

Technical Support Organization Conference

23–27 April 2007, Aix-en-Provence, France

The International Conference on the Challenges faced by Technical and Scientific Support Organizations (TSOs) in Enhancing Nuclear Safety was held in Aix-en-Provence, France, from 23 to 27 April 2007. A total of 170 participants from 45 countries, four international organizations and two observers participated in the conference.

The conference concluded that TSOs are playing an important role in the safe, reliable and secure use of nuclear energy and associated technologies in a technically sound manner and are thus an essential participant in efforts to achieve global energy security and sustainable development. The importance of TSOs having a strong knowledge base and technical competencies, including adequate resources was affirmed, and it was agreed that TSOs should be able to provide independent technical and scientific advice without pressure from outside bodies. In addition, effective regional and international cooperation between TSOs was considered important in ensuring and continuously improving their ability to provide services necessary for safety. It was further agreed that TSOs should meet regularly to discuss common challenges and to exchange and share experience.

The conference identified a number of recommendations to be considered by TSOs, regulatory authorities, national governments, relevant international and regional



The conference opening.

organizations, the nuclear industry and other stakeholders.


The recommendations of the conference, especially those addressed at the IAEA, will be analyzed to see how these can be incorporated into the IAEA's programme. It is important to strengthen technical and scientific support, especially to the regulators, in the context of enhancing the Global Nuclear Safety Regime. The discussions clearly indicated that TSOs are seeking clarification with respect to their role and are requesting common guidance coordinated by the IAEA.

A message from Philippe Jamet — Director, Division of Nuclear Installation Safety



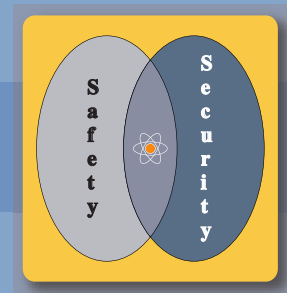
It is an honour and a privilege for me to have been designated as Director of the Division of Nuclear Installation Safety, and I am well aware of the great responsibility that this position brings with it. Since the beginning of my professional life I have been strongly involved both in the area of safety as well as of international cooperation at the French Atomic Energy Commission, the Institute for Radioprotection and Nuclear Safety and also as a member of the French Advisory Groups for Reactor Safety and Waste Management. I could therefore not hope for a better position than the present one.

I am a strong believer in teamwork. Since my arrival, I have not ceased to be impressed by the quality of the staff and by their diversity. It is my impression that their standard of professionalism and their dedication to work are extremely high. I strongly believe that teamwork is the best way to fulfill our mission with the greatest added value. Furthermore, I am convinced that it is the best way to attain personal accomplishment in our professional lives. I will do my best to promote team spirit as a part of our work.



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NS Update



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Current safety activities and developments taking place in the Department of Nuclear Safety and Security

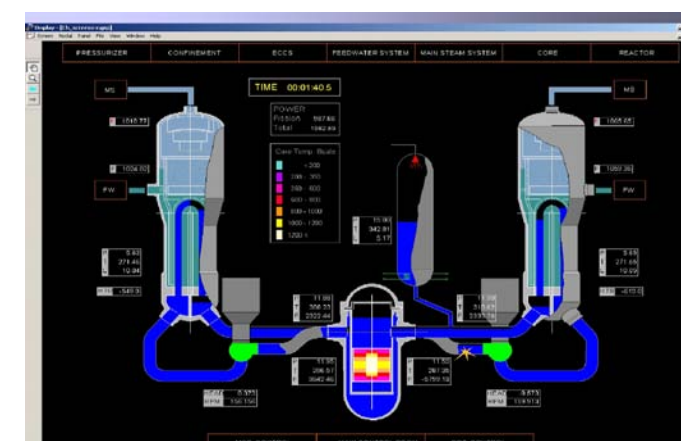
<http://www.iaea.org/OurWork/ST/NS>

Centre for Advanced Safety Assessment Tools (CASAT)

The objective of the IAEA's Programme on Nuclear Safety and Security is to increase the capability of Member States to achieve and maintain a high level of safety and security in nuclear installations under design, construction or in operation. This is being accomplished through the development of a coherent and authoritative suite of internationally accepted safety standards, by supporting an integrated approach to their application and promoting the networking of information and knowledge. Safety standards can only be applied if adequate technical safety assessment capabilities are available. Safety assessments are complex by nature and require a significant multidisciplinary effort, extensive skills and experience, analytical methods and supporting information. To improve the efficiency of safety assessment methods, ensure transparency in their validation and application and establish an excellent knowledge base and training programmes, the IAEA's Centre for Advanced Safety Assessment Tools (CASAT) has therefore been formed. The Centre is not a new development at the IAEA but a function of the Safety Assessment Section of the Division of Nuclear Installation Safety.

The Centre addresses the need for continuous technical support mechanisms for safety assessment methods. It provides support to Member States to enhance their safety assessment capabilities for present and future generations of nuclear systems, with a special focus on countries with a developing nuclear technology and nuclear safety infrastructure. It serves as a consolidated repository of relevant safety analysis knowledge, provides for focused training including advanced analytical simulations, and supports collaboration on safety assessment projects among Member States.

The resources provided through CASAT include codes, models, databases, verification and validation information, analytical procedures and guides. In order to



Example of a CASAT simulation screen.

assure effective configuration control and support a limited number of high quality, internationally tested computer codes are deposited within CASAT. Currently the codes cover design basis accidents, beyond design basis accidents and probabilistic safety assessment. Organizations may request access to a code through their respective Permanent Mission, specifying their particular training needs. Access to codes implies the possibility to perform calculations for training purposes without downloading, copying or modifying the code.

CASAT uses an internet based system that offers Member States a means for collaboration on safety assessment methods and tools. The Coordinated Research Project on Uncertainties in Best Estimate Safety Analysis, initiated in October 2006, is the pilot project for the use of the collaboration features offered by CASAT. The internet based system is also a powerful instrument for facilitating distance learning. In this connection, a safety assessment training curriculum is being prepared aimed at the focused and result oriented development of safety assessment skills that will allow the effective utilization of best expert resources in Member States.

Recovery of Sources — a New Strategy

The new Radioactive Source Technical Coordination Group (RSTCG)

It is essential that all IAEA activities related to the control and management of radioactive sources is provided in a consistent, harmonized and coordinated manner. The main purpose of the recently established Radioactive Source Technical Coordination Group (RSTCG) is to facilitate the technical coordination of activities of the IAEA related to the control and management of radioactive sources through the development of common approaches in technical matters and to advise the management of the relevant Divisions.

Why is it needed?

Recognizing the risk associated with disused, and in many cases abandoned, orphan radioactive sources and the number of accidents that have had a wide range of consequences including widespread contamination and deterministic health effects, the IAEA has embarked on various activities dealing with the recovery and safe and secure management of disused radioactive sources. These activities include the provision of direct assistance to Member States for the recovery, conditioning and safe and secure storage of radioactive sources. While the radiological safety aspects of the management of disused radioactive sources have received attention for many years, physical security concerns have received increased attention since the events of 11th September 2001. There is an obvious need to coordinate all these different activities to ensure that certain actions will not preclude or hinder subsequent steps, to avoid duplication and to facilitate the efficient use of funds.

The strategy

A systematic approach has been developed to decide on the most appropriate actions to strengthen control over Category 1-3 radioactive sources (IAEA Categorization of Radioactive Sources, Safety Guide RS-G 1.9). Depending on the status of the radioactive source (in use, disused, or orphan) and the actual technical, safety and security situation, several options exist to ensure the source is properly brought or maintained under control.

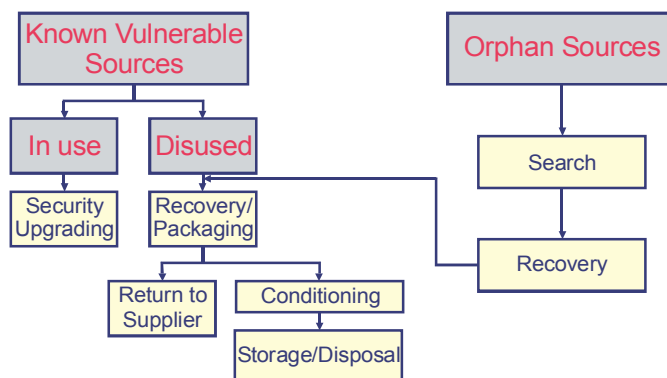


Figure 1: Strengthening control over radioactive sources

For example, if a source is in use but not secured, it is necessary to upgrade the security of the facility by implementing more robust security measures. Disused and recovered orphan sources, on the other hand, need to be removed from their respective facilities and equipment and returned to the original supplier if known and if possible. If returning a source is not possible, it needs to be conditioned and arranged for long term storage under appropriate safety and security conditions. These options are also shown in Fig. 1.

Implementation of the strategy

The IAEA works closely together with Member States to improve the safety and security of radioactive sources worldwide. Besides the IAEA Technical Assistance Programme and Technical Cooperation Fund, donor States provide significant financial contribution to the Nuclear Security Fund and/or direct technical support to other States to recover, condition and transfer into safe and secure storage facilities disused sources (Fig. 2) and to upgrade the physical protection of sources in use. Under the USA-Russian Federation-IAEA ("Tripartite") Initiative disused sources of a total activity of 2120 TBq (57251 Ci) were recovered and transported into safe and secure storage facilities in six countries of the former Soviet Union. Additionally, thirteen countries in the region received security upgrades at source facilities as part of this Initiative. Canada is also funding such work in this region. Similar activities have started and are being carried out in South-Eastern Europe, the Middle East and Africa with financial donations from the EU and other countries.

The IAEA is facilitating the repatriation of disused radioactive sources, at least those which can be recycled or reused. A number of Radioisotope Thermoelectric Generators (RTGs) and sealed sources containing ²³⁹Pu and ²⁴¹Am have been recovered and have either been repatriated to the country of origin or conditioned and stored for repatriation at a later date. However, the repatriation of disused radioactive sources to countries of origin presents a number of issues and challenges. Combined with the technical issues associated with source recovery and collection is the issue of availability of certified transport packages and shipper organizations. It is difficult to arrange for transport packages and to identify shipping companies who are willing to undertake these operations. Additionally, national legislations in some countries do not allow the import of radioactive waste. International support and cooperation is needed in order to solve these problems.

A new concept has been developed by the IAEA to recover, condition and package for long-term storage spent high activity sources (SHARS) on-site, using a mobile hot cell and storage container, both of which were designed and constructed by the Nuclear Energy



Figure 2: Old disused irradiator

Corporation of South Africa (NECSA) (Fig. 3). The concept and the equipment were recently successfully demonstrated using real radioactive sources. The hot cell will be used soon in African countries to manage disused sources that cannot be repatriated.

The IAEA works closely together with Member States to improve the safety and strategy and capabilities to search and recover orphan radioactive sources. The forms of assistance in this case are the provision of expert advice to develop a national strategy, staff training and technical tools. However, the implementation of search campaigns can only be done by the countries themselves.

Tasks and operation of the RSTCG

It is the task of the RSTCG to provide the programme managers of the participating divisions/sections with a common opinion/advice on technical issues related to the control and management of radioactive sources. The RSTCG members obtain, *inter alia* from programme managers, information on all relevant project proposals, and share relevant materials in due time to allow a broad discussion and to form a consolidated opinion. This should apply to requests for assistance from recipient states as well from donor states/organizations.

Efficient coordination is necessary in order to:

- Consider the interdependencies of subsequent technical steps (e.g., a graded approach to ensure control of operational sources or recovery and return to supplier if possible, or recovery, conditioning, packaging and transport to storage and/or disposal site);
- Take the optimum decision on the technical solution to be followed; and
- Prioritize and justify activities and enable effective utilization of the available funds in a coordinated and timely manner.

Participation in the RSTCG is based on competencies and responsibilities. Currently the following divisions/sections within the IAEA's Department of Nuclear Safety and Security with responsibilities related to the control and management of radioactive sources are represented: Division of Radiation, Transport and Waste Safety with responsibilities in radiation safety related to sealed radioactive sources, Division of Nuclear Fuel Cycle and Waste Technology, with responsibilities in recovery, conditioning, storage and/or repatriation and Office of Nuclear Security with responsibilities in the protection against malicious acts (through the whole life cycle of sources). Other Departments such as Technical Cooperation or Nuclear Sciences and Applications may also be invited in cases relevant to their expertise and responsibilities.



Figure 3: Mobile hot cell for handling spent high activity sealed sources (SHARS)