

Social Technology for Safety and Peace of Mind



Hideyuki Horii

Department of Civil Engineering, School of Engineering,
University of Tokyo

In recent years, safety and peace of mind have been the buzzwords in many different fields. What does it mean that not "safety," but "safety and peace of mind" are strongly demanded by people? Is this simply a fad or is this a fundamental change in thinking?

Abraham Maslow divided people's needs into five layers in his Hierarchy of Human Needs. These layers are Physiological Needs for survival, the Need for Safety and Security, the Need for Love and Belonging, the Need for Esteem and the Need for Self-Actualization. He states that higher level needs are only required after lower level needs have been satisfied. In his hierarchy, "the Need for Safety" is positioned as a basic need, since it is second from the bottom. The Need for Safety include avoiding pain, fear, anxiety and danger, and it is the need for stability and dependency. Although he uses the term "safety," what he means is closer to the term "peace of mind" in our usage. This hierarchy shows that achieving peace of mind is a very basic need among human beings.

In the 20th century, the age of mass production and mass consumption, economic value was everyone's goal. Today, since material needs have been satisfied to a certain degree, people probably need to have more spiritual needs satisfied. One of those is peace of mind.

Engineering has been involved with safety, but it has not necessarily directly faced the issue of peace of mind. As a result, there is a greater need for engineering to provide peace of mind. Safety and peace of mind are not the same thing. Even if safety is assured, peace of mind is not always achieved. Unless we can answer such basic questions as, "What is peace of mind" and "How can peace of mind be achieved," we will not be able to provide measures to achieve peace of mind.

In examining how the terms safety and peace of mind are used, we can find that peace of mind is a subjective concept as in a given person's peace of mind. When there is a state in which peace of mind is achieved and another state in which peace of mind is not achieved, it is not always clear which state provides peace of mind. Safety is based on scientific standards, and peace of mind is trying to assure a subjective feeling through safety.

Sakai, et al, (2003) used word association to get their subjects to freely describe the things that they associated with "safety" and "peace of mind" and the reasons for those associations. They categorized their results as shown in the figures below.

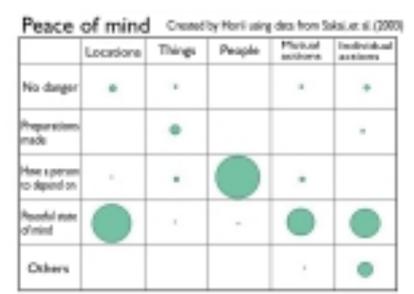
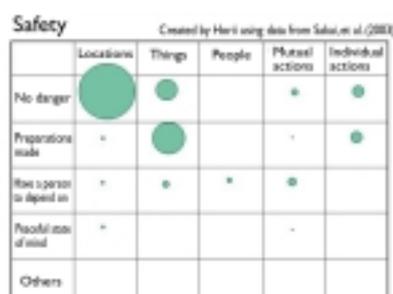
Profile:

Education:

- March 1980 Graduated from the Department of Civil Engineering, Faculty of Engineering, University of Tokyo
- August 1981 Completed the masters course at the graduate school of Northwestern University
- August 1983 Completed the doctorate course (Ph.D.) at the graduate school (civil engineering) of Northwestern University

Work Experience:

- September 1983 Post-doctoral fellow at Northwestern University
- April 1985 Full-time lecturer, Department of Civil Engineering, Faculty of Engineering, University of Tokyo
- April 1986 Associate professor, Department of Civil Engineering, Faculty of Engineering, University of Tokyo
- April 1996 Professor, Department of Civil Engineering, School of Engineering, University of Tokyo



"Safety" is thought of as a state in which there is no danger around oneself because of measures taken with things or systems, or a state in which there are things with which one can protect oneself. Conversely, "peace of mind" is thought of as a state in which one feels at peace with oneself through one's own actions or through mutual relations with others, or a state in which one has someone that he or she can depend on. There are big differences in the images that "safety" and "peace of mind" project, and this shows that achieving safety does not always lead to achieving peace of mind.

The engineering framework that has been constructed to provide safety is not sufficient to achieve both safety and peace of mind. It goes without saying that a psychological approach that handles peace of mind is required, but a slightly larger and new framework that includes a psychological approach is probably necessary. In recent years, it has been hoped that social technology research which appeared on the social problem solving stage and produced significant results would be able to provide such a framework.

Social technology is technology that solves social problems and, in the broad sense, helps to keep society working smoothly. Technology in this context is not only about engineering technology, but it includes legal and economic systems, social norms and all other societal systems. If technology for industry is industrial technology, then technology for society can be called social technology.

The feature of this approach is that it solves social problems by combining the results of science and technology with social systems. Solutions to problems created by combining the results of science and technology with social systems are called social technology. The feature of social technology research is apparent in the cooperation between the humanities and the sciences to utilize all available knowledge in order to solve social problems. (Refer to "Social Technology" to Solve Problems by Horii" Chuko Shinsho, March 2004, for more on social technology.)

So, what kind of social technology is needed to provide safety and peace of mind for railroads? Here is an example: The "technology" in the broader sense realizes social peace of mind towards railroads, and it achieves securing the trust of society towards railroad companies. It is hoped that such "technology" will promote more appropriate safety activities within companies through their efforts toward achieving social trust.

The example given here of social technology is what ties together the safety technology that companies are introducing, the safety measures and safety activities that they are implementing, and social trust. We hope that social trust functions as a mechanism to secure an appropriate balance in the tradeoff between efficiency and safety.

At the same time, social trust should function as a mechanism to

improve the effectiveness of the safety measures and safety activities implemented by companies. The foundation of safety measures and safety activities is a model that gives priority to safety. There is a limit to the effectiveness of top management telling all workers "safety first," and it is not easy to foster a safety culture in that way. However, it is believed that "aiming to be a trusted company" is a principle that can be shared easily. If the relations between individual safety activities and social trust are manifested, we believe that this principle could become the driving force in safety activities.

Although safety is a prerequisite, absolute safety is not. Greater safety can be assured with more money invested in it, but what degree is necessary to achieve social trust? Specifically developing the social technology that we have been discussing is not easy. Let us list some of the items that need to be studied.

First, the requisites for achieving social trust for a highly public company involved in safety must be clarified. It is probably necessary to make public safety measures and safety activities, but it is not necessarily clear what kind of information provided in what kind of manner will win social trust. It is necessary to decrease the knowledge and understanding gap between specialists and the general public, a mechanism to overcome the asymmetrical nature of information is probably necessary, and exchange of information in both directions is also thought to be important. In addition, the role of third party organizations must also be considered. It is also necessary to clarify the relation between the trust towards railroad companies and the peace of mind felt towards railroad companies.

With respect to the risks inherent to railroad companies, it is probably necessary to index and compare the size of each risk, and the effectiveness and cost of each measure taken. We believe that showing the overall situation concerning risks and measures, and demonstrating that appropriate resources are being provided for the measures will lead to social trust.

One of the things that social technology research is aiming at is the utilization of knowledge between different disciplines. It goes without saying that efforts have been made over many years in the field of railroad safety and that practically everything possible has been done. We believe that analyses, what has been implemented in other safety fields and it is possible to apply successes in other fields to railroads, that span various fields in this manner have a chance of leading to new breakthroughs. It is also believed that comparisons of risks and measures that span different fields will provide important information when considering the appropriateness of measures.

Gaining an understanding of the overall problem, combining science and technology with social systems, and utilizing knowledge from different fields -- it is also believed that the comprehensive approach taken by social technology will contribute in some way to the safety and peace of mind with regard to railroads.