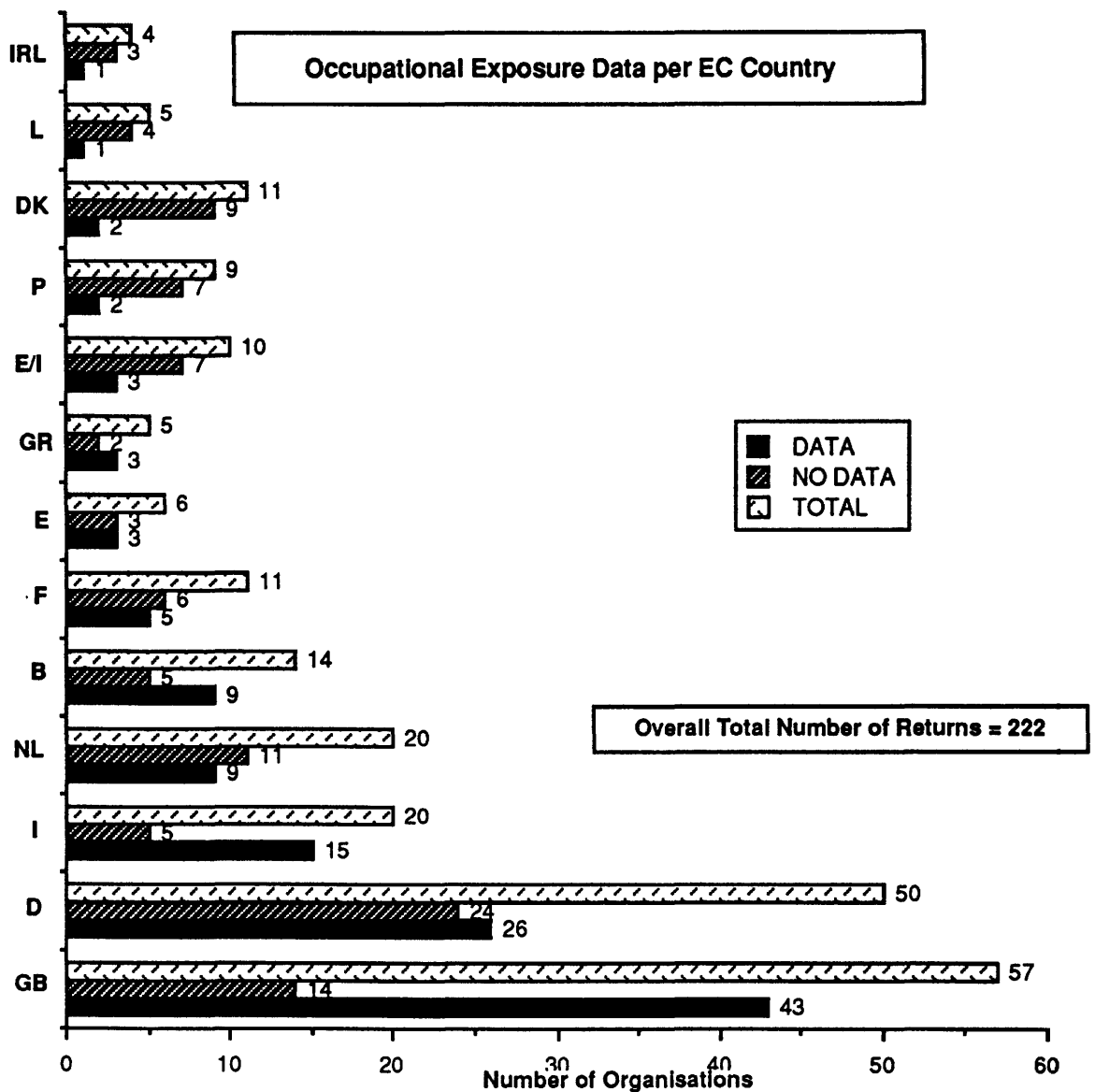
An explanation for the overall greater response by organisations in the United Kingdom than from other European Community countries, may be that the organisations (especially large manufacturing companies known to undertake occupational exposure monitoring) were easier to target. It is important to note, however, that other European Community states had a comparable percentage return *vis à vis* the number of questionnaires sent out. Germany, the Netherlands and Luxembourg each had a response rate of around 45%.

2.3.2 Organisations which have Occupational Exposure Data - First Survey

Of the 222 questionnaires returned, over half of organisations (55%) i.e. 122 organisations indicated that they have occupational exposure data and 100 (45%) that they did not possess such data.

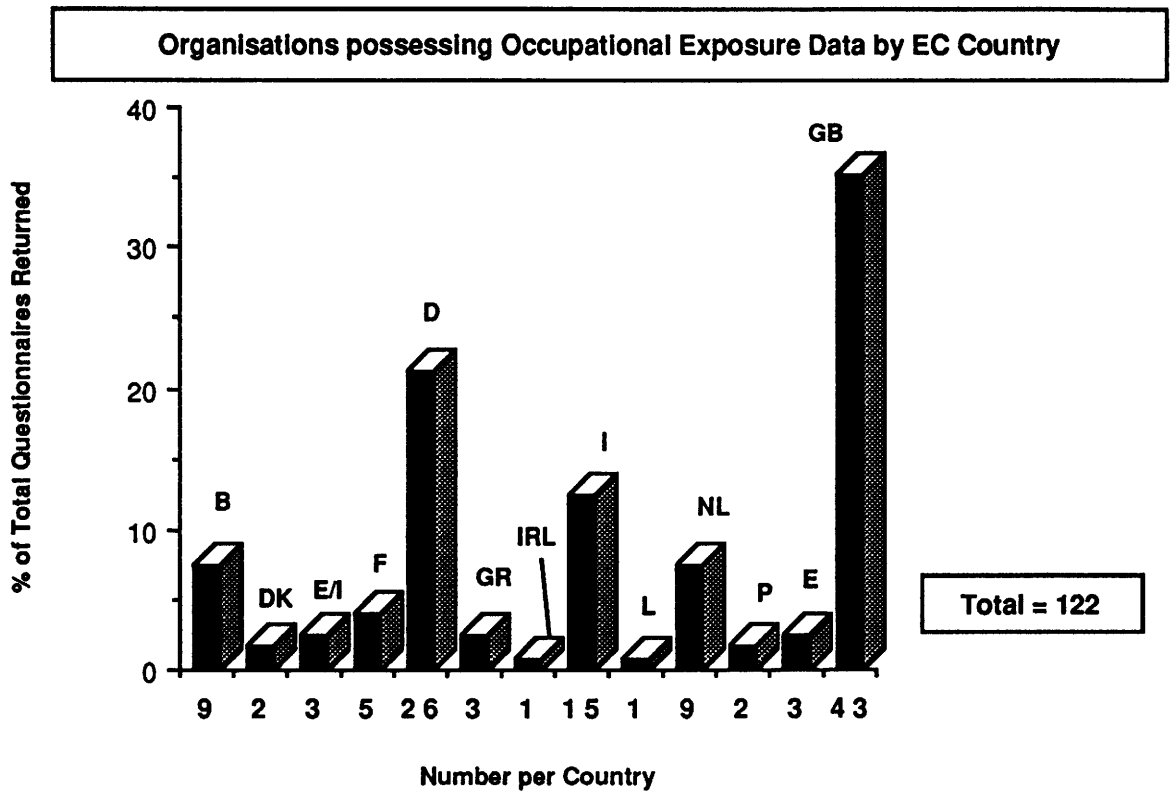
The number of questionnaires returned and whether they held and maintained occupational exposure data is described below in figure 4:

Figure 4



In figure 5, the countries within the European Community and the number of organisations where occupational exposure data is generated and maintained (according to the study) is shown:

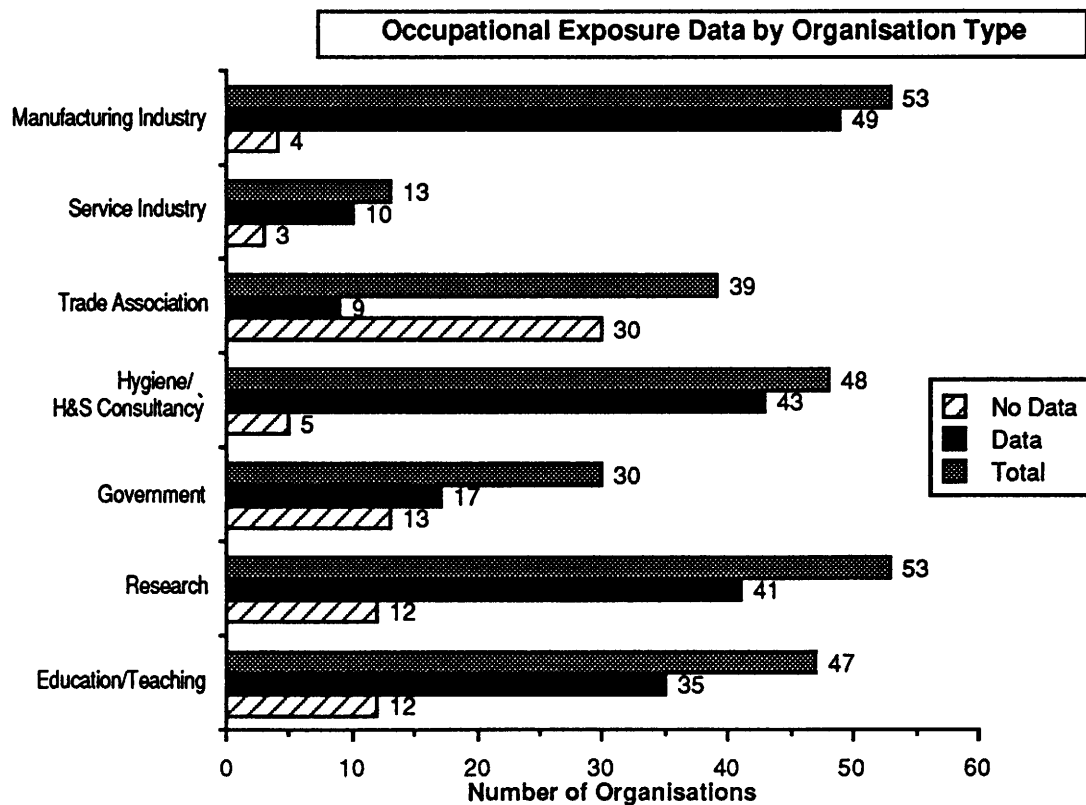
Figure 5



2.3.3 Types of Organisation

The 222 organisations which responded in the questionnaire study, had an opportunity to describe their organisation. Several organisations considered that they could be categorised in more than one category of the broad classification groups e.g. a university institute may undertake research, have an education and teaching function and also undertake occupational hygiene consultancy work. In all these areas of work, occupational exposure measurements may be taken or collected. Figure 6 indicates the categories into which the organisations classified themselves:

Figure 6



Total number of organisations responding = 222

The types of organisation which indicated that they possess occupational exposure data are broken down further into their respective European Community countries in table 4 below:

Table 4 Number and Type of Organisations holding Occupational Exposure Data in the EC

| EC Country | Manufacturing Industry | Service Industry | Trade Assoc | Occ Hyg or Health & Safety | Research | Governmental body | Education or Teaching |
|--------------|------------------------|------------------|-------------|----------------------------|-----------|-------------------|-----------------------|
| B | 0 | 1 | 1 | 5 | 5 | 3 | 5 |
| D | 8 | 5 | 3 | 12 | 11 | 4 | 8 |
| DK | 0 | 0 | 0 | 1 | 2 | 0 | 2 |
| E | 1 | 0 | 0 | 1 | 1 | 1 | 1 |
| E/I | 1 | 0 | 1 | 0 | 0 | 0 | 0 |
| F | 1 | 1 | 1 | 2 | 2 | 0 | 3 |
| GB | 30 | 2 | 2 | 10 | 8 | 1 | 6 |
| GR | 0 | 0 | 0 | 2 | 2 | 1 | 3 |
| I | 5 | 1 | 0 | 7 | 7 | 2 | 6 |
| IRL | 0 | 0 | 0 | 0 | 0 | 1 | 0 |
| L | 0 | 0 | 0 | 0 | 0 | 1 | 0 |
| NL | 3 | 0 | 1 | 3 | 2 | 1 | 1 |
| P | 0 | 0 | 0 | 0 | 1 | 2 | 0 |
| Total | 49 | 10 | 9 | 43 | 41 | 17 | 35 |

From the responses, manufacturing industry undertakes occupational exposure monitoring (particularly in the United Kingdom and in Germany) in order to comply with national legislation (in the case of the UK). Several companies reported that they supplied data to the competent national authorities for standard setting purposes e.g. Germany and the United Kingdom. A database on occupational exposures has been set up in the United Kingdom and various industries are voluntarily contributing exposure data to it (further discussion on the United Kingdom's National Exposure Database may be found below).

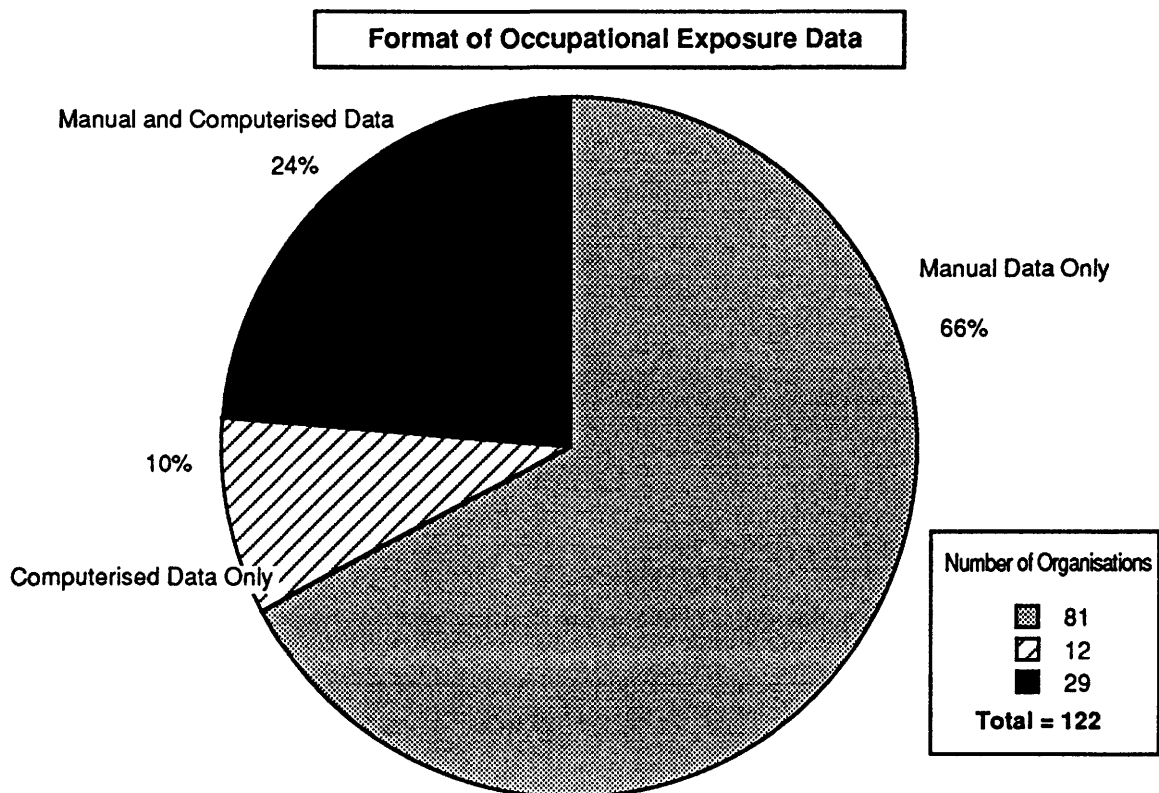
Another potential source of occupational exposure data are occupational hygiene and health and safety consultancies. This is clearly reflected in the table above. A relatively large number of research establishments and institutes indicated that they gather and maintain exposure data.

2.3.4 Form of Occupational Exposure Data

The format in which occupational exposure data is held is important. Generally data are kept in a manual form - often as reports on word processors and on paper. Where both manual and computerised data are held, it is usually because the computerisation post-dates data collection. Generally new data only are entered onto computer. The proportion of data computerised, therefore, depends on the age of computerisation within the organisation and will change over time.

This study found that of the 122 organisations indicating that occupational exposure data was kept, a larger proportion had exposure data in a manual form alone (66%), some organisations had both manual and computerised data (24%) and a small number only kept data (10%) on computer. The pie graph figure 7 illustrates this.

Figure 7



2.3.5 Why are Occupational Exposure Data Collected?

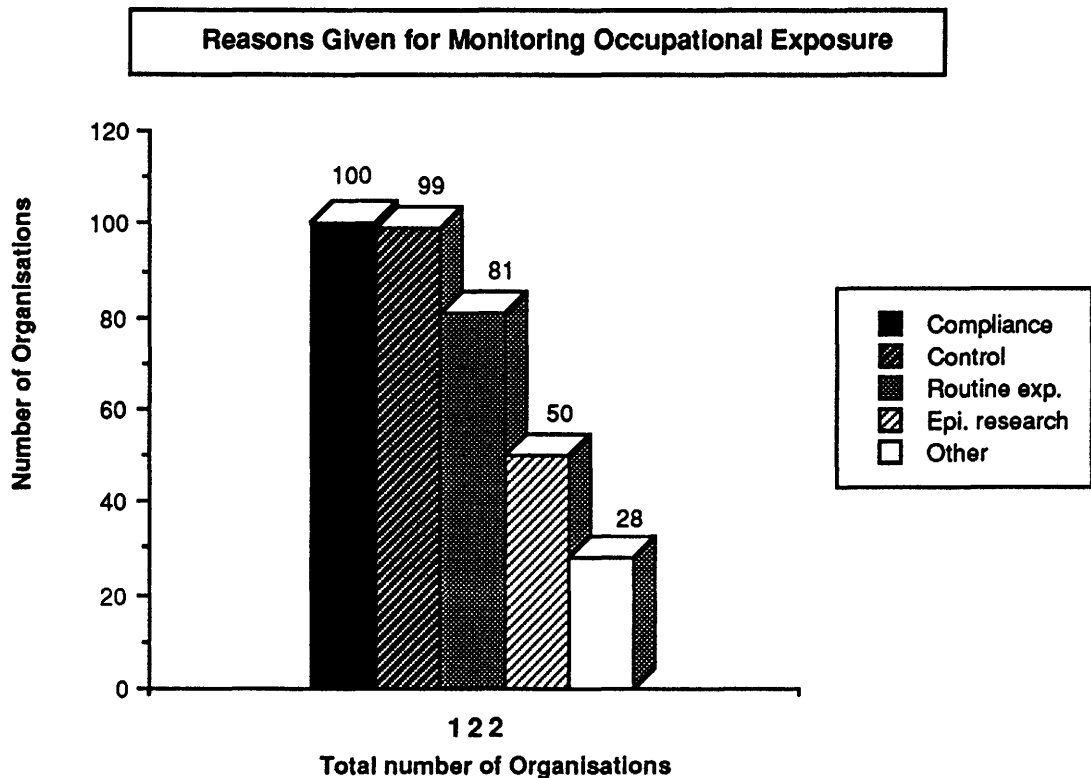
The reasons for monitoring occupational exposures vary. A majority of organisations monitor either to comply with legislation which can be specific for a named substance or general - such as in the United Kingdom where legislation requires all employers to comply with the Control of Substances Hazardous to Health Regulations (COSHH Regs) protecting the worker in the workplace. Monitoring is also undertaken to assess control measures in a workplace which only indirectly relates to compliance with legislation. Various

university and other research establishments generate occupational exposure data for use in epidemiological research.

Other reasons for exposure monitoring were mainly provided by those organisations undertaking exposure monitoring at the request of manufacturing and/or service industries and also for *ad hoc* problem identification and solving. In Germany, for example, exposure monitoring is undertaken to provide expert scientific committees with usable data in support of the work of the 'expert opinion' group and for standard setting of maximum limits in the workplace⁷.

Figure 8 gives the overall reasons provided by organisations for exposure monitoring.. Only the 122 organisations which indicated that they hold exposure data are shown. Any one organisation may have more than one reason for monitoring occupational exposure. The reason for data collection did not appear to affect the way in which the data was held. Approximately the same proportion of each group were computerised.

Figure 8

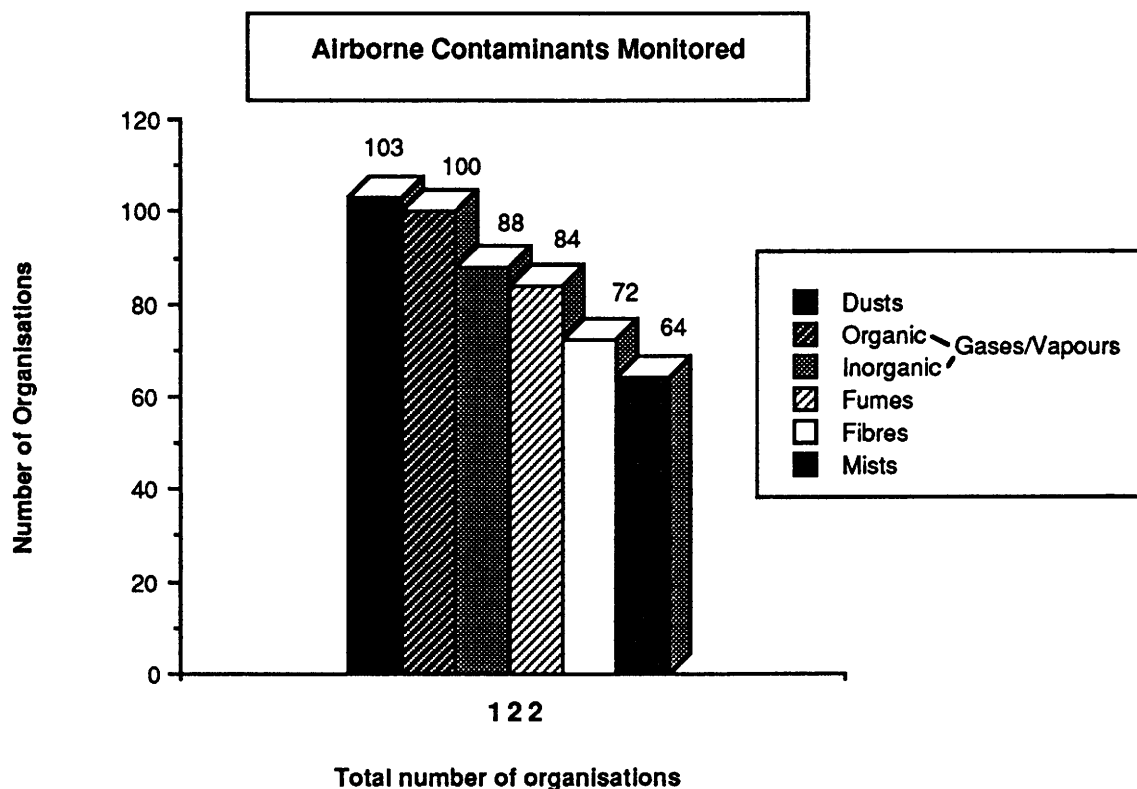


⁷ For example, the Deutsche Forschungsgemeinschaft publishes a yearly report setting out maximum concentrations at the workplace and biological tolerance values for working materials (Henschler 1991).

2.3.6 What Airborne Contaminants are Monitored and what Data are Collected?

Over 80% of the 122 organisations undertaking monitoring, indicate that they monitor dusts and organic gases or vapours; and 70% monitor both fumes and inorganic gases or vapours. Over half monitored mists and fibres. The number of organisations monitoring each airborne contaminant according to the survey are given in figure 9.

Figure 9



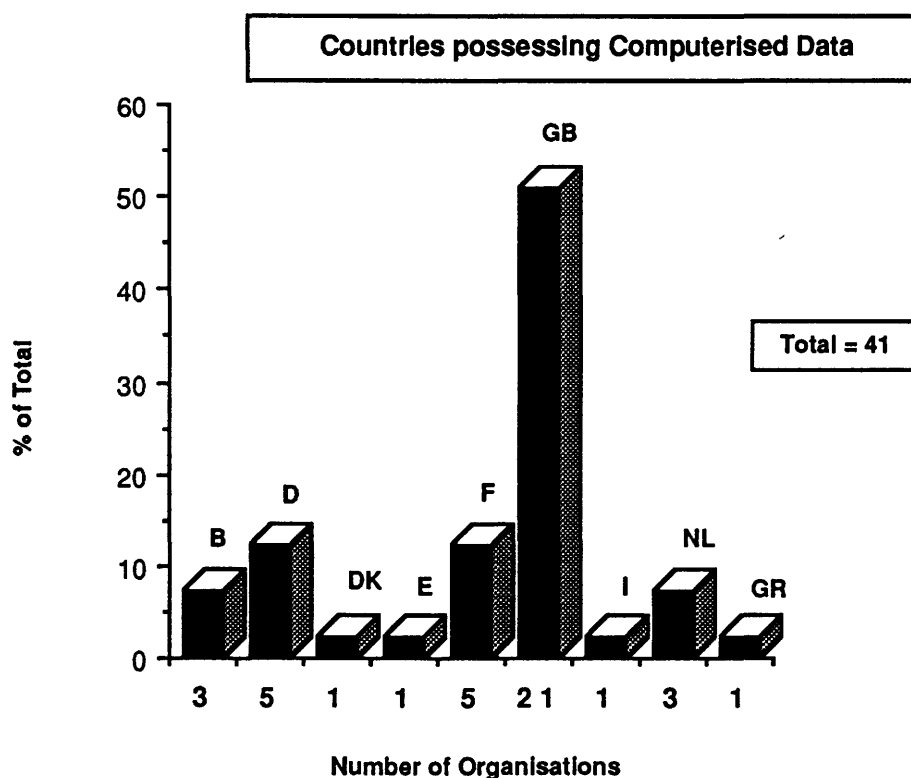
2.3.7 Who has contributed to the Databanks of Occupational Exposures?

Ninety (73%) of the 122 organisations indicated that they are the sole contributor to the store of data held. Fourteen organisations included data from industry as well as their own in the databank. Industry was also the only contributor to some 7 databanks. The remaining 11 databanks held data that was internally generated as well as data from other sources. These included regional occupational health services, universities, suppliers and commerce.

2.4 Computerised Systems

Forty-one organisations indicated that data is maintained and stored on computer. (29 organisations have manual and computerised data and 12 indicated that only computerised data is kept.) This study revealed (see figure 10) the spread of computerised systems within the European Community as follows: 21 organisations within the United Kingdom; in both France and Germany 5 organisations in each country indicated that they have such a system; 3 in both Belgium and the Netherlands; and one each in Denmark, Spain, Italy and Greece.

Figure 10



2.4.1 Types of Organisations holding Computerised Data

The group of forty-one organisations⁸ may be categorised as follows:

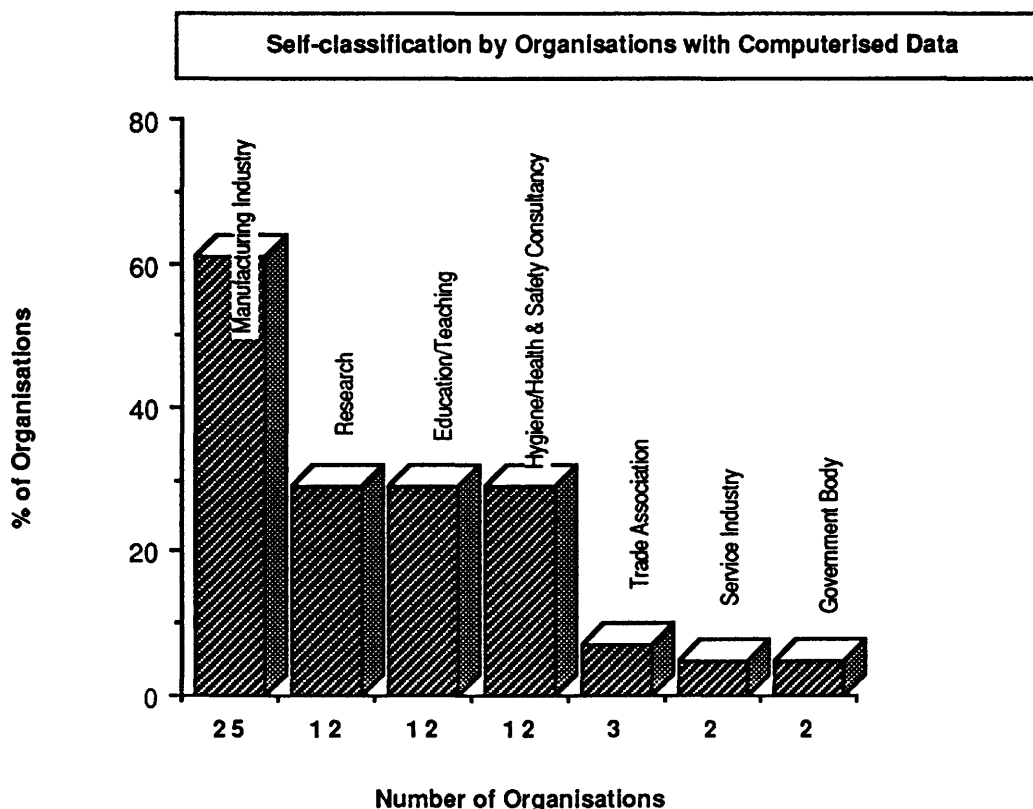
Twenty five of the 41 organisations maintaining computerised exposure data are representatives of the manufacturing industry. These manufacturing industry organisations are, in the main, of the petroleum, chemical and agro-chemical industry (12); pharmaceutical industry (4); fibre producers (2 companies); automobile manufacturers (2 companies); manufacturers of

⁸ See section 4 below for a description of each of the respondent's systems.

components for the automotive and other industries (3); and other manufacturing industries (2). Two trade associations with computerised data were located and 8 universities and research establishments. Three occupational hygiene consultancies (one in each France, the United Kingdom and Germany) and an insurance group have computerised data. Finally, in both the France and the United Kingdom a government body has a databank of exposure data.

The organisations categorised themselves (according to the same classification system used before) and figure 11 indicates into which category they considered themselves to fit. Many organisations conduct different forms of business and therefore are part of one or more categories:

Figure 11

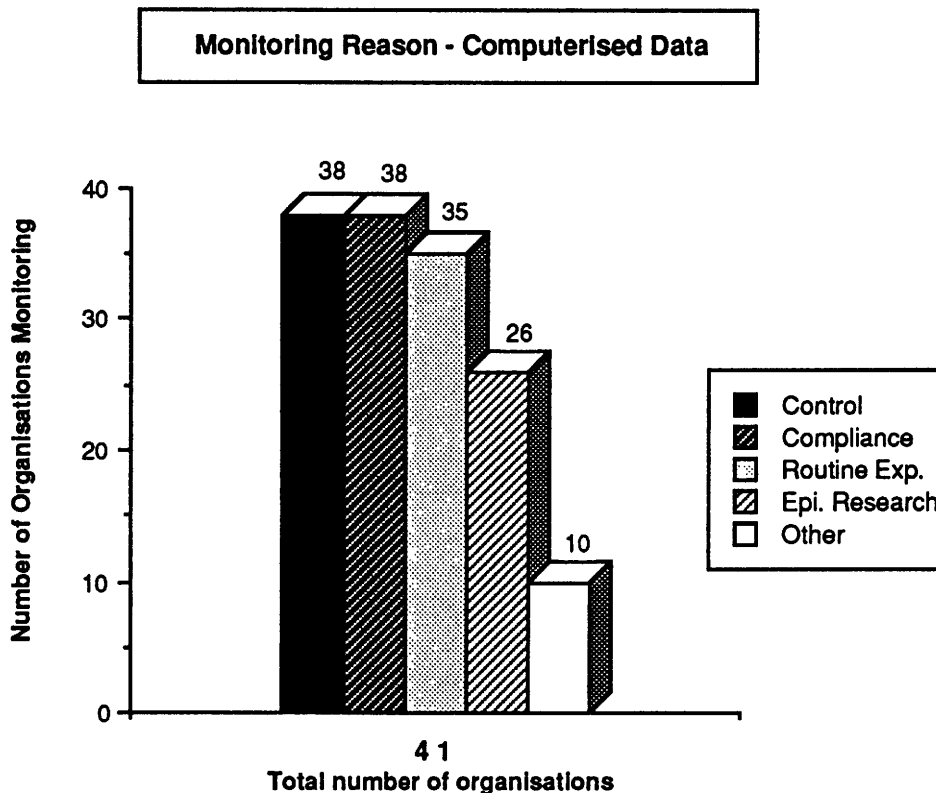


Approximately 60% of the organisations with computerised occupational exposure data considered themselves to fall within the manufacturing industry category. 30% indicated that they undertake research, teaching and occupational consultancy work. Two are government bodies, two classify as service industry, and 7% trade associations.

2.4.2 Reasons for Monitoring Occupational Exposures

The reasons for the monitoring of occupational exposures was provided by the organisations. The main reasons given for monitoring are for control assessment and to establish compliance with legislation. Since control is usually needed to achieve compliance, it is not surprising to find that these two categories given as reasons by the same company. Figure 12 illustrates the number of organisations giving each reason.

Figure 12



Some of the reasons for monitoring being undertaken and included under 'other' were as follows:

- a) The 'diagnosis of prevention' i.e. how exposure can be prevented;
- b) As documentation for authorities;
- c) Ad hoc problem identification and solving;
- d) Non-routine exposure measurements were made at the request of management, workers, trade association or on judgement of a local hygienist;
- e) Validation of procedures (such as cleaning);
- f) Methodological research in occupational hygiene;
- g) As a reaction to recently published papers on suspected carcinogenicity of new substances as pre-emptive exposure data collection; and
- h) Assessment whether remedial work is needed to protect workers in terms of engineering controls.

2.4.3 Extent of the Data

It was possible to establish what the databanks contain (this information is taken from the first survey questionnaire). The table below (table 5) indicates the number of organisations (total = 41) monitoring each of the six broad categories of airborne contaminants.

Table 5 Number of Organisations Monitoring Airborne Contaminants

| Number of Monitoring Organisations | Organic Gases / Vapours | Inorganic Gases / Vapours | Dusts | Fumes | Fibres | Mists |
|------------------------------------|-------------------------|---------------------------|-----------|-----------|-----------|-----------|
| 20 | x | x | x | x | x | x |
| 2 | x | | | | | |
| 1 | x | | x | x | | |
| 2 | x | | x | x | x | x |
| 2 | x | x | x | x | | x |
| 4 | x | x | x | x | x | |
| 1 | | | | | x | |
| 2 | x | x | x | x | | |
| 1 | x | | | x | | |
| 1 | x | x | x | | | |
| 2 | x | | x | | | |
| 1 | x | x | x | | | x |
| 2 | not given | not given | not given | not given | not given | not given |

Key x = yes

Nearly half of the databanks contain information on all six airborne contaminants. The number of substances each databank or database contains varies substantially. The number of substances in the databanks may vary from only 1 substance to over 10,000 in any bank⁹. It was not possible to ascertain the extent and value of the information kept on the databanks. Several databank holders were cautious about the interpretation of the data held. One manufacturing industry data-holder stated that it would not readily support the formation of a monolithic European Community Database as occupational hygiene is of such variable quality, obtained for a variety of purposes such that the data may be heavily biased.

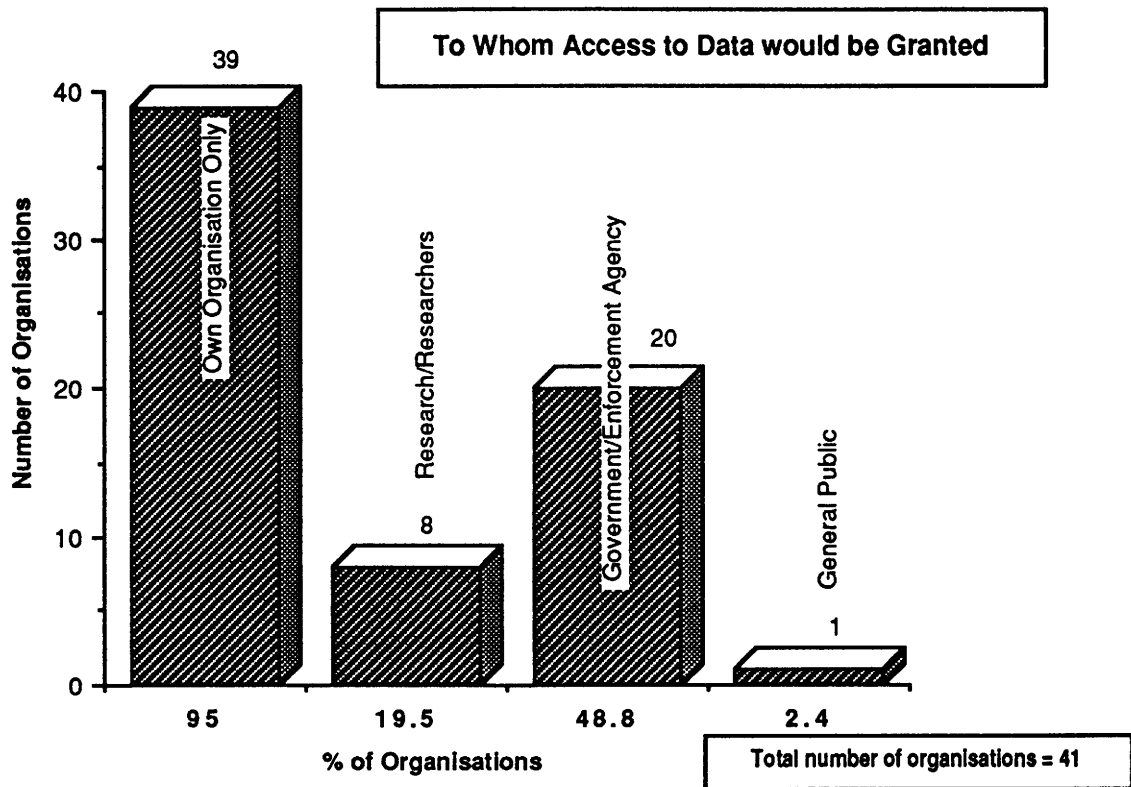
The period over which data was collected varies (anything from 1 to 36 years) and often computerisation is a relatively recent event (generally computerisation was begun within the last five years) in the history of data collection. One organisation indicated that their databank system has been in operation for 10 years but was recently completely rewritten.

⁹ See Section 4 for a description (where available) of the number of substances held in each databank.

2.4.4 Access to the Data

Access to the data which is maintained on the computerised systems is limited. Figure 13 indicates the responses organisations gave to who would be granted access to the data within their individual system:

Figure 13



95% of the organisations indicated that data in their computerised system is mainly for use by their own organisation only. Only 19,5% (or 8 out of the 41 organisations) indicated that they would consider releasing selected data to research institutions or researchers but this would only be possible after permission has been sought from the databank holder or after an agreement with the client (on behalf of whom the work was taken and monitoring done) had been reached. Much of the data is confidential and is bound by a secrecy or a data protection act. In United Kingdom, for example, the Health and Safety Inspectorate has the legal right to examine all occupational exposure data (especially those which show compliance with the COSHH Regulations) for enforcement purposes. A large percentage (48,8%) of organisations make data available to government or enforcement agencies.

An indication of data accessibility, by organisation type to requesting bodies, is given in table 6.

Table 6 Access to Exposure Data by Organisation Type

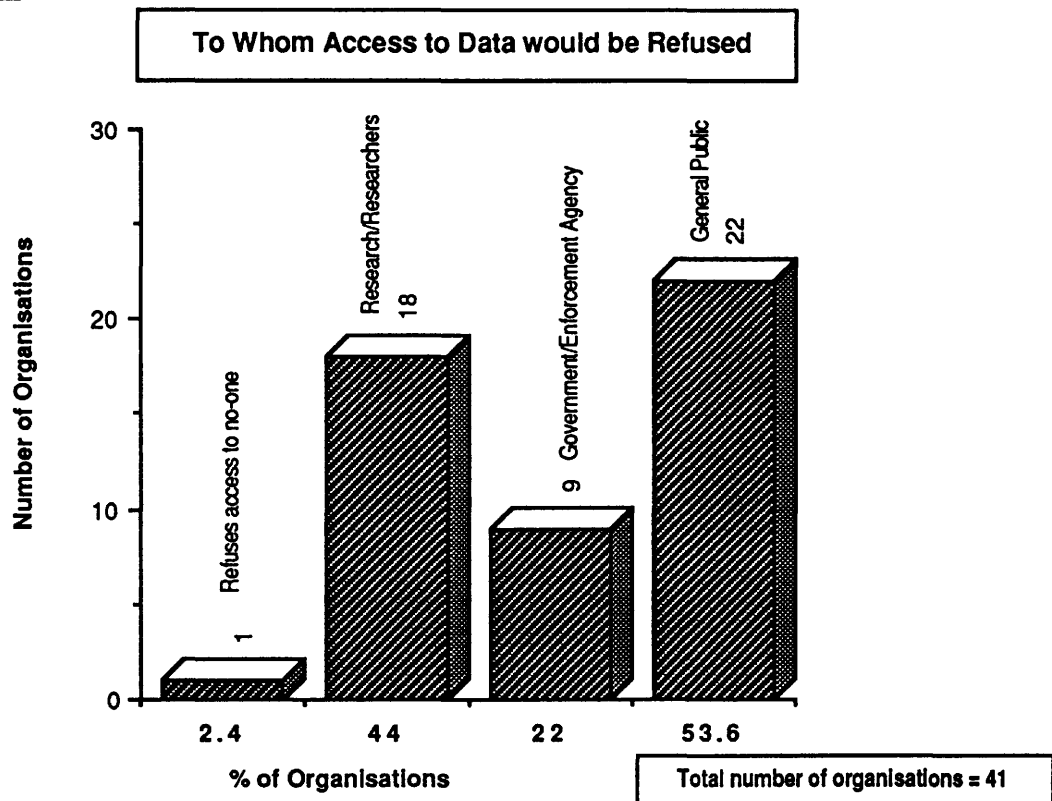
| Type of Organisation | Number | Access within own organisation | Access given to Research or Researchers | Access given to Government or Enforcement Agencies | Access given to the General Public |
|---|--------|--------------------------------|---|--|------------------------------------|
| Manufacturing Industry Total = 25 | 10 | yes | no | no | no |
| | 1 | yes | yes | no | no |
| | 5 | yes | yes | yes | no |
| | 9 | yes | no | yes | no |
| Service Industry Total = 2 | 1 | yes | no | no | no |
| | 1 | yes | no | yes | no |
| Research / Researchers Total = 12 | 5 | yes | no | no | no |
| | 1 | yes | yes | no | no |
| | 3 | yes | no | yes | no |
| | 2 | no | yes | yes | no |
| | 1 | yes | yes | yes | yes (qualified) |
| Government / Enforcement Agy Total = 2 | 1 | yes | yes | yes | no |
| | 1 | yes | no | yes | no |
| Education / Teaching Total = 12 | 5 | yes | no | no | no |
| | 2 | yes | yes | no | no |
| | 0 | yes | yes | yes | no |
| | 2 | yes | no | yes | no |
| | 2 | no | yes | yes | no |
| | 1 | yes | yes | yes | yes (qualified) |
| Occupational Hygiene / Health & Safety Consultancy Total = 12 | 4 | yes | no | no | no |
| | 2 | yes | yes | no | no |
| | 1 | yes | yes | yes | no |
| | 3 | yes | no | yes | no |
| | 2 | no | yes | yes | no |
| Trade Association Total = 3 | 1 | yes | no | no | no |
| | 1 | yes | no | yes | no |
| | 1 | no | yes | yes | no |

A number of organisations pointed out that selected data would not be denied to requesting organisations and may be released on a case-by-case basis where the data are accompanied by interpretation and explanation. Such interpretations and explanations, considered the nature of the monitoring data, how exposure measurements were carried out, correlation with medical data, and an understanding of how the data would be used etc would be given.

There appears to be a reluctance on the part of several organisations to release data into another database and thereby loose control of the data.

A number of organisations would not consider releasing occupational exposure data. In figure 14 the number of organisations which indicated this and their relative percentages are given:

Figure 14



54% of organisations would refuse to release information to the general public and 44% would not release data to researchers. Generally organisations indicated a reluctance to release data without some form of explanation or interpretation on the data with respect to the sampling strategies and workplace conditions etc. They expressed the need to put the data into the context in which it was monitored.

2.4.5 Quality Control

Twenty organisations had some form of quality control over the data entered into the computer. The types of quality control included, checking the data against expected figures, membership of external quality assurance schemes for sampling and/or analysis, and checking that the data have been entered correctly. Nine organisations indicated that there was no formal quality control. There was no information on quality control measures for the remaining thirteen computerised systems.

2.5 Details of the Computerised Systems

The forty one organisations were contacted for more detailed information on the system employed. A second questionnaire (appendix 2) which was sent by means of facsimile to those organisations. Unfortunately, not all the organisations replied and 30 out of the 41 completed the questionnaire. The remaining 11 were approached by post and again by facsimile for information but did not respond.

46% of organisations have had the computer system for data maintenance for less than five years (13 of these have had the system for less than three years). Seven organisations indicated that the system has been in operation for between five to ten years with no changes except upgrading being made. Only one company stated that their computerised system has been in operation for more than 10 years. For three organisations the computer system was less than a year old.

2.5.1 Hardware

The hardware chosen by organisations for the maintenance of their data, fall loosely into three main categories, namely personal computer based, mini system and Mainframe. The table below (7) gives an indication of the hardware chosen and numbers of organisations utilising a broad category system. It was possible only to include the 30 organisations which submitted full information on hardware here:

Table 7 Hardware employed for the maintenance of Occupational Exposure Data

| Number of organisations | Description of system |
|--------------------------------|---------------------------------|
| 13 | Personal Computers (IBM -based) |
| 5 | VAXen plus Personal Computers |
| 1 | Siemens 7570 plus PC's |
| 1 | VAX system |
| 1 | IBM 3090 |
| 1 | IBM Mainframe |
| 1 | COMEXED Mainframe |
| 1 | HP 9000-360 Workstation |
| 1 | IBM RS6000 plus PC's |
| 2 | ? Mainframe plus PC's |
| 1 | Mainframe Prime 2850 multiuser |
| 1 | IBM 9/370 |
| 1 | Not given |
| 30 | TOTAL |

2.5.2 Software

The software selected for the purpose of data management varies as much as the hardware. Where commercially available software packages were chosen, they have been adapted and extensively 'rewritten' to suit and fulfil individual the requirements of the organisation.

Table 8 gives an indication of the the software packages chosen and the numbers of organisations utilising them. (An organisation may use more than one package e.g. for statistical or graphical manipulation of the data another package may be accessed.) On the other side of the spectrum, some organisations made no use of commercially available software at all. These generally had access to 'in-house' professional computer analysts and programmers to who were able to write programmes for the specific use of data management.

Table 8 **Number of Organisations and Software Packages used**

| Number of organisations | Name of Software Package |
|--------------------------------|---------------------------------------|
| 3 | Camhealth (CamAxys) |
| 1 | COSTAR |
| 2 | DATAEASE |
| 2 | DBASE III+ |
| 1 | dBase IV |
| 1 | Degrath (DEC) |
| 1 | EMMIL |
| 1 | Enable |
| 1 | Excel |
| 1 | Flow Gemini |
| 2 | Harvard Graphics |
| 4 | In-house |
| 1 | INGRES |
| 1 | Kedit |
| 1 | Lotus Magellan |
| 1 | Metrosonics |
| 1 | Microstat |
| 1 | MS Word |
| 3 | MUMPS |
| 13 | No information given |
| 1 | Oases |
| 1 | S1800 Database |
| 2 | SAS (Statistical Analysis) |
| 1 | SIR DBMS |
| 1 | Statgraphics |
| 1 | Status |
| 1 | Text system as ASCII Files |
| 1 | Word-processing Package (Unspecified) |

Some computer systems have been not been operating for any length of time and therefore it is impossible to make quality control judgements on the system's performance. It may be difficult to standardise such systems or even to make them compatible.

2.5.3 Proformas

A number of the organisations collecting data which are computerised use a standard proforma. Several were provided by questionnaire respondents (see appendices 4-9). There is inevitably a great deal of overlap on the proformas but there are also differences largely reflecting the differing reasons for data collection - mainly because of the differing function of the databank.

3. DISCUSSION

3.1 All Data Holders

3.1.1 Questionnaire Returns

We are reasonably confident that the organisations holding data to which access might be made, returned questionnaires. Anecdotal evidence from data holders suggest that many of the nil returns were likely to be because no data was held or had passed them on to other organisations who they knew or felt might hold data.

3.1.2 Number of Organisations holding Occupational Exposure Data

Organisations not surveyed may hold data but limited time and resources were available. Most larger organisations were covered. Further work might include surveying all hygienists in professional associations in all member states where such exist. The larger number of responding companies and other organisations holding data in the UK may be because we were better able to target industry (through occupational hygienists working in industry) or that more databanks are to be found in the United Kingdom. A second reason may be that six of the U K databanks were held by companies within the ICI group.

3.1.3 Type of Organisation holding Occupational Exposure Data

Manufacturing industry seems to be a good source of occupational exposure data in Germany and the United Kingdom. Several of these indicated that data would be available for standard setting. Consultancies do collect data but are probably less focussed than industry. Research and teaching establishments collect data but much of this will be for specific projects and probably published in the peer-reviewed literature.

3.1.4 Form of the Occupational Exposure Data

Computerisation is taking over from paper records in this sphere. This is an appropriate time, therefore, for those who are setting up systems to learn from the more established databanks.

3.1.5 Why is Data Collected?

The variety of reasons for data collection partly explains the variety of software and coding systems in use. It also explains why many organisations qualify their agreement to make data available. If data has been collected to demonstrate compliance, it is probably worst case monitoring i.e. not typical e.g. Lucas Industries see section 4.9.15.

3.1.6 What is Monitored?

Most organisations surveyed monitor for a variety of materials. It was not practicable to individually identify the possibly hundreds of materials. Dusts and organic gases and vapours were, not surprisingly, the most commonly surveyed materials.

3.2 Computerised Occupational Exposure Data

3.2.1 Holders of Occupational Exposure Data

Industry, government and research bodies all hold exposure data in computerised form. However manufacturing industry forms the single biggest group of occupational databank holders. Not surprisingly, compliance, control and routine monitoring are the most usual reasons for holding data. Control and compliance monitoring data might not, of course, necessarily be representative of routine exposure. Computerised systems, however, have the advantage over paper data as they allow identification of trends over time e.g. deterioration of control measures.

3.2.2 Quality Control over Occupational Exposure Data

Several holders rightly pointed out the variability in quality of data, that is the reliability of the figures given. The choice of when and where samples are taken is critical. In addition, quality control over laboratory analysis is now recognised as an important. Quality control is therefore required before data could be transferred from system to system (see 3.1.5 on worst case monitoring).

3.2.3 Access to the Data

A surprisingly high number of databanks would be prepared to allow access to standard setting organisations (48%). In Section 4, these organisations are identified and any qualifications that they gave are presented. These qualifications fall into two main areas. The first is that of data security. Organisations need to be assured that the data will be treated as confidential and anonymised as there will be an understandable reluctance to disclose data which might result in enforcement action against the company concerned. The second area is that holders would want to provide circumstantial details with the data such as to identify data collected for compliance e.g. worst case monitoring.

3.2.4 Computers, Hardware and Software

Thirteen organisations have had a computer system for less than three years and the system of three organisations was less than a year old. Computer systems are very costly to set up in terms of time, resources and effort. There is evidence that the software chosen had to be adapted to suit organisational specifications, or proved to be unsuitable in use and had to be changed. Exchange of experience would be particularly useful for new users.

3.3 Future Developments

3.3.1 Pooling Data

The European Community will be setting community-wide standards for occupational exposures. It would therefore be an advantage to have a pool of anonymous data to tap into. Many substances are used in a variety of industries in many different ways under different control measures. It is only by pooling data from all over the community can this variety be exposed. The experience in the United Kingdom is that industry generates and collects a great deal of data, and "any harmonisation of the way in which hygiene data is collected and stored will give industry the opportunity to contribute to the standard-setting process" (Hammer 1987). Upon this premise, industry has been invited to submit data to the UK's National Exposure Database. Extending this proposal to form a community wide databank would be an exciting initiative. Standardised methods for occupational hygiene sampling and analysis will be needed and standardisation of data coding and storage should be encouraged. This will allow linkage between systems and information exchange within the European Community to enable the effective utilisation of increasingly expensive resources.

3.3.2 Standard Proformas and Sampling Methods

In order to achieve data exchange between existing databanks or the larger goal of a pan-European databank, it will be necessary to collect and record data in a uniform way. The easiest way to ensure this is to make use of a proforma. This is already recognised within individual databanks (see the proformas in appendices 4-9). Holders of databases participating in the Copenhagen meeting agreed that an exchange of proformas would be useful. The core of information demanded by the proforma is common but there are differences, mainly because of the differing functions of the particular databank. It is important, particularly for the standard setting process, that the reason(s) for the data collection are recorded on the proforma, so that an assessment of how typical the exposures are, can be made. The databank holders also agreed that merging data could not take place until measurement strategies and methods were uniform between countries. It was agreed that the outcome of the discussions by CEN Technical Committee 137 would be crucial to harmonisation in this area.

3.3.3 Standard Coding Procedures

The information collected must be coded in order to transfer it to a databank. In particular, the industry, occupation and task must be coded. The normal codes that are used are the ILO SIC/SOC codes. Most users have found, however, that these are too broad for use in this context and have modified the codes. This modification can be in the form of additional digits but the additions have not been uniform. Each organisation has built up its own dictionary. Sharing this information would be useful for existing and new users.

3.3.4 Uniform Hardware and Software

The existing systems all use different equipment and programmes. It is difficult to see how these existing systems can be harmonised as the time, money and effort required to do so, would be considerable. Some areas may be more amenable to standardisation than others, for instance the Danish System ATABAS had a very interesting and thoughtful list of search fields.

3.3.5 Proposed New Computer Databanks

During the course of the study, some organisations (which currently hold data in a manual form) indicated that computerisation was being considered, and at the Copenhagen meeting it became clear that some new national systems are being planned. It would seem reasonable to suggest that if the European Community wishes to establish a databank of occupational exposures, a uniform method of data entry storage and retrieval be proposed for new systems established within the member states which could eventually be implemented on an European Community-wide basis. New users would certainly benefit from discussing the pros and cons of systems with existing users.

3.3.6 The Way Forward

The First Meeting of Product and Exposure Registers in Copenhagen concluded that current holders of databanks and prospective holders of such databanks could benefit from sharing experiences and perhaps avoid common pitfalls. There was general agreement that the demands of the organisation (i.e. the current owner and generator the database) would continue to dictate the nature and format of the data - highlighting the fact that databanks are set up to serve particular purposes. In addition, the data itself requires expert interpretation because of the variability of sampling methodology and workplaces. It was concluded that exchange at a technical level e.g. software, hardware and search fields would be useful. Direct data exchange is not feasible at present even if confidentiality problems could be overcome.

This group, representatives of the other databanks identified by this survey and other hygienists from the European Community, could form the basis of an expert group to establish what information an ideal databank would hold, and the format of the information.

4. DESCRIPTION OF SOURCES OF OCCUPATIONAL EXPOSURE DATA

The sources of occupational exposure data described below, are in the main the forty one organisations indicating that occupational exposure data is stored on computer. The organisations differ in hardware, software, content and scope of the data stored in this way. None of the databanks described is available to the general public but access to the data is possible following the correct channels. The United Kingdom's National Exposure Database has been included here and not in the section concerning existing databases (which can be found at appendix 3) as it is not yet available on-line or in the form of CD-ROM. The sources of data are arranged alphabetically per European Community member state.

4.1 BELGIUM

4.1.1 Academisch Ziekenhuis - Blok A
Rijksuniversiteit Gent
Faculteit Geneeskunde
Dienst voor Hygiëne en Sociale Geneeskunde
De Pintelaan 185
B-9000 Gent

tel: +32.91.40.36.91
fax: +32.91.40.49.94

Contact: Dr M Vanhoorne
Senior Lecturer

This is a university department of the medical faculty which undertakes research, teaching and also occupational hygiene consulting work. Data are held on approximately 20 substances (inorganic and organic gases and vapours and dust) and have been collected since 1963. Systematic data was collected (1980-1986) for epidemiological research on CS₂ and H₂S from the viscose industry. These individual exposure data are linked to results of medical examination. Data have been computerised for 10 years and use is made of the University Mainframe. Statistical and graphical manipulation is possible.

Hardware: Siemens 7570-CX 32MB
Operating system BS 2000 (9.5)
PC/AT 286 and mathematical co-processor

Software: SAS (Statistical Analysis)
Harvard Graphics
S1800 (Database)

Access: At the moment, limited to own organisation but access by researchers and/or an official body may be negotiable.

Standard setting: Data is in a convenient form for standard setting and this organisation would be in a position to submit anonymous data.

4.1.2 AIB-VINÇOTTE
Avenue du Roi 157
B-1060 Brussels

tel: +32.2.536.85.21
fax: +32.2.537.46.19

Contact: Dr L Thiessen
Section Head: Environmental Studies

This organisation is an authorised inspection body which undertakes hygiene consulting work, research and teaching as well as being categorised as a service industry. It is an international group which evaluates whether products conform with the requirements of customers and any relevant legislation and regulations. Thus three functions are applicable: certification, inspection and laboratory testing.

The environmental studies section holds data on approximately 10 substances and has collected these over a period of more than 5 years. Data has been computerised for 3 years. Data on organic and inorganic gases/vapours, dusts, fumes and fibres is kept. The information is stored on personal computers in the form of reports. Statistical manipulation is not undertaken. Details of the working conditions may be found in each report but these are not centralised.

Hardware: PC's

Software: Mainly word-processing

Access: Own organisation and to enforcement agency, government and health and safety body.

Standard setting: The data are in a convenient format for standard setting purposes but due to confidentiality clause, permission would have to be sought from clients before anonymous data could be used.

4.1.3 Katholieke Universiteit Leuven
Arbeids- & Verzekeringsgeneeskunde SMGZ
Kapucijnenvoer 35, 5de verdieping
B-3000 Leuven

tel: +32.16.21.70.80

fax: +32.16 21.69.70

Contact: Mr H Veulemans
Head: Laboratory, Occupational Hygiene and Toxicology

This is a department within a university which undertakes research, teaching and occupational hygiene consultancy work. Over a period of some 20 years, occupational exposure data has been collected on some 300 substances (data concerning organic and inorganic gases/vapours, dusts, fumes and mists).

The computerised system is 6,5 years old (mainly personal computers) and the database contains analytical results of approximately 12,000 air samples which have been analysed by the laboratory for approximately 150 different organic solvents. Both industry and occupational health services have contributed to the bank of data. Job details, working conditions and industry type is not systematically available in this system. Such details are kept in the files of occupational medical services and employers - who actually provide this organisation with data on air samples. The data that are available may be converted into any desired format - text, spreadsheet, graphics and statistics.

Hardware: Hewlett Packard PC

Software: In-house

Access: At the moment the data is only available to members of the organisation and to enforcement agencies or governmental health & safety bodies.

Standard setting: The data are confidential and the format of the data is not convenient for standard setting bodies to use. The question of possible submission of anonymous data would depend on the kind of data requested.

4.2 DENMARK

4.2.1 Arbejdstilsynet
Arbejds miljøinstituttet
Lersø Parkallé 105
DK-2100 København Ø

tel: +45.31.29.97.11

fax: +45.39.27.01.07

Contact: Mr P-A Lund
Chief Information Officer

The Arbejds miljøinstituttet is part of the Danish Labour Inspectorate and conducts research and teaching. It has an occupational exposure databank called ATABAS. The databank was set up in 1983 and the older measurements (1983-87) were taken to assess efficacy of control measures. Much of the occupational exposure data contained therein is from the work of the Danish Labour Inspectors monitoring the workplace.

The Arbejds miljøinstituttet used to undertake the analysis of the samples taken by the inspectors - this occurred automatically until three years ago, when inspectors started to use other analytical laboratories for analysis. The Institute does not automatically receive data now and the data which are now entered are those which are generated in the course of particular investigations and research of the Arbejds miljøinstituttet.

The database contains information on approximately 210 substances [representing 3000 companies; 8000 workplaces; 20,000 air samples and 70,000 air contaminants]. Apart from this the database also holds information on the workplace (processes and products) and the number of personal samples taken (some 10,000). Data is kept in the form of reports which are in Danish. Caution: Data should be used carefully since the measurements were made in different ways - some short-term e.g. near a process, and others random 8-hour measurements.

ATABAS is one of four databank held by the Arbejds miljøinstituttet. All four databanks contain data pertaining to the workplace. The other databanks deserve a mention here. They are:
BIOBAS - biological measurements (e.g. metals in blood and urine);
FYSBAS - physiological and ergonomical data; and
PROBAS - a product register (the oldest in the EC) - which contains physical, chemical and toxicological data on 130,000 compounds.

Hardware: Digital VAX 3100 minicomputer

Software: RMS file structure and Smartstar (4 generation tool)

Access: Requests only dealt with through staff at the Arbejdsmiljøinstituttet to researchers and research agencies, and government, health & safety bodies and enforcement agencies.

Standard setting: The data may be used for standard setting purposes and the Arbejdsmiljøinstituttet would be in a position to submit anonymous data.

4.3 FRANCE

4.3.1 Association Française de l'Amiante 10 Rue de la Pépinière F-75008 Paris

tel: +33.1.45.22.11.77

fax: +33.1.42.94.98.86

Contact: Mr F Hébrard
Director

This trade association collects information on asbestos and fibres. The fibres on which data are collected are used for the same purposes as asbestos by industry. Data have been collected for some 15 years. There is no indication how long computerisation has been used. Data are contributed by industry and are passed on to the Permanent Committee on Asbestos¹⁰ which in turn enables controlled use of asbestos.

Hardware: No information

Software: No information

Access: Researchers and their agencies; government, health and safety and enforcement agencies.

Standard setting: The data available in a convenient form or available to be made anonymous for standard setting purposes.

¹⁰ The CPA, in its own words, 'has made it possible for France to become the only country in the world to protect man, nature and society from the risks associated with the use of a dangerous but useful product and yet to maintain a high- performance industrial activity' (Secretariat of the Permanent Committee on Asbestos 1991 p. 24)

4.3.2 G.E.R.D.A.
Groupe d'Études et de Recherches en Dermato-Allergologie
Clinique Dermatologie
Hôpital Universitaire
B.P. N° 426/R5
F-67091 Strasbourg Cedex

tel: +33.88.16.11.78
fax: +33.88.16.10.32

Contact: Prof E M Grosshans MD
Professor of Dermatology and
Director of the Dermatology Clinic

The databank held by this university hospital and research centre contains information on allergens and allergen-containing products. The computerised system holds information from various countries i.e. mainly France and Belgium, and co-operation with Spain, Switzerland and Italy. Information is kept on more than 10,000 occupational and non-occupational allergens including chemicals, natural (plant) allergens, drugs, clothes, and cosmetic allergens. Data have been collected over 10 years.

The hardware has been used for three years and the computerised system has been in use as an information system for 2 years. Because of the very detailed approach adopted, the computer system was developed in-house. The system will allow statistical and graphical manipulation. Four databases are interacting with each other in this system, namely a patient database, a prime materials database, an industrial products database and a project database.

Hardware: IBM - 9/370
DASD: 4x400M; Tape 1600 Epi
I/O: 32 (printers, 3270 terminals)
Operating system: V.M.

Software: No information

Access: Own organisation only i.e. researchers co-operating with G.E.R.D.A.

Standard setting: Data are in convenient format for standard setting bodies but the financial implications of making the data anonymous must be discussed.

4.3.3 IBM France
Tour Descartes
F- 92066 Paris
La Defense

tel: +33.1.49.05.79.64
fax: +33.1.47.88.94.04

Contact: Mr F Bermond
Industrial Hygienist

This manufacturing company has collected data for 10 years and has information on approximately 40 substances. Not all of the data are easily usable but recent improvement of the software does make data of the last three years more convenient to use. The system currently in use has been in operation for 2 years. Monitoring data on organic and inorganic dusts/vapours, dusts, fumes and fibres are kept.

The in-house system only is for the use of managers, medical and health and safety specialists who are linked into the system, i.e. allowing authorised users to be on-line. Managers thus have access to the exposure levels of persons dealing with chemicals. Graphs are shown on the screen which compare the personal exposure of a particular employee comparing it to the TLV.

It is envisaged that information will be stored in this database for two years after which exposure results will be transferred to another database which could be accessed if required. Please refer to appendix 5 for a copy of a technical report on the database.

Hardware: IBM host

Software: In-house

Access: Own organisation only.

Standard setting: Data could be made available for standard setting and these data are in a convenient format. Anonymous data may be made available.

4.3.4 Institut National de Recherche et de Sécurité (I.N.R.S.)
Centre de Recherche et de Formation
Avenue de Bourgogne
B.P. n° 27
F-54501 Vandœuvre Cedex

tel: +33.83.50.20.20
fax: +33.83.50.20.19

Contact: Mr B Carton
Charge de Programmation

I.N.R.S. is an independent organisation which works closely with the Social Security System in France. Data contained within the national COLCHIC database have been collected and computerised since 1987 and the database contains information on approximately 500 substances (organic and inorganic gases/vapours; dusts, fumes and fibres). By 1990 more than 13,000 air samples had been collected from workplaces and included¹¹. Use is made of a proforma for data input. Data is provided by the eight Regional Health Insurance Fund (CRAM's) Laboratories¹² which conduct local sampling and analysis and data is also included from sampling undertaken by co-workers. CNAM (Caisse Nationale d'Assurance Maladie) contributes directly to INRS.

Statistical and graphical representation of the data is possible. Use is made of an in-house classification system for industries and jobs, and working conditions are recorded but as 'further information' (not compulsory to do so). It is envisaged that another computerised database will be created at Nancy and will include information from all locations. This collection of exposure data will be useful in setting exposure standards and for epidemiological studies. Use is made of proformas (appendix 6).

Hardware: HP 9000 - 360

Software: INGRES

Access: Restricted to I.N.R.S. Occupational exposure data is the property of the Regional Laboratory contributing to the central database and permission would have to be given by the Regional Laboratory for release. Access is dependent on the enquiry and who is making the request for data.

Standard setting: The data is available for standard setting and is in a format which is easy to use.

¹¹ Personal communication, B Carton at the First Meeting of the Product and Exposure Registers, Copenhagen 29/30 August 1991.

¹² These are based at Bordeaux, Lille, Rouen, Nantes, Paris, Nancy, Marseille and Lyon.

4.3.5 Université de Lille
Institut de Médecine du Travail
Faculté de Médecine
1 place de Verdun
F-59045 Lille Cedex

tel: +33.20.53.55.32

fax: +33.20.52.10.22

Contact: Professor Haguenoer and Professor D Furon
Occupational Medicine and Toxicology

This Institute is part of the medical faculty at the University of Lille. Toxicological research is carried out and physiological surveys undertaken. The Institute has access to an analytical laboratory for surveying atmosphere and biological levels.

Data on approximately 20 substances is kept (organic and inorganic gases/vapours, dusts and fumes). The computerised database was made for a study on welders which was done. Unfortunately no further information is available on this system.

Hardware: No information

Software: No information

Access: Own organisation and researchers/research agencies. Data are presented at conferences and in papers.

Standard setting: Anonymous data could be made available.

4.4 GERMANY

4.4.1 Beiersdorf AG
Abt. Industriehygiene
Unnastraße 48
D-2000 Hamburg 20

tel: +49.40.569.45.43
fax: +49.40.569.34.34

Contact: Mr H Ziebell

This manufacturing company produces cosmetics, technical tapes and pharmaceuticals. The databank contains about 30 substances and data have been collected over a period of about 5 years. Organic gases/vapours and dusts are monitored. Data are kept in the form of reports. The reports are created only by a computerised text system as an ASCII file. No further information available on the system.

Hardware: No information

Software: Text system as ASCII files

Access: By law it is compulsory to control workplace areas (dangerous substances and chemicals) and thus government and enforcement agencies have access.

Standard setting: Submission of data would need to take into account workplace situations. Access is negotiable.

4.4.2 Berufsgenossenschaftliches Institut für Arbeitssicherheit (BIA)
Hauptverband der gewerblichen Berufsgenossenschaften e.V.
Alte Heerstraße 111
Postfach 2043
D-5205 Sankt Augustin 2

tel: +49.2241.231.722
fax: +49.2241.231.234

Contact: Dr M Stückrath
Head of the OMEGA Organisation System
Measurement Data on Hazardous Substances
at the Workplace

In Germany, statutory accident prevention and insurances institutions in industry (known as 'professional associations') support their members with technical control and advice on all work safety problems. These professional associations together with BIA are responsible for a special measuring system for 'hazardous substances'. The professional associations are responsible for maintaining contact with enterprises and provide technical advice. They undertake sampling and quality

assurance. BIA on the other hand, is responsible for maintaining and co-ordinating the computerised system including software analysis and the development of measuring methods. BIA also undertakes quality assurance. The database is called MEGA. The MEGA system forms part of a much larger database called GESTIS. There are logical interfaces with the ZeSP (Central Substance and Product Database) and the Occupational Disease Documentation System (BK-Dok) amongst others.

In Germany, it is obligatory for employers to ensure that limit values on dangerous substances are complied with. In order to do this adequately, measurements have to be taken. Monitoring may be done by employers and inspection of the workplace is done by occupational associations (Berufsgenossenschaftens). These data are submitted to the BIA.

MEGA contains information on 290 substances which is in the form of 400,000 records on workplace exposures taken since 1972 to date. Data is related to the industry activity and the workplace conditions. Approximately 150 different pieces of information are recorded on each sample of a dangerous substance. Data pass several validation procedures to ensure that data collected are of a uniformly high level of quality. Monitoring is undertaken by 230 hygienists of all the six types of airborne contaminants using proformas (appendix 7). The measurement data documented in MEGA are not representative statistically. On the one hand, sampling is undertaken at workplace sites where increased exposure is expected and on the other hand, inspections of the workplace are done often after action has been taken to reduce exposure - thus there may be a wide range in the data.

Hardware: No information

Software: No information

Access: Data contained in the MEGA documentation system may be used only by the owners of the data or with their approval. In general, data from the database must not be handed out to other institutions than the Statutory Accident Prevention and Insurance Institutions in industry in Germany (who are the owners of these data).

Standard setting: The data could be made available in the form of special surveys with respect to special industrial branches and special workplaces or with respect to specific substances. There is a large amount of data on the data record, specific knowledge of the collection and sample analysis would be required and BIA would need to provide interpretation.

4.4.3 Esso AG
Industriehygienische Abteilung
Moorburger Bogen 12
D-2100 Hamburg 1

tel: +49.40.77.17.53.21
fax: +49.40.77.17.52.33

Contact: H-G Schwarzer

This oil company has, amongst others, two refineries and one chemical plant. The organisation monitors only organic gases and vapours. The substances on which data are kept are: benzene, toluole, xylene - data on these substances go back 10 years; data on vinyl acetate and maleic anhydride has been recorded for two years. The computerised system has been in operation for three years. The database has been developed using dBase IV software. No details of the working conditions are kept.

Hardware: IBM PS2 (model 50 Z)

Software: dBase IV

Access: Strictly only to the organisation's own medical and industrial hygiene departments.

Standard setting: Data could be made available. It is in a convenient format and could be made anonymous.

4.4.4 Institut für Hygiene und Arbeitsmedizin
Klinikum der Gesamthochschule Essen
Hufelandstraße 55
D-4300 Essen 1

tel: +49.201.723.45.77
fax: +49.201.723.59.11

Contact: Dr W Popp

This Institute for Hygiene and Occupational Medicine is a university department which undertakes research, teaching and occupational hygiene surveys. Data are kept on 5 to 10 substances (namely organic gases/vapours and fumes) and have been kept for an unspecified number of years. The computerised system has been in operation for three to four years. Data is stored in occupationally-exposed groups consisting of 20 to 40 persons each. Thus such data is easily managed by 'MS-word' files or 'kedit' software on PC's. Statistical and graphical programmes are applied as necessary (using mainly Macintosh computers). Data has been recorded partly for the MAK commission in Germany.

Hardware: IBM compatible PC's

Software: MS word or Kedit

Access: Mainly own organisation only. Data is reported in scientific papers or should reports be requested.

Standard setting: Data could be made available - this depends on the form, purpose and definition.

4.4.5 Volkswagen AG Gesundheitswesen D-3180 Wolfsburg 1

tel: +49.5361.92.11.40
fax: +49.5361.92.73.49

Contact: Dr. med. Dr.-Ing. H-G Grimm
Arzt für Arbeitsmedizin and Leiter Grundatzfragen
Arbeitsmedizin und Toxikologie

This automobile manufacturing company monitors organic and inorganic gases/vapours, dusts, fumes, fibres and mists. Data are retained on 166 substances and data have been collected since 1966. Much of the older data is kept in a manual form only, since 1988 a computerised database has been in operation. Data are entered in the form of reports and proforma. The database contains workplace measurements. Within the database the reason(s) for monitoring, the time and production dependent factors of measurement, the substance, results (short-term and TWA), production materials and relevant part of the workforce are included as a matter of course. The system allows graphical and statistical manipulation.

Hardware: IBM 3090/MUS
IMS/DL1 (Datenbanksystem)

Software: No information

Access: In-house only

Standard setting: Data is already being made available to standard setting bodies and for scientific investigations.

4.5. GREECE

4.5.1 Athens University
Department of Epidemiology and Public Health
Sturnara 32
GR-10433 Athens

Contact: Dr E Velonakis

This department is part of a public university which undertakes research and teaching. In the main epidemiological research is undertaken. The computerised system has been in use for a year and was developed with the help of an external consultant. This pilot system was developed for the collection of exposure data for a cohort (aircraft maintenance) and for a retrospective (case-control) study. ILO SIC/SOC classification was used but modified for the evaluation of asbestos exposure and for confounding factors.

Hardware: AP PC connected to University Mainframe

Software: No information

Access: Own organisation only for the purposes of research.

Standard setting: Data could not be made available.

4.6 ITALY

4.6.1 ENI - Ente Nazionale Idrocarburi
AGIP Petroli
P. de Enrico Mattei 1
I-00151 Roma

tel: +39.6.59.98.57.86

fax: +39.6.59.98.52.04

Contact: Mr Nardi Pietro
Head: Occupational Health and Environmental
Protection Department

AGIP Petroli is a branch of the ENI group which is concerned with the refining and distribution of petroleum products. Since 1978, several (number not given) substances have been monitored - organic and inorganic gases/vapours, dusts, fumes, fibres and mists. The computerised data is held in the form of reports and according to proforma. No further information was provided on the system concerned.

Hardware: No information

Software: No information

Access: Basically only within the organisation unless permission granted or when required by law.

Standard setting: No clear information given.

4.7 SPAIN

4.7.1 Comision de Seguridad Industria Siderometalurgica
(C.S.I.S.)
c/ José Cueto, Nº 40, 1º
Apartado de Correos 195
E-33400 - Aviles

tel: +34.85.56.29.59
fax: +34.85.56.28.02

Contact: Dr D A M Arévalo
Technical Secretary

This organisation is an occupational hygiene or health and safety consultancy. It monitors all the six airborne contaminants and has data on 25 substances. Data have been collected since 1982 and are put into the databank using proforma entry.

Hardware: No information

Software: No information

Access: Own organisation only

Standard setting: The organisation is in a position to submit anonymous data to a standard-setting body.

4.8 THE NETHERLANDS

4.8.1 Akzo Corporate Health
Velperweg 76
Postbus 9300
NL-6800 SB Arnhem

Contact: Dr W W Brouwer
Corporate Medical Officer

This organisation is a chemical multinational which is a major producer of fibres, amongst other products. The corporate health section provides occupational hygiene consultancy. Monitoring is undertaken of all the six airborne contaminants. These data have been collected over a period of 10 to 15 years and the organisation now holds data on some 10,000 substances. Several databases were used but the organisation was looking to have one software system which could be used by the whole company. The software selected (which has been used for one year) because of its dedication to occupational health service requirements and reasonably priced, was Camhealth, module 'COSHH'. The system is used in-house to supply occupational hygienists and management of the several plants with data for occupational health service management. The system interfaces with statistical and graphical packages.

Hardware: IBM PS/2 with 80MB hard disc

Software: 'Camhealth' by CamAxys

Access: For own organisation only generally but sometimes to researchers/research agencies.

Standard setting: This subject is under full discussion within the company.

4.8.2 Philips
Safety Department (Occupational Hygiene)
Willemstraat 22A
Bldg. ECY-1
Postbus 218
NL-5600 MD Eindhoven

tel: +31.40.75.63.95/568.92

fax: +31.40.75.67.19

Contact: Mr T A J Noy
Occupational Hygienist

The safety department is a central body within Philips. Several specialist groups exist within the department and the group advises on occupational hygiene and safety matters. It carries out measurements at Philips plants. Monitoring of organic and inorganic gases/vapours, dusts,

fumes, fibres and mists are carried out. Data on approximately 100 substances have been collected over a period of 5 to 6 years. Computerisation has taken place over the last three years. The database has the following structure: report number, city, building, substance, workplace, date, concentration, personal/static sample.

Hardware: Philips P3230 (PC)

Software: DBASE III+

Access: Own organisation only.

Standard setting: Dependent on the requirements the data should meet for standard setting. Under certain conditions (unspecified) the organisation could submit anonymous data.

4.8.3 Wageningen Agricultural University
Department of Air Pollution
P O Box 8129
Bomenweg 2
'De Dreijen'
NL-6700 EV Wageningen

tel: +31.83.70.82.106 or 82.684

fax: +31.83.70.84.457

Contact: Prof J S M Boleij
Professor and Head of Department

This department of the university concerns itself mainly with research and teaching. Data on organic gases/vapours, dusts and fumes are collected and retained and used mainly in epidemiological research. Data has been collected for 5 to 10 years. The computerised system is 5 to 8 years old. Industry and regional occupational health services have contributed to the bank which contains approximately 5 substances. Statistics and graphics are possible. Working condition details are recorded.

Hardware: VAX (DEC)
Various IBM compatible PC's

Software: Mainly SAS

Access: To the own organisation only in the main, and to others provided they have adequate research proposals.

Standard setting: It is possible and providing it is not too time consuming, data can be made anonymous.

4.9 UNITED KINGDOM

4.9.1 Albright & Wilson Ltd
P O Box 3
210-222 Hagley Road West
Oldbury
GB-Warley B68 0NN

tel: +44.21.420.53.00

fax: +44.21.420.51.51

Contact: Mr S J Hayles
Company Occupational Hygiene Manager

This chemical manufacturing industry produces phosphates, detergents, water treatment chemicals etc. Organic and inorganic gases/vapours, dusts, fibres and fumes are monitored as part of compliance and ad hoc problem identification. The data (on approximately 100 substances which have been collected between 10 to 15 years) have been maintained in a paper system. The computerised system was purchased at the beginning of 1991. It allows downloading via ASCII files to other data handling systems. When the system is linked to all sites (those in the United Kingdom and in Europe) full risk assessment including conditions of work will be incorporated. As the system is very much in its infancy, a quality assurance scheme will be introduced. All methods of monitoring will have been validated with by the HSE or by NIOSH/OSHA.

Basic field names are to include: Hazards (substance list, health hazards and location); Work activities (types, activities and substances used); Employees (data, training records, location data); Assessments (risk, dates and review requirements); Controls examination (specification data, records and review requirements); Exposure monitoring (result records and review requirements); and Health surveillance (result records and review requirements).

Hardware: RS6000 IBM
IBM PS/2 on site

Software: CamAxys

Access: Own organisation and enforcement agency or government have access.

Standard setting: Data could be made available but the paper data is not convenient to use. The organisation would be in a position to submit anonymous data.

4.9.2 BBA Group plc
Occupational Hygiene Unit
P O Box 18
206 Bradford Road
Cleckheaton
GB-West Yorkshire BD19 3UD

tel: +44.274.87.44.44 ext 2219
fax: +44.274.87.34.16

Contact: Mr D J Glinski
Senior Occupational Hygienist

This company manufactures friction materials, automotive components and industrial textiles. The occupational hygiene unit provides an occupational hygiene service for internal and public sector companies. Monitoring of all six airborne contaminants is undertaken and data are kept on approximately 70 substances. Such data have been kept since 1966 (on paper only) and since 1981 on computer. The current system is 5 years old. The database is a customised version of an MS DOS system and information is kept in the form of reports. Standard statistical manipulation is possible. The exposure data are validated under NAMAS accreditation for sampling and analysis. Working conditions are included.

Hardware: Dell 316SX
Novell networked

Software: Enable

Access: The data are not publicly accessible, however, researchers, government and own organisation have access.

Standard setting: The data are in a convenient format and this company would be in a position to submit anonymous data to a standard-setting body.

4.9.3 Ciba-Geigy plc
Hulley Road
Macclesfield
GB-Cheshire SK10 2NX

tel: +44.625.42.19.33
fax: +44.625.61.96.37

Contact: Mr B H Witham
Group Product Safety Executive

This manufacturing company produces speciality chemicals, colourants, pharmaceuticals and agricultural chemicals. There are

eight operating sites in the United Kingdom and specific policies may vary from site to site. The amount of data and the period of collection varies from site to site. In the group as a whole, all six types of airborne contaminants are monitored. Manual recording of the data in the form of reports and/or results has moved to computerisation. No information was given on the computerisation of the data.

Hardware: No information

Software: Flow-Gemini

Access: In the main for own organisation purposes only and data is made available to the UK authorities upon request to demonstrate compliance.

Standard setting: The data are variable at present - will become more uniform. It would depend on the specific circumstances whether anonymous data would be provided.

4.9.4 Esso Petroleum Company Limited
Occupational Health Department
Esso Refinery
Fawley
GB-Southampton SO4 1TX

tel: +44.703.89.61.19

fax: +44.703.89.63.24

Contact: Dr M C W Lockwood
Senior Occupational Hygienist

Esso is a petroleum company which monitors organic gases/vapours, dusts, fumes, fibres and mists. It holds data on approximately 20 substances and data has been kept for more than 20 years. The computerised system has been in use for 3 years. Data are kept in the form of reports and data entry is by proforma. A world-wide system is being introduced by Exxon USA hence an in-house system is used for job and industry classification. No statistical or graphical handling of the data is possible, only calculations of overall exposure in either ppm or mg/m³. Working conditions are recorded with the exposure data such as temperature, humidity, wind direction, wind velocity, type of PPE/RPE worn etc. Data is validated using an in-house system called REMP (Rationalisation of Exposure Monitoring Programmes).

Hardware: IBM PS/2

Software: DATAEASE 4.2 used to develop own system called PCIHS
Communication to the USA via EMMIL

Access: Own organisation only

Standard setting: Data is available for standard setting. The organisation is in position to submit anonymous data and by the end of 1992 the data should be in a more convenient format.

**4.9.5 Exxon Chemical Ltd
Esso Refinery Fawley
GB-Southampton SO4 1TX**

tel: +44.703.89.60.53
fax: +44.703.89.47.54

Contact: Mr J T Sanderson
Environmental Health Manager - International

This petrochemical manufacturing industry monitors organic gases/vapours. Monitoring data is restricted to a small number of chemicals, however, exposure assessments on a once-off or very infrequent basis are made for welding fumes, catalyst dusts, noise, vibration etc. Data is held on 12 to 15 substances for routine monitoring data. Depending on the substance, the period over which it has been collected varies from 6 to 15 years. 95% of the data are on hard files but two years ago a computerised system was specifically developed for the company using a database management programme called 'Dataease 4.2'. Data entered into the database are by entry proforma (appendix 8).

Hardware: IBM compatible PC

Software: DATAEASE

Access: Own organisation only.

Standard setting: Although it is possible for data to be made available for standard setting, it would be very time-consuming to supply as 95% of the data are on paper. The very limited data on computer would be in a convenient format and could be easily made anonymous for submission to a standard setting body.

4.9.6 ICI plc
Alderly Park
GB-Macclesfield SK10 4TJ

tel: +44.625.51.45.70
fax: +44.625.58.53.96

Contact: Dr B A Mountfield
Group Occupational Hygienist

This company is a major chemical and related products manufacturer. It has data on several hundred substances which have been collected from 1975 to date. All six types of airborne contaminants are monitored. The computerised system is an in-house one not linked to any external system and there are no proposals or intention to be linked to other systems. The exposure database is only one element of the occupational health system. It has been up and running for seven years. Exposure data can be graphically and statistically handled. Selected data may be downloaded to IBM DOS files for external analysis. The job classification system used within the United Kingdom is in-house, elsewhere a user-defined table of job codes is used. No working conditions are recorded.

Hardware: DEC VAX
IBM PC

Software: In-house using MUMPS

Access: Own organisation only and clearly the data is available for inspection by an enforcement agency (e.g. the UK Factory Inspectorate) on a confidential basis. Data, however, are not routinely passed on to databanks (such as the HSE NEDB).

Standard setting: Data could be made available for standard setting but is release only on a case-by-case basis with proper interpretation. Data would not be released for haphazard amalgamation with other information which may lead to spurious conclusions. The organisation would not be in a position to submit anonymous data.

4.9.7 ICI Agrochemicals Fernhurst
Hazelmere
GB-Surrey GU27 3JE

tel: +44.428.64.40.61 ext 5729
fax: +44.428.65.57.58

Contact: Mr P Natkanski
Environmental and Occupational Hygiene Manager

This independent company is part of the ICI Group and produces agrochemicals. Data are kept on some 40 to 50 substances and these have been kept for 10 to 12 years. Organic and inorganic gases/vapours, dusts, fumes, fibres and mists are monitored. Both a manual and computerised system for data maintenance are used. No further information on the database was given.

Hardware: No information

Software: No information

Access: Data access limited to company only.

Standard setting: The organisation already contributes to standard setting. Each request for data would be considered on merit as quality of the data can vary.

4.9.8 ICI Chemicals and Polymers
The Heath
Runcorn
GB-Cheshire WA7 4QF

tel: +44.928.51.13.43
fax: +44.928.51.51.46

Contact: Mr J C Edwards
Occupational Hygiene Manager

This independent company is part of the ICI Group. Once again all six types of airborne contaminants are monitored and data are held on 100 substances. Data go back to 1974 and exist in both a manual and computerised form. Data are held on the ICI Group Occupational Health System which was developed in-house with input from a

hygiene specialist and is similar to the commercially available COSTAR system. This has been available for the last eight years. Statistics and graphics are possible. Initially, data are put in temporarily and after validation transferred to permanent store.

Hardware: DEC VAX
20 terminals - IBM clones

Software: MUMPS developed into in-house system

Access: Own organisation only and as a legal requirement it is available to the enforcement agency.

Standard setting: Data may be used but would need explanation e.g. data from an investigation of a high exposure task could be taken as a representative sample.

4.9.9 ICI Paints
Safety, Health and Environment Department
Wexham Road
GB-Slough SL2 5DS

tel: +44.753.87.77.12/87.77.07
fax: +44.753.53.26.18

Contact: Mr J L Clark
Manager: Safety, Hygiene and Ergonomics

This organisation monitors organic and inorganic gases/vapours, dusts, fumes and mists. Data is held on approximately 60 substances which have been collected since 1975. The pre-1985 data are in a manual form thereafter may be found on computer. The hygiene element of the databank was developed in-house. ICI has licensed the system for use externally. The system allows statistical and graphical analysis of the data. Details such as operating conditions, start up and shut down, spillage, emergency etc. and details of the task performed are included.

Hardware: Mini (VAX and PDPII)
PC

Software: In-house

Access: Own organisation, enforcement agency or government body and to research bodies in specific circumstances.

Standard setting: Data could possibly be made available for standard setting but could not be transferred without detailed explanation of the basis on which the data was collected. This would be very time-consuming. The data would only be useful where corresponding health status data are available. This is likely to be limited.

With regard to the submission of anonymous data, this would depend on the use to which the data would be put and only after detailed consultation between the parties concerned.

4.9.10 ICI Pharmaceuticals
Safety, Health and Environmental Department
Alderly Park
GB-Macclesfield SK0 4TJ

tel: +44.625.51.35.46
fax: +44.625.58.69.12

Contact: Mr M Rackham
Occupational Hygiene and Environmental Affairs Manager

This company concerns itself with the manufacture of pharmaceuticals and research. Over a period of more than 10 years, data has been collected on more than 250 substances. Organic and inorganic gases/vapours, dusts and fumes are monitored. All the data on the databank have been collected in-house. No further information was given on the databank.

Hardware: No information

Software: In-house

Access: Own organisation and upon request by an enforcement agency or governmental body.

Standard setting: Only in specific cases where it is believed that it would assist a regulating body. Data could be provided but only with appropriate interpretation. The organisation would not wish to provide raw data to any database without interpretation.

4.9.11 ICI Specialities
P O Box 42
Hexagon House
Blakley
GB-Manchester M9 3DA

tel: +44.61.721.10.91
fax: +44.61.795.60.05

Contact: Mr C D Money
Occupational Hygiene Manager

The company is concerned with the manufacturing of speciality chemicals at about 25 sites in Europe. The chemicals include colours, resins, bulk pharmaceuticals, agrochemical activities, biocides, biological products etc. Although data has been collected for about 10 years, the majority date from the mid-1980's. Data on more than 1500 substances are kept. Organic and inorganic gases/vapours, dusts, fumes, fibres and mists are monitored. Other data include biological indices such as legionella, endotoxins etc. Exposure measurements have been made for compliance, control assessment, routine monitoring and epidemiological research and also for validating cleaning procedures. The data, however, is not consistent and comparison between data sets is therefore problematic.

Data are mainly kept manually and on computer at the major UK sites. The ICI Group Occupational Health System is the one used (based on COSTAR). Data included in proformas have been altered with time, but the primary data have remained more or less consistent. The in-house data is capable of being interrogated for epidemiological purposes because of the company's total commitment to occupational health. No details given on the system employed.

Hardware: No information

Software: Based on COSTAR - developed in-house

Access: Own organisation and to enforcement agency/government in specific cases. Access to data within the organisation is limited to a restricted number of users but summaries of results are prepared for managers and workforce. Individual results given to those affected.

Standard setting: The company indicated that as it is a multi-batch manufacturer, therefore comparisons or trends and statistical analysis are very different in such circumstances.

4.9.12 Industrial Health Limited
The Old Surgery
Queen Victoria Road
GB-Newcastle upon Tyne NE1 4HL

tel: +44.91.232.57.13
fax: +44.91.221.06.28

Contact: Mr A G Smith
Senior Occupational Hygienist

This occupational hygiene consultancy undertakes hygiene surveys and its other interests lie in education and teaching. The organisation has occupational exposure data on over 100 substances and this has been collected since 1960. The data is private and confidential to the company and the client and is kept in a textual report form on computer. Exposures measured in the test room (these are confidential) are kept on a databank.

Hardware: No information

Software: No information

Access: Own organisation only and the client on whose behalf the assessment has been done.

Standard setting: Data could be made available for standard setting, if written permission is given. Owing to the lack of manpower, it would not be possible to process data into a usable anonymous form.

4.9.13 Institute of Occupational Medicine Ltd (Edinburgh)
8 Roxborough Place
GB-Edinburgh EH8 9SU

tel: +44.31.667.51.31
fax: +44.31.667.01.36

Contact: Mr P L Bodsworth
Director of Occupational Hygiene and
Mr J Fintan Hurley
Director: Data Sciences

This Institute undertakes research, consultancy and training in the fields of occupational and environmental health and hygiene and also operates an advisory and analytical service to industry and commerce.

Monitoring of all six types of airborne contaminants is undertaken and as a result, extensive data is held on many (figure not given) substances. These have been kept since the early 1950's but computerisation has been in use since 1984. The practice at this

organisation is that separate exposure databases have been created for the measurements obtained in separate studies. Thus each is custom-built and inevitably (and intentionally) are different in structure, use and purpose.

Exposure databases are constructed by in-house analyst programmers using the SIR DBMS system. This has been in use since 1984, prior to which flat files were used. Statistical summaries but no graphics can be provided directly using SIR DBMS. Generally statistical and graphical representation is carried out by outputting to BMDP, Genstat and other statistical packages. Use is made of a purpose-built job name and place of work classification. Working conditions were included as appropriate to the study. At various stages the data is validated e.g. at the field measurement stage, laboratory measurements, and during data entry into the database.

Hardware: Prime 2850 multi-user system

Software: In-house development using SIR DBMS system

Access: Information held from consultancy and service work is largely confidential to the client. Research data may be available at the Institute's and the sponsors' discretion. Data would be made available to government and enforcement agencies.

Standard setting: The data would need evaluation to determine applicability and relevance and would need to take other factors into account such as industry type, prevailing conditions, reasons for sampling etc. The costs incurred in making data anonymous would need to be discussed.

4.9.14 Jaguar Cars Ltd
Occupational Hygiene Department: Medical Centre
Browns Lane
Allesley
GB-Coventry CV5 9DR

tel: +44.203.40.21.21 ext 2078

fax: +44 203.40.54.51

Contact: Mr A M Singleton
Occupational Hygienist

This manufacturer of automotive vehicles has collected exposure data over a period of more than 20 years. Monitoring of organic and inorganic gases/vapours, dusts, fumes, fibres and mists is carried out. Data is kept on over 3000 substances. Monitoring is undertaken for compliance, control assessment, routine exposure, epidemiological

research and also in response to complaints from individuals exposed to substances and also as a reaction to recently published papers on suspected carcinogenicity of new substances (pre-emptive exposure data). The computer system has been operating for 5 years. No statistical or graphical analysis can be done. Data entry is in the form of reports and proforma.

Hardware: IBM PC XT and Toshiba 1640 laptop

Software: dBase III+
Harvard Graphics, Microstat, Microsonics

Access: Own organisation and enforcement agency or government body.

Standard setting: Unlikely permission would be given for submission of anonymous data. Specific cases could not be disclosed because the data is confidential.

4.9.15 Lucas Industries plc
Group Occupational Hygiene Department (F6)
Great King Street
GB-Birmingham B19 2XF

tel: +44.21.554.52.52

fax: +44.21.523.23.57

Contact: Dr S Richards
Group Occupational Hygiene Services Manager

This company manufactures a wide range of automotive components. Data has been collected since 1966, and in the main data is kept on 10 to 20 substances with small amounts of data on another 50. Organic and inorganic gases/vapours, dusts, fumes, fibres and mists are monitored. The reason why exposure measurements have been made include control assessment, compliance with legislation and routine exposure monitoring. This company's philosophy has been in the main to enable control of exposure is to make measurements in the worst conditions and if the appropriate air limit is exceeded, to improve the standard of control. As a result of this company philosophy, only maximum exposures are recorded, and no average typical exposure over 8 hours.

The data is stored in the form of reports using a word-processing package. Key words may be searched using another software package called Lotus Magellan. Details of working conditions are included.

Quality control and validation of the data is by the RICE and WASP schemes. The databank is not structured as such.

Hardware: Compaq Deskpro 386S
Epson LQ 850 printer

Software: Lotus Magellan

Access: The data may be used by researchers and is available to enforcement agencies and government bodies.

Standard setting: If the data is considered to be of value, it may be used for standard setting purposes. The limitation being that they are worst case measurements.

4.9.16 Mobil North Sea Ltd
Grampian House
Union Row
GB-Aberdeen AB1 1SA

tel: +44 224.85.54.24
fax: +44.224.85.53.00

Contact: Dr A D Sneddon
Staff Environmental Engineer

This exploration and production oil company holds data on some 10 substances. These include data from the monitoring of organic and inorganic gases/vapours, fumes and mists. Data have been collected over a period of approximately 5 years and for more than two years this has been computerised. Monitoring is carried out for control assessment, for routine exposure assessment and to assess whether remedial work on engineering control is needed to protect workers.

The data are stored on a Mainframe using a system called 'Status' which is a textbase. It does not allow statistical or graphical manipulation of the data.

Hardware: Mainframe VM system
PC Terminal emulation

Software: STATUS

Access: Own organisation only

Standard setting: Whether data could be made available would need to be decided by the company. The question of whether anonymous data could be submitted would also need to be discussed but the company indicates that it may be able to do this.

4.9.17 National Exposure Database (NEDB)
Health and Safety Executive
Technology Division
Magdalen House
Stanley Precinct
Bootle
GB-Merseyside L20 3QZ

tel: +44.51.951.40.00
fax: +44.51.922.79.18

Contact: Mr P L Beaumont
Principal Specialist Inspector

The Health and Safety Executive (HSE) has two databases - the older database called the Occupational Hygiene Visit Report (OHVR) database (which began in 1981) which stores textual summaries which provides information on processes, use of substances, ranges of exposure and control measures required. The other is the National Exposure Database which is a computerised system of data storage of the quantitative results of the monitoring of occupational exposure levels to airborne substances. According to Beaumont *et al* (1988) 'the objective of the NEDB was the flexible storage, retrieval and analysis of occupational hygiene data. The benefits would be the ready availability of historical data for establishing national pictures of exposure and control in industries'. The OHVR and the NEDB are cross-linked and are complementary.

The NEDB database contains data which has mainly been collected during the the course of HSE Specialist Inspector surveys, investigations and inspections of the workplace. Subsequently the co-operation of industry has been sought and some industries are now voluntarily contributing monitoring data to the NEDB. The initial reluctance by industry was for fear of possible enforcement action by the HSE. Assurances of confidentiality are honoured and the contribution of validated industry data will enable good quality information to be available to United Kingdom's standard setting committees¹³. All data on the database is made anonymous. Routine data input began in January 1986.

As the co-operation of industry was sought, some method of standardisation became necessary. With the help of the British Occupational Hygiene Society¹⁴, a proforma was developed for use by HSE inspectors (appendix 4) and industry encouraged to use the same method of recording. According to Beaumont *et al* (1991) the objective of this proforma is 'to establish a nationally recognised set of data and the failure to collect the correct information during measurement of occupational exposure to agents in the workplace, may result in wasteful use of scarce and expensive resources and failure to

¹³ Committees such as ACTS (Advisory Committee on Toxic Substances).

¹⁴ Special Interest Group on Occupational Hygiene Information Systems.

adequately control risks to health.' The NEDB will be able to highlight problem areas in particular industries or specific jobs where it may not reasonably be practicable to reduce exposure below a proposed new limit so that more realistic, better informed standards are set. Information held on NEDB will be available to epidemiological studies. Studies may lack good quality exposure data linked to particular processes or jobs.

The NEDB aims, in the long term, to become a national focal point for information on exposure to toxic substances as data from industry are included. The reasoning behind the National Exposure Database is that a broad national exposure database is developed in order to facilitate the setting of sensible standards - i.e. for worker protection and practicalities. 'NEDB is a crucial part of the mechanism for setting "experience based" occupational exposure limits which can be authoritatively supported in Europe' (Beaumont *et al* 1988).

A statistics and graphics package is included for processing data. At the present time, the databank contains data on approximately 370 substances. Information is not publicly accessible, but anonymous reports (which will contain data) will be given to selected enquirers.

Hardware: VAX 11/750 mini computer
IBM PC - 640 KB XT

Software: DSM - Digital Standard MUMPS
Degraph (DEC)
'Statgraphics'

Access: There is no direct access to the data. The data contained on the database is confidential. Upon request for information, the database is searched in-house and relevant data passed to an in-house topic specialist (an occupational hygiene inspector) who will qualify the data (statistically and graphically) and a report will then be provided. It is hoped that the database will eventually be provided on CD-ROM in the future when the data contained is more representative¹⁵.

Standard setting: Data are used in standard setting.

¹⁵ Personal communication, P Beaumont.

4.9.18 Roche Products Ltd
P O Box 8
Welwyn Garden City
GB-Hertfordshire AL7 3AY

tel: +44.707.32.81.28 ext 2774
fax: +44.707.33.82.97

Contact: Ms S R Hughes
Occupational Hygienist

This organisation is concerned with pharmaceutical research. The monitoring of organic gases/vapours and dusts are conducted. Data are held on approximately 30 substances and have been collected for approximately 10 years. Computerisation has been applied for the last two years. A software package called 'Camhealth' by CamAxys was selected as this allows interaction between health/medical records and exposure data. At the present time, statistical and graphical manipulation is not possible. Details of working conditions are included and because it is for in-house use only, coding of jobs and industry is also in-house. Data is kept in the form of reports and proforma on the computer.

Hardware: IBM PC PS/2
Hewlett Packard Deskjet printer

Software: 'Camhealth' by CamAxys

Access: Own organisation, safety representatives and enforcement agencies/government bodies.

Standard setting: Although the data is in a convenient format which standard setting bodies could use, the information is confidential and company specific. Would need to refer to the pharmaceutical trade association.

4.9.19 T & N plc
Ashburton Road West
Trafford Park
GB-Manchester

tel: +44.706.732.92
fax: +44.706.732.92

Contact: Mr J B Heron
Group Health and Safety Adviser

This is an international group with a wide range of operations including metals, chemicals and fibres production. All six airborne contaminants are monitored and data has been stored on approximately 20 substances. The period of data collection varies for the substances and could be anything from 1 year to 20 years. No information was given on the computerised system.

Hardware: No information

Software: No information

Access: The data is accessible by the organisation and government/enforcement agencies and some of the data may be made available to researchers.

Standard setting: Some of the data could be made available for standard setting and the company is in a position to submit anonymous data.

4.9.20 Texaco Limited
Safety and Environmental Affairs
1 Knightsbridge Green
GB-London SW1X 7QJ

tel: +44.71.584.50.00
fax: +44.71.581.55.48

Contact: Mr J Stenhouse
Co-ordinator Product Safety and Industrial Hygiene

This petroleum and chemical manufacturing company. Data have been collected over a period of 10 years and includes approximately 50 substances. Organic and inorganic gases/vapours, dusts, fumes, fibres and mists have been monitored. The primary purpose of the database was epidemiological but over the years it has been used to fulfil industrial hygiene requirements. The company is linked to the Mainframe in the USA. The system is called 'Comexed' and links medical, industrial hygiene and epidemiology databases. Currently 50,000 industrial hygiene samples are held (world-wide sample results but predominantly from the United Kingdom). The whole database is to be revised in 1992/93 to the 'Oases' system which will be on the

Mainframe in Houston. Data is stored in the form of reports and proforma (appendix 9). Please note that this will be revised when the system is changed). The extensive exposure data are concurrent with activity, location etc. All data sheets are verified and checked by industrial hygienists in the USA before data is entered into the system.

Hardware: COMEXED Mainframe

Software: Moving to Oases

Access: In-house only

Standard setting: The company can make data available in a convenient format and anonymous.

4.9.21 Vickers Shipbuilding & Engineering. Ltd
Barrow-in-Furness
GB-Cumbria LA14 1AF

tel: +44.229.87.57.26

fax: +44.229.87.43.71

Contact: Mr I Shrives
Occupational Hygiene and Environmental Services Manager

This company is involved in shipbuilding and heavy engineering. The products include: submarines, ships, armament and combat systems. The company carries out monitoring of exposure to most hazards e.g. heat and cold stress, as well as organic and inorganic gases/vapours, dusts, fumes, fibres, and mists. Some of the data is 10 years old and there are over 100 substances in the database. Information is kept on paper as well as in a computer system - the latter has been in operation for 3 years. The computer system was developed in-house and has a support group of some 300 people. Basic data or statistical analysis and representation can be made. Working conditions are not included nor are any validation procedures applied. Data is kept in proforma and details here include: number, date, type of sample, sampling technique, substance sampled, name, unique number, position, analysis, location/department, minutes and result.

Hardware: IBM PC

Software: Excel

Access: Own organisation only

Standard setting: Data could be made available for standard setting and the company will be in a position to submit anonymous data. Not certain whether the format is convenient.

REFERENCES

1. Leigh, Richard, (Ed.) (1986): **Directory of European Industrial and Trade Associations** 4th Edition, CBD Research Publication.
2. Adams, Robert , (Ed.) (1989): **Directory of European Professional and Learned Societies** 4th Edition, CBD Research Publication.
3. Williams, Michael, (Ed.) (1978): **Directory of Trade Unions in the European Economic Community** Graham & Co.
4. Commission of European Communities (1989): **Industrial Health and Safety: Occupational Hygiene Education in the EEC: A survey of existing programmes.**
5. INRS (1980): **International Directory of Applied Research for the Protection of Man at Work** 3rd edition (International Section for Research on Prevention of Occupational Risks) pp 217-301.
6. Parmeggiani, Luigi (Ed.) (1987): **International Directory of Databases and Databanks in Occupational Health** 1st Edition, International Commission on Occupational Health (ICOH).
7. ILO, Occupational Safety and Health Series No. 37. (1991) **Occupational Exposure Limits for Airborne Toxic Substances** 3rd edition
8. Millard, Patricia (Ed.) (1988): **Trade Associations and Professional Bodies of the United Kingdom** 9th Edition; Pergamon Press.
9. Union of International Organizations (Ed.) (1989): **Yearbook of International Organizations volume 3 1989/90** K G Saur (publisher).
10. ELC International (1990): **Europe's 15,000 Largest Companies 1990** ISBN 0-948058-43-9.
11. Henschler, D (1991): **Maximale Arbeitsplatzkonzentrationen und Biologische Arbeitsstoffleranzwerte 1991: Mitteilung XXVII der Senatskommission zur Prüfung gesundheitsschädlicher Arbeitsstoffe** DFG Deutsche Forschungsgemeinschaft ; VCH.Verlagsgesellschaft.
12. Hulm, P (1990): **International Register of Potentially Toxic Chemicals (IRPTC)** United Nations Environment Programme 1990 Information Booklet.
13. **Conference Proceedings: Management of Occupational Hygiene Information** held in Manchester 22-23 April 1987 (organised by HSE, BOHS and IOH).
14. Parmeggiani, L; Roi, R; Aresini, G ; Del Bino, G (Eds.) (1986): **Proceedings of the 1st International Workshop on Data Banks**

in Occupational Health, held at Villa Ponti, Varese, Italy
October 30/31, 1986 Organised by ICOH and Commission of the
European Communities.

15. **Beaumont, P L; Burns, D K and Taylor, T E (1988): The National Exposure Database - A Computer Record for Occupational Hygiene Data** HSE Technology Division Specialist Inspector Reports Report no. 8 March 1988
16. **Hastings, M R (Editor and Chief Compiler) (1990): The Health and Safety Directory 1990/91** Croner Publishing Ltd.
17. **McLeod, W T (Managing Editor) and Hanks, P (Consultant Editor) (1982): The New Collins Concise Dictionary of the English Language.**
18. **Cuadra/Elsevier (1987): On-line Databases in the Medical and Life Sciences.**
19. **Pantry, Sheila (1985): Health and Safety: A Guide to Sources of Information** CPI Information Reviews no. 6, 2nd revised edition.
20. **Conference Proceedings: Management of Occupational Hygiene Information**
Manchester 22-23 April 1987; HSE, BOHS and IOH.
21. **European Foundation for the Improvement of Living and Working Conditions (1990): Catalogue of Systems for the Monitoring of Working Conditions Relating to Health and Safety**
Working Paper No.: **WP/91/16/EN.**

Other Working Papers (compiled by the European Foundation) provide a fuller description the individual systems in the European Community member countries:

WP/91/11/EN: Belgium, Germany, Luxembourg, The Netherlands;
WP/91/12/EN: France, Greece, United Kingdom, International Labour Organisation, Organisation for Economic and Cooperation Development;
WP/91/13/EN: Spain, Portugal;
WP/91/14/EN: Papers presented at the Conference;
WP/91/15/EN: Consolidated Report;
WP/91/17/EN: Ireland, EC;
WP/91/18/EN: Denmark, World Health Organisation;
WP/91/19/EN: Italy; and
WP/91/20/FR: France.

22. **Secretariat of the Permanent Committee on Asbestos (1991): Controlled use of asbestos Utopia or Reality? A white paper from the Permanent Committee on Asbestos 1990.**
23. **Shackleton, S; Smillie, M V; Levy, L S, Fletcher, A C; Harrington, J M; Binks, S P; Chipman, J and Glass, D C (October 1990):**

Criteria Document for an Occupational Exposure Limit for Hydrogen Selenide prepared for the European Commission.

24. Binks, S P, Smillie, M V; Glass, D C; Fletcher, A C; Shackleton, S; Robertson, A S; Levy, L S and Chipman, J K (November 1990): **Criteria Document for an Occupational Exposure Limit for Ethanolamine** prepared for the European Commission.
25. Smillie, M V; Chipman, J K; Shackleton, S; Fletcher, A C; Levy, L S; Binks, S P; Glass, D C and Aw, T C (November 1990): **Criteria Document for an Occupational Exposure Limit for Monochloroethane** prepared for the European Commission.
26. Smillie, M V; Glass, D C; Chipman, J K; Levy, L S; Cross, H C and Fletcher, A C (October 1991): **Criteria Document for an Occupational Exposure Limit for Methyl Formate** prepared for the European Commission.
27. Smillie, M V; Glass, D C; Cross, H C; Levy, L S; Chipman, J K and Fletcher, A C (October 1991): **Criteria Document for an Occupational Exposure Limit for Triethylamine** prepared for the European Commission.
28. Beaumont , P L and Dalrymple, D L (1991): **Recording Occupational Exposure Data** paper presented at the 1991 BOHS Conference
29. Degimbe, J (1990) Forward to: **Social Europe: Health and Safety at work in the European Community** Commission of the European Communities.

Appendix 1

INITIAL QUESTIONNAIRE SURVEY

Name of contact person
Address of organisation
Country

(Please correct any mistakes.)

Completed by: _____ (Name)

Job title: _____

Telephone no: _____

Facsimile no: _____

1. Please describe your organisation.

Circle the appropriate (more than one if applicable)

- | | |
|---|----------|
| (a) Manufacturing industry | Yes / No |
| (b) Service industry | Yes / No |
| (c) Trade Association | Yes / No |
| (d) Occupational hygiene or health and safety consultancy | Yes / No |
| (e) Government body | Yes / No |
| (f) Research | Yes / No |
| (g) Educational / Teaching | Yes / No |
| (h) Other, please name: _____ | Yes / No |

Give further details about your organisation:

2. Does your organisation possess occupational exposure data on chemical substances?

Yes / No

(a) Does your organisation collect, generate and retain such data?

Yes / No

(b) What do / did you monitor? Please tick the appropriate boxes and give more information below.

Gases/Vapours

Organic

Inorganic

| |
|--|
| |
| |

Particulates

Dust

Fume

Fibre

Mist

| |
|--|
| |
| |
| |
| |

Other, please name:

(c) On how many substances do you hold data? _____
(please give an approximate figure, if total not known)

(d) Over what period have the data been collected? _____
(Please give approximate dates or years)

3. Why have the exposure measurements been made?

(Please mark the appropriate, more than one if applicable)

(a) Control assessment **Yes / No**

(b) Compliance with health and safety legislation and standards **Yes / No**

(c) Routine exposure monitoring **Yes / No**

(d) Epidemiological research **Yes / No**

(e) Other, specify _____

Please give more information.

4. In what format is the data held?

(a) **Manual recording i.e. on paper only, in the form of reports and/or results** **Yes / No**

(b) **As a computerised database?** **Yes / No**

(i) **In the form of reports?** **Yes / No**

(ii) **Using a proforma?** **Yes / No**

(iii) **Other, specify** _____

Please give more information on the computerised database.

(c) **Other, please specify** _____

5. (a) Have you recorded the information for any other purpose than your own? **Yes / No**

Please give all the information you believe would assist us.

(b) **Who has contributed to your database/databank?**
e.g., industry, law enforcement organisations etc.

6. Who has access to the data?

- | | |
|---|----------|
| (a) Own organisation only | Yes / No |
| (b) Researchers / research agencies | Yes / No |
| (c) Enforcement agency, government, health & safety body | Yes / No |
| (d) Publicly accessible | Yes / No |
| (e) Other, specify _____ | |

Please provide more information on access.

7. Could the data be made available for standard-setting purposes? Yes / No

If no, why not? Please give more information.

- | | |
|--|----------|
| (a) Is the data in a convenient format which standard-setting bodies could use? | Yes / No |
| (b) Would your organisation be in a position to submit anonymised data to a standard-setting body? | Yes / No |

If no, please give reasons.

8. For whatever reason(s), if you are unable to complete this questionnaire, we would be grateful for your reasons.

Thank you for the trouble you have taken to complete this. Please feel free to make any further comments if you so wish.

Appendix 2

SECOND QUESTIONNAIRE - COMPUTERISED SYSTEM

Name of contact person
Address of organisation
Country

Fax Number

1. What hardware do you use? Briefly describe the system.
2. Did your organisation select a commercially available software package for the management of the occupational exposure data ? **Yes / No**
If so, what type? Name?

Please give reasons why this choice was made. (e.g.. costs etc)

3. Was a system developed 'in-house' for the organisation's use or did you utilise external consultants? What technical support is available? Please give more information.
4. Does it function as an in-house system only? **Yes / No**
Please give details.

5. How long has your organisation had this computerised system?

Please indicate the number of years

Did you have a different system previously? Why did you decide to change?
Please give more information.

6. Does the system allow statistical and graphical representation of the data to be processed? **Yes / No**
Please give more information.

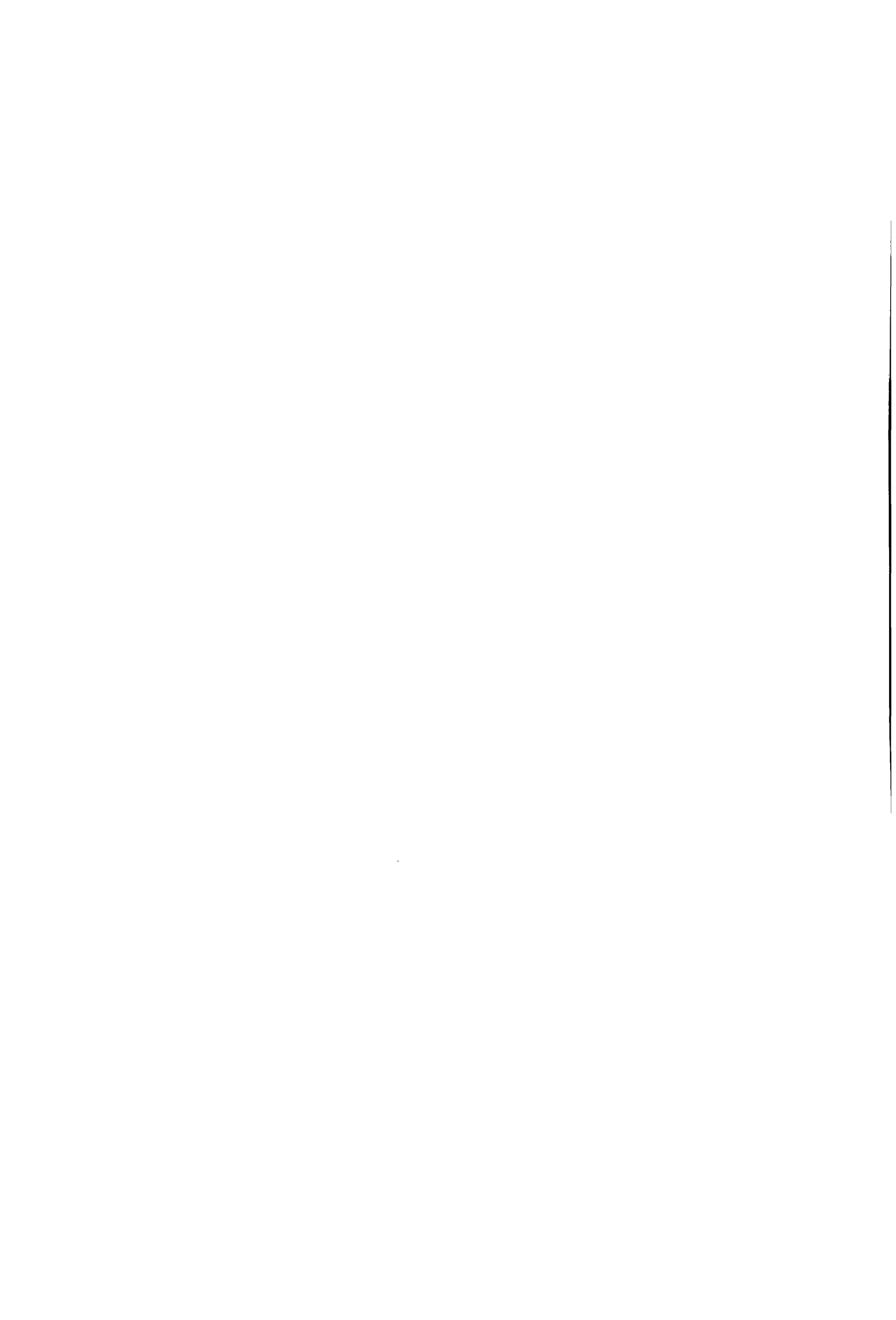
7. Do you use a standard classification such as the ILO SIC/SOC classification for industry and jobs? Please give details on classification you use.

8. Are details of the working conditions recorded in the system?
Please give more information.

9. Are validation procedures (quality control) applied to the exposure data?
Please explain.

10. Please could you provide a more detailed breakdown of this database's structure below. It would be helpful if you could attach either a list of fields names or entry proforma.

THANK YOU ONCE AGAIN FOR COMPLETING THIS.



Appendix 3

DESCRIPTION OF EXISTING DATABASES

1. CELEX

Communitatis Europae LEX
Commission of European Communities

CELEX is an on-line system which is updated weekly. It is the legal database for the European Community. Included on the database are references to case reports of the European Court, Directives and Regulations of the European Community, Parliamentary records and legislation of member countries where Directives have been implemented. It is possible to gain access to the text of most of the Directives. Texts of some older Directives, however, are not available, only references to the Official Journal are cited. No information is given on this database on occupational exposure databases nor on occupational exposure data. Its use is mainly for information on "European Communities acts, treaties, secondary legislation documents, parliamentary records, decisions of the Court of Justice, Parliamentary questions and answers" (Pantry 1985, p. 68).

2. CISDOC

Centre International d'Information de Securite et d'Hygiene du Travail
(International Labour Organisation, Health and Safety Centre,
Geneva, Switzerland)

CISDOC is the database of the ILO's International Occupational Safety and Health Information Centre. It provides an abstracting service on occupational hygiene, medicine, physiology, industrial toxicology, accident prevention, safety engineering, hazards in industry, conditions of work, ergonomics, training, epidemiology etc. It has about 20,000 references and is updated seven times a year. Its use is access to world-wide occupational health and safety references in published literature especially legislation. This database has been available since 1975 (Pantry 1985). Data are also available in printed version as CIS Abstracts. CISDOC is available on CD-ROM and is published together with NIOSHTIC and HSELINE as OSH-ROM.

3. ECDIN

Environmental Chemicals Data and Information Network
Commission of European Communities, Joint Research Centre

This on-line factual databank on environmentally and occupationally hazardous chemicals contains approximately 63,000 chemical compounds. The Occupational Exposure Limits file includes lists which have been published over the last 15 years by governmental authorities and private research institutions. The database is updated periodically as new data becomes available and is international. A CD-ROM version covering 1700 compounds has also been produced.

4. HSELINE

Health & Safety Executive (HSE), United Kingdom

The HSE is a government body responsible for health and safety in Great Britain. Part of this function is the provision of a library and information service. Since 1977, the information pertinent to matters of health and safety have been gathered into a computerised database. Currently (latest figure given for June 1990) the database has approximately 130,000 bibliographic references on a variety of subjects including: engineering, medicine, technology, agriculture, occupational health, occupational hygiene, safety, construction, electrical and electronics engineering, explosions and explosives, hazardous chemicals, industrial safety, nuclear technology, industrial pollution, protective equipment, industrial diseases, asbestos and robotics.

This is a bibliographic service which is publicly available on-line through three major computer services: the European Space Agency Information Retrieval Service Service, Datastar and Pergamon Orbit Infoline. The information which is provided is: author detail, title, publisher, date of publication, ISBN, keywords, journal citation, abstract. The full text of the reference is not supplied.

The HSE collaborated with NIOSH in the USA and with CISDOC in Switzerland to produce OSH-ROM (Occupational Safety and Health Compact Disc Read Only Memory). HSELINE is available on this system. HSELINE on OSH-ROM allows access to 200,000 citations with abstracts or keywords from more than 500 journals and 100,000 reports, codes of practice and books (Hastings 1990).

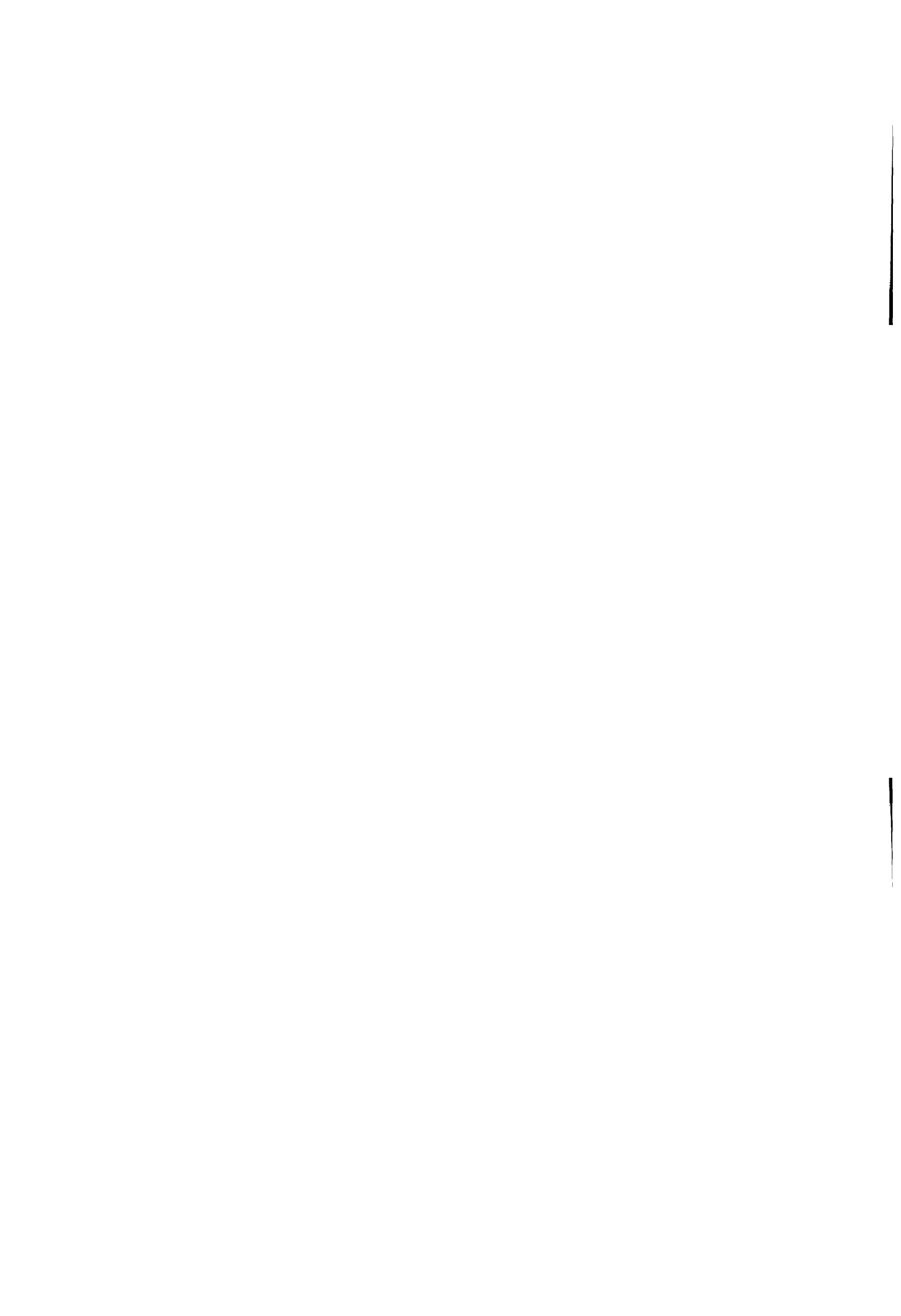
5. IRPTC

International Register of Potentially Toxic Chemicals
United Nations Environment Programme, Geneva, Switzerland.

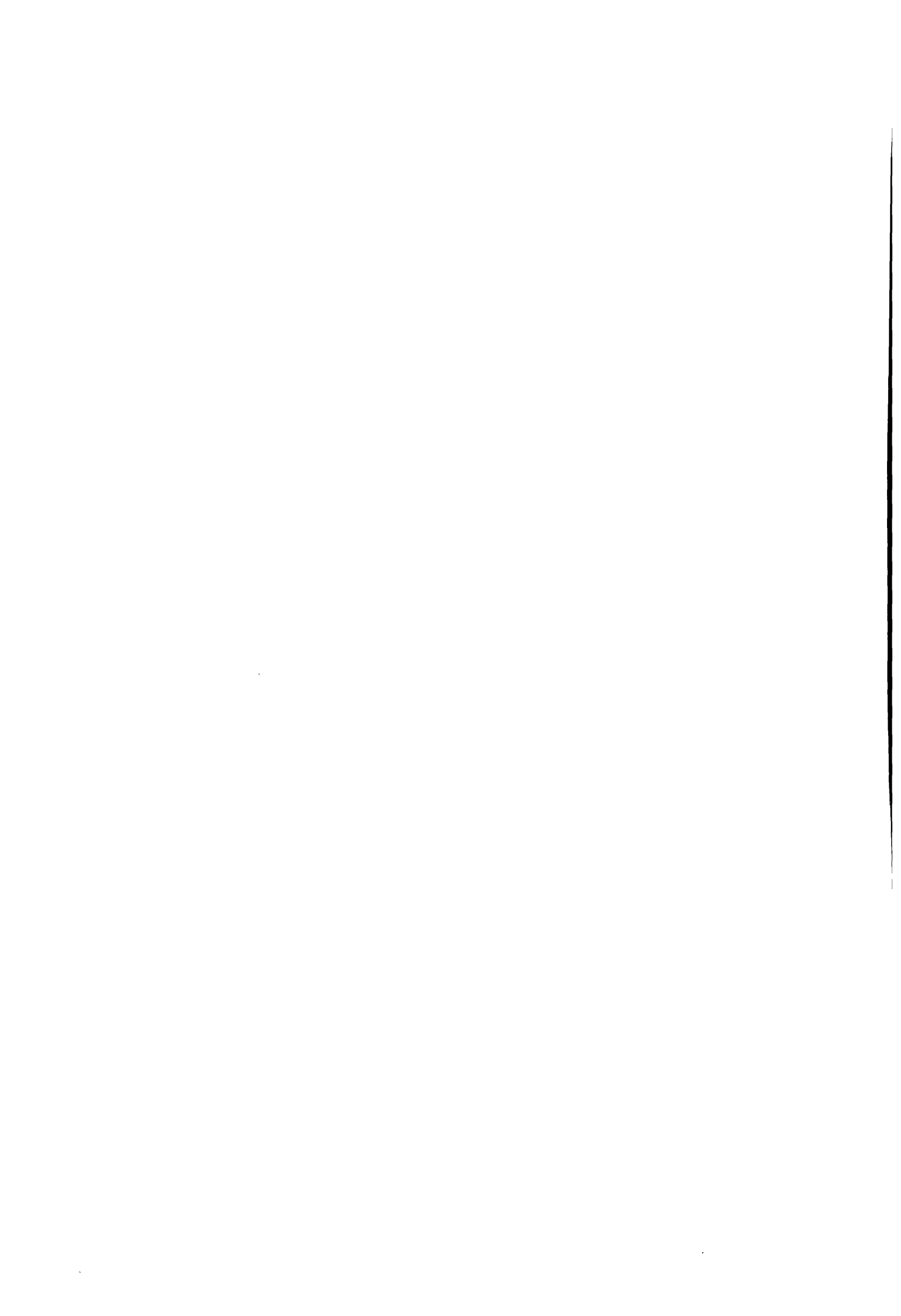
This database deserves mention here as 'toxic substances in the workplace, production processes and international trade are all covered in IRPTC's databank and publications' (IRPTC 1990). The Legal File contains occupational exposure limits in about 12 000 of the records held in the database. According to the Director of IRPTC/UNEP, the database 'covers approximately 8000 chemicals and contains international guidelines and national regulatory information from 13 countries and 6 international organisations. Occupational exposure limits have also been collected and stored in the file for another 10 countries. (The European Commission falls into this latter category).' (Huismans 1991)¹⁶

¹⁶ Written communication, September 1991.

The Database is run on a Mainframe computer at the International Computing Centre in Geneva. In Europe the Legal File may be accessed through ECDIN - EEC Environmental Chemicals Data and Information Network. IRPTC is in the process of converting the database to operate on personal computers for easier access. This new system should be available by the end of 1991 for a limited number of network and contributing partners, thereafter the next version should be available to a wider audience early in 1992.



Appendix 4 - Environmental Monitoring Data Proforma HSE/BOHS



Environmental monitoring Data



Author
Tel. no.

| File reference | | Reference to related records | Date of sampling | Total no. of people on site | Agent | | | | | | | | | | | |
|---------------------------------------|-------------|---|------------------|-----------------------------|---------------|---------------------------|--------|--------|--------|-----|--------|-----|--------|-----|--------|-----|
| Occupier of premises | | | | | | CAS No. | | | | | | | | | | |
| Address of premises/Location/Identity | | | | | | Units | | | | | | | | | | |
| Department/Area | | | | | | Sampling/Analysis Details | | | | | | | | | | |
| | | | | | | MSDS Ref | | | | | | | | | | |
| Building/Room | | | | | | Males exposed | | | | | | | | | | |
| | | | | | | Females exposed | | | | | | | | | | |
| Reference number | Sample type | Sample description (eg name/task/process/equipment) | Male Female | NI no. Personal no. | Sample period | Duration (Mins) | Result | TWA | Result | TWA | Result | TWA | Result | TWA | Result | TWA |
| 1 | | | | | | | | | | | | | | | | |
| 2 | | | | | | | | | | | | | | | | |
| 3 | | | | | | | | | | | | | | | | |
| 4 | | | | | | | | | | | | | | | | |
| 5 | | | | | | | | | | | | | | | | |
| 6 | | | | | | | | | | | | | | | | |
| 7 | | | | | | | | | | | | | | | | |
| 8 | | | | | | | | | | | | | | | | |
| | | | | | | Exposure limits | | | | | | | | | | |
| | | | | | | | | 8 Hour | | | | | | | | |
| | | | | | | | | 10 min | | | | | | | | |

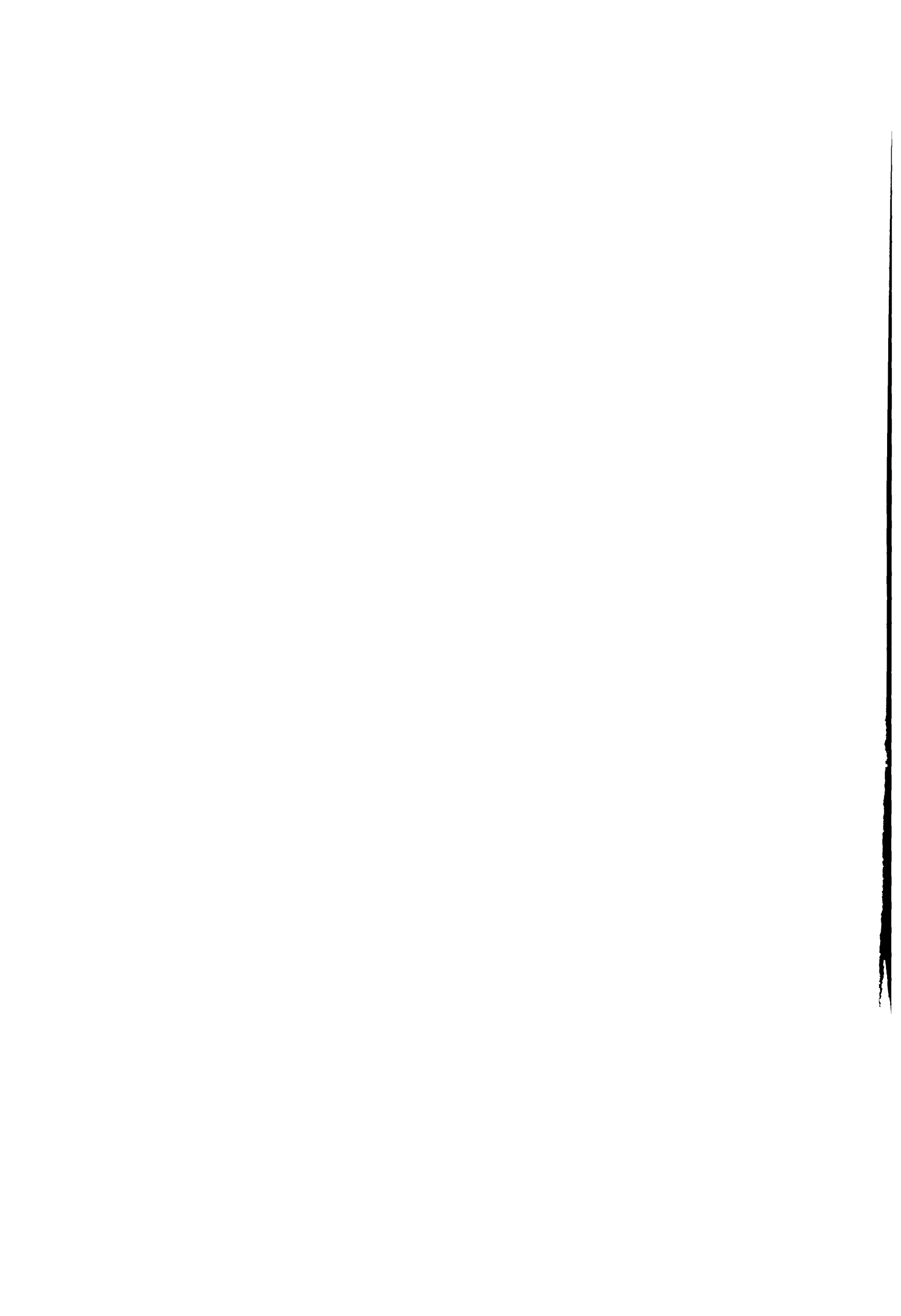
1
2
3
4
5
6
7
8

| Industry and SIC Code | | | | | | | |
|-----------------------|-----------|------------------|-----|----------------|-----------|-----------------|-----------------|
| Reason for monitoring | | | | | | | |
| Biological monitoring | | | | | | | |
| Exposure details | | Control measures | | Metabolic rate | | Related records | |
| Conditions | Frequency | RPE | LEV | Metabolic rate | Frequency | Related records | Related records |
| 1 | | | | | | | |
| 2 | | | | | | | |
| 3 | | | | | | | |
| 4 | | | | | | | |
| 5 | | | | | | | |
| 6 | | | | | | | |
| 7 | | | | | | | |
| 8 | | | | | | | |

Comments on origin of sampled material e.g. product name

Comments on exposure modifiers, e.g. skin contact, other relevant jobs, confounding factors, biological monitoring

Appendix 5 - IBM France Technical Report



IBM France

PROJECT PURPOSE

The purpose of this project is to improve, to optimize the storage of industrial hygiene results in order to have a good and simple system to store these data, data which could be easily used by plant specialists interested by exposure results: safety and medical people and by managers responsible of people dealing with chemical products.

As a base of this project it has been established that this application must be "friendly users" mainly for managers in manufacturing lines, so access to this application must be very easy and graphs obtained on V.D.U. must contain all informations for providing good comprehension to people not deeply involved in health and safety.

*** IBM INTERNAL USE ONLY ***

IBM France

PROJECT IMPLEMENTATION PHASES

At the beginning of 1989, the basic rules of this project have been defined by Safety/Industrial Hygiene and I.S representatives; the main objective of this project was to reduce the time spent in result calculations for giving various answers to medical department, to managers and to people concerned by the exposure to chemicals.

Details of data base and graphs which have to be shown on V.D.U have been defined during meetings between Safety team and IS representatives; a G.A.Q. (Quality Improvement Group) has been created in order to establish the draft project and to present it to the users, to obtain critics and suggestions on this project.

When the entire project has been formally approved by all the counterparts involved in health and safety and by managers of people dealing with chemicals, all exposure data for 1989 have been stored in this data base in order to provide information to people outside our safety department.

A guide has been established to help people using this application, VM links have been done. At the present time, 25 managers, medical and health and safety specialists are linked; it is the first step but, based on the real needs of manufacturing managers which have people dealing with chemicals, the numbers of links will be increased.

*** IBM INTERNAL USE ONLY ***

IBM France

DESCRIPTION OF DATA BASE

Exposure results requested to laboratories by Safety/Hygiene department are collected in the data base which contains hereunder columns:

Sector: area with specific ventilation and without interferences with the others areas; the chemical components contain in the atmosphere are the same due to the use of a certain types of chemicals: solvents, acids, gas (See attachment 1).

Product List: all chemical products which might be present in the atmosphere have been listed and for each product a code defined; the two last digits of FTS (French MSDS) have been chosen : 16 for acetone 81 for perc, 13 for arsenic.

In this list ,VME and VLE which are the french equivalents to US limits: TLV (TWA,STEL) in order to compare limits.

(See Attachment 2)

Measurement data: week and year (of sampling)

(See Attachment 3)

Identification: might be or the name of a person which has worn gas-badges, or tubes or pumps, a working station in which chemical are used or a room.

(See Attachment 3)

Measurement types: all sampling methodes have been listed and for each method a code has been chosen: 10 for gas-badges,11 for solvent tubes,13 for acid impingers,14 for filters.

(See Attachment 4)

Measurement Values: they are the results obtained by laboratory.

(See Attachment 3)

So each time, new industrial hygiene results are received from laboratories the existing data base is updated by the technician in charge of this job.

*** IBM INTERNAL USE ONLY ***

IBM France

INDUSTRIAL HYGIENE REPORTS

Instead of several data calculations for creating typed reports sent by internal mail or PROFS ,calculations which could generate : errors and losts of time,which are activities of low interest ; our data base described previously is linked with medical department and all the managers in charge of persons dealing with chemicals.

So, with the usage of this application, managers might have the access to exposure results of their employees; graphs shown on V.D.U are easy understood by all persons dealing with chemicals. So managers will be deeply involved in health and safety and all information requested by the working levels will be known.

. The access of this application is easy and a panel entrance is very usefull for helping people (See Attachment 5).

The first part of this panel which include options S,L,A,R,V, are used only by technicians in charge of updating the data base.

The second part of the panel is authorized for all persons linked to this application, several graphs could be seen on the screens depending of the interest of the user; the options from 0 to 9 are summarized hereunder:

. Several graphs could be shown, starting from the more detailed to the wider ones or the opposite : from wide to detailed graphs based on the exact need of the user.

a) Graph for one identification code / one sector / one product / one measurement code (See Attachment 6)

See Attachment 6 : On the graph, Minimum, Maximum and Average results are shown, number of values which are taken in account VME limit is indicated in order to compare it with exposure results given on the Y line.

b) Graph for one sector / one product / one measurement code.

See Attachment 7 which indicate all values found in one sector for a given product (per week/year)

c) Graph for one sector/per week /all products / one measurement code

See Attachment 8 : same as hereabove but for all chemicals found in one sector.

d) Distribution graph for one sector /one product for a given

*** IBM INTERNAL USE ONLY ***

IBM France

period.

See Attachment 9 : for given sectors, results are screened in four classes and for a chosen period of time.

Lower than 1% of VME

Between 1 and 10% of VME

Between 10 and 25 % of VME

Higher than 25% of VME

Results indicate the number of analytical values for each class.

Managers in charge of sectors where chemicals are used are able to choose several periods of time and to check on VDU the tendencies of chemical exposures.

Information will be stored in this data base for two years, after this delay exposure results will be archived in another data base which could be accessed if needed.

*** IBM INTERNAL USE ONLY ***

IBM France

CONCLUSIONS

This application has reduced the time necessary for publishing reports to Medical department and to managers which have in charge people dealing with chemicals.

The access to this application is easier than to store and manipulate paper files. Presentations have been done to the management and to employee council in order to motivate management to communicate exposure results to all persons which might be exposed.

With this new application, managers of people exposed to chemicals are able, immediately, to answer any questions from people concerned by chemical expositions.

As it has been mentionned in the Project Purpose chapter, this application is very "friendly users" even for people which have not good skills in VDU usages or which are not deeply involved in chemical exposures.

If VMAS is available in an I.B.M. site, this application could be installed very easily without additionnal hardwares, no investissements are necessary, only data base spaces .

MG - Dpt 1718/G1B, ESSONNES

*** IBM INTERNAL USE ONLY ***

SECTOR LIST

This panel indicates the name of sector (LIBSECT) for each sector of production areas.

| SECTEUR | LIBSECT | Action |
|------------|------------|--------|
| ABL CC | C.CENTRAL | |
| ABL CM10 | C.MAINT. | |
| ABL CM15 | C.MAINT. | |
| ABL CM6 | C.MAINT. | |
| ABL CM7 | C.MAINT. | |
| ABL MAINT6 | OP.MAINT. | |
| ABL M10 | OP.MAINT. | |
| ABL Z10 | MS ACIDES | |
| ABL Z13 | MS RESINES | |
| ABL Z15 | MS IMPLANT | |
| ABL Z6 | P SOLVANTS | |
| ABL Z7 | | |
| BAU Z1 | P EXP0125 | |
| BAU Z10 | MS IMPLANT | |
| BAU Z11 | METAL/QTZ | |
| BAU Z12 | | |
| BAU Z13 | P WET NPR | |
| BAU Z14 | META/DRY.E | |
| BAU Z15 | | |
| BAU Z2 | P EXP0/PLY | |
| BAU Z3 | MS EXOP125 | |
| BAU Z4 | MS EXP082 | |
| BAU Z5 | P EXP0 NPR | |
| BAU Z6 | E.BEAM | |
| BAU Z7-1 | L-OFF/SILY | |
| BAU Z7-2 | P DEVEL | |
| BAU Z8 | | |

ABL : Advanced Bipolar Line
BAU : Business As Usual

PRODUCT LIST

| PRO- | LIBELLE | LIBRED | VME | VLE | Action |
|------|----------------------|----------|-------|-----|--------|
| 03 | ACIDE SULFURIQUE | H2SO4 | 1 | | 3 |
| 04 | ACIDE NITRIQUE | HNO3 | 5 | | 10 |
| 05 | ACIDE CHLORHYDRIQUE | HCL | 0 | | 7.500 |
| 06 | ACIDE FLUORHYDRIQUE | HF | 0 | | 2.500 |
| 07 | AMMONIAC | NH3 | 18 | | 36 |
| 1065 | HAFNIUM | HAFNIUM | 500 | | 0 |
| 127 | ACETATE ETHYL GLYCOL | AEG | 27 | | 0 |
| 13 | ARSENIC | ARSENIC | 200 | | 0 |
| 1319 | ACETATE METHYLGLYCOL | AMG | 24 | | 0 |
| 15 | CHROME 6 | CRO3 | 50 | | 100 |
| 16 | ACETONE | ACETONE | 1800 | | 2375 |
| 164 | PLOMB | PB | 150 | | 0 |
| 17 | ACETATE DE N BUTYLE | BUTYLE | 710 | | 940 |
| 18 | ACETATE D'ETHYLE | AE | 1400 | | 0 |
| 20 | ALCOOL ISOPROPYLIQUE | I.P.A | 980 | | 1225 |
| 33 | TRICHLOROETHANE | TRI111 | 1650 | | 2500 |
| 355 | ETHYL GLYCOL | CELLOSOL | 19 | | 0 |
| 382 | METHYLETYLCEtone | MEK | 600 | | 885 |
| 42 | 3CHLORO3FLUROETHANE | CFC113 | 7600 | | 9500 |
| 5000 | METHANE EQUIVALENT | CH4 | 0 | | 0 |
| 5001 | ALUMINIUM | AL | 5000 | | 0 |
| 5002 | TUNGSTENE | W | 5000 | | 10000 |
| 5003 | PLATINE | PT | 1000 | | 0 |
| 5004 | SILICE AMORPHE | SiO2 | 10000 | | 0 |
| 5005 | CUIVRE | CU | 1000 | | 2000 |
| 5006 | TITANE | TI | 10000 | | 0 |
| 5007 | CHROME TOTAL | CRTOTAL | 500 | | 0 |
| 61 | N METHYL PYRROLIDONE | NMP | 400 | | 0 |
| 616 | ETAIM | SN | 2 | | 0 |
| 63 | O.DICHLOROBENZENE | O.DCB | 0 | | 300 |
| 67 | PROTOXYDE D'AZOTE | NO2 | 6 | | 30 |
| 81 | TETRACHLORETHYLENE | PERCHLO | 335 | | 1340 |
| 82 | TOLUENE | TOLUENE | 375 | | 550 |
| 88 | XYLENE | XYLENE | 435 | | 650 |
| 189 | BENZENE | C6H6 | 16 | | 0 |
| 30 | CHLORURE METHYLENE | DICHLORO | 360 | | 1800 |
| 121 | POTASSE | KOH | 0 | | 2 |

PRODUIT : last digits of MSOS number

LIBELLE : name of chemical

LIBRED : condensed designation of chemical

VME : valeur moyenne d'exposition (équivalent to TLV/TWA)

VLE : valeur limite d'exposition (équivalent to TLV/ceiling value)

PANEL FOR DATA BASE INPUT

FONCTION SECURITE DU TRAVAIL

A USAGE INTERIEUR II

MESURES D'HYGIENE INDUSTRIELLE

| SECTEUR | PRODUIT | DATE | IDENTIFICATION | MESURE | TYPE | COMMENTAIRES |
|----------|---------|------|----------------|--------|------|--------------|
| BAU Z7-1 | 1065 | 8925 | SOUFFLAGE TR. | 0.004 | 18 | 2 |
| BAU Z7-1 | 127 | 8943 | COURET | 0 | 10 | CC38 |
| BAU Z7-1 | 127 | 8943 | KHADRI | 0 | 10 | CC142 |
| BAU Z7-1 | 127 | 8943 | KHADRI | 0 | 10 | CC155 |
| BAU Z7-1 | 127 | 9003 | LIGNE 21 | 0.100 | 10 | 81 |
| BAU Z7-1 | 127 | 9003 | LIGNE 21 | 0.100 | 10 | 91 |
| BAU Z7-1 | 127 | 9003 | LIGNE 23 | 0.100 | 10 | 104 |
| BAU Z7-1 | 127 | 9003 | LIGNE 27 | 0.100 | 10 | 117 |

F3=RETOUR MENU PRINCIPAL

FF7=PAGE PRECEDENTE PF8=PAGE SUIVANT

NOTE :

- . See date base description page 5
- . MESURE : analytical result in mg.m³
- . TYPE : see measurement types At. 4

MEASUREMENT TYPES

| TYPE | DESIG | REFER | Action |
|------|-----------------|-------|--------|
| 10 | GAZ BADGE | UME | |
| 11 | TUBE CHARBON | UME | |
| 12 | DRAEGER | VLE | |
| 13 | BARBOTTAGE | UME | |
| 14 | PRELEV. FILTRE | UME | |
| 15 | PRELEV. IN SITU | UME | |
| 16 | TUBE SILICAGEL | UME | |
| 17 | CHROMATO. OVA | UME | |
| 18 | PRELEV. FILTRE | VLE | |
| 19 | GAZ-BADGE | VLE | |
| 20 | TUBE CHARBON | VLE | |
| 21 | CHROMATO. OVA | VLE | |
| 22 | ROYCO | VLE | |
| 23 | TUBE SILICAGEL | VLE | |

FONCTION STE HYGIENE INDUSTRIELLE A USAGE INTERIEUR IE:

GESTION DES MESURES D'EXPOSITION ENTREZ LES DONNEES CI-APRES :

| ETAPE | SECT | PROD | IDENT | TYPE | DATE |
|-------|------|------|-------|------|------|
|-------|------|------|-------|------|------|

S SAISIE DES MESURES
 L RECEPTION DES MESURES LABORATOIRES
 A ANNULATION DES DONNEES PAR SECTEUR PRODUIT
 R MISE A JOUR DES REFERENCES
 V VISUALISATION DES DONNEES PAR SECTEUR

1 GRAPHIQUE PAR SECTEUR PRODUIT IDENTIFICATION
 2 GRAPHIQUE PAR SECTEUR PRODUIT
 3 GRAPHIQUE PAR SECTEUR TOUS PRODUITS
 4 DISTRIBUTION PAR SECTEUR PRODUIT CLASSES DE MESURE
 5 DISTRIBUTION PAR PRODUIT CLASSES DE MESURE
 6 GRAPHIQUE POUR SECTEUR SPECIAL

8 LISTE DES SECTEURS TRAITES
 9 LISTE DES PRODUITS TRAITES
 0 LISTE DES IDENTIFICATIONS TRAITES

PF3 = EXECUTION

PF12 = RETOUR CMS

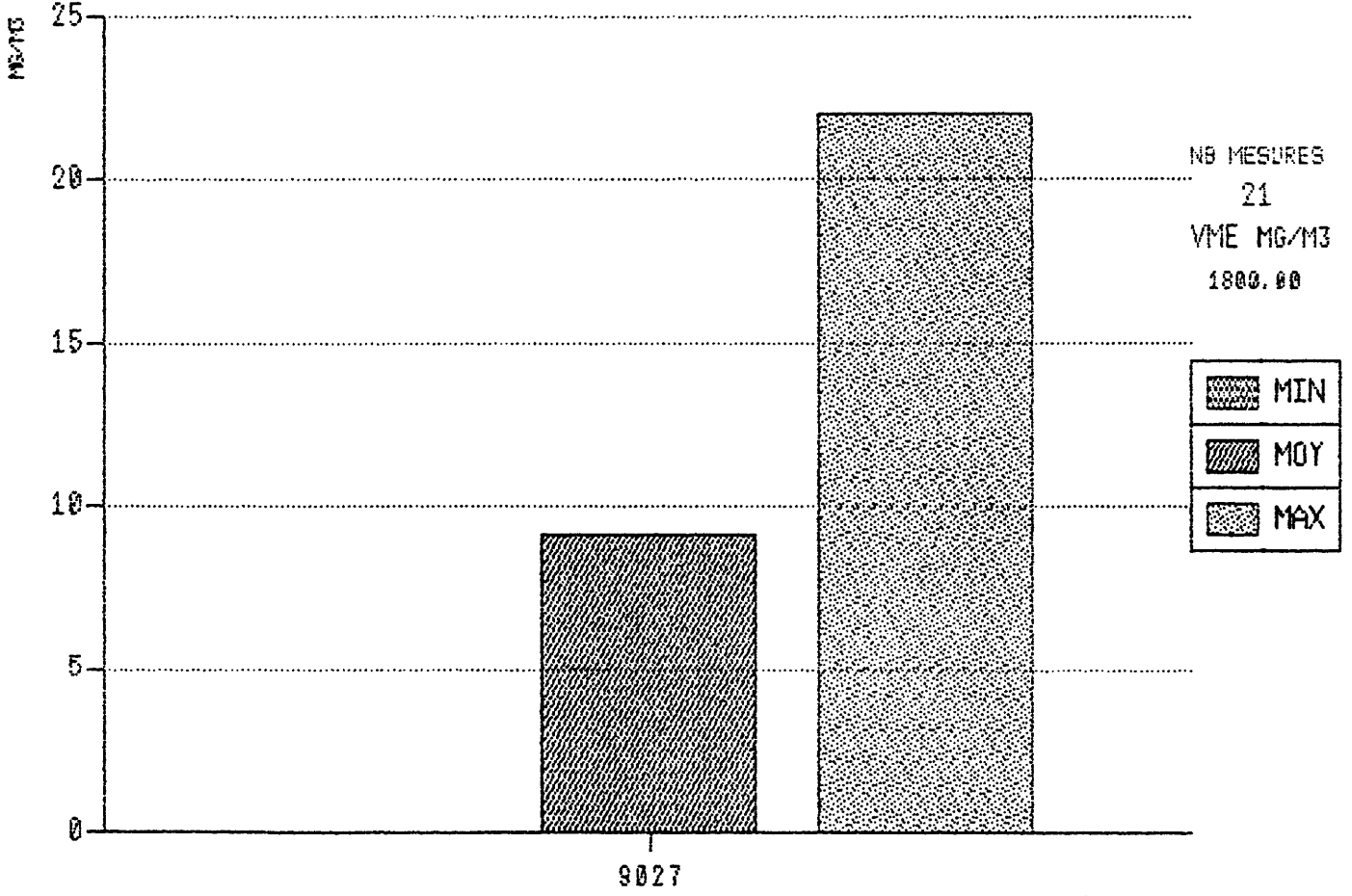
PF4=LISTE DES SECTEURS PF5=LISTE DES PRODUITS PF6=LISTE DES TYPES DE MESURE

DISTRIBUTION DES PRELEVEMENTS GAZ BADGE

SECTEUR= 86L 222

PRODUIT= ACETONE

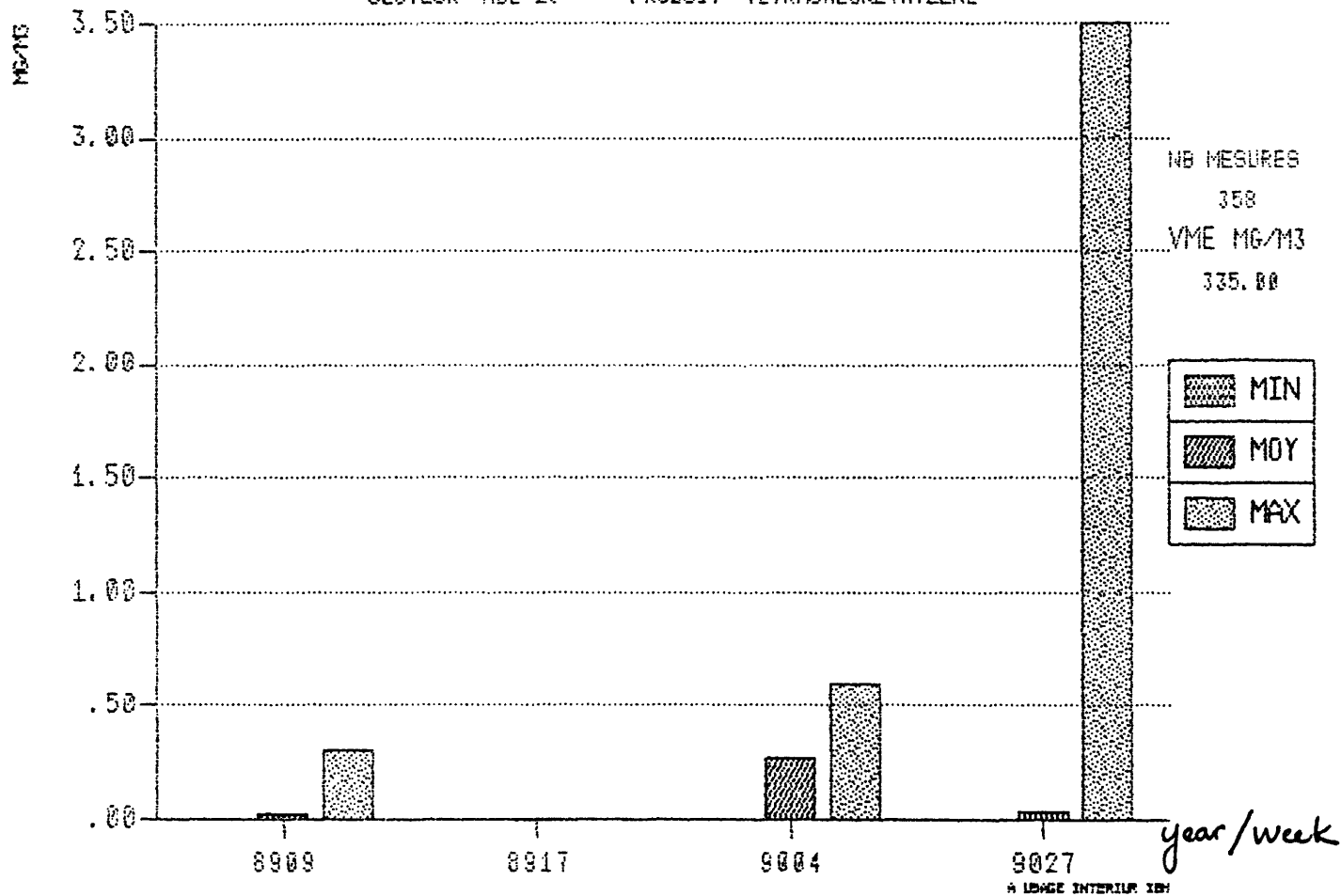
IDENTIFICATION= DEPOT 6EOL



DISTRIBUTION DES PRELEVEMENTS GAZ BADGE

SECTEUR= ABL Z6

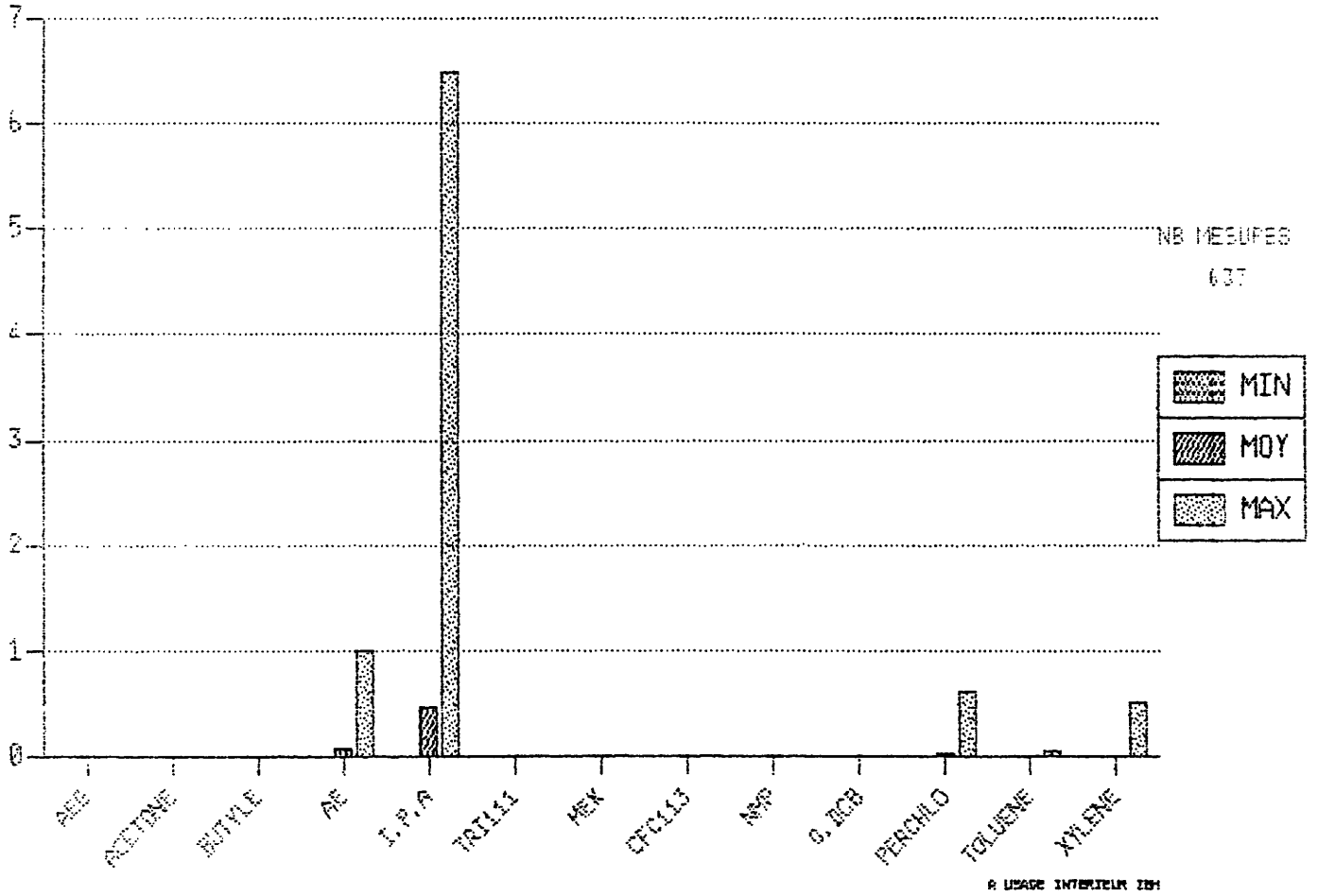
PRODUIT= TETRACHLORETHYLENE

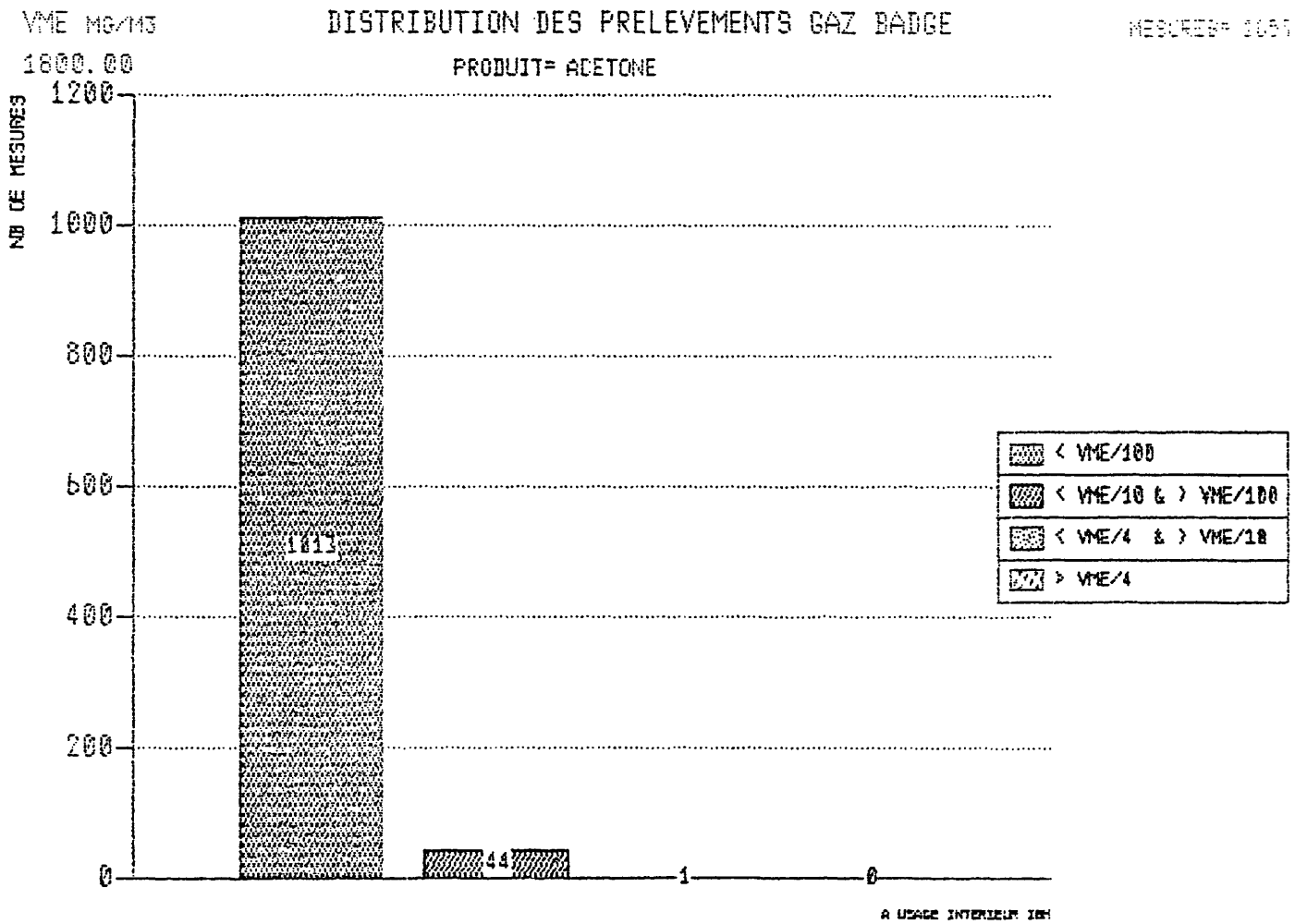


DISTRIBUTION DES PRELEVEMENTS GAZ BADGE

SECTEUR= PCL

SEMAINE= 9030





Appendix 6 - COLCHIC Proformas

COLCHIC

FICHE D'INTERVENTION

ETUDE N° _____ 19__ PAGE 101

LABORATOIRE : _____ N° D'ORDRE : _____ DOSSIER GRAM : _____

RESPONSABLE DU SECTEUR GRAM : _____

N. SIRET (1) : _____ NOM DE L'ETABLISSEMENT : _____

ADRESSE : _____

VILLE : _____ BUREAU DISTRIBUTEUR : _____ TEL : _____

CODE POSTAL : _____

C.T.N. (1) : _____

NUMERO RISQUE 99 (2) : _____

ETABLISSEMENT DEJA DANS FICHER LABO OUI (O) NON (N)

LIEU DES PRELEVEMENTS : _____

PRELEVEMENTS EFFECTUES PAR (1) : _____ LE 11/11/10

ORIGINE DE LA DEMANDE (1) : _____

MOTIF DE L'INTERVENTION (1) : _____

RENSEIGNEMENTS COMPLEMENTAIRES : _____

SYMPTOMES OBSERVES 1 : _____ ORIGINE MEDICALE

2 : _____ OUI (O) NON (N)

EFFECTIF EXPOSE AU RISQUE : _____ NOMBRE DE CAS : _____

PERSONNES ASSISTANT AU PRELEVEMENT : _____

DESTINATAIRES DES RESULTATS D'ANALYSE : _____ LABORATOIRE : _____ GRAM : _____

MEDECIN OU INSPECTEUR DU TRAVAIL : _____ NOM ET PRENOM : _____

ADRESSE : _____

CODE POSTAL : _____ VILLE : _____

OBSERVATIONS CONSERVANT LA FICHE D'INTERVENTION : _____

N° MA 207/4/01/06/INRS

(1) COCHER SOIT LE CODE SOIT LE LIBELLE

COLCHIC

DEMANDE D'ANALYSE DE PRODUIT

ETUDE N° _____ 19__ PAGE P

LABORATOIRE : _____ N° D'ORDRE : _____ DOSSIER GRAM : _____

RESPONSABLE DU SECTEUR GRAM : _____

NOM COMPLET : _____

REFERENCE DU FABRICANT : _____

NOM DU FABRICANT : _____

ADRESSE : _____

CODE POSTAL : _____ VILLE : _____

NOM DU REVENDEUR : _____

ADRESSE : _____

CODE POSTAL : _____ VILLE : _____

DESCRIPTION DE L'ETIQUETAGE UTILISE : _____

CATEGORIE DU PRODUIT (1) : _____

CONSUMMATION/UNITE DE TEMPS : _____

DESCRIPTION DE L'ECHANTILLON : _____

ACCOMPAGNE PRELEVEMENT REFERENCE : _____

| REFERENCE | METHODE DE PRELEVEMENT | CODE ATELIER/POSTE DE TRAVAIL ET DESCRIPTION (1) | CODE ANALYSE DEMANDEE ET DESCRIPTION (1) |
|-----------|------------------------|--|--|
| _____ | _____ | _____ | _____ |
| _____ | _____ | _____ | _____ |

OBSERVATIONS (Indiquer en particulier les composants recherchés)

N° MA 207/4/01/06/INRS

(1) COCHER SOIT LE CODE SOIT LE LIBELLE

| | | | | |
|--------------|---|---|--|--|
| REF** | A1: M° DU SUPPORT METHODE DE PRELEVEMENT BICODE CILIBELLE DIOBJECTIF REPRESENTATIVITE | A2: ATELIER/POSTE DE TRAVAIL BICODE FILIBELLE | A3: MINURE DE DEBUT H DUREE PRELEVEMENT J VOLUME PRELEVE | A4: ANALYSE DEMANDEE RICOODE LILIBELLE |
| | A1: _____ B1: _____ C1: _____ D1: _____ | A2: _____ B2: _____ C2: _____ D2: _____ | A3: H: _____ D: _____ J: _____ V: _____ | A4: R: _____ L: _____ K: _____ L: _____ |
| OBSERVATIONS | | | | |

| | | | | |
|--------------|---|---|--|--|
| REF** | A1: M° DU SUPPORT METHODE DE PRELEVEMENT BICODE CILIBELLE DIOBJECTIF REPRESENTATIVITE | A2: ATELIER/POSTE DE TRAVAIL BICODE FILIBELLE | A3: MINURE DE DEBUT H DUREE PRELEVEMENT J VOLUME PRELEVE | A4: ANALYSE DEMANDEE RICOODE LILIBELLE |
| | A1: _____ B1: _____ C1: _____ D1: _____ | A2: _____ B2: _____ C2: _____ D2: _____ | A3: H: _____ D: _____ J: _____ V: _____ | A4: R: _____ L: _____ K: _____ L: _____ |
| OBSERVATIONS | | | | |

| | | | | |
|--------------|---|---|--|--|
| REF** | A1: M° DU SUPPORT METHODE DE PRELEVEMENT BICODE CILIBELLE DIOBJECTIF REPRESENTATIVITE | A2: ATELIER/POSTE DE TRAVAIL BICODE FILIBELLE | A3: MINURE DE DEBUT H DUREE PRELEVEMENT J VOLUME PRELEVE | A4: ANALYSE DEMANDEE RICOODE LILIBELLE |
| | A1: _____ B1: _____ C1: _____ D1: _____ | A2: _____ B2: _____ C2: _____ D2: _____ | A3: H: _____ D: _____ J: _____ V: _____ | A4: R: _____ L: _____ K: _____ L: _____ |
| OBSERVATIONS | | | | |

* COCHER SOIT LE CODE SOIT LE LIBELLE
** NUMERO DONNE PAR LE PRELEVEUR ET QUI PEUT COMPORTER DES INDICATIONS QUI LUI SONT PERSONNELLES

A. NATURE DU LOCAL

- 1 = ouvert totalement et air libre
- 2 = ouvert partiellement
- 3 = fermé

B. VOLUME DU LOCAL

- 1 < 50 m³
- 2 = 50 à 500 m³
- 3 = 500 à 5000 m³
- 4 > 5000 m³

C. HAUTEUR DU LOCAL

- 1 < 3 m
- 2 = 3 à 6 m
- 3 > 6 m

D. SOURCE ET MODE DE GENERATION DU POLLUANT

- 1 = ponctuelle
- 2 = plane
- 3 = volume
- 4 = continue
- 5 = discontinue

E. CAPTAGE LOCALISE-ESTIMATION SIMPLE DE LA SITUATION (VOIR NOTICE)

- 1 = encoffrement total
- 2 = encoffrement partiel
- 3 = cabane fermée
- 4 = cabane ouverte
- 5 = aspiration intérieure grande surface (cuisine)
- 6 = aspiration intérieure petite surface (baignoire, toilettes)
- 7 = aspiration - soufflage
- 8 = hotte en dôme

F. VENTILATION GENERALE-ESTIMATION SIMPLE

- 1 = mécanique
- 2 = naturelle, portes-fenêtres
- 3 = naturelle; toiture ventilée
- 4 = mécanique
- 5 = naturelle
- 0 = non (3^e digit)

G. % DE SOURCES NON CAPTEES DU LOCAL POUR LE POLLUANT CONSIDERE

- 1 = 0 %
- 2 = 0 à 20 %
- 3 = 20 à 60 %
- 4 > 60 %

H. EPURATION

- 0 = aucune
- 1 = mécanique
- 2 = voie sèche
- 3 = humide
- 4 = sans récupération d'énergie
- 5 = avec récupération d'énergie
- 6 = partiel
- 7 = total

I. REJET A L'EXTERIEUR DE L'ATELIER

- 1 = sans récupération d'énergie
- 2 = avec récupération d'énergie
- 3 = partiel
- 4 = total

J. SI PROTECTION INDIVIDUELLE

- 1 = non
- 2 = oui

K. TEMPERATURE APPROXIMATIVE (°C)

- 1 = 0
- 2 = 10
- 3 = 20
- 4 = 30
- 5 = 40
- 6 = 50
- 7 = 60
- 8 = 70
- 9 = 80

| | | | | | | | | | |
|-----------|-------|-------|-------|-------|-------|-------|-------|-------|-------|
| REFERENCE | A | B | C | D | E | F | G | H | I |
| _____ | _____ | _____ | _____ | _____ | _____ | _____ | _____ | _____ | _____ |
| _____ | _____ | _____ | _____ | _____ | _____ | _____ | _____ | _____ | _____ |
| _____ | _____ | _____ | _____ | _____ | _____ | _____ | _____ | _____ | _____ |

DATE D'ENTRÉE EN SERVICE: _____ SIGNATAIRE: _____ DATE D'ARRIVÉE: _____

Appendix 7 - BIA Proformas

Anhang A Blatt 1

Blatt 1 für Auftraggeber

BIA Berufsgenossenschaftliches Institut für Arbeitssicherheit, 5205 Sankt Augustin 2, Lindenstraße 80, Tel. (02241) 231 724

OMEGA Auftrag zur Untersuchung von Luftproben zur Beurteilung von Arbeitsplätzen

[0] BG-Intern [1] Probenahme/Messung [2] Berichts-Nr. Dat. T T M M J J

Betrieb

[3] Individual-Kennung BIA BG Mitgl.-Nr. [4] Artkennung BIA-Schlüsselverzeichnis HBA Hauptbetriebsart TBA Teilbetriebsart

[8] Individual-Kennung IBA-Nr. indiv. betriebl. AB max. 5 num. Zeichen [9] Artkennung BIA-Schlüsselverzeichnis AB Arbeitsbereich

[2] Berichts-Nr. Probe + von Feld 10-32 identisch mit Probe Meßergebnis ja/nein Mittelwertbildung [10] Angaben zur Tätigkeit siehe Schlüsselverzeichnis der Unfallanzeige nähere Angaben Anzahl Exponierter im IBA/JAB während d. Messung insgesamt

Verfahren

[5] Name Straße/Postfach PLZ, Ort [6] Betriebsgröße (Mitarbeiter) [7] Gefahrart [12] Produktionsanlage/Arbeitsmittel Anzahl Hersteller Typ Baujahr Inv.-Nr. [13] Produktionsparameter: Durchsatzmenge Verarbeitungstemperatur °C, Druck bar/h Pa Sonstiges

[11] Atemschutz nein/zeitweise/ja Bezeichnung [14] Arbeitsweise: 1 kontinuierlich 2 diskontinuierlich regelmäßig Taktzeit min 3 diskontinuierlich unregelmäßig 1 manuell 2 halbautomatisch 3 vollautomatisch Schichtbetrieb: Anzahl der Schichten

Technische Angaben

[15] Raum 1 im Freien L m B m H m 2 Raum teilweise offen geschlossen 3 Behälter Kugel 4 Untertage Ø m [16] Lüftung (FL = freie Lüftung) 1 FL Fenster/Türen geschl. 2 FL Fenster/Türen offen 3 FL Dachreiter geschlossen 4 FL Dachreiter offen [17] (ML = maschinelle Lüftung) 1 ML geringe Wirksamkeit 0 keine 2 ML Abluft überwiegend über Erfassungseinrichtung 3 ML Frischluft 4 ML Raumabluft 5 ML Frischluft u. Teilumluft 6 ML Frischluft und Abluft [18] Luftführung ML 1 Zuluft im Deckenbereich 0 keine 2 Zuluft im Bodenbereich 3 Abluft im Deckenbereich 4 Abluft im Bodenbereich [19] Emissionsquellen EQ: Anzahl im Raum davon abgesaugt: Anzahl im AB davon abgesaugt: Abstand Quelle/Erfassungsquerschnitt: Luftgeschwindigkeit im Erfassungsquerschnitt: m/s [20] Maßnahmen gegen Emission 0 keine 1 Naßbearbeitung 2 emissionsarmes Arbeitsmittel 3 geschlossenes System [21] Erfassung E (durch Absaugung) 0 keine E vorhanden 1 E geringe Wirksamkeit 2 E ohne Nachführung 3 E mit Nachführung von Hand 4 E mit Zwangsnachführung 5 E stationär offen (z. B. Saugtrichter) 6 E stationär offen mit Blasstrahl 7 E stationär halboffen (z. B. Arbeitstisch/Kabine) 8 E stationär geschl. (z. B. Einhausung) [22] Reiniuftrückführung RLR 0 keine RLR RLR Anteil Rückluft/Frischluft ca % 1 Einzelabscheidung 2 Zentralabscheidung Zahl der Zuluftstellen Zahl der Abluftstellen [23] Wärmerückgewinnungsanlage 0 keine 1 rekuperativ 2 regenerativ [24] Konz.-Überwachung 0 nein 1 kontinuierlich 2 quasi kontinuierlich Zyklus h 1 mit Warnsignal 2 ohne Warnsignal 3 diskontinuierlich Zyklus Tage

[25] Bemerkungen:



Anhang A Blatt 3

Blatt 3 für BIA

BIA Berufsgenossenschaftliches Institut für Arbeitssicherheit, 5205 Sankt Augustin 2, Lindenstraße 80, Tel. (02241) 231 724

OMEGA Auftrag zur Untersuchung von Luftproben zur Beurteilung von Arbeitsplätzen

[0] BG-Intern [1] Probenahme/Messung Dat. T Y M M J J

[2] Berichts-Nr. Probe + von Feld 10-32 identisch mit Probe Meßergebnis ja / nein Mittelwertbildung

[3] Individual-Kennung BIA BG Mitgl.-Nr.

[8] Individual-Kennung IBA-Nr. indiv. betriebl. AB max. 5 num. Zeichen

[26] Wetter 1 sonnig/bewölkt 2 bedeckt, Regen, Schnee 3 Inversionswetterlage, Nebel

[27] Wind 4 schwach 5 mittel 6 stark, stürmisch Wind aus Richtung

[28] Temperatur: innen °C außen °C

Luftdruck: h Pa.

relative Feuchte im IBA: ca. %

[29] Erzeugnisse/Einsatzmaterial [30] Verarbeitungsmenge [31] Inhaltsstoffe (z. B. Xylol)

[29] [30] [31]

[30] [31]

[31]

[29] [30] [31]

[29] [30] [31]

[30] [31]

[29] [30] [31]

[29] [30] [31]

[30] [31]

[31]

[29] [30] [31]

[29] [30] [31]

[30] [31]

[31]

[29] [30] [31]

[30] [31]

[31]

[29] [30] [31]

[30] [31]

[32] Messung Grund der Messung: 1 BK-Forschung 2 Wirksamkeitskontrolle nach Sanierung 3 Sonstige 4 Im Rahmen der Aufsichtspflicht

[33] Expositionsmessung 2 Arbeitsbereichs-3 Kontrollmeßplan analyse 4 Sonstige 1 Erstmessung 2 Wiederholungsmessung

1 stationär 2 an der Person 1 repräs. für angeg. Expositionsdauer 2 ungünstigster Fall

[34] 1 Schichtmittelwert 8 h/S N/S S/Jahr bei verkürzter Exposition: bedingt durch

1 technisches Verfahren 2 Aufenthaltsdauer [35] 2 Kurzzeitwert: Spitzen 1 regelmäßig 2 unregelmäßig

Dauer je Spitze min Spitzendauer von bis min

Anzahl der Spitzen pro Schicht Zeitabstand zw. den Spitzen min

Anzahl der erfaßten Spitzen [36] Messung ohne Expositionsbezug an

1 am Emissionsort 2 in der Raumluft 3 an Maschinen/Geräte 4 an Lüftungsanlagen 5 Simulation anderer Betriebszustände

[37] Probenträger Ind.-Nr. Probenahmesystem s. Bl. 7

Probenträgerart s. Bl. 7 [38] PN-Zeit von bis Uhr

PN-Dauer (h) (min) Volumenstrom (l / min)

[39]

Analyse

[33] Expositionsmessung 2 Arbeitsbereichs-3 Kontrollmeßplan analyse 4 Sonstige 1 Erstmessung 2 Wiederholungsmessung

1 stationär 2 an der Person 1 repräs. für angeg. Expositionsdauer 2 ungünstigster Fall

[34] 1 Schichtmittelwert 8 h/S N/S S/Jahr bei verkürzter Exposition: bedingt durch

1 technisches Verfahren 2 Aufenthaltsdauer [35] 2 Kurzzeitwert: Spitzen 1 regelmäßig 2 unregelmäßig

Dauer je Spitze min Spitzendauer von bis min

Anzahl der Spitzen pro Schicht Zeitabstand zw. den Spitzen min

Anzahl der erfaßten Spitzen [36] Messung ohne Expositionsbezug an

1 am Emissionsort 2 in der Raumluft 3 an Maschinen/Geräte 4 an Lüftungsanlagen 5 Simulation anderer Betriebszustände

[37] Probenträger Ind.-Nr. Probenahmesystem s. Bl. 7

Probenträgerart s. Bl. 7 [38] PN-Zeit von bis Uhr

PN-Dauer (h) (min) Volumenstrom (l / min)

[39]

Analyse

[40] Auftraggeber Name BG Str./Postl. PLZ, Ort nur ausfüllen bei Probe 1

Für die Richtigkeit der Angaben

(Code-Nr. und Unterschrift des Auftraggebers)

BIA

Anhang B



Berufsgenossenschaftliches Institut für Arbeitssicherheit, 5205 Sankt Augustin 2, Lindenstraße 80, Tel. (02241) 231 724

Blatt 11 für Auftraggeber

OMEGA – Begleitbogen

Produktblatt zur Luftprobe

[0] BG-Intern

[1] Probenahme-Messung

[2] Berichte-Nr.

Input field for BG-Intern

Date input field (T T M M J J)

Bestand

[3] Individual-Kennung

Input fields for BIA, BG, and Mitgl.-Nr.

[5] Individual-Kennung

Input fields for IBA-Nr. and nähere Angaben

Arbeitsbereich

Luftprobe
Id. Nr. des Produktblattes

Verarbeitetes Material

Verarbeitetes Material

[41] Materialbezeichnung

[42] Handelsname (nur bei Produkten)

[45] Produktgruppe

[47] Hersteller

Name and Straße/Postfach for manufacturer

PLZ, Ort

[49] Verarbeiter

Name and Straße/Postfach for processor

PLZ, Ort

Verzeichnung durch BIA (nur bei Produkten)

[43] BIA-interne Nr. (mehrfach eintragen)

[44] ZVG-Nr. (mehrfach eintragen)

[46] Prod.-G-Nr. (mehrfach eintragen)

[48] U.-Nr. (mehrfach eintragen)

[50] V.-Nr. (mehrfach eintragen)

Materialhinweise

[31] DIN-Sicherheitsblatt

BG erfährt unter Nr.

liegt bei: ja nein

Input field for BG number

DIN Blatt Nr.

Input field for DIN number

[32] Gefahrensymbole

Input field for hazard symbols

[33] Weitere Kennzeichnung – Inhaltsstoffe

- 1. _____
- 2. _____
- 3. _____
- 4. _____
- 5. _____
- 6. _____

[34] Form:

Form checkboxes: Stück, Pulver, sonstiges, Granulat, flüssig, Emulsion, gas- und dampfförmig

Bemerkungen

Large text area for remarks

BIA 3/88



Anhang C

Blatt 3 für Labor
5205 Sankt Augustin 2, Lindenstraße 80, Tel. (022 41) 231 724



Berufsgenossenschaftliches Institut für Arbeitssicherheit, 5205 Sankt Augustin 2, Lindenstraße 80, Tel. (022 41) 231 724

OMEGA
Auftrag zur Untersuchung
von Material- und Produktproben

[0] BG-Intern [1] Probenahme/Messung

[2] Berichts-Nr.

Dat. T T M M J J

[3] Individual-Kennung

BIA
BG
Mitgl.-Nr.

[8] Individual-Kennung

IBA-Nr.
indiv. betriebl. AB
max. 5 num. Zeichen

Probe _____ von _____

[4] Artkennung BIA-Schlüsselverzeichnis

HBA
Haupt-
betriebsart

nähere Angaben

[10] Angaben zur Tätigkeit
siehe Schlüsselverz.
der Unfallanzeige

Betrieb

TBA
Teil-
betriebsart

[9] Artkennung BIA-Schlüsselverzeichnis
AB
Arbeitsbereich

nähere Angaben

Anzahl Exponierter im IBA
während d. Messung _____ insgesamt _____

[5]

Name
Straße/Postfach
PLZ Ort

[6] Betriebs-
größe
(Mitarbeiter)
1 50
2 51-1000
3 >1000

[7] Gefahr-
tarif
Bau BG

[11] Atemschutz nein zeitweise
 ja

Filterklasse

Verarbeitetes Material

[41] Materialbezeichnung

Verschlüsselung durch BIA (nur bei Produkten)

[43] BIA-interne Nr. rechtsbündig eintragen

9 . 1

[42] Handelsname
(nur bei
Produkten)

[44] ZVG-Nr. rechtsbündig eintragen

Verarbeitetes Material

[45] Produktgruppe

[46] Prod. G-Nr. linksbündig eintragen

[47] Hersteller

Name
Straße/Postfach
PLZ Ort

[49] Vertreter

Name
Straße/Postfach
PLZ Ort

[48] H.-Nr. rechtsbündig eintragen

[50] V.-Nr. rechtsbündig eintragen

[51] DIN-Sicherheitsblatt

liegt bei: ja nein

[32] Sondermeßprogramm

[52] Gefahrensymbole

[37] Proben-Individual-Nr.

Art: 101 abgelagerter Staub 102 Originalsubstanz/Produkt
105 Lösemittel 109 Biolog. Material

[53] Weitere Kennzeichnung — Inhaltsstoffe

1. _____
2. _____
3. _____
4. _____

[39]

[40] Auftraggeber

BG
nur ausfüllen bei Probe 1

Name

Str./Postf.

PLZ Ort

[54] Form stückig Granulat
 Pulver flüssig
 sonstiges Gel Dampf

Für die Richtigkeit der Angaben

(Code-Nr. und Unterschrift des Auftraggebers)

BIA 1499



Appendix 8 - Exxon Proforma Entry


```

SAMPLE-HEADER
No record on screen
EXXON PCHIS: Version 2.2 ----- ECI/INT ----- 03/29/90 13:04:56
Plant ----- Sample# ----- Sample Date(D/M/Y) / /

Empl#      Name
Unit
Job
Task
Shift
24hr Time: Start : : Stop : : Elapsed Minutes
Flow Rate (Units: mL or L ) Start Stop Avg
Pump Counter: Start Stop Net Vol Per Count mL
Total Sample Volume Liters

Sample: Type P,A,S,O Method T,P,D,I,S,B,O,C,A
Term P,P,G Survey Type P,T,O,R,I,W
Barometric Pressure MM Temperature / ( ) Relative Humidity %
Wind Direction Wind Velocity 0.000000
Remarks / /

Instrument Type Serial Number

F4CMDHELP ESCEXIT F2SAVE Sh-F1TABLE F3VIEW F7DEL F8MODIFY F9QBE F10MULTI

```

Figure 2-3. The SAMPLE-HEADER Form

Appendix 9 - Texaco Proforma

European Communities – Commission

EUR 14378 – The availability of occupational exposure data in the European Community

Martine H.P. Smith, Deborah C. Glass

Luxembourg: Office for Official Publications of the European Communities

1993 – XIII, 132 pp., num. tab., fig. – 21.0 × 29.7 cm

Health and safety series

ISBN 92-826-4331-X

Price (excluding VAT) in Luxembourg: ECU 13.50

The Health and Safety Directorate of the Commission of the European Communities would like to express its gratitude to those organizations or persons who were kind enough to reply to the questionnaires concerning 'the availability of occupational exposure data in the European Community' or who participated in any other way in the preparation of this report.

Any other organizations or persons who did not receive the questionnaires and who might wish to give information to the Commission on their systems are invited to send the completed questionnaire (Appendices 1 and 2 of this report) to the Commission of the European Communities, Health and Safety Directorate, Mr R. Haigh, Head of Industrial Medicine and Hygiene Unit, Office C4/89, Jean Monnet Building, Luxembourg.

Venta y suscripciones • Salg og abonnement • Verkauf und Abonnement • Πωλήσεις και συνδρομές
Sales and subscriptions • Vente et abonnements • Vendita e abbonamenti
Verkoop en abonnementen • Venda e assinaturas

BELGIQUE / BELGIË

Moniteur belge / Belgisch Staatsblad
Rue de Louvain 42 / Leuvenseweg 42
B-1000 Bruxelles / B-1000 Brussel
Tél. (02) 512 00 26
Fax (02) 511 01 84

Autres distributeurs / Overige verkooppunten

Librairie européenne/ Europese boekhandel

Rue de la Loi 244/Wetstraat 244
B-1040 Bruxelles / B-1040 Brussel
Tél. (02) 231 04 35
Fax (02) 735 08 60

Jean De Lannoy

Avenue du Roi 202 /Koningslaan 202
B-1060 Bruxelles / B-1060 Brussel
Tél. (02) 538 51 69
Télex 63220 UNBOOK B
Fax (02) 538 08 41

Document delivery:

Credoc

Rue de la Montagne 34 / Bergstraat 34
Bte 11 / Bus 11
B-1000 Bruxelles / B-1000 Brussel
Tél. (02) 511 69 41
Fax (02) 513 31 95

DANMARK

J. H. Schultz Information A/S

Herstedvang 10-12
DK-2620 Albertslund
Tlf. (45) 43 63 23 00
Fax (Sales) (45) 43 63 19 69
Fax (Management) (45) 43 63 19 49

DEUTSCHLAND

Bundesanzeiger Verlag

Breite Straße
Postfach 10 80 06
D-W-5000 Köln 1
Tél. (02 21) 20 29-0
Telex ANZEIGER BONN 8 882 595
Fax 2 02 92 78

GREECE/ΕΛΛΑΔΑ

G.C. Eleftheroudakis SA

International Bookstore
Nikis Street 4
GR-10563 Athens
Tél. (01) 322 63 23
Telex 219410 ELEF
Fax 323 98 21

ESPAÑA

Boletín Oficial del Estado

Trafalgar, 29
E-28071 Madrid
Tél. (91) 538 22 95
Fax (91) 538 23 49

Mundi-Prænsa Libros, SA

Castelló, 37
E-28001 Madrid
Tél. (91) 431 33 99 (Libros)
431 32 22 (Suscripciones)
435 36 37 (Dirección)
Télex 49370-MPLI-E
Fax (91) 575 39 98

Sucursal:

Librería Internacional AEDOS

Consejo de Ciento, 391
E-08009 Barcelona
Tél. (93) 488 34 92
Fax (93) 487 76 59

Librería de la Generalitat de Catalunya

Rambla dels Estudis, 118 (Palau Moja)
E-08002 Barcelona
Tél. (93) 302 68 35
302 64 62
Fax (93) 302 12 99

FRANCE

Journal officiel
Service des publications
des Communautés européennes

26, rue Desaix
F-75727 Paris Cedex 15
Tél. (1) 40 58 75 00
Fax (1) 40 58 77 00

IRELAND

Government Supplies Agency

4-5 Harcourt Road
Dublin 2
Tél. (1) 61 31 11
Fax (1) 78 06 45

ITALIA

Licosa SpA

Via Duca di Calabria, 1/1
Casella postale 552
I-50125 Firenze
Tél. (055) 64 54 15
Fax 64 12 57
Telex 570466 LICOSA I

GRAND-DUCHÉ DE LUXEMBOURG

Messageries Paul Kraus

11, rue Christophe Plantin
L-2339 Luxembourg
Tél. 499 88 88
Télex 2515
Fax 499 88 84 44

NEDERLAND

SDU Overheidsinformatie

Externe Fondsen
Postbus 20014
2500 EA 's-Gravenhage
Tél. (070) 37 89 911
Fax (070) 34 75 778

PORTUGAL

Imprensa Nacional

Casa da Moeda, EP
Rua D. Francisco Manuel de Melo, 5
P-1092 Lisboa Codex
Tél. (01) 69 34 14

Distribuidora de Livros

Bertrand, Ld.^a

Grupo Bertrand, SA
Rua das Terras dos Vales, 4-A
Apartado 37
P-2700 Amadora Codex
Tél. (01) 49 59 050
Telex 15798 BERDIS
Fax 49 60 255

UNITED KINGDOM

HMSO Books (Agency section)

HMSO Publications Centre
51 Nine Elms Lane
London SW8 5DR
Tél. (071) 873 9090
Fax 873 8463
Telex 29 71 138

ÖSTERREICH

**Manz'sche Verlags- und
Universitätsbuchhandlung**

Kohlmarkt 16
A-1014 Wien
Tél. (0222) 531 61-0
Telex 112 500 BOX A
Fax (0222) 531 61-39

SUOMI

Akateeminen Kirjakauppa

Keskuskatu 1
PO Box 128
SF-00101 Helsinki
Tél. (0) 121 41
Fax (0) 121 44 41

NORGE

Narvesen information center

Bertrand Narvesens vei 2
PO Box 6125 Etterstad
N-0602 Oslo 6
Tél. (2) 57 33 00
Telex 79668 NIC N
Fax (2) 68 19 01

SVERIGE

BTJ

Tryck Traktorvägen 13
S-222 60 Lund
Tél. (046) 18 00 00
Fax (046) 18 01 25

SCHWEIZ / SUISSE / SVIZZERA

OSEC

Stampfenbachstraße 85
CH-8035 Zürich
Tél. (01) 365 54 49
Fax (01) 365 54 11

CESKOSLOVENSKO

NIS

Havelkova 22
13000 Praha 3
Tél. (02) 235 84 46
Fax 42-2-264775

MAGYARORSZÁG

Euro-Info-Service

Pf. 1271
H-1464 Budapest
Tél./Fax (1) 111 60 61/111 62 16

POLSKA

Business Foundation

ul. Krucza 38/42
00-512 Warszawa
Tél. (22) 21 99 93, 628-28-82
International Fax&Phone
(0-39) 12-00-77

ROUMANIE

Euromedia

65, Strada Dionisie Lupu
70184 Bucuresti
Tél./Fax 0 12 96 46

BULGARIE

D.J.B.

59, bd Vitocha
1000 Sofia
Tél./Fax 2 810158

RUSSIA

**CCEC (Centre for Cooperation with
the European Communities)**

9, Prospekt 60-let Oktyabrya
117312 Moscow
Tél. 095 135 52 87
Fax 095 420 21 44

CYPRUS

**Cyprus Chamber of Commerce and
Industry**

Chamber Building
38 Grivas Digenis Ave
3 Deligiorgis Street
PO Box 1455
Nicosia
Tél. (2) 449500/462312
Fax (2) 458630

TURKIYE

Pres Gazete Kitap Dergil
Pazarlama Dağıtım Ticaret ve sanayi
AŞ

Narlıbahçe Sokak N. 15
Istanbul-Cağaloğlu
Tél. (1) 520 92 96 - 528 55 66
Fax 520 64 57
Telex 23822 DSV0-TR

ISRAEL

ROY International

PO Box 13056
41 Mishmar Hayarden Street
Tel Aviv 61130
Tél. 3 496 108
Fax 3 544 60 39

CANADA

Renouf Publishing Co. Ltd

Mail orders — Head Office
1294 Algoma Road
Ottawa, Ontario K1B 3W8
Tél. (613) 741 43 33
Fax (613) 741 54 39
Telex 0534783

Ottawa Store:

61 Sparks Street
Tél. (613) 238 89 85

Toronto Store:

211 Yonge Street
Tél. (416) 363 31 71

UNITED STATES OF AMERICA

UNIPUB

4611-F Assembly Drive
Lanham, MD 20706-4391
Tél. Toll Free (800) 274 4888
Fax (301) 459 0056

AUSTRALIA

Hunter Publications

58A Gipps Street
Collingwood
Victoria 3066
Tél. (3) 417 5361
Fax (3) 419 7154

JAPAN

Kinokuniya Company Ltd

17-7 Shinjuku 3-Chome
Shinjuku-ku
Tokyo 160-91
Tél. (03) 3439-0121

Journal Department

PO Box 55 Chitose
Tokyo 156
Tél. (03) 3439-0124

SINGAPORE

Legal Library Services Ltd

STK Agency
Robinson Road
PO Box 1817
Singapore 9036

**AUTRES PAYS
OTHER COUNTRIES**

ANDERE LANDER

**Office des publications officielles
des Communautés européennes**

2, rue Mercier
L-2985 Luxembourg
Tél. 499 28 1
Télex PUBOF LU 1324 b
Fax 48 85 73/48 68 17

NOTICE TO THE READER

All scientific and technical reports published by the Commission of the European Communities are announced in the monthly periodical '**euro abstracts**'. For subscription (1 year: ECU 118) please write to the address below.

Price (excluding VAT) in Luxembourg: ECU 13.50

ISBN 92-826-4331-X



OFFICE FOR OFFICIAL PUBLICATIONS
OF THE EUROPEAN COMMUNITIES

L-2985 Luxembourg

