

Easy Establishment of Japan's Nuclear Regulatory Agency Won't Be Permitted: Securing Professionalism Engenders Safety and Trust

Tetsuo Sawada

Ph.D., Assistant Professor Research Laboratory for Nuclear Reactors
Tokyo Institute of Technology



On June 15, 2012, the House of Representatives in Japan passed the Nuclear Regulatory Commission Bill. The Liberal Democratic Party and Komeito reviewed and revised the draft put forth by the ruling Democratic Party of Japan, such that, for instance, the Commission's organizational structure would instead be an "Article 3 Committee," or a government agency with strong independence. Considered an improvement over the original draft, the final bill with all revisions intact appears likely to become law. Beginning with the appointments, the challenges now are how to actually staff and build the organization, and how to enhance genuine competency among the staff. This column discusses the appropriate format of a nuclear regulatory agency with a mission to protect citizens' lives, in order to prevent nuclear disasters like the Fukushima nuclear power plant accident to recur.

Accidents Always Arise from Unforeseen Circumstances

Just like Three-Mile Island (1979) and Chernobyl (1986), the accident at Fukushima Dai-Ichi Nuclear Power Plant occurred in the wake of unforeseen circumstances, and advanced in the midst of unforeseen circumstances.

In July 1992, a safety relief valve controlling steam within a reactor at Barsebäck Nuclear Power Plant in Sweden opened by mistake. The subsequent blowout of steam caused insulation to strip off, and part of the strainer on the intake side of the emergency reactor-core cooling pump became clogged. Safety inspections at the time set forth neither by the SKI (Swedish Nuclear Power Inspectorate) nor worldwide had foreseen this incident or ensuing development. Here was another "unexpected" incident.

SKI General Director Judith Melin seriously and respectfully acknowledged that safety inspections had not been able to identify the possibility of this incident, and strongly appealed to the Swedish Government for the assessment and evaluation of SKI's inspection capacity by international committee. In order to study the problems concerning SKI safety inspections, the Swedish Government invited opinion leaders within and outside the country to form an assessment committee. The committee noted, "Safety regulatory inspections of SKI are appropriate and high quality. Many procedures, however, are not documented." The deferential acceptance of these points by SKI led to the fresh introduction of a QMS (quality management system).

The respectful reflection on an incident by the head of the regulatory authority, solicitation of global advice with an open stance, and prompt implementation of recommendations made are quite a contrast to Japan. In 2007, the Nuclear and Industrial Safety Agency (NISA) received an IAEA evaluation of just a portion of its regulatory organization, but the subsequent called-for evaluation across the entire regulatory organization has not been conducted in Japan. The country neglected the "culture of safety" to which Japan itself had contributed ideas to, while doubtful eyes from around the world were cast towards NISA. The consequences were truly dire. The Fukushima Dai-Ichi accident occurred in the midst of this inaction.

The Nuclear Regulatory Agency scheduled for establishment in 2012 should quickly receive an assessment and evaluation by the IAEA and immediately act on those results. This activity will become the foundation to restoring trust within Japan and internationally.

3 Key Points to Regulations

Within a group composed of researchers and experts, I dug deeply for root causes lurking in the backdrop to the Fukushima Dai-Ichi accident, and identified three issues.

(1) Delay in engagement on new regulatory challenges

- (2) Delay in periodic review of existing safety regulatory policy
- (3) Process lacking where experts and opinion leaders present opposing views for examination.

What should we be doing then? A proposed counter plan is described in the sequence of (1) to (3) next.

(1) Before the Three-Mile Island accident, the U.S. NRC had compiled a general issues program (GIP) that identified problems to be studied in light of safety, and problems where regulatory policy was not established. This program established priority for matters that should be subject to regulation by considering their effectiveness towards safety and requisite costs. The GIP led to formation of a project team composed of NRC technical staff and legal personnel with respect to important safety issues for the study of regulatory policy. The legal personnel participated, since various laws provide the regulatory foundation.

The status of these studies is reported periodically to the U.S. Congress. These efforts are project based, which minimizes the impact of position transfers. Japan should also adopt a format where legal personnel participate from inception like the technical staff. Periodic reporting to the Diet is also necessary in order to ensure these efforts.

(2) The periodic review of existing safety regulations is the key to perennially effective and rational safety regulations. In this context, the NRC implements reviews every five years.

Japan's nuclear energy regulations have accumulated new regulations on top of old regulations remaining in effect, like building a roof atop the roof. Blindly forging ahead with tightened regulations will lead to compliance fatigue on-site at the power plant, diminish the trust in regulatory policy, and inflict degradation of the culture of safety. Everyone engaged in administering safety regulations for nuclear energy must be seriously aligned here. Periodic reviewing and reassembling into more rational statutes and directives are mandatory, even when existing regulations are scrapped and new regulations are established.

(3) With respect to regulations already in operation, an examination process must be established to address situations when staff members raise opposing views. At the NRC, for instance, anybody with an opposing view must first explain the matter to the head of his or her department in writing, and the relevance of the opposition will be deliberated in a study committee established immediately below the department head. If the holder of the opposing view is not satisfied with the study conclusions, the opposing view may be resubmitted ultimately to an NRC commissioner or the executive director of NRC operations for a re-examination. The results of the examination may be released, if the person with the opposing view so desires.

Safety evaluations for nuclear energy require professional expertise, yet even the professionals do not necessarily agree in their opinions. The regulatory agency, however, must still render an administrative decision. In this type of case, the stability and transparency of regulations improve as discussions and administrative decisions build on each other.

Rooted in an administrative culture spanning more than 1,000 years, the Japanese government system is not well established to capture opposing views. This condition is diametrically opposed to the culture of safety. The regulatory agency must be separated from this administrative culture. In fact, there is a way to accomplish this by creating a strongly independent government agency, called an Article 3 Committee. But the head who governs the regulatory agency with direct influence should not be a minister. Ministers in Japan frequently lack competency, and tend to be replaced frequently over short periods of time as the impact of the political climate takes its toll. Thus, the regulatory agency needs to be isolated and independent of Kasumigaseki (Japanese government departments) and Nagata-cho (Japan's political centre).

The above relates to structural issues of the program itself, but we need people to run the program. No matter how well the program is designed, missteps in its operation will lead to failures. The following recommendation discusses the people factor.

Competency Available?

The head of a regulatory agency and senior full-time staff assume critical roles in implementing responsive measures, and must thus possess sufficient professionalism to fulfill their duties. Professional expertise is a minimum requirement in handling nuclear safety regulations. Knowledge alone, however, is insufficient. Capabilities are important in terms of human qualities, such as the ability to guide issues to resolutions and the ability to successfully manage. In short, competency is needed.

Drawing from the practice in Sweden, I believe the following five perspectives should be evaluated with respect to competency.

- (1) Professionalism: Delivering professionalism with respect to nuclear reactor physics, thermohydraulics, safety evaluation methods, etc.
- (2) Personal character: Ethical decision-making, release of creativity, and strong sense of responsibility
- (3) Sociability: Cooperative stance with colleagues, networking ability
- (4) Strategic poise: Capability of judging from overall perspective with long-term outlook
- (5) Operative function: Capability of executing duties by bringing together multiple factors

In fact, these are demanded from all staff members. More senior positions will require a higher level of proficiency. Knowledge associated with nuclear reactor physics, thermohydraulics, and safety evaluation is mandatory. The head of the regulatory agency must have expert knowledge.

The director-general level where heavy responsibilities lie within the regulatory agency will require the following four qualifications.





- (1) Extensive knowledge and experience regarding nuclear reactor safety. Competency as a generalist is required on both the technical side and the organizational communication side.
- (2) Knowledge regarding how the various government institutions functions.
- (3) Knowledge of international developments in the field of nuclear reactor safety.
- (4) Excellent track record as manager and leader of scientifically and technologically sophisticated experts.

Of course, a person with all of these abilities is rare. Such director-general candidates, once named to their posts, will be ordered to improve their abilities in guiding issues to resolutions and executing management skills, wherever they lack such abilities.

Years of Service and Assignment of the Head

The term for the regulatory agency head is also a concern, because a change in top leadership of the agency within short periods is quite harmful and best avoided. The following table shows the terms for the leadership at regulatory agencies in Europe and the U.S.

Table 1. Regulatory Agency Leadership Terms for Major Countries

Country	Top Governance	Term	Number of Members
 U.S. NRC	NRC	5 years	Five appointed to Commission by President, subject to Congressional approval
 France ASN	ASN Board	6 years	Five , of which three are appointed by the President, and one each by the presidents of the National Assembly and Senate.
 Sweden SKI	General Director	7 years, on average	The highest decision-making body is the Council made up of eight , chaired by the SKI General Director.
 Finland STUK	General Director	Lifetime, until 67 years	

The following table provides the years of service of the past agency heads at NISA.

Table 2. Past Heads of NISA and Years of Service

No	NISA Head	Assumption (Term)
1st	Nobuhiko Sasaki	Jan 2001 (3.5 yr)
2nd	Kazuo Matsunaga	Jun 2004 (1.3 yr)
3rd	Kenkichi Hirose	Sep 2005 (2 yr approx.)
4th	Yasuhisa Komoda	July 200 (2 yr)
5th	Nobuaki Terasaka	July 2009 (2 yr)
6th	Hiroyuki Fukano	Aug 2011-

As the table shows, the NISA Head has alternated approximately every two years, a significant difference in length of service compared to Europe and the U.S.

The NRC Chairman appoints key officials, such as the NRR (Nuclear Reactor Regulation) Director. According to a 2005 survey, the years of service for the four past directors ranged from three to seven years, and all had career experience in the field of nuclear safety for 20 years or more before assuming the position of director. The lesson here is that the leader of Japan's regulatory agency should not be an appointment made simply by the Minister of Environment, or otherwise an appointment exploited for politics.

The senior staff of Japan's nuclear regulatory agency should be appointed with the proper competency and hold the same positions for at least five years. The Executive Director or Council with the authority to appoint the senior staff, therefore, needs to have a term of around five years like the European nations and the U.S. have, and the posts should not be assumed through rotating assignments, based on ceremonial performance evaluations.

Rely Not on Advisory Boards

What is the appropriate relationship between government nuclear energy agencies and external advisory bodies?

The IAEA asks for the following relationship modes, when a regulatory agency requests opinions from an advisory body or external consultant. These modes are the core to the culture of safety promoted by the IAEA.

"The regulatory agency shall maintain seasoned experts with the ability to evaluate the quality and results of work conducted by external consultants."

"The regulatory agency should not rely on safety evaluation made by external opinion leaders or evaluations made by businesses alone. Thus, the regulatory agency must maintain full-time staff with the capability of examining and evaluating for purposes of regulation, and of evaluating the appropriateness of such evaluations made by external opinion leaders."

"The advice of an advisory body or dedicated technology support group does not release any responsibility associated with decisions made by the regulatory agency."

Up until now, Japan's governmental administration of nuclear regulations has appointed academic experts from university, for example, to the Nuclear Safety Commission and advisory committees. The responses received from these committees supplemented the lack of professionalism at the regulatory agencies, but therein lay a large issue and defect. The resulting structure fostered a monoculture of coziness called the "Nuclear Village."

The bulk of inspection standards employed for safety inspections in Japan has been established by the Nuclear Safety Commission as an advisory body. No other nation has taken this approach, however.

For efficiency and speed in governmental administrative decision-making, for clear identification of responsibilities, and for improved capability of reporting to citizens, the nuclear regulatory agency must increase its numbers of full-time staff who have seasoned professional expertise associated with nuclear energy, and train these ranks to become professional

administrators of nuclear energy.

In Japan, the assignments within the public sector for regulatory administrative personnel have proceeded under a regular succession plan. Such practice is the most harmful for regulation, and exposed its harm in the response by NISA after the Fukushima Dai-Ichi Nuclear Power Plant accident.

At the least, direct hiring into the regulatory agency should take place for candidates desiring regulatory work among those who pass the national civil service examination. That arrangement would provide fundamental retention and improvement to the professionalism associated with regulations. Assignment to the nuclear regulatory agency in opposition to the wishes or intentions of those hired to work at other ministries or agencies must be forbidden.

The immediate securing of specialized knowledge, however, will require the employment of private-sector experts. Such hiring is authorized under the National Civil Service Law, Article 36, where the National Personnel Agency rule establishes an exception to hire private-sector human resources for revitalizing government concerns.

The Law Concerning Exceptions to Hiring and Compensation for Term-Attached Staff for General Positions [trans.] also authorizes hiring for a limited term. Based on these laws, hiring of private-sector human resources would appear to be important. In such cases, however, aggressive appointments of hirees from the private sector to managerial positions based on the principle of competency should take place, with the elimination of any discrimination between those passing the national civil service exam. This step is indispensable in securing human resources and stimulating the organization.

In order to supplement the lack of professional caliber in the past, critical parts of regulations have depended on an advisory program constituted by experts, such as university academics, whose competency was sought. This system aggravated the Fukushima accident, and made the post-accident effects more dire. The advisory mechanism of leaning on each other and structure of coziness are no longer permissible.

Disallowing Political Intervention

Examining the sequence of events after the Fukushima Dai-Ichi accident reveals a frequent change in tone to the announcements made by the Minister in charge. The behavior has been criticized as populism. The nuclear regulatory agency, whether under the government's proposed scheme or the LDP-New Komeito scheme, currently hangs off of the Ministry of Environment. This structure signifies the potential for political intervention or political exploitation, and is quite harmful.

An important subject is selecting the leader for the regulatory agency. Scientists and experts associated with nuclear energy in Japan appear to have no qualifications, since they have managed in practice to neglect any substantive regulations in relation to severe accidents over the past 30 years. Yet the experts outside the domain of nuclear energy lack the most critically needed competency in terms of expert knowledge of nuclear energy.

Japan stands today as a developing nation in terms of nuclear regulatory affairs. What shall we do? Ideally, among the five advanced nuclear regulatory nations noted above, the best solution would be to select and invite somebody from Sweden or Finland, since these nations have renounced nuclear arms. Moreover, they have taken their own innovative and sincere steps across regulatory administration in general, including severe accidents, since the Three-Mile Island accident. It was further intensified after the Chernobyl. The U.S. would be the next best option, but a difficult one politically and legally. In any event, the people who learn deeply from the insights of these countries should take those jobs at the top and senior levels.

At the same time, many staff, not just the senior staff, should engage actively in exchanges with the regulatory agencies in Europe and the U.S., argue the different views based on the experiences of different nations, and nurture a culture of safety for Japan.

The establishment of a quality management system (QMS) is key for the nuclear regulatory agency to gain tangible results in regulatory administration. The QMS describes the specific implementation of the agency's mission, details the activities for accomplishing the mission, and establishes the policy for securing the training of human resources for the mission. The status of implementation calls for self-evaluation and third-party evaluation, and necessary corrections are made. The IAEA guidelines related to regulatory organizations also call for the regulatory agency to build a QMS.

When NISA received IAEA inspections in 2007, the continuation of QMS structuring activity was recommended. The structuring and implementation of the QMS by the nuclear regulatory agency is an absolute requirement for shoring up Japan’s nuclear energy safety regulations to an international level. Naturally, the actual QMS operations must not remain confined to documentation work, but have substance. Here again, the pedigree of the leader is in question, as to whether implementation with actual effectiveness is possible. Otherwise, no nation—Japan included—has the qualifications to handle nuclear energy.

Table 3. Comparison of Government Proposal vs. LDP-New Komeito Proposal

	Govt. Proposal	LDP-New Komeito Proposal
Authority under accident	Nuclear Energy Disaster Response HQ (Headed by PM)	Nuclear Regulatory Commission (55 commissioners)
Positioning of regulatory agency	External bureau of Ministry of the Environment (scale of 500 people). Parallel installment of Nuclear Safety Commission (5 commissioners)	Secretariat of NRC (scale of 500 people)
Dependence	Regulatory Agency entrusted by MOE in establishing regulatory legislation. Minister of the Environment appoints Agency Head.	NRC established as Article 3 Committee under MOE jurisdiction. Regulatory legislation drafted independently by NRC, and submitted by Minister of the Environment. Commission members to be approved by the Diet.

Reference: Tetsuo Sawada, *The Truth about Fukushima Nuclear Power Plant that Nobody Wrote About*, Chapter 5: Four Keys to Recovery of Nuclear Power Plants [title trans.], (2012, WAC).

Profile

Tetsuo Sawada

Doctorate of Engineering, Assistant Professor, Research Laboratory for Nuclear Reactors, Tokyo Institute of Technology. Born in 1957, and was graduated from Physical Sciences Division, Faculty of Science, Kyoto University. Entered Mitsubishi Research Institute, transferred to Karlsruhe Institute of Technology (1989-1991), and subsequently assumed position at TIT. Specialization in nuclear engineering with emphasis in nuclear safety, nuclear nonproliferation, and nuclear security. Recent interests include engaging with problem groups beset by nuclear energy in social systems, and elementary and secondary education of nuclear energy and radiation. Recent publication: *The Truth about Fukushima Nuclear Power Plant that Nobody Wrote About* [title trans.], (2012, WAC).

(Published June 18, 2012 in [Japanese](#))