Inspection Practice and a Role of TSO

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Abstract. Technical and Scientific Support Organisations (TSOs) are not only expert organisations helping operators to fulfil the legal obligations but they can perform at least five tasks related to regulatory authority activities. Namely, TSOs can be an expert support when preparing legislation or guidelines. They can provide specific technical service e.g. providing independent monitoring of radioactivity in the environment or monitoring of foodstuff. They can also provide valuable data to regulatory authorities because they follow the achievements of science and technologies i.e. they are familiar with best available techniques and technologies. In many cases TSOs can be a pool of future employees of regulatory authorities and TSOs are expert or technical support at on-site inspections. Involvement of TSOs in on-site inspections either foreseen inspections or interventions requires very well defined roles of all organisations involved. Regarding the experiences of the Slovenian Nuclear Safety Administration the involvement of TSOs in on-site inspections is very beneficial to all stakeholders and leads not only to less financial and other burdens posed on the owner of sources but also basic safety requirements are implemented efficiently.

INTRODUCTION

The development of the nuclear science and nuclear industry as well as the development of other uses of radioactive materials and ionising sources in general was conducted without clear definitions of roles of institutions involved in the first fifty years of the last century. For example, nuclear research institutions with the excellent expertise were users and promoters of nuclear energy, but at the same time they were also strongly involved in the establishment of nuclear safety standards. Only after TMI in 1979 and Chernobyl accident in 1986 an urgent need to establish clear roles between users of ionising radiation, i.e. operators, regulatory authorities and Technical and Scientific Support Organisations (TSOs) was identified. National legislations as well as international standards, e.g. in the IAEA BSS 115 [1], focused mainly on safety requirements, standards and guidelines which should be fulfilled by operators and in a smaller extent they also focused on the safety requirements related to regulators. TSOs were mainly supporting the activities of the users or regulators, but there was a room for different interpretation of the role of TSOs in processes of regulating a use of ionising radiation. The international harmonisation of regulating a nuclear field can be achieved by many mechanisms. Ones of them are conventions i.e. *Convention on Nuclear Safety* [2] published in 1994 and *Joint Convention on the Safety of Spent Fuel management and on the Safety of Radioactive Waste* Management [3] published three years later. Although both conventions do not explicitly tackle a role of TSOs they both implicitly include TSOs though a clear demand that “technical support” should be available in all safety related fields as given for example in the Article 19 [2] and Article 9 and Article 19 in [3].

As a result of different interpretation of a role of TSOs no harmonisation is achieved on the international level regarding the recognition of TSOs which is given by regulatory authorities e.g. TSOs can be a qualified expert as defined for example in EURATOM [4]. Moreover, no harmonisation is present regarding a role of TSOs. In view of nuclear renaissance in some countries which started around 2005 and taking into account a fact that the nuclear industry is a worldwide industry the international community became aware of challenge related to harmonising a role of TSOs in relation not only to regulatory authorities and operator, but also in relation to producers of equipment and others involved in nuclear safety issues. A role of TSOs in a specific country strongly depends on historical development of nuclear issues in the country as well as on a present legal system. In addition, in some countries the TSOs and particularly individual experts from the TSOs play a role of a moderator between nuclear industry and a general public. As a result TSOs can play very different roles at the same time and no international harmonisation is achieved. In this respect the IAEA conference *International Conference of the Challenges Faced by Technical and Scientific Support Organisations in Enhancing Nuclear Safety* in 2007 [5] was a big step forward. Moreover, a need for a harmonised approach was also identified by the TSOs as given for example in [6].

RECOGNITION OF THE TSO

The recognition of the TSO is the main step in order to assure a high quality of expertise given by the TSO. Usually the recognition is a formal process on demand of the TSO. The TSOs are as a rule identified by the regulatory authority e.g. in Slovenia two regulatory authorities share a responsibility for authorisation of TSOs in a field of radiation and nuclear safety. The TSO competence is inspected in this process taking into account a field of the TSO expertise. The process of recognition is well defined in a legislation including all criteria, e.g. IEC or ISO standards, which should be taken into account in a process of recognition, as well as appeals. Usually a process of the recognition should be repeated on a predefined period of time e.g. every few years. The recognition of TSOs is available to the public so that all stakeholders e.g. operators, other regulatory authorities, contractors or other TSOs can use such information. For example, a list of TSOs in Slovenia is available in the annual reports on the radiation and nuclear safety in the state available at http://www.ursjv.gov.si/en/info/reports/. In spite of a fact that Slovenia has a relatively small nuclear program altogether 14 institutions were recognised as TSOs in 2008. Details are given in the annual report given in [7].

TSO AND ON-SITE INSPECTIONS

In general, TSOs are contractors of two main groups of institutions, namely:

- operators, designers, service and equipment providers etc.
- regulatory authorities.

TSOs can be also a support of other state institutions that are not regulatory authorities, e.g. agencies for radioactive waste management. Moreover, in special circumstances TSOs can be also contractors of a part of a general public, e.g. TSOs can provide expertise regarding sitting of a nuclear installation on demand of people living around a potential site. In all above cases TSOs should pay attention to avoid a conflict of interests and each country should develop an effective system to control this very sensitive issue.

In general, TSOs are contractors of operators and other users of sources of ionising radiation in all lifetime phases of sources e.g. from assessment of a foreseen nuclear site till a decommissioning. As a rule the users of ionising radiation are required to consults TSOs in a very first step of authorisation procedures. Namely, a result of consultation or a formal assessment of the operator documentation is a part of a licensing procedure. Moreover, when authorisation is issued, TSOs can be contracted by an operator to control specific tasks during operation. Sometimes such contract is based on a very specific or unique task, e.g. refuelling of an NPP or maintenance procedures in an installation, while other contracts are based on periodical activities of the TSOs, e.g. a TSO monitors regular maintenance and service procedures in an installation, measures radioactivity of effluents from a nuclear installation, controls working conditions in control areas etc.

Regarding TSOs as contractors of the regulatory authority at least five tasks can be identified.

(1) TSOs can be an expert support when preparing legislation or guidelines.
(1) TSOs can provide specific technical service for example providing independent monitoring of radioactivity in environment or foodstuff or monitoring of effluents from nuclear installations.
(2) TSOs can provide valuable data to regulatory authority because they follow the achievements of science and technologies related to nuclear field i.e. they are familiar with best available

techniques (BAT), they have usually their own databases of users with valuable data and they are in many cases on a daily bases in contact with operators, so that they can posses important information.

(3) TSOs can be a pool of future employees of regulatory authority.

(4) TSOs are expert or technical supports at on-site inspections.

Regarding the last task the regulatory authority can also decide to authorise TSOs so that inspection tasks are performed only by TSOs, if the national legislation enables such arrangements. On the other hand regulatory authority can decide to conduct inspections together with TSOs. In such cases roles of both partners involved should be very well defined in preparatory phases of inspections not only from technical point of view but also from organisational point of view. Especially in cases when other institutions are involved, e.g. an agency for radioactive waste management, a success of inspection activities strongly depends on harmonisation of roles of all involved institutions. Two types of inspections can be identified, namely foreseen inspections and interventions.

1. Foreseen inspections

Before foreseen inspections TSOs and regulatory authority can in the preparatory phase discussed details and such inspections are very effective. Figure 1 shows a TSO control of packing a transport of radioactive material, i.e. yellow cake and unirradiated nuclear fuel, which was provided by the Slovenian TSO. The photo was taken by inspection of the SNSA in 2007 that also performed inspection on a site during whole process.

FIG. 1 A TSO control of packing a transport of radioactive materials (photo: inspection SNSA, 2007).

2. Interventions

Interventions occur usually at very traffic sites e.g. border controls or at premises where an owner is faced with a fact that abandoned sources or contamination exist. Very seldom incidents with authorised sources occurred. Because of the nature of interventions they require more flexibility from TSOs as well as from regulatory authority and other stakeholders, e.g. agencies for radioactive waste management. In general, predefined procedures of TSOs and regulatory authorities are beneficial but lessons learned attitude is mandatory. An example of intervention conducted by the TSO and the SNSA is shown in figure 2. Inspection was conducted in 2004 when a source with Cs-137 was found in the abandoned industrial hall. The total activity was about 5 GBq. A source was found with a help of a former employee of the industrial facility. The measurement and safety assessment were provided by the TSO which also dismantled the source and transported to the Storage for radioactive waste. The source was before a transport checked by the expert of the Agency for radioactive waste management so that no delay occurred when a source was transported from the site to the storage. The inspection of the SNSA led whole process in a harmonised way including the involvement of the owner.

FIG. 2. On-site inspection with a TSO which dismantled Cs-137 source of about 5 GBq installed in abandoned industrial hall (photo: inspection SNSA 2004).

CONSLUSIONS

The TSOs play a vital role in the establishment of an efficient system for control of operators and other users of ionising sources in a state. They can perform research as well as many technical tasks as partners of users and as contractors of regulatory authorities. As contractors of regulatory authorities the TSOs can be involved in on-site inspections, either in foreseen inspections, when tasks of TSOs can be very well defined, or in interventions, when a certain level of flexibility exists. The involvement of the TSOs requires very well defined roles of such organisations. Regarding experiences of the SNSA inspection the involvement of TSOs in on-site inspections are very beneficial to all stakeholders involved and lead not only to less financial and other burdens posed on the owner of sources but also the implementation of basic safety requirements given in [8] is more efficient.

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