

PROJECT FOR DEVELOPING A COLD RISK ASSESSMENT AND MANAGEMENT STRATEGY FOR WORKPLACES IN THE BARENTS REGION

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Background to the project

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any branches of industry and commerce and numerous other occupations involve substantial cold exposure which may have significant adverse effects on human performance and health, affecting work safety and productivity (i.e. both the amount and quality of goods and services produced). This may cause mounting disadvantages and costs for both the employer and employee (5). Furthermore, these negative effects are not acceptable when considering work and safety regulations (1). Cold exposure in outdoor occupations is more significant in the northern circumpolar areas than in the southern parts of the Nordic countries or elsewhere in Europe, because of the long winters and harsh climatic conditions. Cold may also be a significant risk factor in indoor work (8), e.g. within the food industry, thus further broadening the category of cold work.

It has been recognised among scientific institutes focusing on cold-related research and development work that there is no existing comprehensive set of methods and models for how to assess and manage cold conditions in northern workplaces in a comprehensive manner. Several ISO thermal standards have been produced for assessing the effects of thermal environments (hot, moderate, cold) on human activities, but no instructions have been drawn up as to how to apply these methods in practice in the work-

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place.

Based on these needs for new cold-related assessment and management practices and methodologies, it was decided to establish a joint project focused on producing practical tools and principles for application to workplaces and to occupational health care in general (2). This project was supported by the European Regional Development Fund and its Barents Interreg IIA Programme from December 1999 to May 2001.

The co-ordinator of the project was the Oulu Regional Institute of Occupational Health, under its "Cold Work Action Programme". This programme established by the Finnish Institute of Occupational Health in 1997 comprised mainly research and development work aimed at improving occupational safety and health for those working in the cold. The other partners in the project were Luleå University of Technology (Department of Human Work Sciences, Div. of Industrial Ergonomics), Luleå, Sweden, the National Institute for Working Life (Climate Research Group), Stockholm, Sweden, THELMA AS, Trondheim, Norway, and the Kola Research Laboratory, Kirovsk, Russia.

Objectives

The aims of the project were connected with the broader objectives of the European Regional Development Fund, which include the improvement of living conditions, the environment and cultural and educational co-operation in the Barents region.

The general aim was to elaborate a model and set of methods for the assessment and management of risks specifically associated with cold exposure at work. The idea was to test the resulting methods among end users in target enterprises in the various participating countries and among occupational health care personnel. Key persons participating in the testing were trained to use the methods in an optimal way. In addition to providing the methodology, the project conducted development work in individual companies based on their specific needs. Furthermore, one mutual objective was to improve knowledge about cold conditions among the staff of the participating companies.

One important purpose of the project was to support the preparation of a proposal for the ISO WD 15743 standard strategy for risk assessment and management and

working practices in cold environments (4). This proposal describes the methods and practices required to assess and manage occupational health and performance risks in cold work.

Implementation

The project was carried out in the Barents region of northern Finland, Sweden, Norway and Russia. The branches of industry and companies targeted represented different types of cold work with regards to the duration and intensity of exposure. The branches were construction work (Finland, Sweden), forestry (Sweden), road maintenance (Sweden) and fish processing (Norway), the last-mentioned representing cold indoor work (8).

Strategy

The participating scientific institutes produced a cold risk assessment and management model and a set of methods, employing existing international standards and other internationally recognised scientific approaches. The key persons in the target companies (e.g. foremen, safety delegates, occupational health care personnel) participated actively in testing the resulting models and methodology, and information on the usability of these was collected in order to amend and improve the methods further. The development work in each company was conducted on the basis of an analysis of the current state of affairs, and the measures taken included cold risk assessment, minor corrective procedures, recommendations, occupational health activities and the training of personnel.

RESULTS

Cold risk assessment

The Finnish subproject included a field test of the usability of the present ISO thermal standards for cold risk assessment (see this issue of IJCH), the findings of which recognised that new practical methods are needed for the identification of

cold-related problems at work.

After this, the participating scientific institutes adopted a three-step model for cold risk assessment which is analogous to the strategy proposed by Malchaire et al. (6). In addition, a two-step model was produced and tested by the Swedish partner participating in the project. A checklist was produced for identifying cold-related hazards at work. The purpose of the checklist is that a majority of cold related problems can be identified and dealt with at the workplace without the need for outside expertise. The usability of this list was tested by end users in the companies in Finland, Sweden and Norway, including foremen, safety delegates and occupational health care personnel. Results of this evaluation will be presented in a later issue of IJCH. In addition to the checklist, the project produced an outline for more detailed risk assessment involving the quantification of cold-related problems by occupational health care staff, occupational hygienists or other instances with adequate competence. These analytical cold risk assessment methods are described by Holmér (3).

Occupational health care in the cold

One of the basic purposes of occupational health care (OHC) is to promote workers' health and working ability. Cold environments entail special needs, as human responses to cold vary widely between individuals. The project produced a model for OHC activities in which the medical screening of individuals takes place at three levels. At the most general level, a questionnaire was produced for assessing the health of those engaged in cold work and identifying health related limitations. The usability of this questionnaire was tested by OHC personnel in the Finnish sub-project. The second level is formed by interviewing and defining the clinical status of those suspected of being sensitive to the cold or of having some kind of limitation on their working ability. If such a disease or limitation is recognised, a further risk assessment related to the specific health condition may be needed at the workplace. The medical screening of the individual worker should preferably be performed by an expert unit in a hospital or a specific provocation laboratory. The nature of the OHC provided will then be based on the result of the risk assessment at the workplace and the

individual health assessment. Common activities will obviously include advice and training, treatment, medication and rehabilitation, depending on the disease or health limitation concerned. More information on the produced method and model will be provided in the next issue of IJCH.

Cold risk management

A cold risk management model should be fully integrated into the occupational health and safety system of each company in order to ensure implementation and continuation of these activities (9). One important part of cold risk management is the systematic planning of working practices. The implemented management activities include organisational and technical measures and the selecting of appropriate protective clothing. A more detailed description of this, too, will be provided in the next issue of IJCH.

Information and training

The project produced a model for information and training practices which can be implemented in three steps. The purpose of the first step is to improve employees' knowledge about cold conditions so that they are able to recognise their own responsibilities in this respect. The information material should be practically oriented. It is also important that new employees should receive training with regard to working in the cold. The next step concerns key persons at the workplaces and the responsible occupational health care and safety personnel. These key persons should be closely involved in the practical assessment and management of cold-related hazards. Training for making optimal use of the necessary methods should be provided by means of special courses. This was done during the project in the case of Finland, Sweden and Norway. In addition, the project produced a guide to working in the cold to be used as information material for these people (see this issue of IJCH). Key persons at workplaces (e.g. foremen) were also provided with support material, including an information file in the case of the Finnish subproject. The third step in the provision of information and training involve experts in this field, who are constantly engaged in updating their knowledge of cold working conditions and integrating scientific

information on the topic into practical working activities in a framework of active co-operation between companies, scientific institutes and educational units.

Significance of the project

The project produced new methods for assessing and managing problems arising when working in the cold, and these have now been included in a proposal for the ISO WD 15743 standard. End users are becoming involved in this standardisation to an increasing extent, and the usability of the methods now needs to be addressed (7). Valuable information from end users was obtained in the course of this project which enabled us to develop practically oriented tools.

It was recognised in the project that appropriate training is needed in the optimal use of cold risk assessment and management methods, and that employees and key persons in companies need increasing amounts of information on cold working conditions, as also do occupational health care and safety experts.

The experience and results that emerged from the workplace validation stage of this project in the Barents region are easily transferable to other areas and branches of industry where employees are exposed to the cold. As considerable costs can be caused to individual companies in terms of decreased work productivity and increased occupational health problems, significant savings can be obtained by reducing or eliminating cold-related problems. Equally well, the development of appropriate cold management practices that ensure workers' comfort and health will improve the quality of the work and lead to cost reductions. At the company level, a rational programme for managing cold-related problems will allow quick and efficient handling of the daily decisions needed to maintain smooth operation.

Although the primary goal of the project was to produce a methodology for use at workplaces, the same material may be applied to the assessment of daily or leisure time activities where these take place in the cold or made use of in the general health care system.

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