Strengthening Regulatory Competence through Techno-managerial Knowledge Integration: Indian Experience

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OUTLINE (1/3)

- Competency Policy Statement of AERB
- Background
- Human Factors, Capacity Building and Knowledge Management
- Methodology for Identifying Competency Gaps
- Broad Quadrants/Elements of Competency Areas for AERB

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- Weightage of Quadrants
- Competency Levels
- Collection of Data
- Major Gap Areas Identified
- Major Strengths Identified
- Training Programs Planned/Conducted to fill Gaps

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- Feedback to Competencies from Training Programs
- Findings of Integrated Regulatory Review Service (IRRS) Mission of IAEA
- Conclusion

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AERB is committed to training and continual development of its staff to enable efficient and effective discharge of their roles and responsibilities to achieve its mandate at all times and encourage their development as motivated regulatory professionals with required competency and versatility.

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Competence development is the process of identifying the competencies required to perform a given job, role or set of tasks successfully at workplace. Strengthening regulatory competence, for the nuclear regulator, is essential to ensure competent human resources for performing the functions of the Regulatory Body.

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The strengthening of existing competence level for the Indian nuclear regulator, takes into account the understanding of the elements such as legal basis and regulatory processes governing operations of regulatory body, technological competences for performing regulatory functions, competences pertinent to regulatory practices, and competences related to personal and interpersonal effectiveness within the organization.

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Competency data from AERB divisions was compiled to identify gaps at various positions with recommendations for making specialized training modules and modifications to basic and refresher training modules. The exercise is aimed at providing continual improvement in knowledge, skills and attitudes of human resources at AERB in a phased manner.
The Government well understands the importance of the availability of sufficient number of competent and qualified experts (engineers and scientists) for the success of its nuclear programme and allocates enormous efforts on the establishment of a sustainable programme on education and training of nuclear human resources.
India has about **700 universities** in addition to the premier institutions like the **Indian Institutes of Technology (IIT)** and the **National Institutes of Technology (NIT)** where students study engineering and science subjects. The graduates from these universities and institutes provide the pool from which companies and governmental organisations select employees.

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The Government of India through the Department of Atomic Energy (DAE) had established Training and educational programme, in 1957 with the foundation of a ‘Training School’ to provide for the broad-based training in the field of nuclear science and engineering.
Later on, when the country started the expansion of its nuclear power programme, **Nuclear Training Centres (NTC)** were also created by the utilities. Recently, such training centres operate at the Raja Ramanna Centre for Advanced Technology (RRCAT), Indore, Nuclear Fuel Complex (NFC), Hyderabad and Indira Gandhi Centre for Atomic Research (IGCAR), Kalpakkam etc. Up to now, about **10,000** engineers and scientists have been trained by these institutions.
In 2005, DAE had established the Homi Bhabha National Institute (HBNI), with a deemed to be university status, to promote advanced post graduate and doctoral programmes in areas related to nuclear science and technology. The HBNI brings together the premier institutions of the DAE, under a single research-driven framework.

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DAE under ‘Board of Research in Nuclear Sciences (BRNS)’ and ‘DAE Graduate Fellowship Scheme’ established a strong relationship with the premier education institutes in the country, e.g. the Indian Institutes of Technology (IIT) for the conduct of masters programmes in nuclear engineering, where it sponsors the masters students and research projects in the field of Nuclear Science and Engineering. HBNI conducts masters and PhD programs in the areas of nuclear science and technology.
India has ensured mechanisms by which nuclear engineers and scientists take part in the international training programmes. Retired staff are used as a pool of experienced and knowledgeable resources in complementing the work of AERB.

All DAE organisations have created the Dedicated Knowledge Management Groups which disseminate and further enhance the available knowledge.
Based on IAEA Safety Report Series ‘Managing Regulatory Body Competence Needs’ (Report No 79; 2013), ‘Regulatory Competence Framework’ was developed for AERB towards systematic approach to competence development and maintenance.
Systematic Assessment of Competency Needs (SARCoN) tool (a software tool) was developed by IAEA (also by AERB)– helps in gathering information on competence needs, existing competencies and gap analysis and automates processing of data for analysis.

SARCoN consists of a set of questions to identify gaps in Knowledge, skills and attitudes in competence areas.
BROAD QUADRANTS/ELEMENTS OF COMPETENCY AREAS FOR AERB (1/4)

- Legal and regulatory basis–knowledge to comprehend

(i) Legal basis e.g. Atomic Energy Act and Rules

(ii) Regulatory policies and procedures e.g. MOU with USNRC, ASN, CNSC, Rosteknadzor for information exchange on regulatory practices, MOU with Technical Support Organisations, IIT, Universities etc.

(iii) Regulations and regulatory documents e.g. AERB and IAEA Safety Standard Series

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Technical discipline competences for performing regulatory functions comprehending

(i) Basic technologies e.g. nuclear engineering, material science, computer science, engineering mathematics etc.

(ii) Applied technologies e.g. Nuclear Reactor and Power and applications of radiation in industry

(iii) Specialized technologies e.g. Environmental Impact Assessment/Radiological Impact Assessment, probabilistic safety analysis
BROAD QUADRANTS/ELEMENTS OF COMPETENCY AREAS FOR AERB (3/4)

- Competences pertinent to regulatory practices

(i) Consent and consenting process e.g. knowledge on safety review in multi-tier Committees, drawing conclusions from deliberations etc.

(ii) Regulatory inspections e.g. ability to gather information through observations, detecting non-compliances with consent conditions and regulations

(iii) Enforcement process e.g. differentiating minor and major conditions of violations of consenting conditions and ability to handle non-compliant conditions

(iv) Regulations e.g. knowledge in contents and development of national and international safety standard series
Competences related to personal and interpersonal effectiveness within the organization.

(i) Personal effectiveness e.g. understanding and use of IT resources

(ii) Analytical thinking and problem solving e.g. synthesise and analyse information from various sources to identify key issues related to safety

(iii) Soft skills e.g. engage in effective dialogue including committed listening, make effective presentation

(iv) Strategic thinking, leadership and management e.g. develop viable strategies and policies, establish goals/targets etc.

(v) Safety culture e.g. learning and questioning attitude, clear communication
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COMPETENCY LEVELS

- Basic Competence (BC) – basic understanding of all regulatory functions according to individual roles and responsibilities
- Applied competence (AC) – ability to apply knowledge to perform the function
- Mentoring competence (MC) – capability to coach others in the subject matter
- Typical levels of competencies required for performing major regulatory functions are specified.
COLLECTION OF DATA

- Data in a prescribed formats are filled by individuals *(existing competencies)*
- Data in prescribed formats for individuals are also filled by their superiors independently *(needed competencies)*
- Gaps between existing and needed competencies are worked out.
Comprehension of international guidance/obligations concerning nuclear/radiation regulation related matters (Legal basis)

Comprehension of industry codes and standards Ageing management (Legal basis)

Ageing management including radiation effects on materials, corrosion, corrosion chemistry, etc. (Technical disciplines)
Comprehension of Probabilistic Safety Assessment (PSA)/ Probabilistic Risk Assessment (PRA) concepts (Regulatory practices)

Ability to determine whether actions of and liaison with other agencies are needed to support an enforcement action (e.g. law enforcing agencies, legal advice or involvement of other regulators) (Regulatory Practices)
Ability to communicate complex issues clearly, adjust communications to the needs of an audience, and to be effectively persuasive (Interpersonal effectiveness)
MAJOR STRENGTHS IDENTIFIED

- Ability to develop **viable strategic plans**
- Ability **to be approachable and open to suggestions from others.**
- Ability **to provide timely and relevant information to others**

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Basic Training module or induction training modules (Orientation course for Regulatory Process–OCRP) implemented in–house to orient incumbent regulatory staff for achieving basic competence.

Advanced training modules consist of class room and on–the job training programs arranged in–house or through outsourcing.
Refresher training modules designed for refreshing basic as well as applied competences to a fraction of employees with experience of 5 years or more and arranged either in-house or through Guest faculty.
Examinations are conducted and the results are used to correct the gaps.
Integrated Regulatory Review Service (IRRS) Mission of IAEA conducted in March 2015 the peer review of nuclear power plants (NPP) and compared the AERB regulatory framework against IAEA safety standards as the international benchmark for safety.

The IRRS team found that India has an experienced, knowledgeable and dedicated regulatory body for the protection of the public and the environment.
CONCLUSION

- A journal can be maintained for each employee giving credentials, training undergone etc.
- The responsible positions in the organisation viz. Chairmen/Member Secretaries of the review Committees, Project Coordinators, Heads of Divisions etc. could be linked to staff credentials vis-à-vis needed credentials.
Thank you

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