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PROJECT ON CHEMICAL SAFETY IN POLAND

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Abstract: This work focuses on main aspects of a proposed system of chemical safety in Poland. General principles have been formulated, including theoretical guidelines, definitions and functions. Additionally, organizational and legislative structures have been proposed. A basic principal of the system says that each activity related to the application of chemical compounds creates a risk of adverse health and environmental effects.
According to the definition adopted, chemical safety means such levels of chemical compounds in the environment, coming from various sources, which ensure that the risk of adverse health effects and other negative effects will not surpass socially acceptable levels. The chemical safety system is aimed at preventing and limiting the risk of undesirable health and environmental effects from chemical compounds.
It is proposed that the system be coordinated by the National Coordinating Committee on Chemical Safety. The most urgent task of the Committee would be to draft a law on human health protection against the harmful effects of chemical compounds.

INTRODUCTION

A dynamic development of industrial and agricultural chemisation in Poland has produced considerable pollution and degradation of the environment due to uncontrolled emission and inappropriate storage of wastes. The extent of the problem may be illustrated by the fact that in 1986 there were almost 11.8 registered poisonings in humans /1/ and that in 27 regions of the country, covering approximately 27 thousand km^2 (i.e. almost 10% of the total area of Poland) inhabited by almost 30% of the population, the ecological balance has been so disturbed that they have been considered areas whose ecology is under threat. Among those 27 regions, there are four, defined as ecological disaster areas (1, 3, 10). People living in those regions are exposed

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to chemical compounds present in the environment in amounts far beyond those considered as safe. Other proofs of the existing situation are: an infant mortality index much higher than the European average, a high mortality due to neoplasm and also a shortened life span, when compared with that of other developed countries, which is equal to 67 for males. The menaces, listed above, are only a part of a whole which has not yet been fully retailed. These are also strong arguments for taking urgent steps, far more conclusive than those so far, in applying systematic and longterm procedures limiting the adverse health and environmental effects of chemicals.

In scientific and popular literature nowadays, one may come across the expression "chemical safety", understood intuitively as an application of chemical compounds in conditions safe for health and human life and not effecting the environment. As a matter of fact, this is an understatement for the very complex, multidisciplinary programme of preventative activities based on experience already accumulated. The main goal of such a programme is to limit the negative effects on human health and the state of environment induced by a wide use of chemicals.

1. The philosophy of chemical safety

If it is understood that the philosophy is, in general, a totality of view points, statements on a given subject which are typical in a certain group of people then, the philosophy of chemical safety should include guidelines, definitions and functions of chemical safety. At present, for obvious reasons, only basic elements of the philosophy can be presented leaving space for supplements which will emerge in the future.

1.1. Guidelines of chemical safety

In the background of chemical safety philosophy, there is an assumption that a man using chemicals creates a certain risk of producing adverse health and environmental effects and the numerical value of such a risk is never equal to zero. Thus, the problem of chemical safety is not a question of how to achieve complete safety but rather what can be considered as an acceptable risk. The reply to this question should be searched for, not only in laboratories where relationships between exposure and noxious effects are determined, but also among economists who reckon the cost of maintenance of a given, accepted risk, and among sociologists investigating the social perception of the risk. But a final decision in this regard should be taken by exposed persons who are aware of the risk, who take into account compensation for the risk and who will define the so-called level of socially acceptable risk.

It should also be stressed, that man is generally exposed to many chemical compounds and the harmfulness of each of them in given conditions can be expressed in a form of risk of adverse effects influencing his health. From this point of view, the risk could be approved as a common ground on which

comparisons could be made between threats created by various chemical compounds. Such a procedure would highlight those compounds which create the greatest threat to the health of an individual and, what is especially important, to the health of large populations. Bearing in mind what has been already said, one may draw the conclusion that chemical safety should refer to all chemical compounds with which man has contact, regardless of the source of exposure or the way they penetrate his organism.

It is obvious that, the risk can be decreased mainly through the limitation of emission of chemical compounds into the environment and through "safe" usage of these compounds in turnover. Limitation of emission is the responsibility of producers and users of chemical compounds; none of the action in view of chemical safety could directly improve the health of exposed persons and the environment unless it becomes mandatory for industry to undertake practical steps. The efficiency of these steps will depend, first of all, on a universal acknowledgment of the threat.

1.2. Definition of chemical safety

One generally approved definition of chemical safety does not yet exist. Following very wide discussion, the International Program of Chemical Safety, set up by UNEP, WHO and ILO has adapted the following definition of chemical safety: "chemical safety means prevention and limitation of harmful effects of chemical compounds on human health and the state of the environment. This effect stems from a short- and long- term exposure present during production processes and application of chemical compounds as well as from handling of wastes" (8). The above working definition, even in the opinion of its authors, does not embrace all issues related to chemical safety.

Taking into account the presented guidelines of chemical safety, the following definition is proposed:
"Chemical safety: — Levels of chemical compounds, present in the environment, and coming from various sources, which ensure that the risk of adverse health effects in human beings and in the environment, will not be higher than the socially accepted levels".

1.3. Scope of issues of chemical safety

The issue of chemical safety refers to the biological effects of chemical compounds on human beings and on the environment. Chemical safety is related to biological effects (the occurrence of harmful effects in populations of live organisms including humans). This is in contrast to technical risks which define the probability of the break-down of technical devices, which may also result in the exposure of people to chemical compounds (2).

Acitivities undertaken within chemical safety should include evaluation of individual chemical compounds, their mixtures as well as semi-products and wastes which may negatively effect people, animals and plants. The issue

should embrace all compounds regardless of whether they are produced in the country or imported, and regardless of the character of their toxic levels if they exist in such amounts as to threaten human life and the environment. Chemical safety should cover all branches of national economy and especially such processes as production, storage, transportation, trade turnover, application of chemical compounds and storage or utilisation of wastes. It should also embrace the whole environment where man lives and works; his working, communal and natural environments: also, all environmental components; air, water, soil, food and products of every day use.

The presented scope of chemical safety has not been yet implemented in any country. It is known, for example, that because of a lack of sufficient factual background, the control of chemical mixtures and semi-products is conducted in a very simplified manner. The problem of human and environmental exposure to the harmful effects of chemical compounds has not been solved in Poland. This seems possible, however, in the near future, on condition that a compact system of chemical safety will be introduced and which will involve many administrative and economical bodies.

2. A system of chemical safety in Poland

In Poland, a number of links in the chain of a future chemical safety system, already exist. Natural environment (air, water, soil) pollution is controlled; the same refers to the working environment and products of every day use. Nevertheless, it is not sufficient in relation to existing needs. The quantitative and sometimes qualitative overview of human exposure to chemical substances, based on conducted controls, is fragmentary and lacks assessment of the risk that some negative health changes may appear in exposed populations. Therefore, the consolidation of all activities involved in chemical safety is indispensable to create a compact system providing an ordered set of rules, methods and organisational principles. Such a system should be coordinated: which means, if considered externally, it should present a given totality: and when considered internally, it should create a collection of defined elements bound up with interdependent relationships.

2.1. Goals and targets of the system

Prevention against chemical threats and limitation of the risk of adverse health and environmental effects of chemical compounds are the main goals of the chemical safety system.

To achieve these, the following targets should be implemented:

1. Collection, processing and promotion of information on all aspects of chemical safety; setting up a centre of toxicological and ecotoxicological information; and organization of a register of all chemical compounds applied in Poland.

2. Elaboration of a unified method of estimation of the risk of negative biological effects on humans and on the environment as a result of chemical compounds.

3. Elaboration and continuous verification of a list of those chemical compounds causing the greatest threat to people and to their environment, and the research and implementation priorities in the field of chemical safety.

4. Elaboration and implementation of economical cost-benefit analysis resulting from the occurrence of chemicals in the environment.

5. Studies on social perception of risk related to application of chemical compounds.

6. Continuous and systematic education of society in order to shape health conducive and pro-ecological life-styles.

The introduction of appropriate legislative and organisational regulations seems to be an important condition of implementing the system. Among them, legislation on comprehensive collection and promotion of information on places and circumstances where chemical compounds may occur, studies on their adverse effect on people and environment, as well as regulations facilitating a complex control of human and environmental exposure to chemicals.

2.2. Legislative and organisational base

The implementation of the chemical safety system depends officially on issuing relevant legislative regulations. In Poland, legislative regulations do exist at present, and they serve to control chemical compounds present in production and trade turnover.

The basic shortcoming in the present situation is a lack of any law in human and environmental protection against the harmful effect of chemical compounds. Such a law should integrate the existing control procedures, as well as research and implementation conducted by a number of institutions under various administrative bodies. It should also create the ground for new initiatives leading to a comprehensive protection of a human being against chemicals.

The organizational activities indispensable for setting up the system should be started by setting up a National Coordination Committee on Chemical Safety. It should be composed of representatives of various ministries, responsible for executing individual targets of the chemical safety system throughout the country, and influencing the general state of chemical safety. Setting up such a coordination committee would permit the union of all efforts of many institutions representing various sectors involved in the limitation of effects of chemicals in the environment. Efforts joined in such a way, in a situation of insufficient funds, may produce much more efficient economical and factual effects. Besides, the committee could coordinate issues of chemical safety at the national level, (very much desired and not existing at the moment) and be more efficient than individual efforts aimed at solving similar problems in individual branches of the national economy.

2.3. National Coordination Committee on Chemical Safety (NCCCS)

Initiation, promotion and coordination of activities, leading to the limitation of harmful effects of toxic compounds on people and the environment, should be the basic and most essential task of the National Coordination Committee on Chemical Safety in the first phase of its activities and in the future. This should be done through implementation of the chemical safety system which would imply execution of the following essential tasks:

1. Evaluation of the existing situation and proposal of a unified version of legislative solutions for all ministries;
2. Undertaking activities in order to prepare a draft law on protection of people and the environment against harmful effects of chemical compounds; and
3. Coordination of actions within the introduced chemical safety system.

In order to achieve these superior goals, promotion and development of research on chemical safety, development of international cooperation in this field, and widely spread health education, upgrading social awarness as well as promotion of health conducive and pro-ecological life-styles, seem to be of extreme importance. Execution of these aims seems impossible without the creation of a central, intersectoral programme of research and development "Chemical Safety", and close cooperation between important international organizations such as the International Programme of Chemical Safety (IPCS) supported by UNEP, WHO, ILO and FAO; also the International Register of Potentially Toxic Chemicals (IRPTC).

Research projects essential for achieving the main goals of the Chemical Safety Programme should include first of all:

a. elaboration of a report on the threat to human health and environment by chemical factors;
b. setting up a centre of toxicological and ecotoxicological information;
c. creation of a chemical compounds register;
d. elaboration of unified criteria on identifying the most dangerous chemical substances in the human environment;
e. working out criteria of assessment of health and environmental effects arising from exposure to chemical compounds;
f. elaboration and practical implementation of evaluation methods with regard to the risk of occurrence of adverse effects on people and the environment;
g. initiating studies on social perception of risk caused by chemical compounds; and
h. initiating cost-benefit analysis related to application of chemical compounds and the introduction of the chemical safety system.

However, there are no final decisions on the detailed tasks of the committee, its basic structure can already be identified. The committee should be composed of representatives of various sectors whose activities influence the state of chemical safety in the country. The committee should bring together

representatives of sectors responsible for health and environmental protection, namely the Ministries of Environmental Protection and Natural Resources, Health and Social Welfare, Labour and Social Policy: also economic sectors whose activities produce harmful effects on the environment, such as the Ministries of Industry, Transportation, Shipping and Communication as well as the Ministries of Internal Market and Foreign Economic Cooperation. Problems related to turnover of chemical compounds, and issues regarding the results of break-downs and chemical disasters should be solved with the participation of representatives of the Ministry of Interior Affairs. In view of matter-of-fact issues, representatives of research institutes supervised by the above listed Ministries should also serve on the committee.

For organisational reasons, it is necessary to set up permanently functioning structure – a committee office – which would be responsible for documentation and proposals to be presented at meetings, and constant cooperation with research and development bodies in the country and abroad. It will be also important to assign groups of experts to work on appropriate common ground for decision-making.

2.4. Conditions for the implementation of the chemical safety system

In previous publications (7, 9) were presented arguments speaking for the need of a chemical safety system in Poland. It cannot be expected that the system will quickly overcome the most important threats to human health and the environment arising from the presence of chemical compounds. But it could be predicted, with great probability, that neither of these issues can be solved without the introduction of such a system as outlined in this work. In developing countries, attempts to introduce similar systems are progressing fast (4, 7). There are a number of conditions which have to be satisfied to make the system function. They are as follows:

a. understanding by the state administration that a system of chemical safety is needed. (At present this condition is to be closely acknowledged);

b. identification of goals and targets of chemical safety in Poland;

c. setting up of the National Coordination Committee for Chemical Safety, identification of its purpose, scope of its activities and organizational structure; and

d. allocation of indispensable means for implementation of this endeavour.

Apart from that, there are issues already obvious which may greatly influence the progress of gradual creation of chemical safety. One is related to the role of society and its attitude to threats produced by chemical compounds; also the participation of society in the process of prevention and limitation of adverse effects of exposure.

The general participation of society is necessary, if one wants to achieve a state of chemical safety. This participation is possible if various forms of

education are available and that information on these issues will be widely dispersed. Countries which have set up, at the managerial level, groups of competent persons responsible for "public relations" can serve as an example (12). "Public relations" means explanation and promotion of decisions taken, and listening to comments and opinions. Such an approach greatly helps society to notice the risk, assess it and, what is most important, define a compromising level of socially acceptable risk.

The other point refers to the economic aspects of chemical safety. It is generally approved that any industrial action (including chemical safety) is associated with the risk of occurrence of negative biological effects. If such a risk exists, beside profits arising from the action undertaken, compensation of risk effects must also be considered. In countries where a free market economy is mandatory, cost-benefit analysis is an inseparable element of each venture. A positive implementation of the chemical safety programme in Poland would also depend on the balance between the costs and benefits of undertaken ventures. The cost-benefit analysis may considerably contribute to rationalization of individual actions and may stimulate health-conducive behaviour.

3. Final conclusions

The presented concepts and proposals on the chemical safety system in Poland indicate that the endeavour is one of great importance and that it should follow multi-stage actions involving various spheres of human activities with special regard to scientific investigations.

The need for a chemical safety system in Poland is also emerging from economic premises. The integration of countries of the European Common Market anticipated in 1992, and the introduction to this market of strict regulations on chemical safety, may create essential obstacles for other countries participating in trading.

Besides, in a situation of deep economic crisis, provision of strong incentives for investments and technological transfer in Poland, may become and opportunity for the location in this country of burdensome production unwanted enywhere else. A properly functioning system of chemical safety may contribute to the limitation or simply elimination of such possibilities.

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