Quality Improvement Measures of Education for Radiological Emergency Preparedness

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Introduction

- Employees of an atomic energy business have to take the education for radiological emergency preparedness. KAERI, designated as an educational institution by NSSC, provides education and training to employees on its own. However, it has been facing several factors that hinder the effectiveness of education.
  (a) Supplier-oriented theoretical education → Emergency staffs do not have sufficient opportunities for practical education to strengthen their required competencies.
  (b) Frequent personnel changes such as reorganization, transference → Human error occurs in selecting persons eligible for education.

- This study sought ways to improve the education quality continuously as means of enhancing the emergency response capabilities as follows. 1. SAT-based education model and its feed-back system, 2. Integrated EP data management system
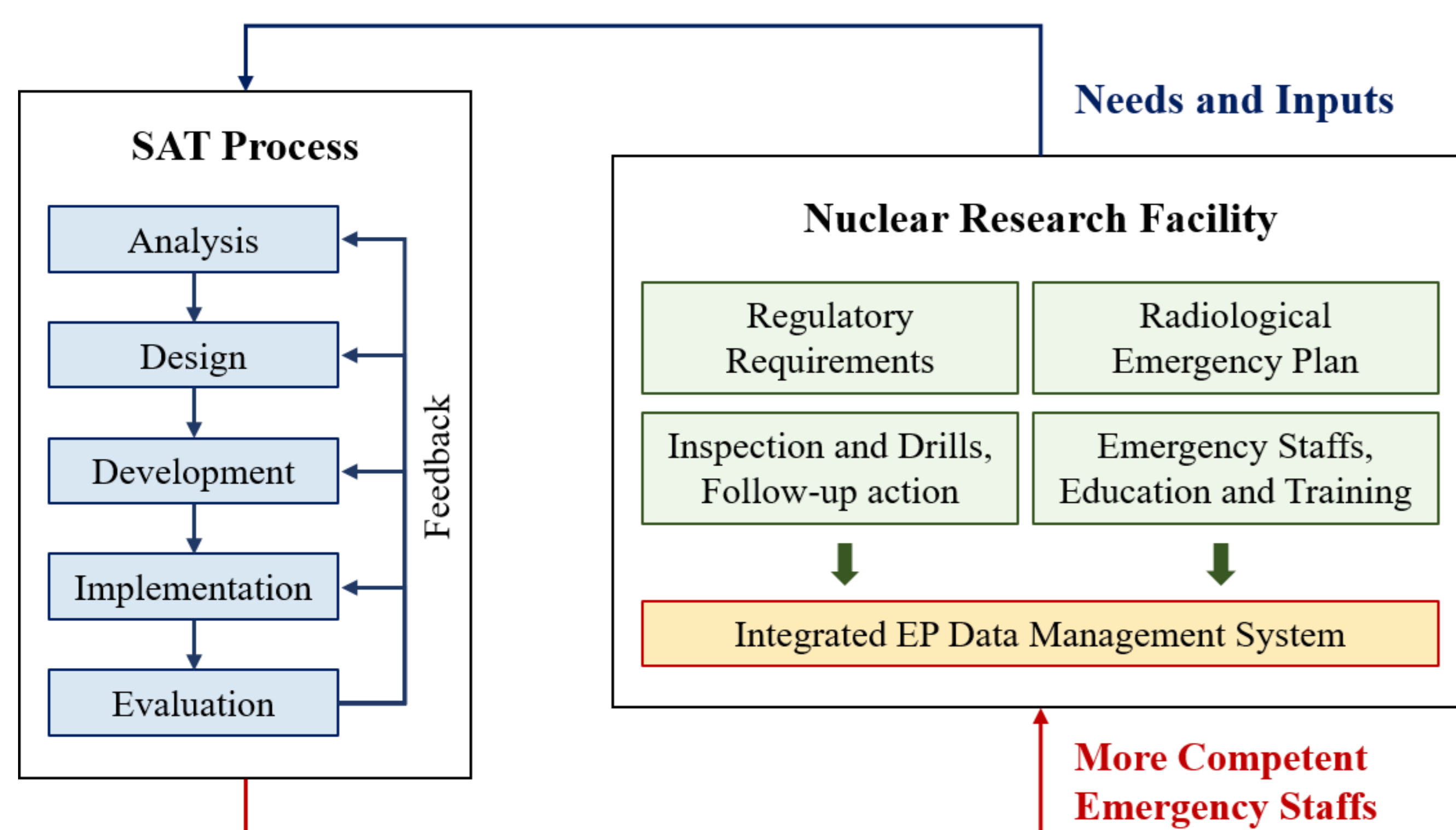
Materials & Methods

Fig. 1. Overview of relation between SAT process and EP for Nuclear Facility

SAT-based Education Model and its Feedback system

- Introducing SAT methodology and full revision of curriculum
  - IAEA's SAT (Systematic Approach to Training) is a methodology that applies QA to training and thus assures NPP personnel competence, which consists of five interrelated phases (Analysis – Design – Development – Implementation – Evaluation).

Integrated EP Data Management System

- Development of comprehensive data management system for tracking the current status of emergency personnel and their education history

Conclusions

- This study investigated the current issues in education for radiological emergency preparedness and suggested ways to continuously improve the education quality as means of enhancing the emergency response capabilities as follows:
  (1) SAT-based education model and its feed-back system
  (2) Integrated EP data management system.

- The results are expected to contribute to the revitalization of education and training to strengthen the radiological emergency response competencies required for emergency personnel at KAERI.

Results & Discussion

Education Model and its Feedback System

SAT methodology was introduced and the education courses were fully revised in 2020. **Table I** describes the inputs, and outputs of each phase of SAT process. A questionnaire was also created to analyze the educational effectiveness, which covers 5 factors and 23 attributes as listed in **Table II** .

→ It enables continuous evaluation and improvement of the training courses

Table I: Description of the Activities, Inputs, and Outputs of Each Phase of SAT

Phase	Accomplishment
Analysis	• Emergency Organization and Duties Analysis • Regulatory Requirements Analysis • Previous Curriculum Analysis
Design	• Establishment of Long-period Plan • Development of Course Design Document

Development	• Development of Training Materials
	  - Participatory Lesson (2)
	  - Learning Contents (12)
	  - Standard Textbook (12)
	  - Questionnaire

Implementation	• Operation
Evaluation	• Education Satisfaction • Pre / Post Learning Achievement

Table II: Evaluation Items of Questionnaire

Factor	Attributes (5-points Likert Scale)
Curriculum	- Expectation　　　- Satisfaction - Clarity of Education Objectives - Understanding of the Content - Acquisition of Knowledge and Skill - Contribution to Work
Environment	- Educational Facility - Curriculum Management
Lecture	- Delivery　　　- Professionality - Contents　　　- Communication - Teaching Plan　　- Learning Methods - Expertise in Education Field - Contribution to Work
Achievement	- Pre　　　- Post
Learning Methods	- Theory　　　- Demonstration - Practice　　　- Group Activity

Integrated EP Data Management System

DB Construction and Major Functions

- **Personnel DB** : Personnel Information, List of Emergency Staff, Selection History, Emergency Organization and Task, etc.
- **Education DB** : Requirements, Plan, Target, Current Progress, Annual Results, etc.
- **Manager DB** : E-mail Notice History, Education Completion Certification, Management Ledger (Excel Spreadsheet), etc.
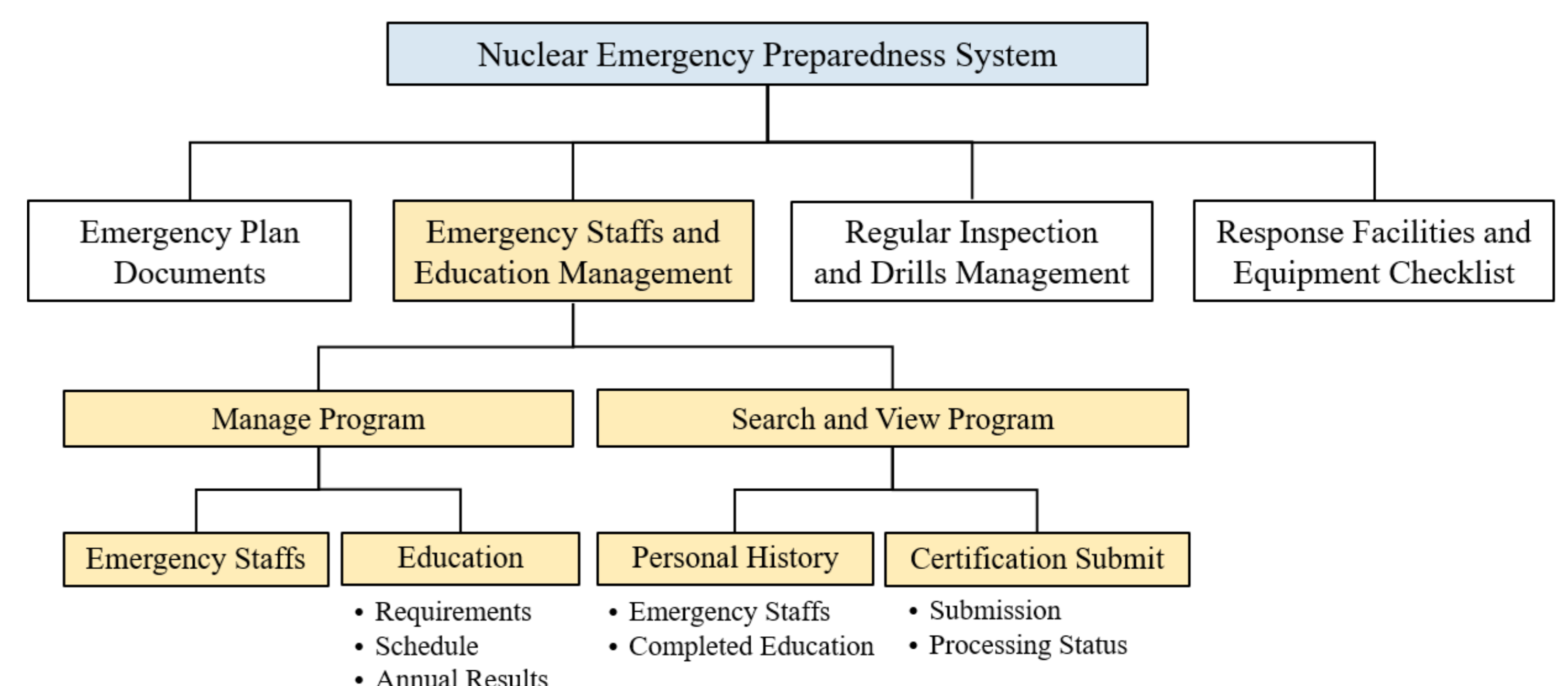

Fig. 2. Configurations of Advanced EP Data Management System.

→ By establishing DB for the information related to the person in charge of emergency response and education, it is possible to prevent human error in the selection of trainees and to improve the efficiency of management tasks.