

TOPICAL ISSUE 3: SAFETY OF FUEL CYCLE FACILITIES

Session Chairpersons' Report

Current Status

Fuel cycle facilities include a broad range of installations covering all of the processes needed to produce, use and reprocess nuclear fuel. The number of such facilities (excluding reactors and waste disposal facilities) worldwide currently exceeds 500, and is increasing. Although the radioactive source term for most fuel cycle facilities is lower than that for reactors, and therefore the potential radiological consequences for the public in the event of an accident may be less severe, recent events at some fuel cycle facilities have given rise to renewed public concern, which has to be addressed adequately by national regulatory bodies and at the international level. Some countries are currently revising their national regulations applicable to fuel cycle facilities.

There is general agreement that many of the safety concepts applied to nuclear power plants are equally applicable to fuel cycle facilities. Recent experience gained with the safety enhancements of nuclear power plants could provide a valuable input when safety improvement measures are proposed for fuel cycle facilities. The discussions focused on some particular examples, such as periodic safety reviews, establishment of safety management, promotion of safety culture, and it was pointed out that exchange of information on these subjects could be of mutual benefit to operators of both NPPs and fuel cycle facilities.

However, it was acknowledged that there are numerous differences between NPPs and the variety of fuel cycle installations. In fuel cycle facilities, fissile and radioactive materials are handled, processed, treated and stored throughout the entire installation. These facilities also rely to a great extent on operator intervention and administrative controls to ensure safety. Specific safety concerns include criticality, radiation protection of workers, chemical hazards, fires and explosions, and the implications of human factors, all of which need to be addressed in an adequate manner in the design and operation of the plants. The safety standards for fuel cycle facilities which the IAEA plans to develop in the next few years will build on established standards and on international consensus regarding the safety requirements and guidance for different types of such facilities.

It was acknowledged that the development of the safety standards is a prerequisite for the IAEA to provide adequate safety services to assist Member States in enhancing the safety of fuel cycle facilities. There is a need for the IAEA to review its existing safety services and consider adapting them where appropriate to enable them to be used directly for fuel cycle facilities.

It was recognized that a significant factor in enhancing the safety of any nuclear installation is the continuing worldwide exchange and analysis of safety relevant information and data. However it appears that, with respect to fuel cycle facilities, this process is mainly limited to countries with well developed nuclear power programmes. The lack of records in international databases on incidents and accidents in other countries should not be taken to suggest that feedback of operational experience is not considered by the facilities in operation in these countries. However, in order to maximize the benefit, it would be helpful if all

Member States provided operational experience feedback so that valuable lessons learned can be shared with the wider international nuclear community.

Findings and Conclusions

The IAEA should be prepared to provide support to Member States, on request, to identify national needs in relation to the safety of fuel cycle facilities.

The IAEA should continue to provide a focus for promoting the safety of fuel cycle facilities by establishing adequate safety standards and by supporting Member States in developing their capabilities in this area. It is important to develop and publish the appropriate IAEA safety standards for fuel cycle facilities safety in a timely manner so that they can be used as a basis for IAEA safety services.

The IAEA should review its existing safety services for NPPs and research reactors and adapt them where appropriate to enable their use for fuel cycle facilities. It is understood that some of the services, such as IRRT and IPSART, could easily be applied to fuel cycle facilities as well, whereas others, such as OSART and design review services, may need significant adaptation. It is suggested that observers from fuel cycle facilities could be invited to participate in future OSART missions for NPPs, so that they can become acquainted with the procedures and approaches used. This will also promote the exchange of information on operational safety assessment between NPP and fuel cycle operators.

The IAEA should provide guidance and assistance to Member States as appropriate to carry out periodic safety reviews, taking into account the experience gained in carrying out such reviews for NPPs and for some fuel cycle facilities.

The IAEA should continue its work of fostering the international exchange of information on regulatory and safety issues for fuel cycle facilities. It is recommended that the IAEA build on its long standing activities on event information exchange and analysis for NPPs (IRS, NEWS, INES) to fulfill the same role for other installations of the fuel cycle and seek co-operation with the OECD/NEA on its FINAS database. Action should be taken to collect and disseminate to all interested Member States the experience and lessons learnt.

Recognizing that training and qualification of the personnel who operate fuel cycle facilities is crucial to safety, it is recommended that the IAEA develop and hold training courses on the safety of fuel cycle facilities. It is also suggested that the IAEA explore the possibility of using existing experimental facilities in France, the USA and the UK for criticality safety training of operators from other countries. Experiments at such facilities may also be used to fill some gaps in knowledge of criticality safety.

The IAEA is encouraged to adapt the experience gained with the establishment and application of safety performance indicators for NPPs in order to assess Member States in the development of safety performance indicators for fuel cycle facilities. It is also recommended that the recent actions taken by the IAEA to support Member States in safety management assessment and promotion of safety culture for NPPs be expanded to cover fuel cycle facilities.