Presentation 3.1
Systematic Approach to Training

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Outline

- **In this presentation, a list of IAEA standards and guidance that recommends competence development in nuclear and radiation safety for the regulatory body is shown here**

- **Provide an overview of the 'Systematic Approach to Training (SAT)' to know about its various phases – analysis, design, development, implementation and evaluation**

IAEA standards and guidance relevant to competence development fo the regulatory body in nuclear and radiation safety

IAEA Safety Fundamentals

Principle 2: Role of government

- **The Govt must establish an effective legal and governmental framework for safety, including an independent regulatory body**

- **[§3.10] The regulatory body must have adequate legal authority, technical and managerial competence, and human and financial resources to fulfill its responsibilities…**

"Governmental, Legal and Regulatory Framework for Safety"

Req. 18: Staffing and competence of regulatory body

The **regulatory body shall employ** a sufficient number of **qualified and competent staff**, according to the nature and number of facilities and activities it regulates.

- **[§4.13] The regulatory body shall** establish a process to **develop and maintain the necessary competence and skills of staff of the regulatory body**

- **This process shall include the development of a specific training program on the basis of an analysis of the necessary competence and skills.**

- **The training program shall address principles, concepts and technological aspects, as well as the procedures followed by the regulatory body for:**

    o **assessing applications for authorization**

    o **inspecting facilities and activities, and**

    o **enforcing regulatory requirements.**

"Leadership and Management for Safety"

- **Requirement 9: Provision of resources**

- **[§4.22] Senior management shall determine which competences and resources the organization has to retain or has to develop internally, and which competences and resources may be obtained externally, for ensuring safety.**

- **[§4.23]** **Senior management** shall ensure that **competence requirements** for individuals at all levels **are specified and**

  o Shall ensure that **training is conducted, or other actions are taken, to achieve and sustain the required levels of competence;**

  o **Shall conduct** an **evaluation** of the **effectiveness of the training** and of the actions taken.

- **[§4.25]** **Senior management** shall ensure that **individuals at all levels**, including managers and workers are **competent and** understand the standards that they are expected **to perform their assigned tasks**

IAEA GSR Part 3

Radiation Protection and Safety of Radiation Sources: International Basic Safety Standards

- **[§2.17] The government shall ensure that the regulatory body has the** legal authority, **competence** and resources necessary **to fulfill its** statutory **functions and responsibilities.**

- **[§2.21] The government shall ensure that requirements are established for education, training, qualification and competence in radiation protection and safety of all radiation workers**

SSG-12 - Organization, Management and Staffing of the Regulatory Body for Safety

Competence management process may include analysis of competence needs including:

- o **Task analysis leading to determination of the necessary/required competences;**

- o **Analysis of existing competences exist within the regulatory body;**

- o **Gap analysis (personal performance review and assessment).**

- **Filling of competence gaps include:**

  - o **Staff training** and development;

  - o **Recruitment** and human resources planning;

  - o Management of external expert support.

- **[§6.57] The processes for competence management are part of the integrated management system...**

- **[§6.81] Efforts should be made to develop a systematic approach to training of staff according to the size of the regulatory body...**

- **This should include identification of the necessary competences to perform a job; design, develop and implement trainings to achieve these competences; and subsequent evaluation of the training.**

- **[§6.83]** Training alone cannot ensure **the necessary competence.**

- **Necessary** work experience, mentoring, coaching **and** refresher training **should be included in competence development plans for individuals.**

IAEA Safety Series/ TECDOCs

SSR-79 -Managing the Competence of the Regulatory Body

- **SRS-79 recommends** establishment of training and development programs **for the regulatory body. It** sets out the required competences in a **four-quadrant competence model**.

- **TECDOC 1757** – SARCoN provides Methodology for the systematic assessment of competence needs for Regulatory Bodies of **Nuclear Installations**

- **TECDOC 1860** – SARCoN describes Methodology for competence needs for Regulatory Bodies for **Radiation Facilities and Activities**

Technical Reports Series No. 380
NPP Training and its Evaluation

- **This constitutes IAEA recommendations on the use of the Systematic Approach to Training (SAT) for the _training of NPP personnel_**

- **This document describes the development of a suitable technique for the identification of the competences needed to perform a job and to design, develop and implement training to achieve these competences, and subsequent evaluation of this training**

Overview of Systematic Approach to Training

SAT Definition

- **Training is very important** to achieve and maintain the required competence level of personnel to perform their tasks and functions efficiently and effectively

- **SAT can be used for determining competence** requirements for employees performing different tasks

SAT Definition

- **SAT provides a complete competence process right from the identification of the required competencies to the design, development and implementation of training to achieve these competencies, and subsequent evaluation of the training**

- **The evaluation of training effectiveness is an inherent feature in SAT which helps to demonstrate that personnel performance has improved and training is of value for the organization.**

Systematic Approach to Training

SAT consists of five interrelated phases

- **Analysis:** In this phase, required competencies to perform particular jobs/ tasks and the training needs to achieve these competences are identified

- **Design:** The aim of the design phase is to convert the competencies/KSAs identified during the analysis phase into training objectives, and the training objectives into a training plan (Annual training calendar)

- Questions are also developed in this phase to assess the usefulness of training

Systematic Approach to Training

- **Development: In this phase, training materials are prepared so that the training objectives can be achieved.**

- **Implementation: During this phase, training is conducted through various training methods using the training materials prepared in the development phase.**

- **Evaluation: Feedback is obtained from trainees and trainers and effectiveness of training program is evaluated**

Flow Chart of SAT Phases
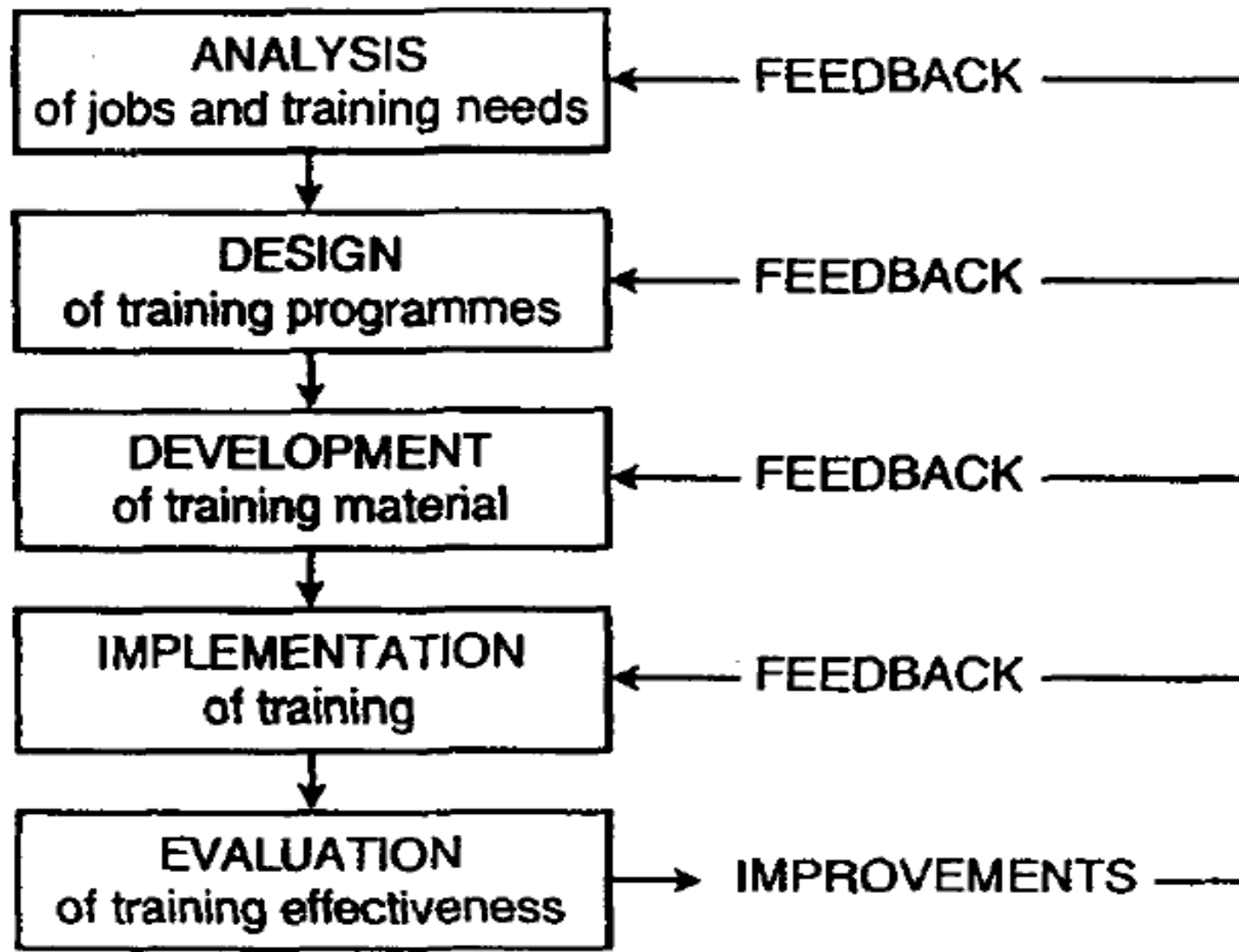
Analysis Phase of SAT through SARCON

SARCON tool can be used for the analysis phase

- **In the first step, required and existing competencies are identified**

- **In the next step, gap analysis is performed by analyzing the required and existing competencies. This enables identification of training needs to fill the gaps through appropriate trainings**

- **SARCON four quadrant competency model contains a list of competencies for regulatory body in different disciplines**

1. Competences related to the legal, regulatory and organizational basis

    1.1 Legal basis

    1.2 Regulatory policies and approaches

    1.3 Regulations and regulatory guides

    1.4 Management system

2. Competences related to technical disciplines

    2.1 Basic Science & Technology Competence

    2.2 Advanced Science & Technology Competence

    2.3 Specialized Science & Technology Competence

3. Competences related to regulatory body's practices

    3.1 Review & Assessment

    3.2 Authorization

    3.3 Inspection

    3.4 Enforcement

    3.5 Development of regulations and guides

4. Competences related to personal and interpersonal effectiveness

    4.1 Analytical thinking and problem solving

    4.2 Personal effectiveness and Self Management

    4.3 Communication

    4.4 Team work

    4.5 Management and Leadership

    4.6 Safety Culture
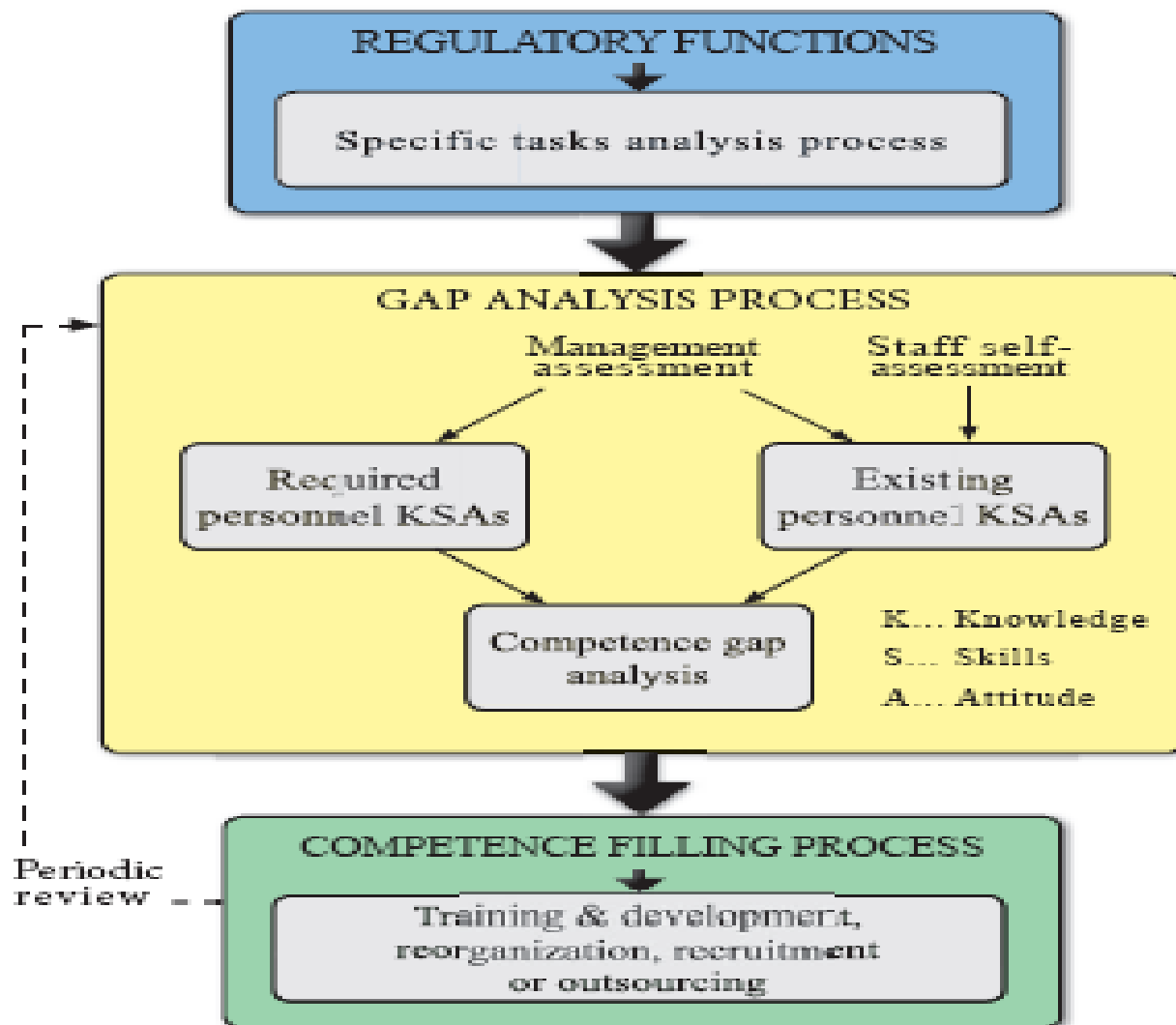
Outputs of the Analysis Phase

- **Identification of a list of competencies required for job performance**

- **Identification of a list of job-related tasks / activities for which training is required**

- **Identification of training needs of the organization**

Output of Design phase

Output of the design phase consists of:

- **List of training objectives;**

- **List of training courses to address the objectives;**

- **Schedule of training modules for both initial and continuing training; Annual training plan**

- **Identification of questionnaire for test**

- **Estimates of resources needed for development and implementation.**

Output of the Development phase

- **Development of training materials needed for initial and continuing training programs**

- **Involvement of subject experts during the development process**

- **Availability of personnel for implementation of training**

Output of Implementing Phase

Out put of the implementing plan include

- **Identification of trainee expected entry level skills and knowledge as prerequisite;**

- **Availability of timetable;**

- **Prioritization of important training for implementation;**

- **The most relevant output is competent personnel.**

Output of Implementation

- **How training will be implemented (e.g. classroom, power point, lab work, number of instructors, etc., for the particular lesson);**

- **Availability of material for trainers (references to textbooks);**

- **Availability of material for trainee (this should include any references to such items as textbooks);**

- **Examination questions for the topic;**

- **Record of approvals/ amendments/modifications.**

Purpose of Evaluation

- **The purpose of the evaluation phase of SAT is to determine the effectiveness, efficiency and impact of training programs and to identify whether and where revisions or improvements are needed.**

What needs to be evaluated?

Training needs. Does training meet the established needs?

People (instructors, trainees, assessors). Does the quality of performance meet established standards?

Processes. Are training and qualification processes (e.g. scheduling, assessment) being implemented as intended?

Purposes. Are they clearly defined? worth while?

Facilities and resources. Are they adequate to support training activities?

Costs. Are they justified by the benefits provided?

Impacts. Is training improving the job performance to which it is related?

32

Implementation of training

There are four distinct activities in the implementation of training:

- **Instructor preparation to conduct training**

- **Pretesting trainees**

- **Conducting training**

- **Assessing trainee performance.**

Pitfalls to Avoid

Common Barriers to Effective Training

- Selection of wrong participants

- Ill-prepared participants

- Faulty training methodology

- Low engagement or relevance

- Poor timing of training

Feedback

- **Trainees should provide prompt feedback on their performance through any assessment method.**

- **The test results from written tests should be scored and returned to the trainees, preferably within a day, but in no more than a week.**

- **Test results should then be discussed in a critique session to point out weaknesses and to indicate areas of necessary improvements.**

Training records

- **The establishment of a training records system is an essential part of a properly implemented training program. Two types of records are needed:**

  - ○ **Records of the training program as implemented.**

  - ○ **Records of individual trainee performance as assessed.**

Most useful information for training program evaluation can be obtained from the following sources:

- **Input from supervisors;**

- **Input from job incumbents;**

- **Input from instructors;**

- **Input from trainees;**

- **Data from observation of activities.**

Conclusion

- **We know the requirements for the competence development – the standards**

- **We are now familiar with different phase of SAT**