# Competencies Setup for Nuclear Regulatory Staff in Thailand

Panupong Pingish, Lopchai Siripirom, Pongpan Nakkaew, Theerapatt Manuwong, Vichian Wongsamarn
*Bureau of Nuclear Safety Regulation, Office of Atoms for Peace (Thailand)*
*panupong@oaep.go.th*

## 1. Introduction

Competencies setup for regulatory bodies oversee a research reactor and nuclear power reactors in Thailand, concentrating on staff development in areas of review and assessment, inspection and enforcement, authorization, and development of regulations and guides. The regulatory body in Thailand is the Bureau of Nuclear Safety Regulation (BNSR) which belongs to the Office of Atoms for Peace (OAP). The BNSR is divided into 4 groups according to the International Atomic Energy Agency (IAEA) [1]. These groups are the nuclear safety administration group, nuclear safety technical support group, nuclear safety assessment and licensing group, and the nuclear installations inspection group. Each group is divided into senior and junior positions. The competencies model was used for implementation of staff qualification, career planning and professional progression by BNSR. Competencies are related to knowledge, skills and attitudes (KSAs) needed to perform their job. A key issue is obtaining competencies for the regulatory bodies [2, 3, 4]. The systematic approach to training (SAT) has been used in several countries for improvement regulator performance [5, 6, 7]. The SAT contains 5 steps, including analysis, design, development, implementation and evaluation, to achieve competencies. The SAT provides a logical progression from the identification of competencies required to perform a job to the design, development and implementation of training using the competencies model. In the first step, BNSR performs an operating analysis of training needs assessment (TNA) by using gap analysis technique, as suggested by IAEA. Individual regulatory bodies address the gap using appropriate training program, after comparing the actual and desired competency profiles to determine the gap. This paper examines competencies setup for regulatory staff of BNSR as a result of gaps analysis to establish a scheme for design characteristics of regulatory staff and training courses, thereby enhancing the regulatory effectiveness for support nuclear safety [8, 9, 10].

## 2. Methods

Competencies are groups of capabilities needed by humans to perform a particular job. A method to reach high competencies needed by an organization is the SAT. The SAT provides an efficient and effective evaluation of knowledge, skills, and attitudes for competencies required in the nuclear regulatory field.

The SAT procedure uses 5 steps; analysis, design, development, implementation, and evaluation (Figure 1).

The analysis step evaluates job assignment and the results of a questionnaire for developing competency profiles. The consequences from them were used in gap analysis. Gap analysis provides self assessment by regulatory staff on a questionnaire in the computer program and compares that with requisite competencies by the BNSR, which is based on IAEA recommendation. BNSR was divided into 4 groups; technical support, assessment, inspection, and authorization. Each group was separated into 2 staff levels; senior and junior which they are needed for different requisite competencies. The training course for regulatory staff have common teaching for junior staff and specific teaching for senior staff, which are base on the results from gap analysis. This information was used in the design step of SAT. The design step evolves in planning strategies about human resources for use with future novice staff. The development step was used for all training material and the implementation step was included in the training course. The last step involved effectiveness evaluation and assessment training course.
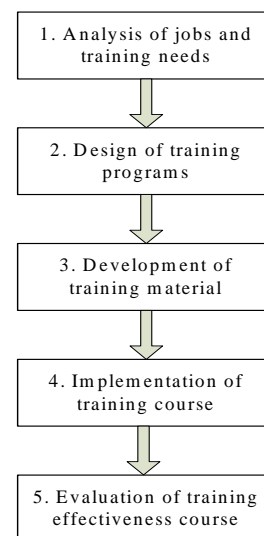


Figure 1 Sequential procedures for Systematic Approach to Training (SAT)

## 3. Consequence from self assessment competencies

The BNSR provided self assessment which each staff of the BNSR in all of levels need to implementation. The consequence from self assessment competencies were indicated that all staff of the BNSR need to implementation (from figure 2). The most important competencies are lacking which junior level were concerned basic

technology and safety culture. For senior level, legal basic and applied technology were needed to implementation (from table 1). In this regard, the BNSR have to setup scheme for training course that focus on performances still lacking. Actually, some training course by the BNSR is currently provided related to required competencies but only in some part. And then, the BNSR is required other training programme to reducing the gap. However, the training programme needs to be improved to ensure that the competencies are performed to establish the BNSR standards in the future. In order to implementation required competencies for regulatory staff, the following programme need to plan with training policy, budget, provisions for training, the evaluation considered for staff competencies, and overall of training programme.
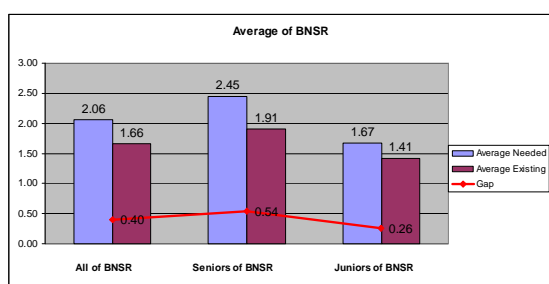


Figure 2 Mean self assessment from gap analysis of BNSR; numbers represent level of competencies

| Competencies | Contents | Gap Average | |
|---|---|---|---|
| | | Senior | Junior |
| Legal Basis and Regulatory Process | 1.1 Legal Basis | 1.11 | 0.93 |
| | 1.2 Regulatory Process | 1.04 | 0.97 |
| | 1.3 Regulations & Regulatory Guidance Documents | 1.06 | 1.20 |
| | 1.4 License & Licensing Documents | 1.08 | 1.16 |
| | 1.5 Enforcement Process | 0.85 | 0.57 |
| Technical Disciplines | 2.1 Basic Technologies | 1.13 | 2.24 |
| | 2.2 Applied Technologies | 1.33 | 0.74 |
| | 2.3 Specialized Technologies | 1.13 | 0.25 |
| Regulatory Practice | 3.1 Safety Focused Analytical Technologies | 1.19 | 1.24 |
| | 3.2 Inspection Techniques | 0.70 | 0.35 |
| | 3.3 Auditing Techniques | 0.59 | 0.25 |
| | 3.4 Investigations Techniques | 0.50 | 0.26 |
| Personal and Interpersonal Effectiveness | 4.1 Analytical Thinking, Problem solving & Decision making | 0.92 | 0.85 |
| | 4.2 Personal Effectiveness | 0.87 | 1.48 |
| | 4.3 Communication | 0.80 | 1.19 |
| | 4.4 Safety Culture | 0.83 | 2.14 |
| | 4.5 Management | 0.36 | 0.27 |

Table 1  Self assessment competencies using mean gap analysis for senior and junior levels

## 4. Concluding Remarks

This paper is showed only first step for competencies setup for regulatory staff that referred from principles of the Systematic Approach to Training (SAT). The next step is applied the SAT to establish and implement for setup training programme which addresses the required competencies. It is possible to invite the outside organizations to accomplish training programme that is perfectly suitable for the regulatory body such as university, specialist, and international agencies. Especially, there are opportunities for BNSR to obtain training programme that deal with regulatory staff competencies through international and bilateral arrangements co-operation from them whom a lot of experiences. The consequence from this will be achieved to setup competencies required and training program for nuclear regulatory body in Thailand.

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