

Development of a Nuclear Safety Knowledge Management (NSKM) Programme in a Regulatory Body

Description of the Case Study

The Government of Astiria¹ has decided to expand its nuclear power programme and build new units to fulfil emission reduction goals. In addition, it has also decided to decommission several coal power plants, which produce a large proportion of its electricity.

Astiria has an established university that has been in existence for 80 years and has a good reputation in the neighbouring countries. The University of Astiria (UoA), which has faculties in mechanical, electrical and civil engineering, as well as Instrumentation and Control (I&C) has established a new faculty of nuclear engineering. However, the number of applicants into this field is very limited. Until now, all nuclear engineers were educated abroad at the supplier country's educational institutions. It is noteworthy to say that the public acceptance of the nuclear power programme is at about 56 % in the country.

The Astirian Nuclear Safety Regulatory Board (ANRB)² has 40 years of experience in fulfilling its regulatory responsibilities and functions over the existing nuclear facilities and activities (e.g. radiation safety activities and one NPP unit).

A medical institution in Astiria has introduced innovative medical practices and associated new and complex equipment and methodology using radioisotopes for treatments. This has created unplanned challenges for the regulator since they were informed of such practices after their introduction.

In order to regulate the medical activities and equipment, ANRB needs to ensure:

- (1) these new practices and the associated equipment are adequately regulated;
- (2) the radiation workers, patients and public are protected accordingly;
- (3) the existing regulations need to be updated (or new ones need to be developed); and
- (4) the regulatory staff need additional training.

This requires ANRB to re-assign some of its existing resources to address these unplanned activities. This will certainly delay the implementation of these new practices. Recruiting regulatory staff, within the country, with the relevant knowledge for these practices is a difficult task. In addition, the regulator needs to remind the medical institutions to comply with legal requirements relating to the authorization of the equipment (e.g. license application for the import of equipment, as well as for the use of such equipment).

¹ Republic of Astiria is located in Asia. It is an economically powerful country. Official language is Astirian, however English is widely spoken. Astiria is an IAEA Member State and has signed all necessary agreements and protocols with the international community.

² The Astirian Nuclear Safety Regulatory Board (ANRB) was created in accordance with the "Law creating the Astirian Nuclear Regulatory Board (Law on ANRB)". ANRB is a competent body in nuclear safety and radiation protection matters, independent from other branches of the Government.

Near the capital is located:

- a research reactor (open pool – max. 50 MW) which serves as a training facility for nuclear education and testing purposes for ageing management of NPP equipment; and
- Blue River NPP, which is a single-unit Pressurized Water Reactor, Westinghouse design, located approximately 60 kilometre outside of the capital. The unit is rated at about 1250 MWe net. Commercial operation started in January 2002. The unit is operated by Blue River Power Company Ltd. which has multiple owners, partly state-owned.

They have nuclear law and regulations to control the use of the radiation and nuclear activities in the country. These were revised last time in 2010.

A group of young and enthusiastic engineers and governmental officials established the Regulatory Body (ANRB) about 30 years ago (in 1990). ANRB staff regularly participate in IAEA activities, but it is limited to several Technical Meetings and to the General Conference. ANRB is planning to invite an IRRS mission in 2024. They have just received the direction from their Government to review the current national legislation and update it according to the IAEA's and other international safety standards and requirements.

Many of the 185 staff of ANRB will be retiring within the next 2-4 years. The government has supported the recruitment of 30 new graduates (maximum) to replace those who will be retiring. There will be an overlap of the experienced and new staff of about 3-6 months. ANRB would like to recommend a one-year overlap to have enough time for training and effective knowledge transfer.

ANRB has a good reputation, public acceptance records and maintains a good relationship with the media. Although, because the government plans to build new units, ANRB plans to communicate with the media and public more frequently in the future. The communications officer has recently retired, and the new officer is a young professional, who just graduated from university and has no relevant experiences with the media.

The management processes of ANRB were developed many years ago and have to be updated in order to fulfil the latest IAEA and ISO requirements (as the RB has an ISO 9001:2008 Certification of its IMS).

The ANRB has identified deficiencies in the NPP's (Blue River) leadership and has decided to implement regular oversight inspections of their activities, which includes the review of their Knowledge management (KM) practices. ANRB itself doesn't have a KM programme. However, 3 employees from HR and the training department have limited knowledge of KM tools and techniques. Some elements of a KM programme exist and are effective (e.g. training, document management, portal) but most of the employees have no idea what KM is or why they would need it. The existing culture can be summed up by the following statement, "I know how to do my job; don't bother me with HR processes!"

The current head of ANRB (Dr. Bill Adams) plans to retire in 1 year and his deputy (Mrs. Hannah Snow) will most likely take over his position. Dr. Adams has openly discussed the possibility of staying on as a consultant for another year after his official retirement. Dr. Adams is a well-educated nuclear expert with several years of teaching experience at the university. He was also

a training manager at the Blue River NPP and has a broad understanding of knowledge management issues. His deputy has been working for ANRB over the last 5 years, for the most part as the Director of Nuclear Safety. Her main areas of expertise are licensing and compliance. She has never worked in the safeguards area, however has a broad understanding of nuclear security matters.

Mrs. Snow was recently assigned the KM Champion and tasked with leading the implementation of an urgently required KM programme to address the risk of knowledge loss. In addition, she also has to prepare ANRB for the licensing of the new NPP.

Individual Analysis

Please read the case study of Astiria and answer the following questions. This individual analysis is in preparation for the group discussion. Answers will not be taken up or reviewed during the workshop.

1. What are the external drivers that will have an impact on the regulatory body? What does your scan of the external environment reveal (opportunities/threats)?
2. What internal challenges is the regulatory body facing? What does your internal environmental scan reveal (strengths/weaknesses)?
3. Who would be the main stakeholders, when considering Nuclear Safety Knowledge Management (NSKM) at the organizational and the national levels?
4. What requirements/standards (both national and international) could ANRB use as best practices in KM?
5. What national/international activities need to be developed or modified to support coordination and alignment?
6. Based on your answers from questions 1. and 2. identify the KM challenges and risks. Consider people, structure, process, technology, as well as organizational culture.
7. What should be included in a KM strategy?
8. What should be included in a KP plan?
9. How could ANRB build a KM culture?
10. Identify critical positions within ANRB.

Group Analysis

As a group, please complete the following two tasks.

Task 1

1. Conduct a SWOT analysis describing the current strengths, weaknesses, opportunities and threats facing the Regulatory Body (please note any assumptions you have made about Astiria and its Regulatory Body).
2. Identify the business challenges and risks facing the regulatory body from a knowledge management perspective.
3. Prepare a 5 to 10-minute presentation (per group) to present the results of the SWOT analysis and the identification of KM challenges and risks.
4. Provide constructive feedback/comments to the other groups based on their presentation.

Task 2

1. Draft a KM vision statement for ANRB.
2. Develop a high-level KM strategy (objectives).
3. Develop a KM plan, which is your roadmap for the programme implementation.
4. Prepare a 5 to 10-minute presentation (per group) to present your KM strategy and programme plan (i.e., a vision statement, objectives and the implementation roadmap).
5. Provide constructive feedback/comments to the other groups based on their presentation.
6. Write down two actions you will take when you return to work based on the knowledge gained and experienced lived in this workshop.