

# General Conference

**GC(49)/INF/9**

Date: 23 September 2005

**General Distribution**  
Original: English

---

## Forty-ninth regular session

Item 15 of the provisional agenda  
(GC(49)/1)

# Letter from the Chairman of the International Nuclear Safety Group

On 24 August 2005, Dr. Richard Meserve, the Chairman of the International Nuclear Safety Group (INSAG) submitted to the IAEA, via a letter to the Director General, his perspectives concerning the worldwide nuclear safety environment. The Group is focussing on four areas: Operational Safety, the Global Safety Regime, Safety Principles, and Stakeholder Outreach. The Director General wishes to share the analysis provided by the INSAG Chairman with all delegates to the General Conference. The transcript of the substantive parts of Dr. Meserve's letter is given below:

“I am writing to you in my role as Chairman of the International Nuclear Safety Group (INSAG). As you know, INSAG's Terms of Reference require that it provide “recommendations and opinions on current and emerging nuclear safety issues” to the IAEA and others. This letter is one of the vehicles by which INSAG seeks to fulfil that responsibility.

“I shall seek to provide an overall assessment of the state of nuclear safety and then turn to certain issues that I believe warrant careful scrutiny in the years ahead. This letter will focus on nuclear power plants.

“INSAG is not able to provide a complete assessment of global nuclear safety because of the limitations that must attend a part-time, volunteer group such as ours. Although we have not undertaken inspections or detailed assessments of particular facilities – and do not have the capability to do so – we bring perspectives on safety from many points on the globe. Moreover, we have obtained insights on safety-related issues from discussions with the IAEA staff, from interactions with WANO, from participation in global conferences, and individual involvement with nuclear regulators, nuclear researchers, and the nuclear industry. Thus, although our assessment does not arise from comprehensive first-hand study, we believe that it does reflect informed judgment.

“There are approximately 440 nuclear power plants around the globe contributing roughly 16% of the world's total generation of electrical energy. Because electricity is a central and indispensable foundation for societal activities and for economic growth, nuclear energy is making a significant contribution to the well-being of the world's people. Indeed, in our view, its importance will grow in the years ahead. Climate change is one of the most pressing challenges confronting humankind and part of the global response must surely involve increased reliance on sources of energy that do not contribute greenhouse gases. The environmental benefits of nuclear power are thus even more important today than they have been in the past.

“The public has particular concerns about the risks that attend nuclear power and, thus, the ability to secure the benefits of nuclear power is dependent on assuring public confidence through the maintenance of safe operations. This reinforces the obligation of all those associated with nuclear power – operators, regulators, vendors, and contractors – to ensure safety by maintaining a high level of vigilance. It is a commonplace but nonetheless valid observation that a nuclear accident anywhere will have significant consequences around the globe, if only through an indirect impact on public opinion. There thus is world-wide interest in ensuring that all nuclear operations maintain a high level of safety. Moreover, those involved with nuclear power have a responsibility to engage the public in appropriate fora to address public concerns and issues and to enhance public understanding

“One additional element has come to the fore as a result of the terrorist events of 9/11, and the subsequent terrorist activities in London, Madrid, Beslan, and elsewhere. Our infrastructure, including our energy infrastructure, may be vulnerable to exploitation by terrorists. Although INSAG’s scrutiny does not extend to security-related matters, we note that safety and security are inextricably linked and that both require focused attention. Perhaps because attention to security has recently been elevated and security approaches differ, there may be more unevenness in attention to security from country to country than to safety. Nonetheless, we perceive that security has, in general, increased. Nuclear power plants are usually the most secure facilities in any country’s energy infrastructure.

“The safety performance of nuclear power plants continues to show steady gains, although there has been some levelling off of performance recently. Plant-based safety indicators (e.g., measures of such things as actuation of reactor safety equipment, availability of safety-related equipment, and unplanned shutdowns) have shown improvement over a period of decades. These improvements can be attributed to greater management attention to operations, maintenance, training, diagnostic and assessment technology, and system upgrades. This steady enhancement in performance is impressive and, as a general matter, is reassuring”.

“Nonetheless, there are challenges with which we must grapple. Noteworthy events continue to occur around the globe, including events at reactors operating in countries with extensive operational experience and strong regulatory capabilities. Fortunately, none of the recent events has resulted in a substantial off-site release of radioactivity. But these events reinforce that assuring safety must be embedded in the management and cultural practices of both operators and regulators and is a day-in and day-out obligation to which constant attention must be provided. In this respect, the maintenance and enhancement of safety culture is a continuing challenge and obligation.

“The challenges that I noted in my letter to you of August 18, 2004, continue to be of overarching concern. These issues include:

- Complacency from uneventful past operations. Nothing is more corrosive to continued safety performance than a belief that the safety challenge has been “solved” and that attention can be focused on other matters. As a result, there is a need to resist economic pressures for cutbacks on safety investments when things are going well. Operators must recognize that every nuclear power plant needs continuing investments in staff and staff training, systems, and equipment.
- Aging nuclear power plants. Aging plants present a continuing safety challenge because equipment can deteriorate with time and older plants may not have all the safety features and characteristics that attend facilities with more modern designs. The interest in the extension of the lives of nuclear plants means that attention to issues associated with aging is of increasing importance.
- Decay in the nuclear infrastructure. The nuclear slowdown of the past two decades has resulted in a smaller cadre of highly qualified experts, fewer graduates in nuclear engineering,

and less global financing for safety research than 20 years ago. A focused effort to rebuild the nuclear infrastructure should be a high priority, but progress is slow.

- Nuclear waste. The resolution of issues associated with the disposition of nuclear waste, particularly those associated with spent fuel, continues to prove elusive. Progress on the safe disposal of nuclear waste is important if reliance on nuclear power is to remain a viable, long-term energy option.

“These are abiding challenges and we remain concerned about them. These challenges are now widely recognized but, in our view, they deserve continuing attention.

“There are several other matters that have not received the consideration that they deserve. Some are particular aspects of the broader issues mentioned above. These include the following:

- Analysis of operating experience. We are concerned that the lessons to be learned from operating experience are not being applied as effectively as they should be. One of the most important ways to anticipate and prevent possible problems is to analyze and learn from the relevant experience of others and to put in place corrective measures to forestall an accident. In this connection, communication about “near-misses” is important because analysis of such events can indicate ways of avoiding sequences that could lead to a serious accident. There are global systems by which regulators report safety-related information, but we are not confident that all relevant events and observations are reported. Moreover, we are concerned that there are inadequate mechanisms to sort and analyze the information, to distill and prioritize the lessons that should be learned, and to propagate these lessons widely in a user-friendly fashion. We now have more than 12,000 reactor-years of experience and the knowledge from that experience should be marshaled far more effectively than it has been to date to guide operators and regulators worldwide. INSAG is continuing to examine this issue and hopes to develop some specific recommendations for change.
- Reliance on Contractors. Perhaps in response to the problem, noted above, of retaining sufficient staff with the necessary sophisticated skills, there is increasing reliance by many operators on contractors as a means for addressing safety-related concerns. Although we recognize and endorse efforts to ensure that appropriate nuclear expertise is brought to bear on problems, operators cannot contract away their responsibility to maintain a core competency on nuclear safety matters. We are concerned that the nuclear skills in the operators’ organizations may, in some cases, be getting thin. This concern is heightened by the trend in some enterprises with operational responsibility for nuclear reactors to rely increasingly on managers with financial experience, at the expense of those with nuclear experience.
- External Events. Reactors must be designed and operated in order to be able to withstand external events – earthquakes, hurricanes, tornadoes, flooding, loss of off-site power, and so forth. The capacity of a plant to withstand such events is accommodated in design by providing an assessment of events that have a certain likelihood of occurring over the lifetime of the reactor and undertaking studies to ensure that the design can accommodate such events without any compromise of safety. Such precautions are important because probabilistic safety assessments typically reveal that the core damage frequency arising from external events is comparable to that from internal events. There have a number of external events – for example, flooding in France, Russia, and Finland, the tsunami affecting a reactor in India, and an earthquake in Armenia – that have challenged operators. The plants were able to accommodate these events, but it appears that extreme events may be occurring more frequently or with greater magnitudes than had been estimated from the historical record. If so, it is necessary to revisit the safety studies to verify that these events are adequately

addressed in the design and to ensure that operators are prepared to respond effectively. These preparations are particularly important because, by their very nature, external events may limit the capacity to replenish and augment onsite resources.

- New construction. The construction of new power plants is occurring in Asia and Finland and it appears likely that extensive new construction may well commence elsewhere in the decade ahead. This presents a cluster of interrelated challenges:
  - Because the nuclear industry is now an increasingly international enterprise, there are opportunities and obligations for regulators to work together to ensure that adequate safety is maintained, while needless roadblocks are eliminated.
  - There is a need to build or strengthen regulatory capacities in countries that are expanding their reliance on nuclear power. In this connection, such countries should make use of international regulatory networks, including multinational, regional, and bilateral mechanisms.
  - Although in the past the research that underlies nuclear safety was largely generated through national and international bodies, increasingly such research is in the control of the vendors and their contractors. Vendors may now have a special obligation to ensure that the world nuclear community has the opportunity to access and apply that knowledge. Moreover, the public investment in nuclear safety research may now be insufficient.
  - New construction will aggravate the shortfall in human resources mentioned above, at least in the short-term. We recognize that the enhanced prospects for nuclear power should encourage an increased supply of skilled staff over the long term.

“Other challenges may also warrant scrutiny, but these seem to us to be of current importance.”