Assessment of Regulatory Competence Needs of Radiation Protection Board in Kenya

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1. Introduction

Nuclear regulatory bodies had an important task to ensure the safe use of radioactive materials for beneficial civilian purposes while protecting people and the environment against harmful effects of radiation. Different regulatory bodies might have different approaches to competence management depending on the country and tasks they are required to perform. The core functions and responsibilities of the regulatory body were as follows.

(a) Development and/or provisions of regulations and guides
(b) Regulatory review and assessment
(c) Notification and authorization, including registration and licensing
(d) Regulatory inspection
(e) Enforcement
(f) Emergency preparedness and response
(g) Communication with interested parties

The IAEA had introduced a methodology and an assessment tool, Guidelines for Systematic Assessment of Regulatory Competence Needs (SARCoN) [1], which provided practical guidance on analysing the training and development needs of a regulatory body, and through a gap analysis, guidance on establishing competence needs and how to meet them [2]. This study assessed the competence of the technical staff of The Radiation Protection Board (RPB) in Kenya which reflected on the ability of a regulatory body in discharging its duties.

The RPB Board members consisted of [3]

1) The Chief Radiation Protection Officer (CRPO) who should act as the secretary to the Board but should not vote on any matter brought before the Board.
2) A Chairman appointed by the Minister
3) The Director of Medical Services

The following persons appointed by the Minister:

i. a public officer nominated by the Minister for the time being responsible for labour
ii. a public officer nominated by the Minister for the time being responsible for higher education
iii. a public officer nominated by the Minister for the time being responsible for industry
iv. a public officer nominated by the Minister for the time being responsible for agriculture
v. a public officer nominated by the National Council for Science and Technology
vi. not more than two persons having special knowledge in safe handling of radiation sources
vii. a public officer nominated by the Minister for the time being responsible for foreign affaires
viii. an officer from the Kenya Defence Forces
ix. an officer from the National Intelligence Service
x. an officer from the National Police Service
xi. an officer from the Kenya Revenue Authority.

The RPB had 26 technical staffs (Radiation Protection Officers, RPOs) distributed across the various departments and the six regional offices. In addition, four RPOs were employed on a one-year contract basis as well as five interns in order to augment the staff capacity. There were 22 vacancies in RPB. There were 14 RPOs holding M.Sc., 11 holding B.Sc. and one holding diploma in radiography. The Boards mandates were met through registration, inspections, licensing and enforcing compliance with the Radiation Protection Act in all practices in the country. Inspectors prepare an "Annual Inspections Planner", including announced and unannounced inspections, for all licensed radiation facilities and activities. The target frequencies ranged from every 6 months to every 24 months according to the level of risk associated with the different activities. The setting of target inspection frequencies was consistent with a graded approach. Reactive inspections were conducted upon receiving information of non-compliance or unlicensed activities.

2. Methodology

SARCoN used a step by step method in identifying the gap between the required competency and the one existing in an organisation. The regulatory functions and the specific tasks to be carried out were considered in the estimation of the required competence. Another estimation was made for the existing competence level of the technical staff. This information was then entered into the

SARCoN tool. This application was based on questionnaires, where the competences for an organisational unit was inputted on a scale of low, medium or high. A high competence level indicated in-depth knowledge, ability and work experience. A low competency indicated basic knowledge and little work experience.

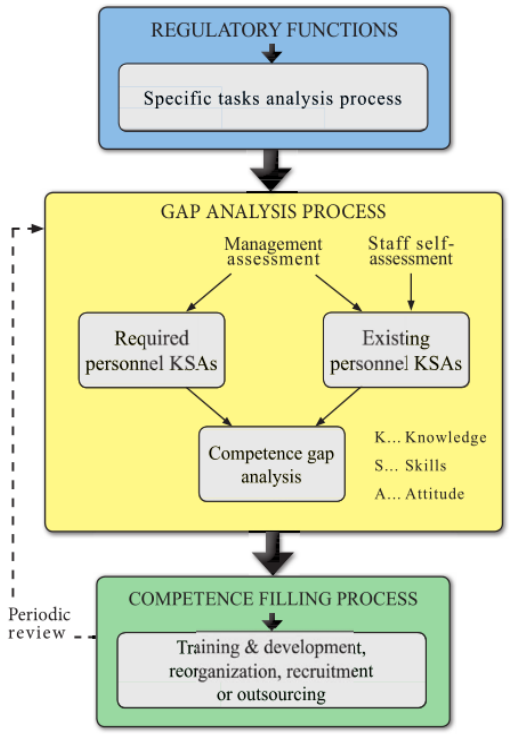

Fig. 1. A competence analysis flowchart [2].

The tool then calculated a comprehensive compilation of competency based on the quadrant model shown in the Figures below. A gap was determined from the inputs of the questions in each quadrant.

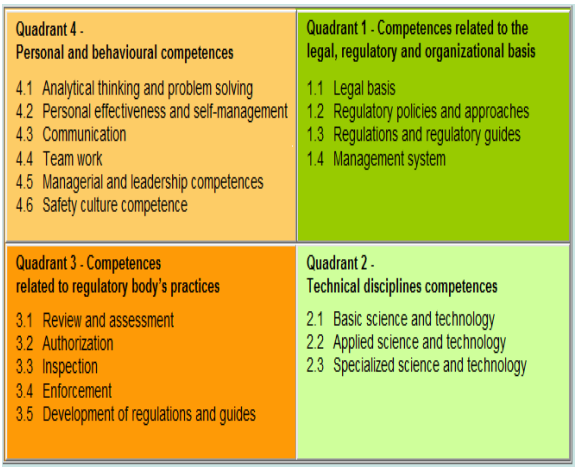

Fig. 2. Quadrant model of SARCoN.

3. Results and Discussion

The tool gave an output in bar graph on a scale of 0 to 3. With 0 indicating low competency level and 3 a high competency level. A gap was seen between the required and existing competencies. A big gap indicated that the organisation was ill-equipped to conduct its duties. SARCoN was effective in identifying the areas where there existed a competency gap which was important in identifying the training needs of the organization.

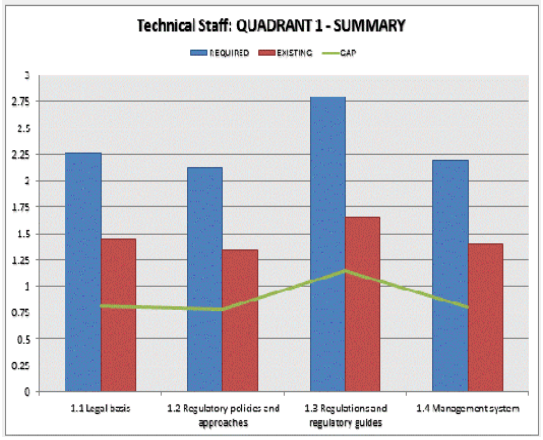

Fig. 3. Competency gap for quadrant 1.

The result showed that understanding of regulatory guides was the most important skillset in this quadrant. It was also the one with the largest gap between the required and existing competency.

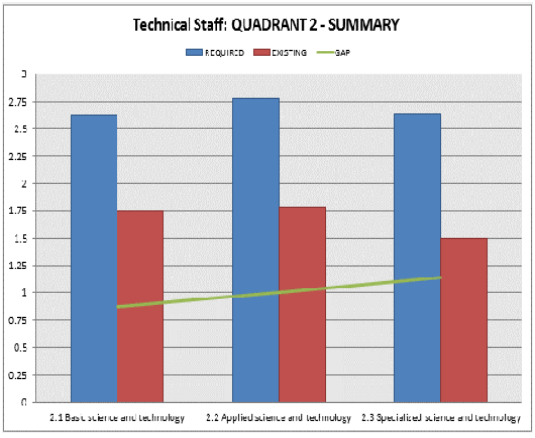

Fig. 4. Competency gap for quadrant 2.

The results for the technical staff assessment indicated that specialised science and technology was the discipline with the largest competence gap.

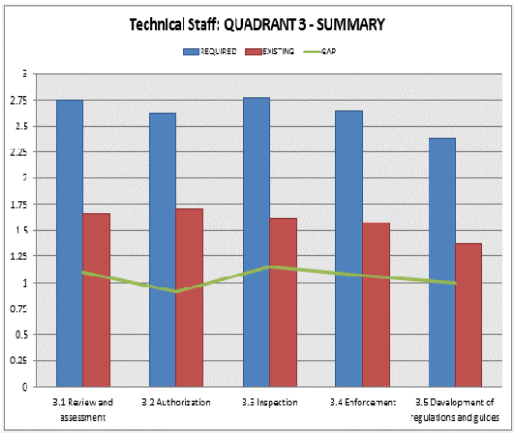

Fig. 5. Competency gap for quadrant 3.

Organization practices based on inspections showed the largest gap between the existing and required competence.

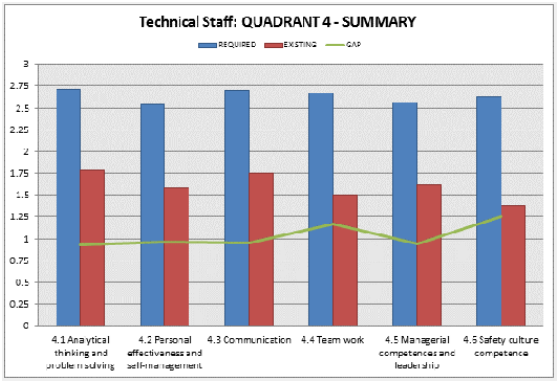

Fig. 6. Competency gap for quadrant 4.

The graph indicated that team work and safety culture competences showed the largest gap in this quadrant.

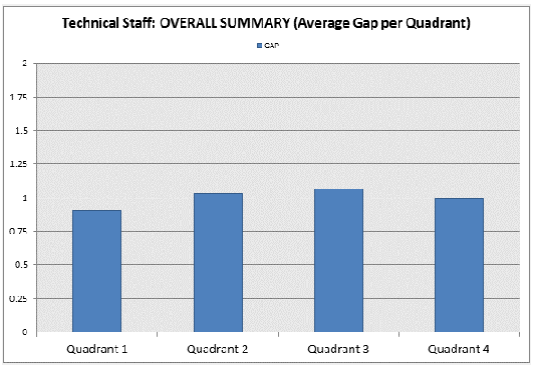

Fig. 7. Overall summary of this study.

This was a comparison of the competence gap across all four quadrants. Quadrant 3, related to regulatory body's practices had the largest gap and should therefore be prioritized.

In general, the following training were required to narrow the competency gap for every quadrant.

Training for 1st Quadrant

- Industrial Radiation Protection Officer
- Medical Radiation Protection Officer
- Radiographers Officer
- Radiation Source Security Officer

Training for 2nd Quadrant

- Medical physics instrumentation
- Radiation Protection training for new employees
- Radiation or health physics
- Radiation dosimetry
- Radioecology training

Training for 3rd Quadrant

- ANSN workshops (BPTC, special OJT, SAT, Nuclear Safety Tailored for Regulators)
- Refreshment training for junior and intermediate inspectors (to include safety culture as recommended by *ETReS*)
- Training of trainer (refreshment, to include soft skill) *(ETReS)*

Training for 4th Quadrant

- English reinforcement training
- Leadership training
- Team work Training
- Emotional, spiritual quotient training

4. Conclusion

This study had three main conclusions below.

1. The number of inspectors was not enough to meet annual inspection targets.
2. The RPB should plan and implement necessary training to meet current and expected future competency needs.
3. The distribution and management of resources in RPB should be improved to increase the effective discharge of regulatory duties.

These views were in line with the IRRS 2016 findings on the RPB as follows [4].

1. The current staffing level did not allow the effective discharge or regulatory responsibilities.

2. RPB should carry out a human resources needs analysis, making use of an objective and scientific methodology to ensure the effective discharge of its regulatory functions
3. RPB should establish and implement an integrated management system consistent with the IAEA safety standards.
4. The following competencies were lacking and need to be enhanced: regulation of NORM, review and assessment, authorization and inspection of linear accelerators, cyclotrons and nuclear medicine facilities.

Acknowledgement

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References

[1] IAEA, Methodology for the Systematic Assessment of the Regulatory Competence Needs (SARCoN) for Regulatory Bodies of Radiation Facilities and Activities, TECDOC No. 1860, 2019.

[2] IAEA, Managing Regulatory Body Competence, Safety Reports Series No.79, 2013.

[3] Radiation Protection Act Cap 243 of the Laws of Kenya

[4] IAEA, Integrated Regulatory Review Service (IRRS) Mission to Republic of Kenya, IAEA-NS-IRRS-2016/05, 2016.