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**To the International Workshop on Nuclear Energy Safety  
Beijing, China  
June 29-30, 2011**

**“Who Ensures That a Nuclear Safety Agency Is  
Actually Carrying Out its Mission to Protect the Public?”**

- 1) Regardless of the cultural context, the fundamental mission of any national Nuclear Safety Agency is:
  - a) To minimize the occurrence of core-damaging nuclear accidents through rigorous regulation of nuclear reactor design, engineering, siting, construction, personnel training, and operations;
  - b) To safely contain radioactivity that could harm plant workers, public health, and the environment should a core-damaging accident nonetheless occur; and
  - c) To reduce radiation hazards to exposed populations and the environment through timely evacuations, sheltering-in-place, and other emergency measures should containment fail, in circumstances where planning to implement such measures is believed to have a reasonable prospect of being feasible and effective.
- 2) In the United States, Russia, Japan, and other countries that have experienced nuclear accidents, nuclear safety regulation has failed to achieve one or more of the preceding objectives.
- 3) These regulatory failures have common origins, including:
  - a) Approval of flawed nuclear reactor designs with known safety weaknesses;
  - b) Arbitrary exclusion of core meltdown accidents from the “plant design basis” for ensuring containment integrity, allowing the licensing of containment buildings whose structural integrity depends upon the successful functioning of emergency core cooling systems – the “worst case” scenario considered for licensing is therefore a temporary “loss of coolant accident” (LOCA) that is quickly terminated by a flood of water injected into the core by an always effective Emergency Core Cooling System (ECCS).
  - c) Failure to consider multiple “triggering events” (for example a cyclone followed by an electrical fire and explosion) leading to multiple simultaneous failures of critical reactor safety systems.
  - d) Inadequate operator training and unspecified emergency procedures, especially with regard to reactor control under abnormal operating conditions;

- e) Inadequate requirements for robust instrumentation systems to monitor key operating parameters under accident conditions;
  - f) Grossly negligent enforcement of equipment maintenance/replacement requirements related to nuclear safety, including:
    - i) delaying the repair of unsafe conditions to coincide with refueling outages;
    - ii) granting frequent “variances” and “exceptions” to existing requirements;
    - iii) modifying and “reinterpreting” regulations to match the degraded conditions of the plant, rather than repairing the plant to bring it into compliance with existing regulations;
  - g) Allowing *decades* rather than days, weeks, or months for the installation of critical nuclear safety upgrades, such as those dealing with the threat of containment over-pressurization, and with ensuring multiple independent fire-resistant pathways for electrically-actuated reactor safety systems.
  - h) Failing to ensure that such critical safety systems and “back-fits” are not only installed but also *maintained* in operable condition, and *will in fact operate* in severe accident conditions, when they are most needed.
  - i) Placing the economic needs of the nuclear plant owners ahead of the agency’s nuclear safety mission to protect the public.
- 4) These negligent actions by regulators are often mistakenly characterized as being “pro-nuclear” in character because they reduce the economic costs incurred by plant owners to maintain their operating licenses:
- a) It is important to recognize that the very opposite is true – the costs of broad nuclear regulatory compliance are likely less than those of one serious nuclear accident, and more importantly—
  - b) Nuclear accidents profoundly undermine the confidence of the general public and world capital markets in nuclear power, and can impair its future growth for an entire generation;
  - c) Ironically, “industry-friendly” regulation represents a *profoundly anti-nuclear* position!
- 5) Given the above historical realities and challenges affecting nuclear safety regulation, how should China organize its nuclear safety effort at the national level to ensure that any nominally “independent” nuclear safety regulator:
- a) Stays independent and is not “captured” by the commercial nuclear industry it regulates;
  - b) Effectively withstands undue pressures by new nuclear technology advocates, inside or outside the federal government apparatus, to approve new types of nuclear reactors and fuel-cycle facilities that may have unresolved or perhaps even *undisclosed* safety issues;

- c) Credibly informs the rest of the government, the public, and neighboring countries regarding the actual characteristics and condition of China's existing and proposed nuclear facilities, and their current levels of operating risk;
  - d) Is publicly accountable in some meaningful way to the legislative representatives of the Chinese people that the nuclear agency is obligated under law to protect;
  - e) Remains open to the acquisition of new nuclear safety knowledge, and to the views and concerns of independent technical experts, as well as ordinary citizens living within the evacuation zone of nuclear facilities
- 6) Meeting these nuclear oversight goals has not been achieved reliably and uniformly in the United States or in any other nuclear state, but this should not distract us from the following important insight:
- 7) *The very existence of some form of credible nuclear oversight process* by the legislative branch of government has important benefits, even if it often falls short of ensuring consistent accountability and transparency in matters of nuclear safety. These benefits are:
- a) Ascertaining the truth about important matters of nuclear safety, by overcoming the natural tendency of regulators to obscure data and industry practices that could be viewed as indicating a threat to public safety
  - b) By insisting on full disclosure and discussion of important nuclear safety issues, the legislative "overseers" can help assure that nuclear industry performance actually corresponds to the level of protection mandated by Atomic Energy law, and the regulations that are based upon it.
  - c) Oversight by the legislative branch of government – in China's case represented by the *Standing Committee of the National People's Congress* (NPCSC) – can expose the existence of a nuclear safety issue, and thereby cause corrective measures to be taken.
  - d) When nuclear safety agency or industry managers are ignoring or minimizing expert opinions suggesting the existence of a safety problem, the very fact that participants in the dispute would have to prepare arguments to be presented and defended in an open proceeding, before a "nuclear safety committee" of the NPCSC, would serve to clarify the main issues in dispute, and cause them to be taken more seriously by the Nuclear Safety Agency.
- 8) Continuing Oversight by the NPCSC could:
- a) Develop a public record of the circumstances surrounding accidents or near-accidents at nuclear facilities;
  - b) Identify regulatory gaps and weaknesses that may have contributed to the dangerous nuclear incident;
  - c) Consider the need for new legislation or regulations to remedy these gaps and weaknesses and further reduce nuclear risks;

- d) Expose nuclear projects that are fraudulent, well-intentioned but technically misguided, or likely to serve narrow business or technical agendas at the expense of the broader public interest.
- 9) Following the partial core melt that occurred during the Three Mile Island accident in March 1979, the independent “Kemeny Commission,” charged by President Carter with investigating the causes and consequences of the accident, recommended a “total restructuring” of the U.S. Nuclear Regulatory Commission that:
- a) Sought to abolish the five-member commission which had functioned so poorly in responding to the accident, and replace it by “an independent agency within the executive branch, headed by a single administrator who is in every sense chief executive officer...” (This change was never implemented).
  - b) But another unimplemented Kemeny Commission recommendation continues to have relevance today to both China and the U.S:
  - c) Both a restructured nuclear safety agency and the nuclear industry should be scrutinized by *an independent nuclear safety advisory committee* with investigative powers that reports annually on their performance to legislative oversight committees and the public.
  - d) The purpose of such independent nuclear safety review committees, comprised of independent nuclear experts from academia, government laboratories, NGO’s and the realm of labor and business, would be:
    - i) to inform the nuclear safety deliberations of oversight committees in the U.S. Congress and the NPCSC, and;
    - ii) become permanent advocates for improvements to nuclear safety in both countries.

Thank you for your attention, and I look forward to your comments and questions.