Role and tasks of safety professionals: some results from an international survey

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1. INTRODUCTION

In 2002 work was started under the auspices of the International Social Security Association (ISSA) Working Group on the Training of Health and Safety Professionals on the collection of data about the tasks which safety professionals actually do in practice. The work was later transferred to the European Network of Safety & Health Professional Organisations (ENSHPO), when ISSA changed its policy on the working group's goals and activities. The survey was undertaken to collect data which can be used to compare the work actually done with the specifications given for safety professionals' tasks in law, training courses and the literature of their professional associations. The focus was initially on European countries, but interest in the survey was shown by two non-European countries, Australia and Singapore, and the survey was subsequently conducted in both of those countries. Individual reports and papers have been presented on the national results of many of the participating countries [Bianchi 2004, Borys et al 2005, Dudka 2004, Jones 2004, Miguel et al. 2004, Lang 2004, Perttula & Saari 2004, Rillie 2005, Ytrehus 2003]. Some early results of the international comparisons were made in conference and journal papers [Hale et al 2005, Hale & Ytrehus 2004]. The majority of this material and other papers, data files and the questionnaire in the languages used in the survey are to be found on the website of ENSHPO at www.enshpo.org.

The objectives of the survey, its historical context and the construction and distribution of the questionnaire are described in the papers mentioned above and will only be summarised here.

2. THE CONDUCT OF THE SURVEY AND PARTICIPATING COUNTRIES

The survey grew out of the concern expressed in discussions in the ISSA Working Group that there was very little known about what safety professionals (SPs) actually do, rather than what the law and their professional associations prescribe or claim that that do. Discussions about harmonisation or mutual recognition of qualifications, sharing of training experiences, development of better training, etc. need a solid basis of knowledge about what SPs do in order to avoid misconceptions and miscommunications. It was decided to conduct a questionnaire survey of practitioners in as many countries associated with the original ISSA group, and later the ENSHPO network as possible. Since there was no central funding available for the work, each country had to find its own *modus operandi* and financing. This was generally forthcoming from a national grant, collaboration with the national professional associations(s), use of masters or other student projects and collaboration with interested universities. Much of the work was done on a voluntary basis by the country coordinators. Limitations in the availability of funds or participants able to devote such time prevented a number of originally interested countries from participating.

To ensure the comparability of all of the surveys a working party of ISSA developed a central questionnaire and oversaw the translation of it into the languages of the participating countries. The questionnaire was prepared initially in English, to arrive at a

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relevant list of questions, which would provide useful data without presenting the participants with too much work in filling in the information. The content of the questionnaire is briefly described in the next section.

Up to now 13 countries have taken part in the survey. The questionnaire and instructions for the conduct of a national survey are to be found on the ENSHPO website (address given earlier), should other countries wish to add their results to the database. The countries and their participating safety professionals are presented briefly below.

2.1. The questionnaire.

A questionnaire is always a compromise between completeness and practicability. The original plan was to ask about the tasks which safety professionals carried out in relation to a range of different hazards, in order to judge their depth of involvement and be able to compare that to the depth of other professional groups such as occupational hygienists, risk analysts and occupational physicians. The possibility of arranging common training across several professional groups lay behind this approach, which would also require that these other groups would complete comparable, overlapping questionnaires. This plan led to a matrix giving a total of almost 300 questions, when demographic questions and tasks related to other aspects of the job were also included. This would have been far too burdensome to complete. A compromise was therefore reached by splitting the questionnaire into three main content parts and two sections related to demographic information. The resulting questionnaire was still long, with an estimated completion time requirement of around an hour, but pilot testing led to the expectation that safety professionals would be enthusiastic enough to take this amount of time. The final structure of the questionnaire, with 169 questions, was as follows:

- 11 questions on where the respondent worked – industry, type of organisation, multi-site, multinational, employees covered, work with other professionals
- 83 questions on the tasks performed and their frequency of performance. Tasks were given under 8 headings, based on a problem solving cycle:
    - Problem identification and analysis,
    - Developing and implementing solutions,
    - Training, information and communication
    - Inspection and research
    - Emergency procedures & settlement of damage
    - Regulatory tasks
    - Knowledge management
    - Management and financial
- 31 questions on hazards dealt with and how frequently encountered
- 36 questions on contacts with different system actors inside and outside a company and their frequency
- 8 demographic questions on age, gender, education and training, and membership of professional associations

Analysis of the questionnaire results led to the realisation that some questions had not worked as desired. In particular there were problems for respondents in allocating their workplace to an industry. The international NACE classification was used, but respondents were clearly not familiar enough with it to know where to code their company's activity;

consultants working in several industries also had problems responding to this. This has meant that analyses comparing across industries have to be treated with great caution.

As with all international surveys, it was also difficult to devise a classification of education levels which could equate education levels in an easily comprehensible way across all countries, given the very different structures per country. This question, and the ones about specific safety qualification training and professional association membership were left to each country to devise according to their own systems, with an obligation to report and explain the coding to the coordinators. In the analysis phase a classification of levels was made based on this information, enabling all countries to be compared on a roughly comparable basis.

There was also some scope for minor changes in wording of a small number of other questions to adapt to the different legal systems and structure of professional associations in different countries. These are taken account of in the analyses reported. The translation process itself was an extremely enlightening activity, revealing may subtle but important differences in the use of health and safety concepts in different countries, even within the same language community. Discussion and back-translation were able to resolve much of these, but this was not possible in all cases and such differences must be borne in mind when trying to understand and interpret the results.

2.2. Participating countries and safety professional groups

Netherlands

The questionnaire was translated (Hale) and distributed to the 1,100 active members of the NVVK (the Dutch association of safety professionals), qualified at middle technical or higher education level in safety on prescribed and approved courses. Analysis was conducted at the Delft University of Technology (Ytrehus).

Norway

Norwegian questionnaires were sent to an address list which was specially compiled for the study. These addresses were obtained from five associations concerned with safety, NBLF (the federation of Norwegian fire officers), ESRA (The European Safety and Reliability Association), VSF (The society of cooperation between safety personnel), TSF (the Interdicipinary Safety Society) and an expert group on HSE within the Norwegian association for graduate engineers (NIF). From the contact network of the Norwegian University of Science and Technology (NTNU) and the Foundation for Scientific and Industrial Research (SINTEF) the participants at a yearly conference called the Safety Days were also selected. In total 1,300 questionnaires were sent out in Norway. Based on the preliminary analyses it was decided to use only the results for VSF members in this paper, as they are the most comparable with other countries' professionals. The questionnaire was translated and analysed at the Norwegian University of Science & Technology in Trondheim (Ytrehus).

Germany

The questionnaire was distributed via VDSI, which is the German safety professional association, to the full membership of 2896 (Hameister). Questionnaires were analysed by the University of Wupperthal (Prof Helge Braunholz). Only aggregated data is available from Germany and it has not been possible to obtain the original database of individual responses to merge with the other countries data in making new analyses.

Austria

The German language questionnaire, slightly modified to fit to the Austrian situation was

sent out to the full membership of 1000 of VÖSI, the Austrian safety professional association. Analysis was arranged by the country coordinators (F. & G. Kaida)

Switzerland

The German questionnaire was adapted to the Swiss situation and was then translated into French and Italian to cover the three principal language communities. It was placed as a web-based questionnaire on the website of the Swiss coordinator (SUVA) and a link was sent to the 620 safety professionals with known e-mail addresses, out of the 1200 registered in Switzerland. Analysis was done by SUVA (Lang & Chivers).

United Kingdom

The British questionnaires were sent out by the Institution of Occupational Safety & Health, the British professional body (Jones). They were sent to all the UK-based registered safety professionals who were members, a total of 2700. This sample is a small fraction of the total IOSH membership, representing the more highly trained and qualified group, most of whom are graduates. No technician level members were included. Analysis was done by IOSH and the University of Leicester (Dr Vassie).

Finland

The Finnish questionnaire was sent to the members of four professional groups in Finland, the Finnish Ergonomics Society, Finnish Occupational Hygiene Society, Association of Finnish Safety Managers (Tyosuojelupaallikot) and the address list of the Centre for Occupational Safety. For the purposes of this paper only the results from the last two groups are presented, as their professional job coverage roughly equates to that of the other countries surveyed. 1250 questionnaires were sent out to these two groups. The Finnish Institute of Occupational Health carried out the translation and the analysis (Perttula & Saari).

Italy

The Italian questionnaire was distributed to the full membership of AIAS, the Italian professional body representing safety professionals (Bianchi). 4200 questionnaires were sent out. The translation was made and the data were analysed in collaboration between AIAS and the University of Genova.

Poland

The Polish questionnaire was translated and sent out by the Central Institute for Labour Protection (CIOP) to an address list established by the Institute through its training and advisory work (Koradecka). 600 questionnaires were sent out to the members of two Polish associations of safety professionals. Data was analysed by CIOP (Dudka).

Portugal

The questionnaire was translated and distributed by the University of Minho (Miguel & Arezes) and distributed to the alumni of safety professional courses at that university and the Technical University of Lisbon and a list of safety engineering specialists from the Professional Association of Engineers. 247 questionnaires were distributed. Analysis was also done at Minho (Lourinho).

Cyprus

The questionnaire was also distributed in Cyprus through the membership of the Cyprus Health & Safety Association (Charalambous). This is a very small society and only 7 responses were forthcoming, so it is not possible to include this country as a separate analysis in this paper.

Australia

Following a presentation of preliminary results of the European survey in Australia in 2003, the Safety Institute of Australia expressed interest in carrying out the survey there also. A version of the UK questionnaire was adapted to the Australian scene and sent out to a sample of 1600 of the professional safety membership of the Institute (Pryor). Analysis was done at the University of Ballarat (Borys, Sawyer & Else)

Singapore

As a result of a direct approach from a masters student from the University of New South Wales (Rillie) it was agreed to use a version of the questionnaire adapted to the Singaporean situation. The questionnaire was sent out to 718 safety professionals through five channels: Ministry of Manpower (OHS division), Singapore Institution of Safety Officers, Occupational Environmental Health Society, Institution of Engineering, Singapore (Environmental Engineering, Health and Safety committee), National University of Singapore (OHS Department) and the Society of Loss Prevention. Analysis was conducted at the University of NSW (Rillie).

3. ANALYSIS OF RESULTS:

3.1. General issues

The response rates in the different countries vary from only 5% in Italy to 60% in UK (see table 1 in the next section). In the countries with response rates less than 40% very great care needs to taken in interpreting the results, since it is almost certain that they will not be representative of the safety professional population of those countries. In the remaining countries the response rate is at, or around, the level which is normal for such surveys. The UK result of 60% is far higher than would normally be expected from a general survey of this type. All of the results should therefore be assessed in the light of these limitations in sampling. Having said this, we must point out that a survey containing 169 questions and taking an hour to complete places a very heavy burden on the respondents and it is a tribute to their concern to support this sort of research and clarify their role and tasks that so many made this effort.

Apart from the results for Cyprus, which are excluded because of the limited total numbers, care must also be taken with the small total numbers in Portugal (30). Apart from the concerns about representativity, this makes the percentage figures quoted very sensitive to single respondent's answers.

In the results we compare the data from the 12 countries on a number of demographic variables and then on the tasks, hazards and contact networks which are dealt with by many or few professionals. We also present some cross-tabulations, but these are limited at present to relatively simple tables by level of education and courses followed. The data analysis is still on-going, delayed by the difficulty of allocating resources to this work without external funding. In a final section we present the first results of some factor analysis of the total and of the Dutch and Norwegian data and indicate further analyses which are planned.

3.2. Methods of analysis

The data were coded into either SPSS or Excel files for tabulation of the data and production of the simple cross-tabulations. Each country provided this data to the central coordination point in the Delft University of Technology, where it was transferred to SAS format for ease of the more complex analyses. A major exercise in cleaning up the data and making it fully compatible was necessary (Guldenmund & Dua) to be able to merge all the

data sets, despite the great care in controlling the translation and distribution of the questionnaires. This process resulted in slightly different totals and distributions to the results published in earlier papers, because of the need to exclude some records and modify a small number of codings. The data used in this paper are these cleaned-up national data sets and the merged total. The German data could not be obtained in its original form for merging with the other data sets. New analyses of the total data set, going beyond what was available in the way of cross-tabulations in the original German report will therefore be only for a maximum of 11 countries. Where less than 12 countries form the basis of the analysis, this is indicated in the paper.

The data have been grouped and reduced in complexity for this first analysis, in order to bring out the main features. The respondents gave their answers to the questions on tasks, hazards and contacts with other system actors in terms of the frequency with which they carried them out, or dealt with them. This scale gave them options of 'weekly or more', 'monthly or quarterly', 'yearly or less', 'never yet, but is part of my job' and 'not part of my job'. For this paper we have grouped the responses in the first three categories together and in the last two categories together, to indicate tasks, hazards and contacts which have been dealt with at some time by a respondent and ones which have never been encountered. Our reasoning was that even those tasks done rarely need to feature in the training, if they are done by a large proportion of the respondents. They are still core competencies. We will return later to more detailed analysis of the frequency of tasks, hazards and contacts.

We have then grouped the responses into bands of 0-19%, 20-39%, 40-59%, 60-79% and 80-100% to give a more general picture of the percentage of a sample carrying out a particular task, dealing with a given hazard, or contacting a given type of person. This gives an idea of the common core content of the job of the safety professional.

A Principal Components Analysis was conducted by Ytrehus (2003) on the Dutch and Norwegian data independently. A varimax rotation was used and a number of factors identified for interpretation. These correspond to clusters of tasks or hazards, which are either carried out, or not carried out by a particular group of respondents. This analysis enables us to see whether there are interesting sub-groups within the total population, which tend to have different groupings of tasks or deal with different clusters of hazard types. A start has been made on factor analyses of the total sample, which can reveal similarities and differences between countries, and how the tasks, hazards and contacts cluster into groups, indicating different sub-groupings of the safety professionals' work.

4. RESULTS AND DISCUSSION OF SIMPLE COMPARISONS

4.1.1 Demographic & employment data: results

These results are given in table 1. The columns represent:

- The response rate in percentage, with the total number of respondents in brackets next to it. This is the number of respondents used in this paper. The total number of questionnaires sent out per country has been given in section 2.2 above.
- The percentage of respondents who are male
- The percentage who have a full-time, as opposed to a part-time safety function
- The percentages who are employed by one company as internal staff, as opposed to working as an external consultant hired in by companies. The difference between the combined percentage of these two groups and 100% is taken up with a miscellaneous 'other category', consisting largely of regulators and those working for public bodies such as the fire service, but not in an advisory function. In the countries marked with an asterisk* this percentage is larger than 10% of the

respondents and the results need to be interpreted with this in mind.

- The percentage whose responsibilities are restricted to one site only, as opposed to several sites (either of one company, or of many clients)
- The percentage who have safety responsibilities outside their base country. For Australia (#) this was stated as outside their base state.
- The percentage with a bachelor or master degree from a university or higher educational establishment giving equivalent degrees, as opposed to those with lower, usually middle level technical qualification.

Country	Response rate % (number)	% Male	% full time	% Internal/ External	%1 site only	% More than one country	% Higher vs. technical education
Austria (A)	22 (217)	96	42	70/23	30	12	77/23
Australia (Au)	40 (634)	71	81	58/28*	16	40#	75/25
Finland (SU)	24 (303)	78	27	72/8*	73	4	68/32
Germany (D)	44 (1330)	93	63	64/27	30	2	77/23
Italy (I)	5 (195)	93	69	59/28*	31	4	38/62
Netherlands (NL)	46 (503)	96	66	60/33	18	18	77/23
Norway (N)	45 (118)	87	54	78/12	46	4	68/32
Poland (PL)	19 (112)	82	54	94/3	37	9	47/53
Portugal (P)	12 (30)	77	67	50/50	53	0	97/3
Singapore (S)	22 (158)	94	76	78/14	32	27	64/36
Switzerland (CH)	44 (274)	92	54	65/19*	28	9	68/32
UK	60 (1621)	89	85	54/27*	10	22	93/7
Total	16 (5495)	88	69	61/25*	34	16	59/41

Table 1. Demographic and employment data for 12 countries

4.1.2. Discussion

The concerns about low response rates and low total numbers in some countries have been expressed in section 3.1, but should be borne in mind in reading the rest of this paper. In this table the unusual spread of the Portuguese results may be due only to the sample size.

The very low percentage of female safety professionals except in Australia, Scandinavia and Poland (and unexpectedly in Portugal also) reflects national participation in jobs and courses which are perceived to be technical. By Norwegian and Finnish standards, the percentage of women in the profession is also relatively low. This is surprising given the

relatively high content of health related topics which form part of the job (see below).

The population in Finland is clearly unusual compared to other countries, with many part-timers and few external to companies. This indicates a different approach to the safety expert task as a part-time, internal function. This is an extreme case, but there is a similar tendency in Norway, Poland and to a lesser extent Austria, Germany, Switzerland and the Netherlands. UK, Singapore and Australia, in contrast have more full-timers in the population. The low level of external consultants in Poland is a reflection of the law there, which requires an internal expert except in companies with less than 50 staff [Dudka 2004]. Elsewhere the ratio of internal to external staff is around two thirds to one third, with the highest percentage of externals in the Netherlands, which had at the time of the survey regulations framed in a way which encouraged outsourcing of professional advice to external working conditions services. Overall we can say that, despite the current tendency in industry to outsource many tasks, the safety professional is still an in-company position for the majority.

The differences in international spread of the responsibilities of the respondents probably reflect partly the size of country (e.g. Singapore, with more working over the frontier) and partly the number of multinationals working in the different countries, with higher numbers with plants in the UK and the Netherlands. The Australian figure is inflated by the responses being out of state, rather than out of country.

The extremely high level of graduates in the UK sample is a factor of the sampling, which concentrated on the registered professionals and not on the lower level qualifications. The reversed ratio of lower to higher qualifications in Italy, compared to almost all the other countries, is striking

4.2. Core tasks, Hazards and contacts: Results & discussion

In this section we look at the tasks which are done, the hazards which are dealt with and the contacts made by either a high percentage of the respondents in a country, or a low percentage. The collapsing of the data into a dichotomy (done at least once a year vs. not [yet] done) was explained earlier. Later analyses will be made taking the frequency more into consideration. For now we have chosen to group the percentage of respondents in bands, each 20% wide. Tasks/hazards/contacts that are conducted/dealt with/made at some stage by more than 80% of the respondents are clearly the core of the profession, which the whole population needs to be trained to deal with, across one or several countries. Down to 60% still represent core issues for the whole professional group, but ones where we need to look to see if there are some more homogeneous sub-groups in which a higher percentage carry them out, so as to define application courses for sub-groups of a profession. In the mid range, where 20 – 60% of a group are concerned, tasks are more peripheral and we need to look for correlations either with sub-groups in a particular industry, at a particular point in their carrier development, or at a particular job level to explain the lower commonality, or we may be confronted with a non-homogeneous study population. Some analyses of these issues will be presented in this paper, but there is still much analysis to be done at a later stage. Where less than 20% of a population carries out a task, we are looking at clear specialisms, or very peripheral activities concerning only a few professionals. Differences across countries in where tasks/hazards/contacts fall in a band may indicate different national philosophies or regulatory regimes, or stages of development of industry or risk control.

We present the data in a descending order of commonality; first the tasks where all countries score highly and then successively where less and less of the countries score so

highly. The reasoning is that the real core of the profession (if indeed safety is an international profession) will be what is common across most countries. We may then find that additional tasks done by many respondents in only some of the countries represent differentiation of the tasks, or shifting into new areas of work. We seem to see a reflection of the development of safety science from technical through human factors to organisational as we present this progression. The full tables for the three areas are contained in the appendix.

4.2.1. The hard core

The following list shows the 22 (out of the total of 83) core tasks that are carried out by more than 60% and usually by more than 80% of the respondents in all 12 countries covered:

- Check compliance of policy & procedures with the law (>80% in all but PL & PT)
- Workplace risk assessment (All countries >80%)
- Job safety analyses (>80% except Su, N, NL)
- Develop company policy on machinery, processes, workplace safety
- Machinery, process or workplace safety (specify safeguards, make procedures, give instructions, check compliance) (>80% in all but Su [all steps], and N, PL, CH for making procedures and giving instructions)
- Personal protective equipment (prepare policy, develop procedures, monitor use)
- Inform/discuss with all levels in the company on risk (safety committee, employees, supervisors, line managers, top management) (All >80% except NL for safety committees, Su for line and top management)
- Investigate accidents/incidents (All >70%)
- Make recommendations after accidents (All but I, PL >70%)
- Carry out physical inspections (All but A, I, Su above 80%)
- Design safety training programmes
- Carry out audits of workplace behaviour
- Prepare policy on emergency situations

The list reflects a very conventional view of the technically oriented safety practitioner, which is not far removed from the picture of half a century ago [Hale & Ytrehus 2004]. The main tasks cluster around machinery, personal protective equipment, workplace analysis, physical inspection and behavioural influence and control, with intensive consultation with and attempts to support and persuade all levels of line management and employees. The law is the touchstone for the job and accidents are the feedback as to its success and the motor for its improvement.

The picture is confirmed by the 7 (out of 31) common hazards and the 7 (out of 36) contacts dealt with by more than 60% of the population in all 12 countries:

- Machinery (>80% in all but Su, N, PL, PT)
- Physical work
- Lifting (>80% in all but Su, PT)
- Working posture (>80% in all but PL)
- Human error (>80% in all but Su, I, PL, PT)

- Noise (>80% in all but Su, PT)
- Lighting
- Contact with employees, line and top management (>80% in all countries and >90% in most)
- Contact with maintenance department (>80% in all but Su)
- Contact with personnel department (>80% in all but Su, PT)
- Contact with visitors
- Contact with government inspectors (>80% in all except NL, PT, S)

The hazards are the ones related to machinery and workplaces, with a clear extension into the ergonomic and working environment hazards. The contacts are with the line and the technical services, although the latter does not extend to tasks related to planning and assessment of maintenance risks – see 4.2.4. below. The long arm of the law in the guise of the inspector is a frequent contact. The concern for human error, behavioural auditing and personnel policy is also clearly central.

4.2.2. Around the core

The following list is of the 21 (of 83) tasks and 8 (of 31) hazards which are dealt with by more than 60% of professionals in between eight and eleven of the 12 countries. Apart from some additional tasks concerning the hard core areas presented in 4.2.1, we begin to see more human factors, policy and management related tasks emerging, but also more attention to dangerous materials: (the abbreviations in brackets indicate the country where **less than 60%** of respondents carries out the particular task).

- Specify PPE to be purchased (Su)
- Dangerous materials (specify policy) (I, PL, CH)
- Dangerous materials (specify preventive measures/ procedures) (Su, PL)
- Dangerous materials (check compliance) (PL)
- Hazards from toxic or carcinogenic materials (PL, PT, Su)
- Prepare policy on safety training (Su)
- Give safety training (Su)
- Publish/distribute information internally on safety (PL,Su)
- Develop (Su) and carry out (NL,Su) safety campaigns
- Keep accident statistics (Su)
- Electrical hazards (N)
- Fire (PL) and explosion (Su, I, N, PL) hazards
- Fall hazards (PL)
- Vehicle hazards (S)
- Hazards in work with computers (S)
- Hazards from cold/heat (S)
- Develop safety management system (N, PL)
- Propose improvements to safety management system (D, I, PL)

- Prepare policy on safety culture (D, PL, PT)
- Assess safety culture (PL)
- Propose improvements to safety culture (PL)
- Advise on organisational change to improve safety performance (Su)
- Emergency situations (make procedures) (N)
- Prepare annual report on safety (Su)
- Prepare annual safety plan (PT)
- Make risk assessments of projects/designs (D, PL, Su)

As suggested in 4.1.1 in relation to the results on sample sizes and the demographic variables, Finland, Poland and Portugal tend to be most often the deviating countries. In particular the concepts of safety management systems and safety culture seem not to have penetrated yet to the former Eastern block, if Poland is typical of those countries. In that country dangerous materials, but also fire and explosion also seem to fall under the role of other professionals.

The presence of safety culture improvement here may be a reflection of the current buzzword status of this term, which tends to have as many meanings as it has users [Hale 2000]. It is a matter of discussion whether we should interpret central attention for this issue as a sign of a modern approach to risk control, coupled to safety management systems, or a throwback to the 'safe person' strategies of accident proneness and blaming the victim. We also see that issues related more to health protection than acute injury begin to be more visible, namely the concern with dangerous materials.

The countries in which all of these tasks and hazards, without exception, are part of the hard core are UK, Australia and Austria.

The system actors with whom more than 60% of the respondents are in contact in 8-11 of the 12 countries (exceptions in brackets) are the following 8 (of 36):

- Occupational physician (S)
- Quality department (Su)
- Finance department (A, PT)
- Safety committee/representatives (A, CH)
- Works council or equivalent (Au, PT, S)
- Safety professionals of other organisations (A, Su)
- Professional association (A, PL, PT, CH)
- Local fire services (Au, NL, PT, CH)

We see the traditional professional colleague, the occupational physician emerge here, as well as the employee representation and the link to quality management. The intensive contact with colleague safety professionals as support and encouragement in what can be a lonely profession is also apparent.

4.2.3. Areas of differentiation.

When we look at the tasks and hazards dealt with by 60% or more of the respondents in only three to seven of the 12 countries, we see a number of other areas emerging. In this list, in contrast to earlier ones, the countries given in round brackets are the ones where **more than 60%** of the respondents **do carry out the tasks**. Where many fewer

respondents deal with these tasks and hazards (less than 20-40%), this is indicated in square brackets.

- Member of design team (A, Au, D, I, PT, CH, UK)
- Review design as external to design team (Au, I, NL, PT, UK)
- Develop company policy on sustainable products (Au, D, NL, PT, S, CH, UK)
- Monitor/audit safety management systems (Au, NL, PT, S, CH, UK + N for auditing)
- Develop safety performance indicators for SMS (Au, PT, S, CH, UK) [I, N, PL <40%]
- Document safety management system (Au, S, UK) [Su, I, PL <40%]
- Document safety training (A, D, I, PL, S, CH) [Su, NL <40%]
- Organise emergency drills (A, D, I, S) [PL <40%]
- Monitor compliance with Permits-to-work (D, S, UK) [Su, I, N <40%]
- Biological hazards (Au, D, NL, UK) [PL, PT <30%]
- Vibration hazards (A, Au, D, UK)
- Other occupational disease risks (Au, D, N, S, CH, UK)
- Mental workload & stress risks (A, Au, D, Su, N, S, UK)
- Bullying (Au, Su, N) [I, PL, PT <20%, + S <30%]
- Alcohol & Drugs (Au, Su, D) [I, PL <30%]
- Environmental risks (D, I, S)
- External safety hazards (Au, NL, UK) [PL <20% + PT <30%]
- Road & transport hazards (A, Au, D, S, CH, UK)

Here, and just creeping into the list of tasks in 4.2.2 we see, at last, involvement in the design process. Only Finland and Poland have less than 60% involvement in all three of the design related tasks. In Australia, Italy, Portugal and the UK more than 60% are involved in all three, whilst in the remaining countries involvement is more than 60% in at least one of the three. This is still a disappointing score, given the emphasis on design in the safety literature.

We see the strong emphasis on some additional tasks in relation to the safety management system in Australia, Singapore and UK and to a lesser extent in Portugal and Switzerland, confirming the conclusions in 4.2.2 above. We see also the addition of tasks related to company policy on sustainability in 6 countries, which include all of the five just mentioned.

In Austria, Germany, Italy and Singapore, in particular we see operational tasks, such as administration, practice drills and PTW being central (in Singapore the issuing of PTWs is also a task of more than 60% of the respondents).

The spread of hazard types covered by the respondents as part of their core activities is highest in Australia. That country shares the attention shown in Scandinavian countries to stress and well-being, as well as that shown in UK for occupational diseases, external safety and transport safety. Portugal and Poland have a clearly narrower range of hazards covered and in the southern and eastern European countries the safety professionals are not

concerned with well being or external issues.

The system actors who are the contacts of more than 60% of the respondents in 3 to 7 countries are the following:

- Educational establishment (A, Au, D, Su, N, CH, UK)
- Safety consultant (Au, I, N, S, CH, UK)
- Designers (D, I, NL, CH, UK) [<30% in A, N, S]
- Environmental experts (D, I, NL, PL, UK)
- Lawyers (Au, I, PL, UK)
- Trades union officials (Au, Su, N, UK)
- Occupational hygienists and ergonomists (Au, NL, N)
- Working conditions services (N, NL, S)
- Other medical specialists (Au, Su, CH)

The widespread contact network of the Australian respondents is striking here, though it does not, unfortunately extend so much to designers. The particular concern of the Anglo-Saxon countries for legal claims is seen here and in the next section and can be coupled with the contact with trades union officials. In the Scandinavian countries the same level of contact with the latter group can be better seen as an indicator of the importance of employee participation. The different place given to environmental issues across countries is reflected in the contact network here and the tasks in the next section.

4.2.4. Peripheral tasks

There remain a range of tasks and hazards which are dealt with by between a quarter and a half of the respondents across countries, with the odd exception either to a higher (round brackets) or lower [square brackets] percentage. These are:

- Involved in devising selection criteria for employees (18- 56%) [A, I, NL <25%]
- Develop policy on environment (N, S >60%)
- Investigate environmental incidents (N, S >60%)
- Answer questions from the public on safety (PL >60%) [Su, PT, S <25%]
- Advise on damage or injury claims (PL, UK >60%) [I, N, CH <25%]
- Prepare policy on insurance/compensation (D>60%) [A, Su, I, NL, N, S, UK <25%]
- Advise on or set safety budget (All 38 – 59%)
- Do cost benefit analysis (20 – 54%) [Su <25%]
- Team member for planning maintenance/modification (21 – 56%) [I, NL <25%]
- Assess plans for maintenance/modification (All 29 – 57%)
- Radiation hazards (D >60%) [Su <20%]
- Subsidence & collapse hazards (PL > 80%) [Su, N <25%]
- Violence to employees (D >60%) [A, I, PL, PT, S <25%]
- Sustainability issues (D >60%) [N, PT, S <25%]
- Product hazards (17 – 52%) [I, N, PL, S <25%]
- Hazards for patients, passengers, students, etc. (UK >60%) [N, PL, PT <25%]

It is significant that all of the financial, insurance and compensation tasks fall in this peripheral area, as do the links to environmental issues, to public information and, most surprisingly, to maintenance planning The last is a vital area both for ensuring safety an integrity and as an activity in which many accidents happen, so these results are disappointing.

The particular attention paid in Germany to radiation, sustainability and violence may reflect national 'green' concerns. The lower range of hazards dealt with in Scandinavia and in southern and eastern Europe is confirmed here.

The system actors falling into this band of contact are the following:

- Work psychologists (Only above 30% in the Scandinavian [N, Su] and central European countries [A, CH] and the Netherlands (where they are a required expert in approved working conditions services, but are still only a contact of 38% of the Dutch respondents)
- Planners (22 – 59%) [Su <25%]
- Policy makers at Ministries (N, CH >60%) [A, PL, UK <25%]
- Policy makers at local/regional authorities (I, N, >60%) [PL <25%]
- Standards bodies (10-57%) [Su, D, PL, CH <25%]
- Certification bodies (NL, S >60%) [PL <25%]
- Industry federations (I, NL >60%) [PL <25%]
- Employers federations (6 – 55%) [PL, CH <25%]
- Insurers (Su, UK >60%)
- Social insurance inspectors (D, PL, CH >60%) [A, NL, PT <25%]
- Local residents (23-46%) [NL <25%]

The predominance of different links per country reflect the different regulatory and insurance regimes at national level and the degree to which regulation has been decentralised from government. Australia is the only country of the 12 which does not fall outside the range of 25-59% contacts on any of these system actors.

4.2.5. Niche involvement

If we turn to the other end of the spectrum and look at tasks which are done by less than 25% of the respondents in the majority of countries, we find the following list, in so far as they have not been mentioned in the sections above.

- Keep statistics about sickness absence (Highest D, 49%)
- Head of company fire brigade (Highest I, 50% and S, 54%)
- Member of company fire brigade (Highest S, 50%)
- Give first aid courses (Highest A, D, 55%)
- Act as expert witness (Highest I 36%)
- Advise at national level on laws, regulations (Highest PT, CH 33%)
- Sit on standards committees for products , competence, safety management, training (Highest PT, S & to a lesser extent Au, UK)
- Advise at national level on safety campaigns (Highest PT 53%)

The low involvement in national level activities is to be expected. There are not so many

opportunities for that to happen.

There is not much overlap between safety and company fire services, except in Italy and Singapore. These appear to be two separate jobs elsewhere.

4.2.5. Professional and management tasks

Finally in this section on tasks, we give a list of the professional development tasks of the safety professional (Table 2).

Country	Read professional literature	Attend course/ workshops	Exchange experiences national	Exchange experiences international	Manage other safety professionals	Publish in safety literature
Austria (A)	99	99	96	47	31	12
Australia (Au)	100	98	96	40	47	25
Finland (SU)	96	89	62	21	28	11
Germany (D)	100	99	97	28	42	15
Italy (I)	100	100	94	31	48	15
Netherlands (NL)	100	97	97	39	37	20
Norway (N)	98	91	91	23	44	10
Poland (PL)	100	94	84	9	31	5
Portugal (P)	93	87	93	73	40	47
Singapore (S)	94	96	94	65	41	30
Switzerland (CH)	100	99	97	49	46	28
UK	100	99	98	41	58	23

Table 2. % respondents carrying out professional development tasks

Keeping up to date is clearly something that almost all professionals do by reading literature and attending courses or workshops. The low interaction with national colleagues of the Finns is surprising, but fits with the conclusion arrived at from the demographic data that they are much more often part-time employees within the company. There is quite a wide range of difference in the international orientation between countries. The latter finding matches quite well the order in which the countries come in terms of the number of practitioners who have responsibilities for sites outside their home country. Publication figures are also variable (the Portuguese figure is likely to be a result of the sample size and bias). There is, however, considerable room for improvement, if we are going to boost the evidence base of our profession. One must also wonder how this question was exactly interpreted, as the number of publications coming out in each country in the field of safety

hardly matches the claims made, according to feedback from country coordinators. Perhaps respondents are interpreting presentations for workshops and meetings as 'publications'.

4.4 Differential analysis, profiles and factor analysis

Ongoing analysis is looking at the way in which the total populations break down in the different countries into groups with different task, hazard or contact profiles and whether there are sub-groups of countries, or respondents to be identified by factor and cluster analysis

In early factor analyses on the Dutch and Norwegian data (Ytrehus 2003, Hale et al 2005), we were able to identify profiles in both countries with the following characteristics:

1. Higher level professionals, dealing with safety in design, policy making across different hazard areas, safety management and performance indicators, and who are involved in national and international networks; and
2. Technical level professionals, centred on procedures, instructions, workplace compliance checks, discussions with employees and supervisors, physical inspections and behavioural audits, accident statistics and emergency drills.

In the Dutch sample, these profiles are associated with two different levels of safety qualification and basic education level. In the Norwegian sample, somewhat similar splits could be discerned, but less clearly. The two profiles seem comparable to two of the profiles found in a Quebec survey by Brun and Loiselle [2002]. It was, however, clear that these differences within each sample were not as great as had been expected, given the considerable differences in training and education level of the different parts of the samples.

In order to investigate this question further we have analysed the data of each country that has a large enough sample, cross-tabulating the tasks, hazards and contacts with education level. Since it was not possible easily to equate the level of safety training in each country, we have concentrated mainly on the highest education level reached. So far the analyses have been limited to comparisons of the total percentage of each group carrying out a task, etc., without taking any account of any possible differences in the frequency with which this occurred. The UK sample was only of the more highly qualified professionals, and has therefore not been included. The German data were only available aggregated and the country was also left out. Finland seemed to have a profile which was too different from other countries to be analysed and several countries did not have large enough samples to analyse meaningfully. We have ended up analysing the data in this way for Austria, Australia, Italy, Netherlands, Singapore and Switzerland

We hypothesised that those with higher education levels would be more often involved in policy making tasks, with contact with top management, with budgeting and cost-benefit analysis, that they would be more concerned with tasks involving safety management and culture and organisational change, with design review and national standardisation, that they would publish more, have more links to international colleagues and be more likely to manage other safety staff. We also hypothesised that they would be less concerned with monitoring and compliance checking, operational tasks like record keeping, fire brigade membership, emergency drills, personal protective equipment (PPE) and communication at shop floor and first-line supervisor level.

The analyses show that remarkably few of these hypotheses are confirmed. For Austria, Australia and Italy practically no statistically significant differences in profiles were found between higher (bachelors level or higher) and lower level professionals in their task

profiles. Since some 60 hypotheses were tested per country we needed to correct our statistical significance levels for these large numbers of tests; otherwise at the 5% significance level we would expect almost 10 tests to be significant in these three countries even if there is no real deifference. With this correction we found the expected relationship in Australia only with involvement in developing the SMS and developing performance indicators for it, monitoring PPE use, managing other safety professionals and publishing on safety. Italy showed a difference only in publishing on safety, and Austria only in managing other professionals and documenting and auditing the SMS.

The picture in the Netherlands, Switzerland and Singapore is very different. In the Netherlands there were 14 hypotheses confirmed, in Singapore 10, of which none were found significant in the opposite direction. In Switzerland, where three different education levels were distinguished the picture was more confused, with 31 of the differences significant, but 7 showing a difference in the opposite direction to the hypothesised one (e.g. with the least educated group having a higher percentage involvement, where we had predicted that for the highest educated group, or vice versa) and another 9 showing the group with the middle level of education having a higher percentage involvement than either the higher or lower educated group. The latter picture is hard to interpret without recourse to discussions with the Swiss coordinator, so we only describe further the Dutch and Singapore results.

The hypotheses which were significantly confirmed by the analysis were:

Netherlands	**Singapore**
Developing SMS Designing performance indicators for SMS Proposing improvements to SMS Policy on sustainability Checking compliance with: Machinery safety PPE use PTW use Preparing PTW Managing & being a member of a fire team National law making National training standards Exchange with international colleagues Publishing on safety Managing other safety professionals	Preparing and checking compliance with PTW Emergency drills Managing or being a member of a fire team Informing/discussing with first line supervisors Doing design reviews Exchange with international colleagues Publishing on safety Managing other safety professionals

This is still a relatively small list of the many hypotheses and shows relatively little commonality between the two countries. This all seems to lead to the conclusion that education level is not a very powerful factor in explaining the allocation of tasks to respondents. Only the differences related to publication, managing other professionals and international networks seem to be at all robust across countries. There may be a slight tendency for involvement in safety management development tasks to be more prevalent in

the higher educated group, but this is a weak relationship.

When we look at the hazards and contacts we find a similar picture of few statistically significant differences in Italy and Austria, rather more in Australia and Singapore and many in the Netherlands and Switzerland (with the latter difficult to interpret). The differences are more in the contact network than in the hazards dealt with. A summary of the significant differences in contact network found in more than one country is as follows. Higher educated professionals have more contact with:

- Occupational hygienists (Au, CH, S)
- Ergonomists (Au, NL)
- Lawyers (AU, NL, CH, S)
- Inspectors (CH, S)
- National policy makers (Au, NL)

In Au, NL, CH and S the network of the higher educated is also significantly more extensive in total

Again, this is not a rich harvest from the many hypotheses and confirms the conclusion above that education level does not seem to be a major determinant of roles and tasks. This is perhaps surprising for a professional group, since our picture of professions is that they are stratified by qualification level, or have a much narrow qualification range than is found in all of the countries surveyed

The factor analysis of the data is only just beginning, Taking countries as units we can discern, as might be expected that the UK, Australia and Singapore, given their common regulatory history, seem to have a relatively close relationship and that the continental European countries cluster. Much more work is need to develop and interpret this part of the analysis and to carry out work looking at factors within the tasks, hazards and contacts. Even some simple cross-tabulation analysis remains to be looked at, e.g. by industry, internal vs. external appointment, size of company and age and experience of the professional.

5. CONCLUSIONS

This international study of the tasks of the safety professional is now showing some interesting results. There is a clear core of tasks and hazards emerging, which is dealt with by safety professionals across all of the countries for which we have results. This is a clear indication that there is an international profession of safety. It has 43 tasks, 15 hazards and 15 contacts which are dealt with by more than 60% of respondents in eight or more of the 12 countries surveyed. Around this lie more potential core tasks in the list of those performed by more than 60% in three to seven of the countries. This core covers particularly the technical and mechanical hazards which stem from the origins of the safety profession. Human factors and safety management tasks have joined that core in most countries, but not (yet) all. Intensive contact with the workforce, line management and top management, but also with the government inspectorate is also found everywhere. The data also confirm earlier studies that many safety professionals deal with the areas of occupational hygiene and ergonomics as well as workplace safety.

The presence in the core tasks of many related to human behaviour and human error and the influences on it underlines the importance of this topic to the safety professional. However it also raises the question as to how this topic is treated both in training and practice. We have had to grow away from the old tendency to blame the victim and look for shop-floor

behavioural change as the basis for safety improvement. The emphasis in the literature and philosophy the past decades has been on involvement with workplace improvement, design and management. A more recent step has been to concentrate again on the whole workforce, including managers in the form of cultural improvements, but predicated on the requirement that the safe workplace has already been achieved and behaviour is the final frontier. It is all too easy for the concern with safety culture to reflect the old tendencies and not the achievement of the second step and the move to the third.

We see from this survey that the first development, towards design and safety management, has still to permeate fully into the international scene, particularly into Eastern Europe, but also into Southern Europe. It has come furthest in the Anglo-Saxon countries (Au, S, UK), but even here involvement with design, with maintenance, with cost-benefit is limited. The great emphasis on safety culture in the task profile therefore needs to be viewed with some scepticism as to whether it is correctly oriented.

Our finding that education level is not a major determinant of job content is one which requires much further analysis and thought. It seems to sketch either a non-elitist profession, in which those from different education levels can carry out the same tasks, or a gap between training and function which needs addressing urgently. We shall concentrate future analysis on resolving this question.

Another question in the minds of the developers of this survey was the extent to which safety professionals in practice are involved with related areas such as the external environment, insurance risk management, product safety and particularly the areas of the working environment often ranked under occupational hygiene, ergonomics and social and physical well-being. This survey shows that the first three areas are peripheral to most safety professionals in most countries. The last three, and particularly occupational hygiene and ergonomics are, however, core areas of concern in the lives of the vast majority of safety professionals, making them broad generalists and not narrow specialists.

REFERENCES

Bianchi, G. 2004. The tasks of safety professionals in Italy. Paper to the 3rd International Conference on Occupational Risk Protection, Santiago de Compostela, 2-4 June 2004.

Borys D., Else D, Pryor P, Sawyer N. 2005. Profile of an OHS professional in Australia and implications for achievement of the National OHS Strategy 2002-2012. Safety Institute of Australia Report. Gladstone Park Victoria. June 2005 67pp.

Brun, J and Loiselle, C. 2002. The roles, functions and activities of safety practitioners: the current situation in Quebec. *Safety Science* 2002, 40: 519-536.

Dudka, G. 2004. The role and tasks of safety professionals in Poland. Paper to the 3rd International Conference on Occupational Risk Protection, Santiago de Compostela, 2-4 June 2004.

Hale A.R. 2000. Culture's confusions. Editorial for the Special issue on safety culture and safety climate. Safety Science. 34. 1-14

Hale, A.R, Bianchi G,, Dudka, G., Hameister, W., Jones, R., Perttula, P. & Ytrehus I. 2005. Surveying the role of safety professionals: objectives, methods & early results. Safety Science Monitor. 9 (1). http://www.monash.edu.au/muarc/ipso/vol9/index.html.

Hale, AR, & Ytrehus, I. 2004. Changing requirements for the safety profession: roles and tasks. *Australian & New Zealand Journal of Occupational Health & Safety 20 (1)*, 23-35.

Jones, R. 2004, The role and tasks of OSH practitioners in the UK. Paper to the 2nd International Conference of the Working on Safety Network, Dresden 31 August – 3 September 2004.

Lang, R. 2004. Swiss results of the international ISSA/ENSHPO survey. Paper to the 2nd International Conference of the Working on Safety Network, Dresden 31 August – 3 September 2004.

Miguel, S., Arezes, P. & Lourinho, N. 2004. Tasks in the emerging safety profession in Portugal. Paper to the 2nd International Conference of the Working on Safety Network, Dresden 31 August – 3 September 2004.

Perttula, P. & Saari, J. 2004. Safety Practitioners' tasks in Finland. Paper to the 2nd International Conference of the Working on Safety Network, Dresden 31 August – 3 September 2004.

Rillie R. 2005. A review of tasks carried out bu OHS professionals in Singapore – as part of a multinational study. M.Sc. Thesis. University of New South Wales. Sydney. School of Safety Science.

Ytrehus. I. 2003. The role and tasks of safety professionals in Norway and the Netherlands: a comparative study. Masters thesis. Norwegian University of Science & Technology, Trondheim, Dept of Industrial Economics & Technology Management.

Appendix: full tables of percentage of respondents in each country carrying out the given tasks, dealing with the given hazards, and having the given contacts.

Table 1 Tasks

		Austria	Australia	Finland	Germany	Italy	Netherlands	Norway	Poland	Portugal	Singapore	Switzerland	UK
I	**Problem identification and analysis**												
B1	Investigate & evaluate workplace or plant risks	100	96	92	98	97	91	88	92	90	96	94	98
B2	Perform job safety analyses	95	88	64	81	96	66	58	95	83	87	81	82
B3	Involved, as a member of a design team, in integrating safety in the design of plant, processes, buildings, etc.	67	62	56	77	70	59	46	51	73	51	76	67
B4	Review a design, based on safety criteria, as someone external to the design team	49	64	39	47	63	68	64	45	70	52	59	68
B5	Carry out risk analysis of projects, designs or activities	63	85	40	57	61	82	70	30	80	74	75	85
II	**Developing and implementing of solutions**												
B6	Develop company policy for sustainable processes or products	48	71	57	60	42	64	44	49	67	69	68	74
B7	Develop company environmental policy	34	35	52	46	44	46	40	31	33	63	51	44
B8	Prepare company policy related to safety of machines, processes or workplaces	68	80	68	72	64	75	54	61	70	74	72	91
B9	Specify safety measures for machines, processes or workplaces	90	86	75	92	83	83	68	81	83	82	89	92
B10	Develop/improve procedures for the safe use and maintenance of machines, processes or workplaces	84	87	70	84	85	81	67	76	80	82	76	92
B11	Give instruction on the safe use and maintenance of machines, processes or workplaces	90	80	77	91	86	83	60	75	87	80	78	83

		Austria	Australia	Finland	Germany	Italy	Netherlands	Norway	Poland	Portugal	Singapore	Switzerland	UK
B12	Check compliance with safety procedures for machines, processes or workplaces	88	89	67	89	83	80	68	93	83	89	80	94
B13	Prepare company policy relating to dangerous materials	68	76	60	77	53	79	46	49	60	72	59	80
B14	Specify safety measures for dangerous materials	84	82	43	90	67	77	48	54	63	82	73	80
B15	Design/improve the safety procedures for the use and the storage of dangerous materials	83	74	56	84	67	73	50	55	70	82	65	78
B16	Check compliance with safety procedures for dangerous materials	79	83	64	84	68	75	57	57	70	87	71	84
B17	Preparation company policy for PPE	86	74	69	85	80	85	49	82	87	81	80	84
B18	Specify which PPE to purchase	87	69	57	91	85	70	41	93	87	78	77	73
B19	Design/improve procedures for the use and maintenance of PPE	80	73	62	77	80	76	48	84	87	77	71	78
B20	Monitor the correct use of PPE	93	73	62	92	76	71	53	85	90	89	80	83
B21	Develop the company safety management system	64	83	62	69	72	75	58	40	70	77	75	93
B22	Design performance indicators for the safety management system	47	76	41	46	38	59	37	35	73	73	62	85
B23	Monitor the functioning of the safety management system	54	86	48	51	44	72	59	38	63	85	72	94
B24	Propose improvements to the safety management system or parts of it	64	93	64	56	48	76	66	43	67	83	82	97
B25	Prepare company policy on safety culture	64	66	74	58	72	76	52	40	57	66	74	79
B26	Assess the safety culture	65	73	69	61	68	80	57	46	63	72	83	84
B27	Propose improvements to the safety culture	76	80	76	66	76	81	69	54	73	73	88	88
B28	Lead or advise on organisational change to achieve improvement in safety performance	91	83	50	92	79	72	70	67	73	78	85	88
B29	Check whether company policy or procedures conforms to legal rules and regulations	83	92	81	83	87	91	77	66	77	90	80	97

		Austria	Australia	Finland	Germany	Italy	Netherlands	Norway	Poland	Portugal	Singapore	Switzerland	UK
B30	Prepare permits to work for dangerous work	57	32	26	55	24	17	22	39	50	63	38	41
B31	Check compliance with permits to work	54	52	35	60	27	40	27	59	53	80	43	67
B32	Member of the team for planning large scale maintenance or modifications	56	37	38	53	24	21	27	44	30	45	50	43
B33	Assessing the plan for large scale maintenance and modifications	57	40	41	53	29	31	28	48	33	48	54	47
III	**Training, information & communication**												
B34	Design a safety campaign	70	70	53	68	61	60	55	66	67	81	81	78
B35	Implement a safety campaign	68	71	53	69	62	54	54	64	67	80	80	76
B36	Inform/discuss with safety representatives/committee about possible risks and safety measurements	91	93	88	97	87	76	77	84	83	92	88	90
B37	Inform/discuss with employees about possible risks and safety measurements	99	94	90	99	91	91	80	95	80	94	90	95
B38	Inform/discuss with first line supervisors about possible risks and safety measurements	97	95	84	96	91	80	82	95	87	91	89	96
B39	Inform/discuss with line managers about possible risks and safety measurements	95	95	77	94	94	94	83	95	87	94	93	98
B40	Inform/discuss with top management about possible risks and safety measurements	97	95	76	94	90	91	78	94	87	92	88	98
B41	Publish information about safety in a company newsletter or other internal communication medium	73	68	59	79	78	69	56	41	64	77	74	77
B42	Involved in the selection of new employees	18	56	28	32	20	24	37	29	27	45	33	45
B43	Prepare company policy relating to safety training	64	72	58	63	63	70	53	86	60	68	74	82
B44	Design safety training programmes, or workshops	62	84	61	61	87	79	54	84	73	79	82	91

		Austria	Australia	Finland	Germany	Italy	Netherlands	Norway	Poland	Portugal	Singapore	Switzerland	UK
B45	Give safety training programmes, courses or workshops	67	87	57	70	87	85	66	94	83	90	89	93
B46	Keep records of employees safety training	69	55	40	73	74	22	37	84	50	61	63	47
IV	**Inspection and research**												
B47	Investigate accidents or incidents	93	86	70	96	79	89	66	97	73	84	84	93
B48	Investigate environmental incidents	42	41	35	55	51	43	45	61	27	63	42	45
B49	Keep statistics about accidents and incidents	77	67	58	87	67	67	55	95	63	78	67	72
B50	Keep statistics about sickness absence	30	21	29	49	20	15	26	26	17	39	36	24
B51	Make recommendations for improvement arising out of investigations	78	86	78	84	69	88	70	62	73	84	81	94
B52	Conduct workplace inspections of physical prevention measures	73	88	60	95	64	86	63	95	80	94	88	93
B53	Conduct workplace audits of safe behaviour	69	76	65	79	68	80	51	77	70	80	82	80
B54	Conduct audits of the safety management system	45	87	48	57	38	75	53	40	60	82	73	92
V	**Emergency procedures and settlement of damage**												
B55	Prepare company policy on emergency procedures, intervention and first aid	82	72	61	84	79	70	49	73	63	73	73	81
B56	Prepare company policy on insurance and compensation	23	32	20	62	19	21	11	31	27	22	26	23
B57	Design/improve emergency procedures	84	72	60	82	87	66	57	65	70	84	76	82
B58	Organize practice of emergency procedures	74	50	40	67	74	54	47	39	50	80	56	55
B59	Manage a company fire fighting team	9	17	9	8	50	11	25	9	43	54	13	11
B60	Be a member of the company fire fighting team	8	14	6	7	32	9	27	16	17	50	16	8
B61	Give first aid courses	55	10	34	55	29	5	20	34	43	25	42	7
B62	Advise employer or employee about damage or injury claims	32	57	33	45	23	28	18	77	37	41	19	69
B63	Act as expert witness in legal cases or claims	16	28	10	13	36	21	10	19	13	17	15	25

		Austria	Australia	Finland	Germany	Italy	Netherlands	Norway	Poland	Portugal	Singapore	Switzerland	UK
VI	**Regulatory tasks**												
B64	Involved with making national/regional or industry wide safety laws and rules	19	30	19	22	14	22	23	16	33	27	33	28
B65	Be a member of a standards committee for product safety	4	11	2	4	4	5	5	2	13	17	7	9
B66	Be a member of a standards committee for safety competence or skills	5	14	3	6	5	7	9	6	20	26	8	19
B67	Be a member of a standards committee for safety management systems	3	17	1	4	2	10	8	7	23	29	8	21
B68	Take part in designing guidance or standards for safety courses or training at national or industry level	9	22	14	8	12	15	16	13	67	24	18	32
B69	Take part in the design and implementation of safety campaigns at national or industry level	8	22	18	8	8	10	15	6	53	22	22	26
B70	Advise on insurance premiums for a workplace or company	6	22	13	21	5	3	6	17	13	8	12	11
B71	Advise on damage claims	8	24	14	23	6	16	8	13	33	10	9	32
B72	Answer questions from the public about safety	25	41	19	36	58	25	42	70	23	22	42	47
VII	**Knowledge management**												
B73	Read professional safety literature	99	100	96	100	100	100	96	100	93	94	100	100
B74	Attend courses or workshops about safety subjects	99	98	89	99	100	97	94	94	87	96	99	99
B75	Exchange knowledge and practical experiences with colleagues at local or national level	96	96	62	97	94	97	92	84	93	94	97	98
B76	Exchange knowledge and practical experience with colleagues at international level	47	40	21	28	31	39	51	9	73	65	49	41
B77	Publish on safety in the professional or scientific literature	12	25	11	15	15	20	25	5	47	30	28	23

		Austria	Australia	Finland	Germany	Italy	Netherlands	Norway	Poland	Portugal	Singapore	Switzerland	UK
B78	Document the safety management system	47	74	30	43	30	55	45	32	57	72	58	78
VIII	**Management & Financial**												
B79	Manage other safety or working conditions professionals	31	47	28	42	48	37	46	31	40	41	46	58
B80	Prepare (parts of) an annual plan for safety	61	71	80	64	68	77	64	72	47	73	72	80
B81	Prepare (parts of) an annual report on safety	67	64	48	72	60	75	63	82	73	70	71	77
B82	Advise on/make the budget for safety	38	45	45	44	43	44	47	45	57	58	59	51
B83	Carry out cost-benefit analyses of safety measures or policies	38	47	20	36	33	41	41	43	50	43	54	50

Table 2. Hazards

		Austria	Australia	Finland	Germany	Italy	Netherlands	Norway	Poland	Portugal	Singapore	Switzerland	UK
C1	Lighting	94	79	74	94	77	78	52	89	76	70	78	89
C2	Cold or heat	92	78	82	91	80	78	56	69	60	48	80	90
C3	Noise	93	86	76	97	85	89	61	91	67	85	86	90
C4	Vibration	63	65	47	79	57	69	42	50	37	52	56	71
C5	Toxic and carcinogenic substances	63	75	54	90	66	82	50	56	50	71	76	83
C6	Biological risks	32	66	35	86	50	61	23	19	23	37	44	67
C7	Other occupational disease	55	70	52	77	51	57	47	39	50	61	73	76
C8	Ionising radiation	29	40	19	78	33	47	20	22	30	39	42	42
C9	Non-ionising radiation	28	45	19	78	51	52	20	30	37	46	50	53
C10	Fire	83	77	61	87	92	86	76	45	80	81	77	91
C11	Explosion	63	60	28	83	56	77	58	33	67	70	69	62
C12	Electricity	89	83	60	90	85	86	60	76	77	79	80	92
C13	Machinery and installations	92	84	71	97	88	91	68	86	77	77	90	91
C14	Vehicles	82	83	61	89	73	75	56	75	50	66	75	90
C15	Human errors	94	89	79	96	79	91	78	74	70	83	90	94
C16	Subsidence and Collapses	40	37	22	39	32	38	30	83	30	43	41	41
C17	Falls	91	87	60	95	82	89	62	52	73	81	86	95
C18	Lifting	95	93	75	96	87	85	63	83	73	87	92	96
C19	Working posture	96	92	86	93	91	85	61	73	83	81	92	94
C20	Other physical workload	84	89	77	85	64	82	58	67	73	76	80	88
C21	VDUs	96	85	79	95	90	81	45	79	70	56	85	94
C22	Mental workload/Stress	76	82	86	76	58	58	61	44	57	41	72	80

		Austria	Australia	Finland	Germany	Italy	Netherlands	Norway	Poland	Portugal	Singapore	Switzerland	UK
C23	Bullying and harassment	44	68	66	57	14	41	43	2	7	21	44	48
C24	Violence against employees	24	59	35	64	11	37	25	9	7	21	33	58
C25	Alcohol or drugs	59	69	61	69	23	37	34	24	33	30	56	58
C26	Environmental pollution	48	49	31	72	64	56	51	39	33	75	59	51
C27	Sustainability of production or products	42	26	37	62	25	39	17	45	23	23	40	29
C28	Product liability	25	25	32	52	17	50	21	19	27	22	38	25
C29	Road/transport safety	65	63	54	87	38	45	44	59	37	63	65	79
C30	Accidents to patients, passengers, students or other clients	39	59	38	56	25	43	29	20	20	41	38	66
C31	External safety	48	61	54	36	46	61	36	18	27	54	46	71

Table 3. Contacts

		Austria	Australia	Finland	Germany	Italy	Netherlands	Norway	Poland	Portugal	Singapore	Switzerland	UK
D1	Occupational hygienist	28	69	40	31	50	83	51	59	33	46	54	59
D2	Occupational physician	99	65	89	98	91	85	67	92	77	48	60	69
D3	Ergonomist	41	73	59	32	26	64	52	16	20	29	50	46
D4	Work & organization psychologist	33	44	33	24	15	38	25	16	17	14	35	20
D5	Other medical specialists	31	60	68	59	34	28	32	53	17	45	68	49
D6	Visitors	68	86	75	74	64	73	67	78	63	80	69	88
D7	Employees	97	98	95	99	98	97	88	98	83	97	93	98
D8	Line management	84	98	94	90	98	99	93	95	87	95	90	99
D9	Top management	98	98	88	97	92	96	90	95	87	93	90	99
D10	Works council or equivalent	95	59	64	93	77	86	77	88	50	46	75	78
D11	Quality department	71	61	53	74	73	72	66	60	60	64	74	61
D12	Technical/maintenance service	95	87	77	93	94	90	80	87	83	85	85	88
D13	Personnel department	89	88	77	91	84	86	73	97	77	83	87	91
D14	Financial division	59	74	66	65	79	62	63	79	47	64	70	75
D15	Lawyer	57	66	39	56	69	52	40	78	37	32	47	68
D16	Designer	19	55	59	82	82	60	28	35	53	29	75	66
D17	Company planner	27	45	22	42	59	48	27	38	47	33	41	51
D18	Environmental expert	58	54	57	71	67	70	54	70	37	57	58	63
D19	Policy maker in Ministry	15	26	26	47	29	34	75	14	33	40	75	21
D20	Policy maker or planner in local authority	32	26	34	55	79	37	72	18	30	36	54	36
D21	Government inspector (national, local)	96	84	81	95	89	61	88	93	60	73	84	82
D22	Working conditions service*	37	-	57	23	46	87	72	50	53	73	-	-

		Austria	Australia	Finland	Germany	Italy	Netherlands	Norway	Poland	Portugal	Singapore	Switzerland	UK
D23	Standards body	32	40	19	15	29	35	32	10	57	52	24	39
D24	Certification body	39	51	32	40	50	66	45	23	53	63	47	45
D25	Industry federation	32	48	-	42	63	65	58	13	53	44	37	52
D26	Professional association	46	83	60	63	65	76	55	28	47	72	47	90
D27	Employers' federation	28	45	45	24	55	26	39	6	47	28	24	43
D28	Trade-union official (local or national)	43	65	68	34	55	21	66	22	27	26	30	68
D29	Insurer	26	53	61	49	33	33	40	26	30	28	48	67
D30	Inspector (social) insurer*	13	-	27	85	39	14	27	77	23	26	96	27
D31	Safety officers of other organizations	45	95	57	93	77	93	82	77	63	89	84	95
D32	Safety Committee or safety representative*	45	95	95	97	88	86	87	80	67	94	58	92
D33	External safety consultant	46	84	54	40	83	50	68	25	43	76	62	77
D34	Educational establishment	62	72	62	72	35	42	70	52	47	44	64	74
D35	People living around the company	35	29	36	29	27	23	32	26	27	39	30	46
D36	Local fire service	73	45	65	69	76	51	56	63	53	64	50	72

* The wording of these was changed per country to fit the prevailing system, or in some cases the row was left blank, since not all have working conditions services, or social insurers with inspectors