

The Goal of Nuclear Regulation is Comprehensive Risk Reduction

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NRA and NRC

The Japanese Nuclear Regulatory Authority (NRA) uses the same Japanese name with the US Nuclear Regulatory Commission (NRC). Unfortunately, the quality of Japanese NRA is completely low, comparing with that of US-NRC.

US-NRC mainly considers the Risk on Nuclear Safety. They audit the licensee activities using comprehensive risks as the safety scale. The NRC staffs are professionals on nuclear engineering and science. They are highly educated continuously at NRC education center. Two key words show the NRC policy, i.e., "We trust Licensees, but verify them." and "What is significant in a risk?"

Japanese NRA does not consider overall Nuclear Safety, but do consider the small visible Risk. Their safety scale is based on newspapers. Therefore, they just try to make the regulatory rule to be severest. The officers are not the nuclear specialist. They have very few experiences on the nuclear power plant (NPP). They are just sticking on the small risk in their specialized field. At an international conference held in Tokyo in April 2013, one NRA commissioner did not answer the question regarding the Active Fault Risk. He said that he is not a specialist on the field. He should have the responsibility on the decision by the commission. However, he escaped from the simple questions. This is surely unqualified as the commissioner. US-NRC commissioner never would make such an answer. I understood that the NRA officers have little knowledge on nuclear safety. Furthermore, NRA commissioners also have little knowledge. A very sad thing.

The nuclear safety can be sustained with the comprehensive risk reduction at the NPP. However, they focus on the small risk, which may increase the comprehensive risk without communicating with stakeholders.

History of Nuclear Regulation

Malfunction of nuclear regulation could cause the NPP accidents, therefore, the regulation system in the world has been continuously improved. In 1980s, just after the TMI accident, the US regulatory body regulated the licensee with charging the penalty. However, they realized that the nuclear safety cannot be sustained with these penalty based regulation. They had lots of discussion with many stakeholders including the licensees, resulting in the development of Nuclear Regulation in 1990s. The new regulation was based on the Continuous Improvement and Performance. Actually, they learned the continuous improvement system from Japan, i.e. KAIZEN. The regulatory body and licensees understood that the nuclear safety is their common goal. Safe NPP is peoples' request, also, Safe NPP can generate more electric power than unsafe NPP. Finally, US-NRC changed their regulatory policy from penalty based (north wind) to risk and performance based (sunshine). They showed the big incentive to the licensees. Safe NPP could earn big money, while unsafe NPP could lose big money. The licensees worked to reduce the comprehensive risk of NPP and improve the NPP system to be safe. By this, the US NPPs have low risks and capacity factor also increased exceeding 90%.

In 1990s, US regulatory system was improving drastically based on risk and performance. However, Japanese regulatory system had no improvement. The safety culture of Japan has completely de-gradated. The main goal of the regulatory body was to satisfy the law. Although the manual had few improvements on nuclear safety, regulatory body ordered the licensees to follow the manual. If the licensee failed to satisfy the manual in very small portion, the regulatory body ordered huge penalty. The Japanese system was turning back to the 1980s US.

When the licensees tried to improve the nuclear safety, usually it was not written in the manual. Therefore, the modification of the manual, i.e., nuclear safety improvement, needed very huge efforts. Licensees then did not want the improvement and just followed the regulatory body's order, i.e., the manual. The inverse incentive system had been applied to NPP. As a result, very few improvements had been adopted to Japanese NPP in 1990s and 2000s. The risk evaluation by the external event

(which had been done in US in the 1990s) are not carried out yet. Risk-informed-Regulation (in 1990s US) is also not taken into account now, and will not be taken for another 10 years. The Japanese Regulatory system is a very very old one, a system more than 30 years behind.

Worst thing was, the licensees accepted the old system completely, and never considered to make further improvements. They just followed the regulatory body's order. Japanese regulatory's wrong concept prevailed the NPP. No NPP people wanted the KAIZEN. These malfunction of the Japanese regulatory system were the root cause of the Fukushima-Daiichi Accident.

The author expected that the new NRA will overcome the old regulatory system and improve it to be world standard. However, NRA has not. The officers at the new NRA are the same persons at the Nuclear and Industrial Safety Agency (NISA), the very people who caused the Fukushima-Daiichi Accident with malfunctioning regulation system. They are creating the same malfunctioning regulation, even now. The NRA commissioners are also supporting the wrong regulation. Author is apprehensive about potential accidents induced by the regulation.

Comprehensive Risk Reduction

As discussed above, the regulatory system should be based on the risk. The risk is a comprehensive risk, not just a local risk. However, NRA focuses on the small local risks. They say that the Japanese regulation is the world severest one. This is completely wrong. All nuclear professional would never say that. Strict regulation has no relation to improvements in Nuclear Safety, but it may reduce newspaper risk, a measure against media. Severe regulation degrades the nuclear safety, because the severe regulation in one part can increase the risks in another part, causing the comprehensive risks to increase. It is well known that all countermeasures can reduce the target risk, however, it also increases the risk in other parts. After 9.11, many people used cars instead of airplanes, causing deaths by the car accidents to increase. They were not killed by the terrorism, but killed by car accidents. When a countermeasure is introduced, other negative effects should be carefully checked and considered. Nevertheless, the NRA ordered to install many hardware to prevent the severe accident. The hardware may be useful for the case of severe accident, but, it may induce high risks for the normal operation and/or maintenance. The nuclear safety can only be sustained with considering the comprehensive risks, not just focusing on a local risk they came up with.

NRA said that they consider the risk of NPP. However, in my understandings, they just consider local risk and newspaper risk. Discussion on the active fault was completely wrong. They did not discuss the nuclear safety, but something with zero risk.

NRA and DPJ

Present NRA is the same with the former DPJ government (Democratic Party of Japan). Amateur politicians just stuck on the local risk without deep thinking, causing Japan's comprehensive risk to increase. Amateur NRA officers just stuck on the local risk without deep thinking, causing the NPP comprehensive risk to increase. Now DPJ are gone, and LDP (Liberal Democratic Party) government with professional politicians seems to lead us to a brighter future, with considering the comprehensive risks. NRA bureaucrat cannot be replaced because of the one way rule. It seems very dangerous. Imagine that the DPJ government were to have continued forever.

For Nuclear Safety, regulatory body and licensees have the same positions. They should focus on the comprehensive risks to improve the nuclear safety. All nuclear power plants have their own characteristics. It should be evaluated at site by site, plant by plant. The amateur NRA is not a teacher to licensees, nor the licensee a student. If NRA creates wrong regulation with their authoritative power, it might be the same like DPJ government.

Sincere communication for the nuclear safety by the regulator and licensees is the only solution to improve the nuclear safety.

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