

Interim evaluation report (draft): Chemical Process Safety Research Group

1. Objectives

The primary task of the research is to devise “a system for the formation of a social consensus on safety in the chemical industry” with the aim of obtaining the trust of the general public in the safety of chemical processes and chemical products. To this end, we will carry out the following tasks:

- (1) Identify what risk information the public wants, and clearly show what items need to be communicated
- (2) Clarify the requirements for promoting voluntary security in which the public can have confidence
- (3) Construct a safety management evaluation system to obtain the trust and confidence of the public
- (4) Based on the results of the above research, present a system for forming a social consensus on safety in the chemical industry

Very few studies have thus far been conducted on the above issues. By holding questionnaire surveys, conducting some demonstration studies, and structuring previous research results, and presenting these visually, we will try to encourage public administrative bodies, corporations, and other entities to mutually understand their positions and circumstances, and devise a system that these entities can use to form a consensus.

2. Members

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Susumu Ohno	Idemitsu Petrochemical Co., Ltd.
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Yuji Naka	Tokyo Institute of Technology
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3. Target achievements

To effectively meet the ultimate goal of forming a social consensus on chemical

safety, we will establish a System for the Formation of Social Consensus on Safety in the Chemical Industry (including a social acceptance system and chemical process safety evaluation system) and publish it on the Internet. We will encourage the sharing of risk information among corporations, residents and administrative bodies with a view to promoting mutual understanding. The expected outcomes of these activities include the following:

- (1) Area residents will be able to obtain information easily about target companies and compare different companies.
- (2) All companies will be able to disclose information using the same format and make inter-company comparisons: the principle of the market mechanism should have a beneficial effect.
- (3) Companies can be expected to use the system actively as a forum for disclosing voluntary security programs, thus increasing the level of public confidence.
- (4) Through promotion of the introduction of this system, administrative bodies will be able to provide administrative guidance to companies, and will also attain an enhanced capacity to inform area residents about chemical companies' safety and information disclosure activities.

4. Status and self-evaluation

4-1. Identification of the risk information demanded by the public, and clarification of items that need to be communicated (progress rate: 80%)

A public survey was conducted by questionnaire, and the following findings were obtained.

- (1) Residents wish for transparency of chemical companies' risk information.
- (2) Residents wish for prior information on evacuation methods in case of emergency.
- (3) Corporations would welcome the presentation of a manual describing information disclosure.
- (4) Corporations hope that the public will be capable of understanding the content of the information they disclose.
- (5) Items for communication include the toxicity of chemical substances and their influence on health, methods of risk management related to chemical processes, evacuations in the wake of incidents, information disclosure items, and the building of a social acceptance system (including social systems).

4-2. Clarification of requirements for promoting voluntary security in which the public can have confidence (progress rate: 70%)

By studying cases in the UK and the Netherlands, where advanced voluntary security programs have been adopted, we identified the problematic aspects of safety regulations in Japan from a legal perspective (the target setting-type regulations in the UK were compared with Japanese functional criteria). As a result, we were able to obtain information on differences in regulations and system designs.

4-3. Construction of a safety management evaluation system to obtain the trust and confidence of society (progress rate: 50%)

We collected several safety management systems implemented by some of Japan's leading chemical companies, and identified the items necessary for such systems. As a result, organizing the framework for building a comprehensive safety evaluation method is now more or less complete.

4-4. Presentation of a System for the Formation of a Social Consensus on Safety in the Chemical Industry (prototype) (progress rate: 50%)

We identified the requisite items and expertise needed to construct a prototype Social Acceptance System, and a prototype Chemical Process Safety Evaluation System, as well as a System for the Formation of a Social Consensus on Safety in the Chemical Industry that incorporates and links these two systems.

The Social Acceptance System clarifies the recognition structure of the risks associated with the chemical industry. Based on the results of a questionnaire survey conducted across different sectors of society (e.g., chemical companies, residents, and students), questions which residents in the area wish to put to chemical companies, information disclosure implemented by chemical companies, legal regulations, and other information will be provided to residents, along with explanations given in easy-to-understand terms. The system will be organized so as to enhance public understanding of information disclosure.

The safety of chemical processes can be divided into two spheres: safety within the premises, and safety related to protecting areas outside the premises. Generally speaking, safety outside the premises is regarded as "the environment"; however, the Chemical Process Safety Evaluation System includes both spheres in the safety management system. Explanations are provided concerning the status of each item of corporate safety management activity so that inter-corporate comparisons (which need to be identified by the client) can be made easily, and the status of various industrial complex companies readily understood. By clearly showing the status of different companies regarding each item, we will establish a yardstick for facilitating evaluations.

For the prototype, we attempted to verify this system by entering real data from actual chemical companies.

The System for Formation of Social Consensus on Safety in the Chemical Industry (prototype) was established using a question-and-answer format on chemical safety between chemical companies and local residents. Thirty questions and thirty corporate answers were prepared. For any other questions, a column was set up so that answers could be entered individually. Here, we have compiled a knowledge database for residents comprising a glossary of terms, including a chemical substance MSDS and information on earthquakes. Furthermore, we took up a case example that had been evaluated with the chemical company's safety evaluation system, and entered the data of an actual company (located in Kawasaki City) and featured it as a test case. As prototypes, regional versions focusing on certain areas have been established. In the future, we will conduct research to complete a nationwide edition of the System for Formation of Social Consensus on Safety in the Chemical Industry.

4-5. Self-evaluation

Clear communication on the subject of risk in the chemical industry has only just begun. From the perspective of ensuring public safety, it is hoped that safety in the chemical industry can be explained in ways that the general public can understand with ease, and that active steps will be taken to resolve any questions that residents in the area may have. It is also important to share information that might ease residents' anxieties concerning possible accidents or disasters, and which will enable the entire community to carry out adequate countermeasures. Companies affiliated with the Responsible Care (RC) Council, which is a member of the Japan Chemical Industry Association, have begun "regional dialogue" programs in regions that have chemical complexes. These initiatives remain at the trial-and-error stage, with only a small number of chemical companies carrying out such programs. Companies, however, still appear reluctant to invite and answer residents' questions without external inducements. Under these circumstances, the present research is clearly very timely and appropriate. One of the survey items is an awareness poll on safety and the environment, targeting society, residents and corporations. This is an innovative attempt to investigate social awareness, and can be evaluated favorably in that it provides valuable data for studying society's means of communication. To gain the trust of the public, companies must of course strive to avoid accidents. They must also clearly show how they implement safety and environmental measures so as to fulfill their accountability with sufficient transparency. To promote voluntary security, it is necessary to clarify relationships with

legal regulations, identify the requisite measures, and conduct system designs, perspectives of which comprised part of our research. During the course of these activities, however, scandals broke out at both food companies and at Tokyo Electric Power Company. A similar incident also occurred at chemical companies. This research can, indeed, be said to have anticipated such problems. In the course of the research, we cooperated with the Legal System Research Group as well as the Nuclear Safety Research Group, and, by so doing, were able to observe similar problems emerge in all sectors. This can be regarded as the result of our functioning as a RISTEX, or as an organization that can study various sectors in a cross-sectional manner.

Using individual research accomplishments as our basis, we discussed the concept of the System for the Formation of Social Consensus on Safety in the Chemical Industry, with the cooperation of researchers in other groups, and established a framework for the system. This System clarifies the perceptions and needs of corporations and local residents vis-à-vis the safety of chemical processes demanded by the public. Questions held by residents were presented in a Q&A format, together with corporate answers. Although the activities of individual corporations have previously been clarified independently, they are now carried out within the same forum. This has made it possible to observe, in a comprehensive manner, the corporate activities at each chemical complex, meaning that not only local residents and administrative bodies but also various companies can understand each other's position, thereby indirectly encouraging beneficial competition. Ultimately, the system can be used as an effective tool to enhance the safety of the chemical industry and to promote clear communication on the subject of risk, the need for which has been increasing in recent years. It can therefore be expected to function as a consensus-forming system. With slight modifications, this system can be applied not only to the chemical industry but also to other industrial sectors. We plan to study further collaborations and cooperation with other industrial sectors.