

## **Security measures for nuclear fuel cycle transport**

Security involves the various measures to guard against the consequences of intentional malicious acts. The main concern in the past was theft and diversion of nuclear material but the tragic events of 11 September 2001 in the USA, and other recent incidents, have heightened sensitivities to security in face of terrorist action. Whereas **safety** of radioactive material transport depends on the integrity of the package and is clearly the responsibility of the consignor, **security** is mainly the responsibility of the State, which has to set up the necessary regulatory framework.

The materials used in the nuclear fuel cycle industry have traditionally been subject to extensive national protection measures. This responsibility extends to the right of a State to oversee the security measures that are taken during the transport of material originating from or obligated to their country. A range of protection measures has been employed during transport, as deemed appropriate, ranging from the design of the package and the vehicles used as well as security forces, access control, employee screening, satellite tracking of shipments and co-ordination with local and national security authorities.

The objectives of the requirements of physical protection of such materials during transport is assisted by minimising both the total time the material remains in transport and the number and duration of transfers of the material, avoiding the use of regular movement schedules and limiting the advance knowledge of transport information including date of departure, route and destination to designated officials having a need to know that information.

## **Recent developments in security requirements**

### **UN and IAEA Initiatives**

In 2002, the IAEA initiated work on the need for enhanced measures for security in the transport of radioactive materials, including nuclear fuel cycle materials. This was intended to complement the security requirements in the UN "Model Regulations" which contain a basic security level for the transport of all dangerous goods as well as additional requirements for an enhanced security level for goods defined as '*high consequence dangerous goods*', which have the potential to give rise to serious consequences in the event of a terrorist incident. These include such materials as explosives, flammable bulk liquids and gases, potentially dangerous chemicals etc. as well as Class 7 radioactive materials in Type B or Type C packages. For all these so-called high consequence dangerous goods, not just nuclear fuel cycle materials, enhanced security requirements apply.

## **Security requirements for sea transport**

The International Maritime Dangerous Goods Code (IMDG Code) became mandatory in January 2001 and the current edition includes a chapter on security which came into force in January 2006 (on a voluntary basis in January 2005).

The Safety of Life at Sea (SOLAS) Convention was revisited after the events of 9/11 in the USA to enhance ship and port facility security. The London Conference on Security at Sea held in 2002 resulted in the International Ship and Port Facility Security Code (ISPS Code) and SOLAS amendments to establish appropriate security plans for ship and port facilities. This came into force July 2004.

## **Special nuclear materials**

In addition to the UN Model Regulations there is an international instrument developed by the IAEA, The Physical Protection of Nuclear Material and Nuclear Facilities, INFCIRC 225. In this context nuclear materials are those which carry a potential risk of being used in a nuclear explosive device. This requires States to take appropriate measures to ensure security and includes the physical protection requirements for nuclear material in use, storage and during transport. Three categories of security are defined depending on the nature of the material.

The nuclear materials covered by INFCIRC 225 are principally plutonium and highly enriched U235 and U233, for which the highest security category applies.

INFCIRC 225 now extends to national as well as international transport.