JANSI Annual Conference 2019 Overview

Conference Overview

Date held: Wednesday, March 13, 2019　13:30～17:20

Venue: Iino Hall & Conference Centre

Participants: Approx. 430

Opening Remarks

William Edward Webster Jr., Chairman, Japan Nuclear Safety Institute (JANSI)

First, I would like to take this opportunity to express my gratitude to everyone for your understanding and enduring support that you provide every day for JANSI's activities.

This Annual Conference affords JANSI members an opportunity to gather and renew our commitment to nuclear safety as well as discuss JANSI's role from the standpoint of safety enhancement. This is our sixth annual conference.

We have moved this year's conference to March to renew our thoughts on the accident that happened at the Tokyo Electric Power Company's Fukushima Daiichi Nuclear Power Station (the Fukushima Daiichi accident) and remind ourselves why JANSI was formed. The theme of this year's conference is "safety culture." Experts from overseas as well as other industries in Japan will be presenting, and I hope that what they say will be meaningful as we think about the nuclear safety culture in Japan.

Before we begin the discussions on the theme of this conference, I would like to talk about some of the latest news around JANSI's activities.

In 2018, JANSI reorganized its Board of Directors Structure to have CEOs of the member utilities serve as board members. This reorganization is indicative of the strong commitment that senior leaders are making to nuclear safety. In 2018 as well, we formulated our Ten-Year Strategy, which sets out the long-term direction of JANSI's activities.

Trial operation of the new inspection system has also been proceeding and full-scale operation is set for April 2020. JANSI will play an important role in this new inspection system which will enable us to achieve world-class excellence. In close liaison with CRIEPI's Nuclear Risk Research Center (NRRC) and the Atomic Energy Association (ATENA), we will together aim to attain the highest standards of excellence.

We will emphasize improving the competence of peer reviewers and continue to enhance the effectiveness of peer reviews. As each and every JANSI staff goes about his or her business every day, it is important that they be professionals conscious of questioning the current status quo and asking what can be done to improve further and raise the level of nuclear safety.

In this conference, I hope that we will consider how organizations can discuss safety culture and ensure that their safety culture is healthy, as well as check the degree to which it is being promoted and its soundness, and think about what we can do when we find deficiencies or inadequacies.

The untiring pursuit of highest standards of excellence is by no means an easy journey. Nevertheless, it is the journey we have chosen. As the Nuclear Regulation Authority lays down the foundation for safety regulations, JANSI will strive for voluntary improvements within the industry. We believe that these voluntary efforts will steadily advance nuclear safety in Japan.

Keynote Presentation: Industry Initiatives Based on Lessons Learned from Fukushima Daiichi Accident

Satoru Katsuno, Chairman, The Federation of Electric Power Companies of Japan

In order to enhance the safety of nuclear power plants, it is important that our efforts be based on the view that "risks will never be completely eliminated," that we do not limit ourselves to just meeting regulatory requirements but maintain that operators have primary responsibility for continuously pursuing safety improvements and accident prevention measure enhancements, and that we appropriately manage risks through the process known as risk management.

Risk management of a power plant requires that we utilize risk information to identify areas that need to be strengthened in terms of the plant's facilities, equipment and operations and that we quickly implement truly effective policies and measures. The framework that we need to do this is Risk Informed Decision-Making (RIDM), in which risk information is made use of throughout the decision-making process. The key here is to construct a proper framework comprising five functions, which are founded upon engineering, processes and personnel: (1) performance monitoring and evaluation, (2) risk assessments, (3) decision-making, (4) corrective action program, and (5) configuration management.

One of the many regrets about the Fukushima Daiichi accident is that rules were satisfied through simple observance and the pursuit of excellence was insufficient. Having reflected on this point, we have been striving to fortify our safety improvement activities and improve power station operation with technical assistance and reviewers from professional institutions, which have included implementing initiatives with voluntary regulatory organizations JANSI and the World Association of Nuclear Operators (WANO) driving safety activities to be the highest around the world, the NRRC developing and advancing probabilistic risk assessment (PRA) methods, and industry representative ATENA promoting the adoption of safety measures and dialoguing with regulators.

So that we may continuously implement the PDCA cycle to improve safety, a process grounded in industry collaboration, it is key that the safety culture elements of engineering capability and compliance take root in

each and every individual of the organization and that we establish a safety culture that gives top priority to safety throughout.

It is important that every person involved in safety always maintain a questioning attitude, keeping in mind risk information, to find issues or problems and then proactively share that information with the organization and management. To that end as well, the top of the organization needs to commit to giving safety the highest priority and to demonstrate that commitment through their own actions. And, every person working at the power plant needs to seize any of a variety of opportunities to communicate the top priority given to safety.

Since the Fukushima Daiichi accident, we operators have sought to voluntarily enhance safety, establish a system of governance led by the top executives, engage in risk management, and strive to improve safety throughout the entire industry in collaboration with relevant groups. In the future as well, we will engage in risk communication not only with communities, but everyone, and endeavor to have the entire nuclear power industry communicate extensively with society. Our continued pursuit of nuclear safety and economic efficiency will promote a sound nuclear power business.

With its independent status and strong leadership, JANSI is expected to be the driving force encouraging operators to engage in activities that enhance safety, help them realize through peer reviews the gaps between their own operations and world-class excellence, and follow operators' improvement activities.

Session: Strategy for Improving Organizational Management Effectiveness and Promoting a Safety Culture—Activities and Future Outlook on Industry & JANSI—

Short Speech

Yeonhee Hah, Head of the Division of Radiological Protection and Human Aspects of Nuclear Safety, OECD/NEA

Previously, when people talked about nuclear safety, their attention was directed toward improving facilities or other technical aspects, but people need to maintain a frame of mind that is tuned toward the safety culture and focus on the human factor, teamwork and other elements on the human side. These aspects are important in ensuring a high level of nuclear safety.

OECD/NEA has emphasized activities concerning the human aspects of nuclear safety (HANS).

When we think about a safety culture within an organization, we need to consider the safety cultural context particular to the country. The reason for this is because circumstances in each country vary the elements that we must address.

The distinguishing characteristics of a country should not be regarded as hindrances to a safety culture, but as something that further strengthens it. To that end, last year, OECD/NEA initiated the Country-Specific Safety Culture Forum, which aims to create safety cultures commensurate with the respective conditions in each country.

The aim of this forum is to encourage participants, through dialogue and reflection, to think about what sort of impact the particular characteristics of a country have on the safety culture. Attendees participate in interviews, role-plays factoring in distinguishing characteristics of the country, and panel sessions with relevant experts in an effort to distinguish which elements are useful for establishing a sound safety culture

and which are antagonistic.

Feedback from attendees has been positive with comments saying: "The forum was much more helpful than I expected in helping me to think about these issues" and "We were able to freely engage in discussions that transcended our particular situations."

This forum is still in the early stage, but I hope that it will be held in Japan as well.

Masahide Wakakura, Executive Director, NPO Japan Safety Competency Center

With the initiation of petrochemical complex construction in the 1970s, the chemical industry experienced many fires and explosions. Later on, multi-tiered protective systems and other process safety mechanisms were developed and the number of accidents occurring tended to decline. However, chemical accidents rose again in the 1980s as the scale of processes became massive, automated, and reaction processes became more complex.

To ameliorate this situation, the United States Occupational Safety and Health Administration (OSHA) introduced the process safety management system, a method for assuring safety based upon risk assessments. As this system gradually started to take root, accidents were able to be significantly reduced.

Nevertheless, as we entered the 21st century, we saw a series of chemical accidents erupt on a scale that exceeded all expectations, and major companies in both Europe and the United States began to focus on safety culture.

It is well known that production operations in Japan have a very high level of safety with workers maintaining high awareness and skills. However, because of the dependence on technical capabilities in frontline operations, the adoption of process safety management systems has been inadequate at not a few plants. There are concerns that, as veteran employees with experience-based engineering skills retire and more and more younger workers come on board, the level of safety at production facilities in Japan may decrease.

To ensure safety, it is necessary that there be enhancements in both the development of safety-related systems and safety culture, in which both people and organizations, the foundation of frontline capabilities in Japan, are involved.

The Japan Safety Competency Center has developed a method which uses multiple items to assess the level of the safety infrastructure and safety culture of the industry and enables operators to verify and improve weaknesses on their own.

There is the ever-present possibility that safety may deteriorate due to a variety of factors. It is difficult to maintain the level of safety unless a constant effort is made to enhance it.

In all advanced nations, facilities are aging, the number of younger workers are rising, and other factors are increasing the risk of an accident or other such event. To address such issues, it is very important that a safety culture be established that is based on communication throughout the organization.

The International Civil Aviation Organization divides the transition in safety assurance into four stages. The focal point has shifted from (1) technology, (2) human factors, to (3) organization, and currently, we are in the "era of integration."

Of these stages, the focus on an organization's safety culture began in the mid-1990s when the report on the Chernobyl accident was released. The airline industry has managed safety principally through risk management.

The attitude of top management and its leadership have a significant impact on an organization's safety culture. Decisions made by top management are key to the distribution of resources and other such arrangements.

Recently, the airline industry has been grappling with: (1) safety issues on runways, (2) problems that have resulted in crashes even though there were no flight issues, and (3) problems where control has been lost during flight with the result that the aircraft crashed. In moving to the next stage which is the "era of integration," it is important that relevant organizations collaborate and work together to find solutions. Of these three problems, achievements have already been made with regard to numeral (1).

ANA holds a variety of events every year in July, which is the ANA Group's aviation safety promotion month. In 2007, ANA established the ANA Safety Education Center, the aim of which is to keep the memory of accidents fresh and enable trainees to experience error and safety mechanisms. A total of over 90,000 employees have attended training at the center in the 10 years since its establishment.

In considering a safety culture, the culture of reporting is the foundation. Last year, there were 1.3 million takeoffs and landings in Japan, but fewer than 2,000 reports were filed, including both voluntary and the statutory reports which are mandatory. Yet, even when no report is made about a flight, there is still information that may be useful for preventing accidents. A system has also been developed in which flight data is used to ascertain flight tendencies and averages, and this information is used for improving pilot competency.

At the time the Fukushima Daiichi accident happened in March 2011, increasing capacity utilization was an important issue for management. Overdependence on plant manufacturers reduced our ability to take a broad view of the entire system as well as our technical capabilities. As a result, risk communication faltered, which, I believe, led to in our perception an assumption that safety had already been established.

Under the Nuclear Safety Reform Plan, we have advanced measures to address internal organizational issues as well as facility issues relating to nuclear power plants. These measures are centralized around the three core values of "safety awareness," "technological capability" and "the ability to promote dialogue." We have set about attempting to drastically transform TEPCO's safety culture. A task force has been formed which is headed by our president and publishes quarterly progress reports. We also have outside professionals monitoring our work as well. Furthermore, management has taken the initiative in carrying out daily reviews, and these activities have been shared to all employees as well.

The Fukushima Daiichi Decontamination & Decommissioning Engineering Company has been advancing many projects simultaneously, so I believe that we should transition to a project management system. Moving away from the stage where we address new issues arising daily, we want to properly manage the entire decommissioning process by setting forth our policy, vision and objectives so that we may transition to the stage where we proceed to conduct the work in a planned manner with an eye towards the future.

Our philosophy here is the "uncompromising pursuit of safety," "enhanced development of individual abilities and improvement of organizational capabilities," and "building a relationship of trust with society." These are responses to the three values laid out in the Nuclear Safety Reform Plan, and serve as the foundation for the Fukushima Daiichi Decontamination & Decommissioning Engineering Company's various activities.

Whether it be the creation of a safety culture or promotion of organizational management, it is people who bear responsibility for such implementation. We will concentrate our efforts even more on ensuring the development of our human resources and their appropriate allocation.

The fundamental destiny of the Tohoku Electric Power Co., Ltd. is to combat many natural disasters. The tsunami height assumed when we applied for a reactor license for Onagawa Nuclear Power Station Unit 1 was three meters. However, after taking into account the opinions expressed by an internal committee of academics and others, we set the height of the site at 14.8 meters. The site height prevented tsunami inflow when the Great East Japan Earthquake struck. The Emergency Response Office functioned properly because the previous administrative building had been reinforced based on our experience during the Chuetsu-oki earthquake in Niigata Prefecture. At Onagawa, the cold shutdown of all three nuclear reactors was success when the earthquake hit. I believe that the various preparations we made before the earthquake were effective.

We have been implementing a variety of initiatives in order to enhance the four strengths, which we learned from the earthquake. These are: (1) prepare for risks that may potentially occur in the future, (2) flexibly and appropriately respond to unanticipated events, (3) quickly and precisely ascertain conditions on site, and (4) share all of this information with all relevant individuals.

Meanwhile, it is also essential that organizational management be improved. Throughout the process of appropriately allocating our personnel resources, we have provided education and training as well as developed procedures.

Our mission is to enhance nuclear safety by maintaining the high level of safety awareness that our predecessors built and to continue to reduce risks by incorporating lessons and knowledge gained from the Great East Japan Earthquake and other events.

To carry out our mission, each and every individual must have a strong sense of responsibility and continuously work to reinforce our safety culture and implement the PDCA cycle, so that we may gain the trust of society.

Our "nuclear safety quality policy" comprised of 5 items serves as the foundation. In the future as well, we will incorporate new knowledge as we strive to achieve, maintain and improve nuclear safety in our aim to be an organization that has society's understanding and confidence.

Hiromi Yamazaki, President & CEO, Japan Nuclear Safety Institute (JANSI)

In addition to the surveys, which we conduct every three years of our 25,000 members, to understand their current safety culture status, JANSI listens to what people are actually saying at nuclear power plants and other facilities to confirm any potential issues in the field.

The results of our interviews have showed that, for nuclear power plants which have restarted, training in severe accident response has been burdensome and the construction of specific severe accident response facilities as well as other such work has been very stressful.

On the other hand, plants, which have not yet restarted, face the challenging reality that their operational capabilities are decreasing due to the retirement of personnel with operational experience and other factors and these plants must accommodate review meetings to verify their compliance with new regulatory requirements.

The new inspection system, which is scheduled to commence next year, is premised on operators having the capability to detect issues on their own and resolve them. I would like us all to take another look back so that we are not just meeting regulatory requirements, but considering such things as potential risks and whether or not we can maintain employee motivation and morale.

JANSI takes these issues into consideration and provides support for building and promoting a safety culture in operators' head offices. Specifically, we work to establish a more sophisticated systemic approach and enhance leadership training, as well as provide assistance for developing a risk management system.

A "state where a safety culture is established" according to JANSI's definition is a state where the value of placing top priority on nuclear safety is shared and has taken root within the organization as well and state where action is taken based upon this value. We would like to continue to support operators' safety culture initiatives.

Moderator: Kenichi Takano, Professor, Graduate School of System Design and Management, Keio University

The action, which is at the core of a safety culture, is to properly discern any potential risks and respond to them in a reasonable manner. To do this, the support of management is necessary as are incentives that facilitate interactive communication as well as awareness and action of safety culture initiatives. The ideal state is one where upper management, middle management and employees unite in working to enhance the safety culture.

Nevertheless, there are issues in the field that hinder safety culture. The level of organizational maturity is key to overcoming such impediments. First, it is vital that top management resolve to raise the safety culture to world-class levels. Next, a high degree of maturity is required so that those objectives may be entrusted to middle management and safety culture activities ultimately advanced independently with leadership by those on the front lines.

At busy worksites, there is no alternative to motivating personnel. It is important that excellent efforts put forth those in the field be praised. A safety culture must not only be top-down, but also bottom-up. From this perspective as well, it is essential that workers' efforts be praised.

Furthermore, there needs to be a high degree of trust in operations. In other words, an environment needs to be created that encourages people to challenge to make improvements and improve efficiency. We want middle managers to change the way they regard leadership and use their own discretion to think seriously about what they can do.

A safety culture means not only preventing accidents from happening, but also maintaining the health of the organization. To those ends, personnel must have the motivation to act on their own volition. The value of safety should be shared by everyone in the business from the top management down to employees on the front line so that a safety culture may be promoted through independently conducted activities in the field.

Summary of Short Speeches

This concludes the short speeches given by the seven panelists, including myself. I would like to thank everyone who presented for the very meaningful, comprehensive and detailed reports of their activities. We heard presentations from the airline industry, which is required to maintain a high level of trust, and the chemical industry, which handles large plants. This information will be very useful and helpful for the nuclear power industry as well. In addition, we also received suggestions from an international viewpoint about how we may regard safety culture in a manner that is specific to the cultural context of each country.

The nuclear power industry has stated that it has firmly resolved never to allow an accident such as the one at Fukushima Daiichi to happen again. However, I believe that this is an issue that the nuclear power industry will have to join together to address in the future as well.

Even in different industries, there is a shared awareness that we need to proactively and earnestly engage in activities to reinforce the safety culture so that accidents which inconvenience those around us never happen again. I would once again like to express my sincere appreciation to everyone. Thank you.

Panel Discussion

(Honorifics omitted)

Moderator:

Kenichi Takano, Professor, Graduate School of System Design and Management, Keio University

Panelists (not in order):

Yeonhee Hah, Head of the Division of Radiological Protection and Human Aspects of Nuclear Safety, OECD/NEA

Masahide Wakakura, Executive Director, NPO Japan Safety Competency Center

Shinichi Inoue, President & Representative Director, Japan Aircraft Pilot Association

Akira Ono, Managing Executive Officer, Tokyo Electric Power Company Holdings, Inc.

Hiroya Harada, Representative Director& President, Tohoku Electric Power Co., Inc.

Hiromi Yamazaki, President & CEO, JANSI

○**Moderator Takano:** I would like to move on to the discussion now. In the first half of the discussion, the topics will be what is necessary and difficult about spreading safety culture mindset and concept to each and every employee, and the second topic concerns the approach needed, including what has worked well and conversely what was not very effective from your own experience, for having the industry as a whole realize the importance of a safety culture or having people broadly practice a desirable organization culture of reporting and learning. In discussing these topics, I hope that each of the panelists will be sure to present your own experiences of what worked well and conversely what did not work well.

○**President Inoue:** The approach of crew resource management started in the United States in the 1980s. Beginning in the 1990s, Japanese airline companies also incorporated it into their training. The skills of assertion and calling items to other people's attention are relevant to the type of communication that crew members engage in. They are encouraged to speak up and check when they have a question. In the cockpit, it is basically just pilot and copilot, who are the two people on board, and the pilot is the higher-ranking officer. In order to create a relationship among the crew so that members, when they have some doubt about something, speak up and say something to higher-ranking members, training has been provided in maintaining the appropriate authority gradient for over a quarter century in which superiors learn leadership and subordinates learn followership. The assertion to speak up has also been extended to maintenance and engineering divisions in the form of e.ASSERTION, and to the entire group including cabin attendants and other such personnel with G.ASSERTION. This is a presentation of an example that has worked well.

Another point is voluntary reporting. In the United States the number of voluntary reports has reached approximately 100,000 annually, but only about 500 in Japan. Even allowing for the difference in scale of the airline industries in the two countries, the percentage for Japan is still quite low. There is a difference between Japan and the United States with regard to non-disciplinary punishment, which, I think, forms a psychological barrier. On the other hand, there is the case of ANA. Beginning around 1990, the company initiated a voluntary reporting system known as ECHO (Everybody Can Help Others). Recently, the number of ECHO reports has increased considerably. This increase seems to be due to a slight change

in the psychological barrier on account of the creation of a reporting system where iPads have been given to pilots, who may then use these to make reports. This has lowered the physical barrier slightly.

With calls for a wide range of reports including those for operational improvement, the groundwork will be laid so that gradually reports about safety will increase. Reports on improving operations can be regarded as constructive. They are easier to file in comparison to reports about non-conformances. The system for providing feedback to those in the field when a report is received will, I think, also lead to more reports about non-conformances.

○**Moderator Takano:** You have pointed out the importance of creating a proper culture of reporting. Yet, how about what is necessary to create that and imbue the safety culture approach in each and every individual?

○**Managing Executive Officer Ono:** I'd like to address this from the perspective of the people on the front lines of the field. I am now in charge of 1F (Fukushima Daiichi Nuclear Power Station). In terms of just the number of employees, I have more than 1,000 and also about 4,000 contracted personnel working there. With this great number and tremendous diversity among these people, it is very important that I properly convey my ideas.

It is important that I announce, in the form of expectations, what I require of these personnel as well as what I want them to do, but it is difficult to truly communicate this to each and every individual. In a context such as this, there are three things that are important.

The first is to have each and every individual accept what is being said. The second is to give simple and as few instructions as possible about what the person is able to sufficiently achieve. And, the third, although difficult, is to have the workers really feel the effect of the work. It is very important to properly explain how the work being carried out is helping the society and to have the worker understand the impact of his or her work.

Although it would be best to talk face-to-face with each of these 1,000 employees, that is quite difficult to do. There are around 70 to 80 group managers (GM), which are the key people, at 1F. I usually assemble about seven people at a time to whom I communicate my ideas and thoughts and repeat this over and over again about 10 times. Then, I have the GMs convey my ideas to their subordinates. After that, the only thing we can do to check is to select some of the people below the GMs and observe or talk to them to see whether or not my ideas and thoughts have truly been conveyed. I hope to continue this sort of activity in the future as well.

○**Moderator Takano:** I think that steady efforts to convey your ideas are very important. Tohoku Electric Power Company President Harada, could you please talk about what sort of means that you've adopted as president to convey your ideas to subordinates?

○**President Harada:** As Managing Executive Officer Ono said, I think it is very important to have people accept and be convinced of what you say. It is absolutely essential to have employees and each and every person working understand and approve. To achieve that, it is necessary for the top manager to talk about safety culture when giving the first speech of the year before everyone starts work, instructions at new employee admission ceremonies, executive meetings, and all sorts of forums and opportunities.

Also, we are currently working to restart Onagawa Unit 2 and Higashidori Unit 1, but I am encouraging our personnel not to consider this a mere restart, but, as they go about performing the necessary tasks,

to think of it as a new departure or recommissioning. In moving toward the restart of these reactors, the Nuclear Power Division as well as the entire company will create that kind of atmosphere and lay the groundwork for spreading the safety culture and other aspects.

I believe it is very important that we create an environment to the extent that each and every employee is able to state in his or her own words what sort of relationship their own work has with improving the safety of nuclear power and the power station, as well as how the trust will be gained of people in the community.

○**Moderator Takano:** I think you have pointed out the importance of being persistent in conveying the safety culture mindset at every turn and taking the initiative in your own work because you yourself have to explain the safety culture and safety in your ties to the community. Is there anyone else?

○**Executive Director Wakakura:** The Japan Society for Safety Engineering initiated a dialogue about 10 years ago with the presidents of chemical companies. In both 2011 and 2012, there were three accidents involving fatalities at chemical companies, which led to a significant change in the way the presidents perceived the situation. There were also more people who not only talked about prioritizing safety, but also said that safety was the foundation. However, when we look at the results of safety capability assessments, there was a shift in recognition about four or five years ago toward making safety the top priority at about half of the worksites. This can be seen from, for example, the permission to shut down operations to prioritize safety during an emergency and companies responding in a manner that allows for a certain margin to prioritize safety in the construction time period.

Yet, about half the businesses still have not sufficiently communicated the priority given to safety. The biggest reason is the presence of a barrier somewhere in the workplace whether it be the operators, team leaders, assistant managers, managers or directors. This means that top management's ideas about safety have not been conveyed and spread among the ranks. From interviews with those at the bottom and moving upward, we can see to a certain extent where the barrier is. However, we can't really see the barrier when we look top-down. What is most effective for surmounting such barriers is for the director to go around the work place often, watch and look for where the barriers are. First, we have to find where the barriers are, and then next we have to devise ways to dismantle them. By doing this, I believe that the degree of seriousness that managers are communicating, can first be conveyed to those working for them.

○**Moderator Takano:** I think that the level of earnestness will be communicated as management takes steps, such as showing that it is serious by going out to the front lines and engaging in a variety of discussions, allocating budgets for safety in some cases, and making sure there is time devoted to safety.

○**Managing Executive Officer Ono:** One more important thing is to take the initiative and set a good example for others. At 1F, when there were many accidents several years ago including fatal ones, despite being an action that people do natural in other countries, we recommended holding onto handrails to increase safety awareness. I took the initiative myself and set an example. I was conscious of even holding onto the handrail at Tokyo Station and other places away from the worksite. People in high-ranking positions, particularly management, make a variety of requests of their subordinates and expect a lot of them, and they need to be aware that such requests and expectations may come back to them and that taking the initiative in setting example is something that is not just part of the work they perform, but they also have to be ready to do it in their daily lives.

○**Moderator Takano:** On the face of it, holding onto a handrail doesn't appear to be effective. However, in the chemical industry, companies with good safety scores are actually practicing that and have reduced their accidents. In addition, there have even been initiatives for those who do not recognize hazards and their perspective has changed by having them take the initiative to hold onto a handrail of their own accord. On the other hand, I think it is also very important that top management take action, set a good example, and show what the model is. Management needs to always look for opportunities to engage in discussion with people in the field, listen to what they are saying, or discuss what they are really thinking. Does anyone have any comments on this point?

○**President Yamazaki:** I would like to make some comments about spreading a safety culture among the people on the front lines and the culture of reporting.

With regard to spreading the safety culture throughout the frontline operations, it is important that the CEO, CNO or station director show conviction when they talk. However, just having that conviction will not enable their ideas to be conveyed. Also, as Executive Director Wakakura pointed out, it is a fact that there are barriers. I think it is also important to have an internal, or an external observer such as JANSI take a look from a variety of angles to see what sort of state the organizational culture is in, acquire that information, and take it into account to find out where emphasis should be placed to make things better and take those kinds of measures. It is necessary that measures be properly taken to make up for weaknesses, including those mentioned by RP & HANS Division Head Hah, where there are particular weak points rooted in Japanese culture. That is the first point.

The second point concerns the reporting culture, I believe that Japanese operators need to get more serious about implementing a corrective action program (CAP). The government is currently revising the inspection system and making preparations to transition to a system that emulates the United States' ROP (reactor oversight process). Within that process, regulators are saying that the key to the new inspection system is whether or not operators' CAP is properly implemented. However, because CAP is an activity that requires quite a bit of labor, if it is initiated in a manner where people explain their actions because that is what the regulations say, then the sense of burden that people on the front lines feel will only increase without any effect. It is very important that the station director be serious about addressing CAP and take seriously daily reports, analyzes them, and respond to them. That will lead to the accumulation of successful experiences where what has been reported turned into a proper improvement, which, I think, will also lead to reinforcing the safety culture.

Last year in March, through discussions with operators and referencing case studies from the United States, the Japanese version of the CAP guidelines was created over a process that lasted half a year. This was due to the disparity in Japanese operators' CAP approaches. The aim was to prepare guidelines in an effort to raise the standard with a view towards introducing the new inspection system in the future. The preface to these guidelines incorporates our ideas where it states: "CAP activities should be considered a foundation for establishing a safety culture in the sense of a system that encourages continuous improvement."

○**Moderator Takano:** As you pointed out, a pro forma adoption would end up increasing the burden placed on the front lines. In our discussions so far, it has been said that it is very important to discuss the process in a way that is convincing and to achieve an understanding among the participants that this is

something that must be done. Also, I think that the adoption of such a system will bring to the forefront, in a more visible way, improvements made on the front lines, that there is a more trusting relationship between management and ordinary workers, and that talking about these things build a better understanding. The effect will really be felt and people will be more motivated to pursue this effort. What about these sorts of activities in the airline industry?

○**President Inoue:** I'm not sure if I'm able to answer that question directly, but, with regard to the reporting and assertion which we discussed earlier, I think that we need to prevent people from being discouraged who courageously make reports and assert their ideas. More specifically, when someone is on the receiving end of an assertion, his or her first words should be "thank you." Organizationally, if the way in which the organization handles the various reports that are filed in a way that people are able to see, then this will lead to subsequent reports. With the CAP which we discussed just now, I think that it is necessary to move forward with initiatives that enables participants to feel that they have had a positive effect.

○**Moderator Takano:** RP & HANS Division Head Hah, I think you said that your goal was to change the way that each individual perceives his or her situation by creating role-plays and having people participate in these sessions where an international perspective is adopted. What you think about this from that viewpoint?

○**RP & HANS Division Head Hah:** One thing that I would like to add to the discussion is that I think it is necessary, in order to encourage a healthy safety culture, we assuage the fear of making reports. I think that it takes a lot of courage particularly when opinions are divided to speak up and state your opinion. Also, there are cases where, despite every effort have been made, a mistake was committed. In such situations, culture is important. The fear, which people have about making such mistakes or failures and being in the spotlight as well as what is hidden behind that, is something that is very important for management to focus on. In culture, there is also the aspect of people's feelings. While we learn from mistakes, we also learn from successes. Incidentally, learning from successes is a very big part of this process. People and organizational aspects are very important. I believe that we should learn from our actions today.

○**Moderator Takano:** For people to say that they have a particular concern is rather a negative information. And, I think you have pointed out that we must properly manage such anxiety and transition to a workplace where such concerns are not present.

While we don't have much time remaining, a member of the audience pointed out something very important and I would like to raise that point and then conclude the first half of our discussion. Nuclear power is not something that comprises only electric power companies, but there are also manufacturers and contractors that support nuclear power. It was pointed out that we must create and build a safety culture and organizational culture that also encompasses those components of nuclear power. Earlier, there was something said about continually going around and discussing such aspects with people. Does anyone have a point to make other than that?

○**Managing Executive Officer Ono:** There are a variety of rules in the workplace to protect workers' safety. What I did while I was the head of 1F was to be quite focused on reducing the number of rules as much as possible and making them easier to understand because, conversely, even if you decide on 20 or 30 rules, then there will be situations where people will be hurt while trying to remember the rules.

Another thing is that, in the case of TEPCO, the company is unable to decommission 1F by itself, so we have asked more than 50 general contractors to help with the work. If the people responsible for the general contractors are really serious about their work, then their workers will get into the spirit too and their expression changes. I think that another major point is how to raise the morale of the worksite supervisor and how to get such personnel motivated.

○**Moderator Takano:** By designating key people for the safety culture or safety in the workplace, providing those people with a variety of information, having them properly educate and train their own staff, and, in some cases, having discussions with them while eating in the workplace, such efforts will gradually lead to the people on the front lines becoming more serious about the safety culture and safety. Those in charge might even provide opportunities and resources to that end. In this regard, what is Tohoku Electric Power Company doing?

○**President Harada:** I think it is important to create an atmosphere with our contractors where anything can be freely shared, as well as information and opinions exchanged. Although there is a culture of reporting for that, I think it is very important to create a system and foundation so that we share with our own employees as well as, of course, the employees of contractors any reports that have been filed as well as the relevant details and results of the response. Reports are an asset. For example, even if a report is about something bad, we should not respond in a negative way by scolding the person because of the report is about something bad or someone stepped forward to offer their opinion. On the contrary, we should create an atmosphere so that the person is able to make these reports without feeling constrained. I think it is important that we establish a culture of sharing information with each other through our responses, which might be "thank you" or "I'm glad you told me about this early."

○**Moderator Takano:** I think that you have indicated the importance of sharing information and praising people for reporting no matter what the content.

○**Moderator Takano:** Now I would like to move on to the second half of the discussion. The effect of a safety culture is not just preventing accidents or how not to let them happen, but it also has considerable influence in sharing organizational values, increasing job satisfaction, improving motivation, enhancing communication, as well as developing better human relationships. I think that the apparent practice of a safety culture also leads to improving the workplace of the organization as well as reforming it. From that perspective, I would like to ask the panelists to present any sort of relevant episodes from your own experience.

○**Managing Executive Officer Ono:** Some distinguishing features of 1F are that the issues there comprise a variety of tasks that entail very substantial uncertainty and we must figure out how to quickly reduce risks that are already present. In addition, there is the particular feature that this is a kind of work that no one has ever experienced before. So, it is difficult to ask or depend on plant manufacturers and we need to form our own plans and strategies as we move forward with decommissioning.

In order to establish a safety culture, I believe that we have to think deeply about what our own work comprises. At such times, I think that we realize, surprisingly, that we don't really know anything. Starting from that point, the discussion moves forward about what we need to do to enhance our own

engineering capabilities and what do we need to do to achieve that. I think that this will be what sustains people's growth. In that sense, there are high expectations for activities that establish a safety culture.

We have a mission and want to perform our jobs with a sense of achievement. By striving to do our very best to create a safety culture, this effort naturally also improves communication and will also produce a real feeling that our own work is truly useful. I hope that through this process we will ultimately be able to raise the capabilities of our company.

○**Moderator Takano:** You have pointed out that, by learning to think on our own and acquire the custom of thinking, the issues which we need to address will become visible. This will enable us to grow and it will spread throughout the entire organization. Does anyone else have something to add?

○**President Yamazaki:** I would like to present one episode pertaining to safety culture, which left a substantial impression on me personally. This story is from the time when I was involved with nuclear power at Chubu Electric Power Company before coming to JANSI. In 2003, I visited the Peach Bottom Nuclear Generating Station. In 1987, it was found that all the operators in the main control room were either sleeping or playing video games. The plant received an order to shut down from the Nuclear Regulatory Commission (NRC). INPO issued very forceful guidance and instructions to the company that resulted in the company's CEO to retire. Although the station had once faced such serious problems relating to its safety culture, it had transformed into a very outstanding station by the time I visited in 2003.

Nuclear power plants in the United States achieved capacity utilization ratios of up to 90% in the 1990s, yet the number of scrams also dramatically decreased. While talking with managers on the front lines even at the Peach Bottom Nuclear Generating Station, I asked what was the primary reason why power plants in the United States, such as the Peach Bottom Nuclear Generating Station, improved their performance. The reply that these front-line managers gave was contrary to my expectations. They said that performance improved because CAP was initiated. Even along the front lines, personnel were picking up issues every day, sharing these with each other, and resolving them. The workers themselves could feel that sense of achievement, so they were performing their jobs in such an atmosphere and had a very positive attitude. That was the impression that I received. In that sense, I felt that CAP is a powerful tool for improvement as well as a key tool for establishing a safety culture and having it properly take root among the people actually involved in operations.

○**Moderator Takano:** You've pointed out that it is very effective for personnel to properly communicate risk information to their superior in their daily activities, let everyone know about these risks and discuss them, then share that information. I think this might be quite effective not only for the organization's safety culture, but also for addressing concerns or fears within the organization about reporting.

Clearing away a variety of problems within such an organization will improve performance, enhance trust among fellow workers, encourage communication, and may have many more positive effects.

Analyzing data from the approximately 20,000 diagnostic surveys of safety cultures, which I have, shows businesses that have been found to have a high level of safety culture, also, in fact, have high job satisfaction and motivation. The results show that there is also an effect that increases productivity and efficiency. I think this suggests the possibility that safety culture initiatives may lead to the achievement of secondary objectives. What you think about this point?

○**Executive Director Wakakura:** Most businesses in the domestic process industry are facing a serious issue in that their facilities are aging. Process industries in all advanced nations are facing a similar issue. Within that context in Japan, the age bracket of workers is becoming more and more polarized with fewer and fewer veteran employees and more and more younger employees. Workers are called upon to possess the ability to detect signs of problems as the facilities age as well as the ability to respond during emergencies or when problems arise which have not been anticipated. Veteran employees received their training while being scolded by their superiors for mistakes or poor performance. They watched their superiors go about the work, so veteran employees haven't received very logical training. There are more and more instances where these veteran employees are reluctant to teach younger employees as they will be called out for power harassment if they use the old teaching methods. On the other hand, younger people are coworkers with people who are older than their own parents, so they hesitate to ask to these senior workers.

An initiative promoted by a certain business requires both veteran and younger employees to stop and think if some sort of problem arises. This initiative begins with veteran employees not teaching, but first thinking about the problem. In just about a year, veteran employees were able to learn how to teach and the younger employees were more and more willing to listen. This kind of information is shared among members of the NPO Japan Safety Competency Center. Thinking is the foundation of a safety culture. This is a case of where a response was pursued once it was shared how to actually move something forward and what sort of effect that has had.

○**Moderator Takano:** A few people have pointed out the importance of thinking, but I think what you're saying is that by thinking we are able to change the organization per se and to change the relationships between people.

I would now like to put forward a question received from the audience. I think we have a consensus here that it is very important for us to properly construct a safety culture of our own accord and to create an autonomous safety culture. However, the reality in Japan is that regulations are very influential. Regulations tell us to do this or that step-by-step and if we do what has been said, then we get a stamp of approval. That is the sort of culture that we have. Within that context, there has not been a culture of workers thinking about safety culture by themselves or thinking about the sort of relationship with regulations that would be suited to the Japanese culture.

I think this is a very important point, so I would like to ask our panelists for their comments. How about the relationship with regulations in the chemical industry? To say that everything is all right if regulations are followed leads to the minimum. Moreover, just doing only the minimum makes the present situation the maximum and creates a situation where we are sort of bound in that we are neither able to move up nor down. I would like to ask you for your thoughts about this question within the context of voluntary safety activities being carried out.

○**Executive Director Wakakura:** Even in talks about this with people in management recently including Keidanren, a discussion about regulations and voluntary safety are inseparable as the two wheels of a car are to keep the car moving. In field operations, particularly in the chemical industry where very dangerous things are used under hazardous conditions, the chemical industry is moving in a direction not tied to regulations. On the other hand, particularly with the High Pressure Gas Safety Act and other such laws and regulations, there is still the way of thinking that the only thing that needs to be done is

follow regulations. This way of thinking still holds with regard to fire regulations, that they only need to be followed as well. This sort of approach makes the department one that simply complies with regulations and unable to positively undertake any activities for managing safety. However, recently throughout the manufacturing industry, the safety management divisions have been more aggressive in contributing to improve productivity and have changed so that people with inventiveness and creative ability are being assigned to these divisions.

In our assessments of safety capabilities, we often ask how safety management division personnel will be assessed in their subsequent career paths. In fact, the safety management department is becoming a career path. I also get a sense from those in the field that there has been a change in the manufacturing industry, shifting away from reliance on regulations.

○**Moderator Takano:** Recently, there have also been moves to provide incentives, such as the Super Certification and other rewards, to encourage personnel to aim even higher.

○**Executive Director Wakakura:** We have also had a variety of discussions with the security authorities. There has been quite a change since the Super Certification concept was first created. I believe that there has been a slow progression toward assessing more independent activities.

○**Moderator Takano:** I would like to ask RP & HANS Division Head Hah for your thoughts on this issue from the perspective of the relationship between regulators and businesses in an international framework and how to form even better relationships.

○**RP & HANS Division Head Hah:** I think this depends quite a bit on the circumstances in the country. Currently, Japan is in quite a unique situation.

It is not the regulator, but the business that has primary responsibility for safety and regulators are situated to inspect the businesses and protect public safety and the environment. However, they are ultimately both aiming for the same thing, yet the paths that they each take to reach that goal are different.

When we think in terms of a safety culture, the roles have been separated into regulators and the businesses regulated, but, within civil society, both are seen as linked in the same field. That is why it is necessary for people to be clearly aware of their own role and to find ways of better communicating with each other as well as implementing best practices in line with the country's circumstances. As necessary, I think that they also have to cooperate with each other.

○**Moderator Takano:** Although operators and regulators have the same objective, in moving toward that objective, as you pointed out, I think a very important question is how to create a win-win situation.

I think that the airline industry in Japan is a very tightly regulated industry. What are your thoughts on that?

○**President Inoue:** After the end of World War II, flying was prohibited. However, even since Japanese aviation restarted in 1952, the industry expanded from the conditions at the time where the government was able to directly conduct a variety of tests and inspections. Over 60 years have passed since that time, but the airline industry still has, as its basic stance, a very strong bent towards the government wanting to verify everything.

However, if we look around the world to North America and Europe, it is the regulators who make the safety rules and the operators who actually realize them. It is my understanding that the world is shifting towards the regulators monitoring whether or not operations are proceeding in accordance with the rules.

Gradually, Japan is also beginning to change. It is shifting away from a system where, principally, the government directly conducts verification. The other day there was an article about the cabinet giving approval to submission of a bill, which would promote this shift, during the present legislative session. I believe that as we move further into the 21st century, things will change slightly.

When describing the safety that regulators think about and the safety that operators think about, I often use the example of a pilot's physical checkup and health. For pilots to perform their jobs, there is a standard known as a physical examination license. If a pilot does not pass this, he or she is unable to work. On the other hand, pilots have to manage the maintenance of their own health as well. The two standards are different. When implementing a variety of operations, one must clear the minimum which is required under the regulations and at the same time maintain one's own health. By these two efforts, the attitude of pursuit to safety is formed.

○**Moderator Takano:** I think you are saying that we pursue a new vision of safety as we strive to sufficiently maintain what regulations require of us. Following on this, what do operators think about the point of forming even better relationship with regulations?

○**Managing Executive Officer Ono:** The word safety has come up in our discussions today. However, when we think about generating nuclear energy and decommissioning 1F, I believe that a relationship with the community, which President Harada talked about earlier, is very important. I believe that observing the substance of regulations is the minimum that should be done, and that we operators must think about another safety assurance and take action to achieve that. The safety that is imposed by regulations is a necessary condition for ensuring security. Yet, I do not think that it is a sufficient condition at all. I believe that we need to address this, including enhancing a safety culture, while properly thinking about it from the perspective of security.

○**Moderator Takano:** The mission of operators is to ensure safety, and within such context, the regulators also have the mission to sufficiently explain to the people in the community what safety is and have them understand that. President Harada what are your thoughts on that?

○**President Harada:** As with regulations, a safety culture is ultimately not realized, as Managing Executive Officer Ono just said, unless people of the community or citizens of the nation have confidence in it. With regard to the safety culture, as each and every individual goes about his or her job, this work is necessarily connected with the greater world through downstream processes, different organizations, people or organizations nearby. We should always perform our work with an awareness that there is some sort of relationship with the community. This is not limited to nuclear power divisions, but it is something that I talk about daily at my company.

Regulations are the bottom line at which we should always be questioning and thinking whether or not the way I am performing my work will properly gain the trust of people in society. However, if we take into consideration the spirit of the regulations which is the social demand, in other words the background that led to formulation of such regulations, then we will also understand why society is calling for work to be done. We need to gain a broad understanding and read sufficiently deeply into social demands as we aim even higher standards. I think that, at such times, what is likely important is implementing a framework in collaboration with JANSI which works to voluntarily improve safety. The relationship among regulations, safety culture, community and other elements is understood in that way.

○**Moderator Takano:** Gaining the understanding of ordinary people will lead to nuclear power being

steadily used and further developing as a power source throughout the future. I think that you have pointed out the importance of standing in the shoes of the members of the community and attempting to think as they do.

Summary of Panel Discussion

○**Moderator Takano:** Although our discussion is still a long way from concluding and I would like to continue to take questions from the audience if there were time, I would now like to proceed to the summary on account of the time restriction.

Today, a few key words emerged in our discussions. I think that one major point was about safety culture and that we must acquire the custom of thinking about it. In order for it to become imbued among personnel, the concept needs to be presented in an easy to understand fashion so that people are convinced, and once they are convinced and understand the safety culture, then it needs to be conveyed in a way so that its effects are visible.

Although tangible measures are very important, I think that it is necessary to improve the effectiveness of organizational management, in other words to transition to managing in a way that is truly helpful and under which it is easy for everyone on the front lines to work. To achieve that, there are tangible aspects and intangible aspects. There was some talk earlier about non-technical skills as well. By making these inseparable and effective, we will be able to move forward toward realizing nuclear safety and sound development of nuclear power. I want to thank our panelists and everyone here today. With that, I would like to conclude today's panel discussion.

Closing Remarks

Hiromi Yamazaki, President & CEO, Japan Nuclear Safety Institute (JANSI)

This conference focused on initiatives and activities of industry and JANSI in improving the effectiveness of organizational management as well as creating and reinforcing a safety culture. We looked back on previous initiatives and activities, and towards the future as well. I would like to express my very great appreciation to the presenters and panelists as well as everyone who participated today. Through the speeches and panel discussion today, we were able to reconsider safety culture within the context of the entire structure and framework of companies and organizations, and we were once again able to think about its significance.

We recognize that improving the effectiveness of organizational management and establishing a safety culture are inseparable from equipment measures and that they support the assurance of nuclear safety.

Based on this understanding, JANSI will, as a professional organization, appropriately drive and support the activities of operators through a variety of measures including increasing the sophistication of diagnostic methods relating to safety culture, enhancing leadership training, supporting the development of risk management systems, CAP and other elements. I would like to ask everyone here today to take with you the fruits of today's conference and put them to use in your respective capacities.

Survey Results

90 responses collected

○On the whole, I found the keynote presentation and sessions (short speech and panel discussion) understandable and satisfactory.

○A reason why I gave high marks to the keynote presentation is that it systematically consolidated initiatives, issues and other elements that industry is currently promoting and dealing with, and the explanations were easy to understand without any difficult expressions.

○I gave high marks to the short speech in the session because it afforded the opportunity to gain knowledge about initiatives and activities to improve safety in an industry other than nuclear power and I was able to understand the basic approach of each of the panelists before moving onto the panel discussion.

○I gave high marks to the panel discussion in the session because the way in which the moderator guided the proceedings was appropriate and there was a specific and sincere discussion about building up a safety culture.

END