

## Extending Safety Culture Development through Communication - 12366

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### ABSTRACT

The Norwegian Radiation Protection Authority has been implementing a regulatory support program in the Russian Federation for over 10 years, as part of the Norwegian government's Plan of Action for enhancing nuclear and radiation safety in northwest Russia. The overall long-term objective is the enhancement of safety culture. The project outputs have included appropriate regulatory threat assessments, to determine the hazardous activities which are most in need of enhanced regulatory supervision; and development of the norms, standards and regulatory procedures, necessary to address the often abnormal conditions at nuclear legacy sites. Project outputs have been prepared and subsequently confirmed as official regulatory documents of the Russian Federation. The continuing program of work focuses on practical application of the enhanced regulatory framework as applied to legacy sites, including safe management of radioactive wastes arising in the process of site remediation. One of the lessons learnt from this practical application is the importance of effective communication at all levels:

- between managers and shop workers;
- between different operators – e.g. waste producers and waste disposal organisations;
- between operators and regulators;
- between nuclear safety regulators, radiation protection regulators and other pollution and safety regulators;
- between scientists, policy makers and wider stakeholders; and
- between all of those mentioned above.

A key message from this work is that it is not just an issue of risk communication; rather all aspects of communication can contribute to safety culture enhancement to support effective and efficient risk management, including the role of regulatory supervision.

### BACKGROUND AND INTRODUCTION

The Norwegian Radiation Protection Authority (NRPA) has been implementing a regulatory cooperation program in the Russian Federation for over 10 years, as part of the Norwegian government's Plan of Action for enhancing nuclear and radiation safety in northwest Russia. The focus of the work is remediation of legacy sites, notably the Sites of Temporary Storage (STS) for spent fuel (SF) and radioactive waste (RW) at Andreeva Bay and Gremikha, on the Kola previous Peninsular, and the management of radioactive waste produced in the remediation process, as described previous Waste Management conference papers in references [1] and [2]. Other examples of important legacy issues with significant implication for

waste management include the decommissioning and dismantling of Radioisotope Thermoelectric Generators (RTGs) [3] and of the Lepse SF and RW storage vessel [4].

Apart from the improvement in safety etc., in relation to specific problems, the overall long-term objective of the regulatory cooperation program is the enhancement of safety culture. The program includes cooperation with the key Russian regulatory authorities: the Federal Medical-Biological Agency (FMBA), the Federal Environmental, Industrial and Nuclear Supervision Service of Russia (Rostekhnadzor) and, most recently the Directorate of State Supervision over Nuclear and Radiation Safety of the Ministry of Defense (DSS NRS). The project outputs have included appropriate regulatory threat assessments, to determine the hazardous activities which are most in need of enhanced regulatory supervision; and development of the norms, standards and regulatory procedures, necessary to address the often abnormal conditions at nuclear legacy sites. With the fundamental input of Russian technical support organizations, project outputs have been prepared and subsequently confirmed as official regulatory documents of the Russian Federation.

The continuing activities in the cooperation program include the practical implementation of these regulatory requirements and guidance at specific legacy sites. This includes the application of assessment tools developed within the program. The latter include visualization software for better understanding, control and planning of radiation situations in the working and wider environment, as well as equipment and procedures for the pre-shift reliability testing of staff involved especially hazardous operations. Recent progress is reported in reference [5].

## **COMPLEXITY OF TECHNICAL SITUATION**

The range of radiation and nuclear safety and security issues arising at these sites is very large, encompassing issues of worker, public and environmental protection in planned situations and in abnormal or possible accident situations. The condition of many of the facilities and the SF and RW is not in compliance with original requirements. That is to say, the normal situation at these sites is, generally speaking, abnormal. Therefore, even planned situations require special consideration and the development and application of new techniques and corresponding regulatory requirements and guidance.

A typical situation that can arise is that in order to avoid continuing degradation of an already poor storage facility, a hazardous operation has to be undertaken. Proper planning can reduce the risks and associated with the remediation operations, and while not completely eliminating any risks, bring them to within acceptable bounds. However, the nature and scale of the existing hazard may indicate a degree of urgency. Early action may reduce continued degradation and avoid possible acute releases from acute failure of containment. However, the remediation action itself, may create its own accident risks, and lead to exposure of workers, or generate effluent discharges affecting the public and the environment, or generate a much larger volume of radioactive waste, or all of these things. The need to develop new or enhanced engineering solutions and techniques applied for example to the decommissioning of the Lepse SF storage vessel [4], in particular because of the degraded state of the SF stored therein. That situation also made it necessary to maintain close supervision over the vessel in the meantime, to address safety of the vessel and the materials held within it, in conditions and circumstances not originally planned for.

Apart from radiation protection and radioactive waste, it has also to be recognized that there are other physical and pollution hazards to take into account, such as asbestos, heavy metals and organic compounds.

As well as the generally understood issues of environmental and human health protection, there are also legitimate concerns over security, including the control of large sources and nuclear material. The security aspect adds additional constraints to the selection and justification of appropriate management decisions. The resolution of many of these legacy issues involves military and civilian authorities, including those involved in safety, security and environmental and human health protection.

To complete the picture, it is necessary to mention the challenge of fitting the management of these legacy sites and situations into a still developing national radioactive waste management strategy, built upon the new Russian Federal Law on the Management of Radioactive Waste, which was adopted by the State Duma on June 29, 2011, and approved by the Council of the Russian Federation on July 6, 2011.

### ADDRESSING REGULATORY COMPLEXITY

The range of technical issues mentioned above gives rise to a range of correspondingly complex regulatory issues. The Russian regulatory framework is comprehensive, even taking into account the abnormality of legacy site supervision. However, as observed in other large countries with a major history of nuclear technology development, practical implementation and interpretation at the individual site level is not straightforward. Examples from the USA, the UK and France, as well as the Russian Federation were discussed at a major NATO sponsored workshop report in reference [6]. Achieving an appropriate balance in the supervision of the multitude of risks arising in legacy management requires many factors to be taken into account, not only legal and technical, but also involving many social and cultural factors, and hence many stakeholders, including in some cases foreign governments. This is illustrated by the involvement and contributions made by experts from Sweden and Norway to the workshop [6].

A key issue is that many of the problems which are normally discussed one at a time have to be considered simultaneously at a legacy site. It is instructive to remember a very serious and critical remark from a previous Director General of the UK's Health and Safety Executive made over 10 years ago [7]:

*“As matters have developed {since 1974}, the real issue is about the protection of workers, the public and indeed the environment from the consequences of industrial technology, and about the risks we need to take, or ought to tolerate, in the interests of creating wealth and happiness. Looked at in this way, we are in as great a confusion as in 1974. Why are so many bodies dealing with this central question – Health and Safety Commission, Health and Safety Executive, the Environment Agency, and soon, heaven help, the Food Standards Agency? **Why does government choose to deal separately with the harms done by processes, by products and by wastes, when industry can neither see them as separate, nor so deal with them?**”<sup>1</sup>*

Accordingly, the NRPA's approach in the regulatory cooperation program is, so far as possible, to work with all relevant regulators. The FMBA is the major authority concerning radiation protection and other health protection issues. Rostekhnadzor has the lead role in nuclear safety. And the DSS NRS is concerned with all such aspects from a military rather than civilian supervision perspective. However, these organisations are not the end of the story. Emergency preparedness and response involves many organisations and the radiological emergency

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<sup>1</sup> Bold emphasis added by the authors of this paper.

training carried out in relation to a hypothetical accident at STS Gremikha fully tested the coordination of the different authorities and responsible organisations, at local, regional and national levels, including operators and regulators and those providing emergency and other support. Local stakeholders and media organisations were able to observe directly. This was the first exercise of its type, involving all relevant organisations as well as foreign observers and is described further in reference [5].

Similar multiple organisation consideration has been given to aspects of radioactive waste management from sites, such as radiation protection objectives during operation and acceptance criteria for waste being delivered for long-term storage to the facility at Saida Bay, as discussed in reference [8]. This report sets out the extension of that regulatory support programme to specifically take into account the roles and responsibilities of the DSS NRS, alongside those of the other authorities. The need for such an extension arises because, in common with other countries, the different aspects of regulation of nuclear and radiation safety are supervised by different organisations, and military aspects are dealt with separately from civilian. Furthermore, remediation of military legacy sites which are due for return to civilian control, and the management of radioactive wastes generated in the process, for storage or disposal either at the sites or elsewhere, are bound to involve both civilian and military authorities.

It is notable that the first key result of the cooperation program was new regulatory guidance on “Safety Provision while Managing Radioactive Waste Containing Nuclear Materials at the Enterprises of the State Atomic Energy Corporation Rosatom in the Northwest of Russia”. The significance is that this guidance was jointly issued by DSS NRS and FMBA. It incorporates:

- Radiation-Hygienic Requirements for Provision of Safe Management of Products Containing Nuclear Materials, and
- Administrative Requirements Providing Safe Management of Products Containing Nuclear Materials, while Transferring them to the Category of Radioactive Waste.

The latter of addresses the issue of how much SF fragments may be accepted within different waste packages and managed with other radioactive waste, as opposed to SF which is to be reprocessed or otherwise managed. In the course of this work, useful discussions took place with US and British counterparts.

A further aspect of sound regulatory supervision is scientific support for the various decisions to be made. This needs to be a two way process, between researches who provide the input and regulatory authorities who need to identify and communicate the challenges which further research may be able to address. In this respect, NRPA is very active, for example in organising a workshop on the “Application of Radioecology to Regulation of Nuclear Legacy Management”, described in reference [9].

## **CONCLUDING REMARKS**

The range of disciplines and relevant experts involved in all the different areas is very large. NRPA staff and their colleagues in sister organisations in Russian take the view that opportunities for cross cooperation have been relatively limited in the past and should be increased. The current practical work therefore is designed to improve such opportunities through joint technical meetings:

- between managers and shop workers;

- between different operators – e.g. waste producers and waste disposal organisations;
- between operators and regulators;
- between nuclear safety regulators, radiation protection regulators and other pollution and safety regulators;
- between scientists, policy makers and wider stakeholders; and between all of them and all of those mentioned above.

In addition, a new initiative is underway to investigate the scope for enhanced coordination of regulatory supervision over radiation and nuclear hazardous legacies. The intention is to set up a joint standing committee of Russian regulatory authorities, with the remit to:

- provide overall coordination of regulatory supervision of legacy sites from the top down;
- investigate particular technical issues relevant to specific types of legacy, and
- develop enhanced processes for interaction, to address challenges which come up from individual sites.

A key message from this work is that it is not just an issue of risk communication; rather all aspects of communication can contribute to safety culture enhancement to ensure effective and efficient risk management, including the role of regulatory supervision.

All these links are considered vital. Although the responsibility for regulatory supervision lies with Russian authorities, in accordance with the requirements of the Russian Federation legal framework, these authorities also take into account relevant international recommendations and include review of supervision practice in other countries.

Accordingly, both FMBA and Rostekhnadzor are participating, alongside NRPA and many others, including the US DOE, US NRC and US EPA, in the IAEA's new International Working Forum on the Regulatory Supervision of Legacy Sites (RSLs). The RSLs has a substantially developed program of work over 2011 – 2014, to support exchange of information and experience internationally on what are common regulatory challenges<sup>2</sup>.

The successes noted in Reference [1] have been substantially based on the building of trust and close cooperation among many organizations: regulatory authorities, operators and technical support organizations, but also local authorities and other stakeholders. Steps are now being taken to build upon that trust to develop an enhanced safety culture. The work goes on!

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