



Development of the safety indicator for KOMAC

Yi-Sub Min, Jeong-Min Park

Korea Multi-purpose Accelerator Complex / KAERI



Introduction

Korea Multi-Purpose Accelerator Complex (KOMAC) has operated proton accelerator with 100 MeV energy and 20 mA beam current, which is developed by Korea's own technology. Because the safety status of nuclear relevant facilities that operate the huge radiation generator is a combination of various systems and factors, It is necessary to develop an indicator that can intuitively understand its safety status. It is required systematic function of various devices and instruments on the operation of an accelerator, even if it is a single system. In order to perform its inherent original function, various devices and sensors must be connected.

And, the soundness of these devices can be one of an indicators of the safety status of the facility. In addition, the safety culture consciousness level of the members should also be an axis of the index that indicates the safety status of the facility.

We will introduce the detailed configuration of the safety indicator on developing. In this paper, we will introduce the detailed configuration of items under developing as facility safety indicator. The indicator is consisted of accelerator operation stability, radiation safety index, and the safety culture consciousness level.



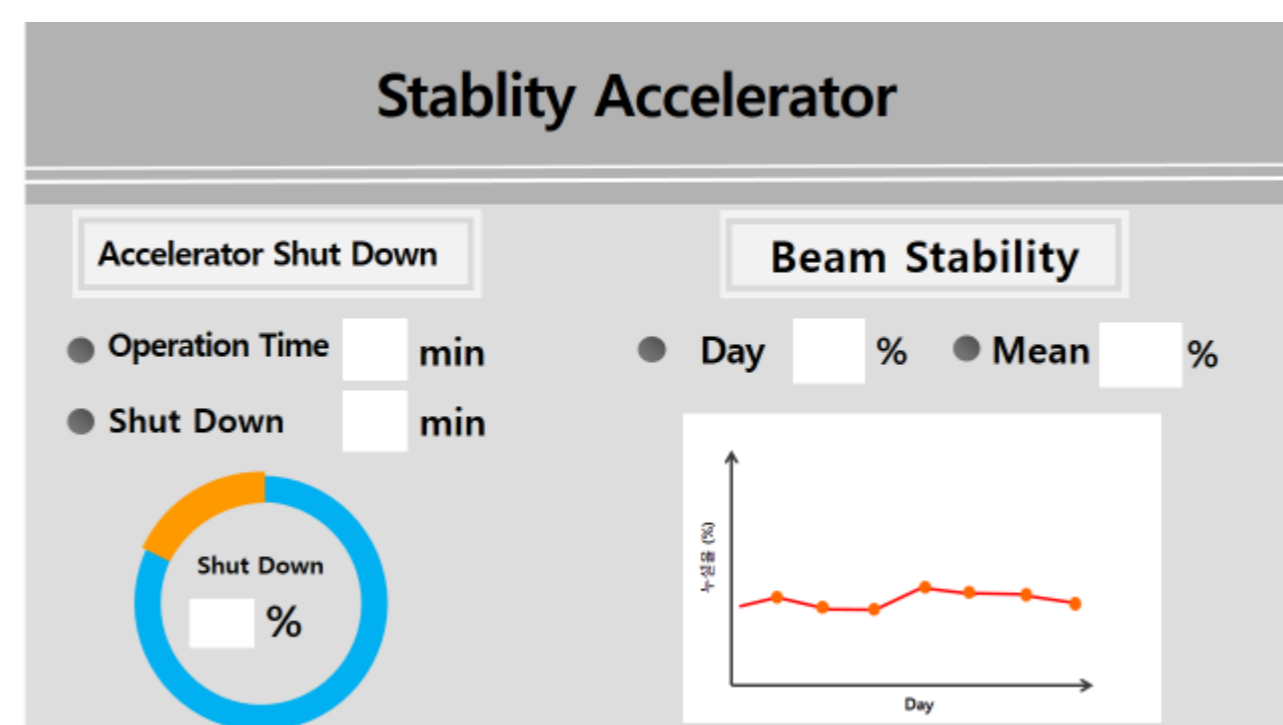
Experimental method

Configuration of Index for Radiation Safety of KOMAC

Accelerator stability

(1) Operation Score

- Count time of Unintentional Operation Stop
The ratio of the unintentional stop time to the planned operation time is scored and divided into 5 sections.



- Beam Stability

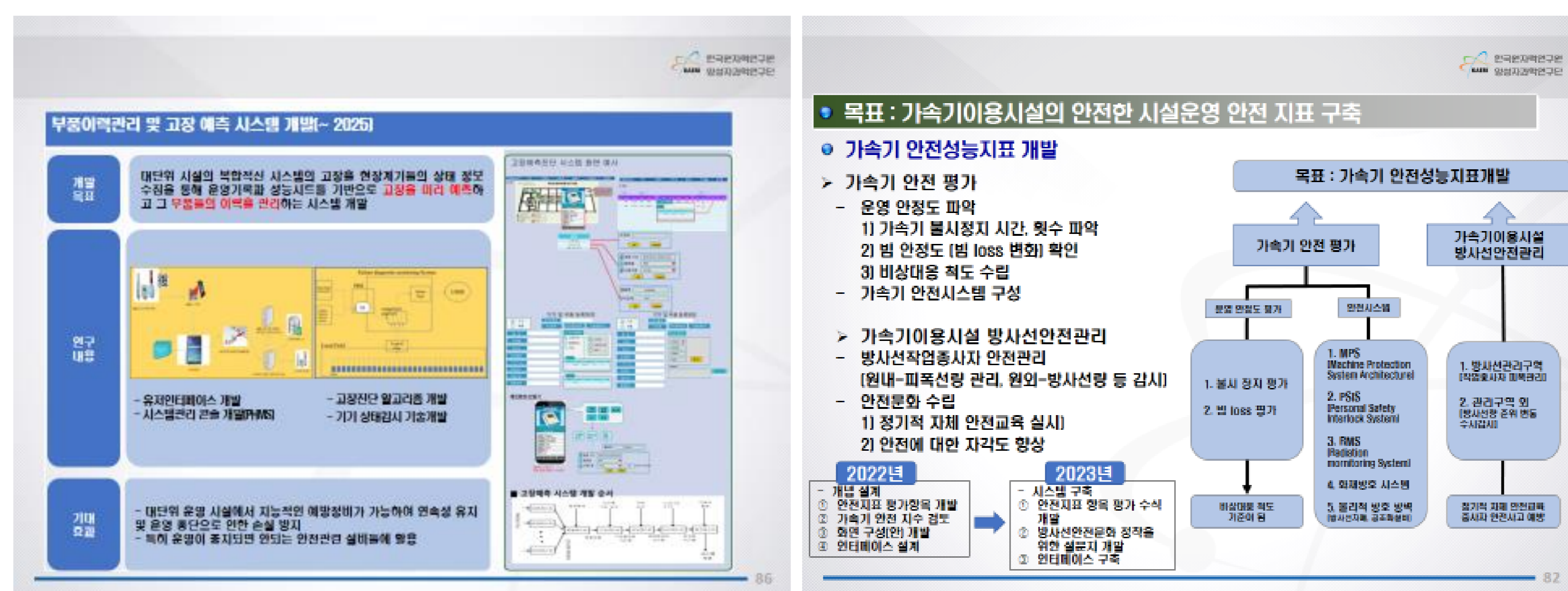
The index obtained by dividing the beam irradiation operation time into 3 sections within the design value.

- Validity Score of Emergency Instruction

The effectiveness of emergency instruction is regularly evaluated, and the performance score of the training program based on the results are scored in 5 sections.

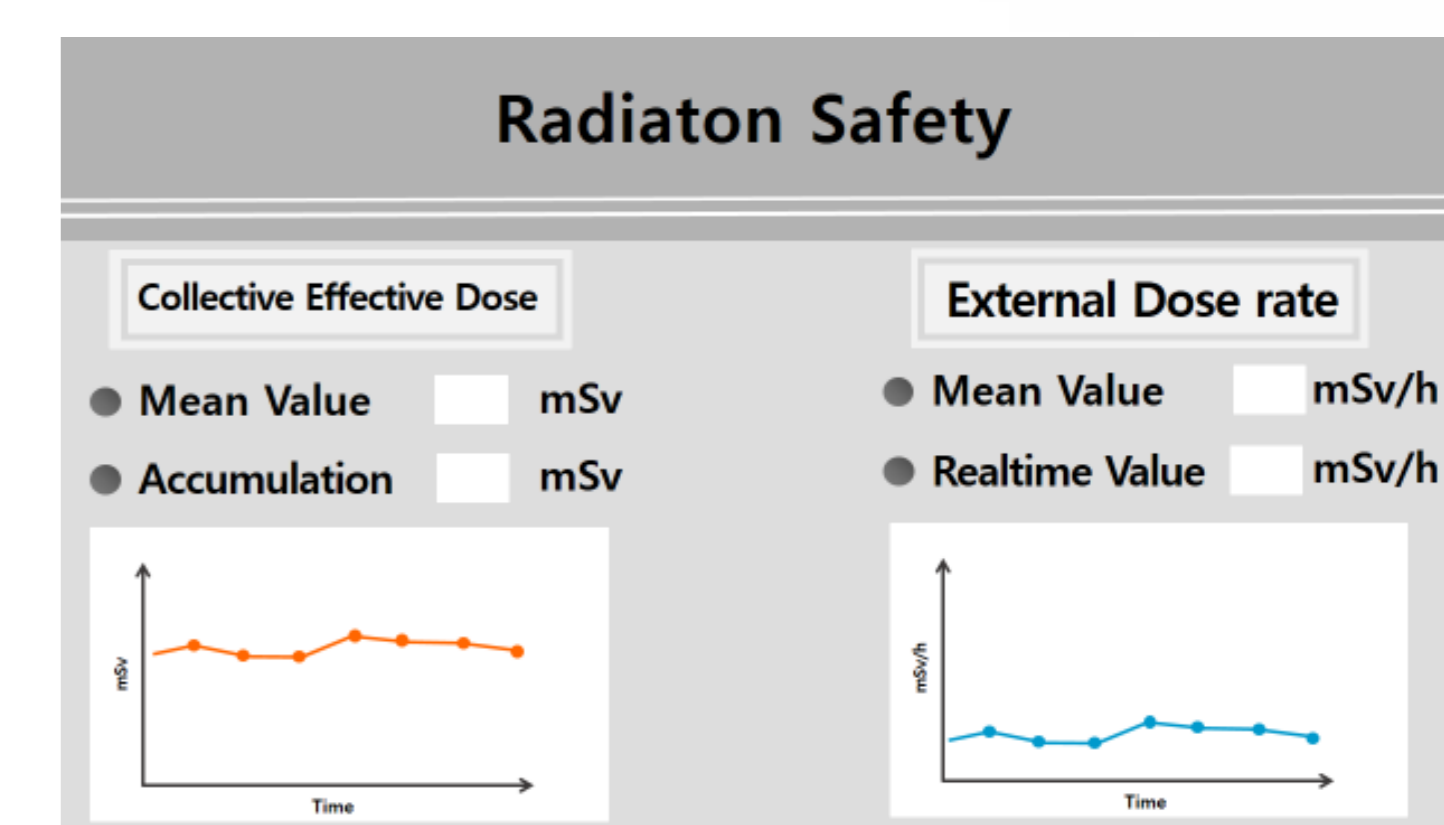
(2) Safety Systems Status-robustness

Score by dividing into 7 sections considering the operation time and the number of failures of the parts compared to the design life time of the safety parts. And also, this index consists of the score concerned about its state confirmed during the periodic performance test using a score board.



Management of Radiation Safety

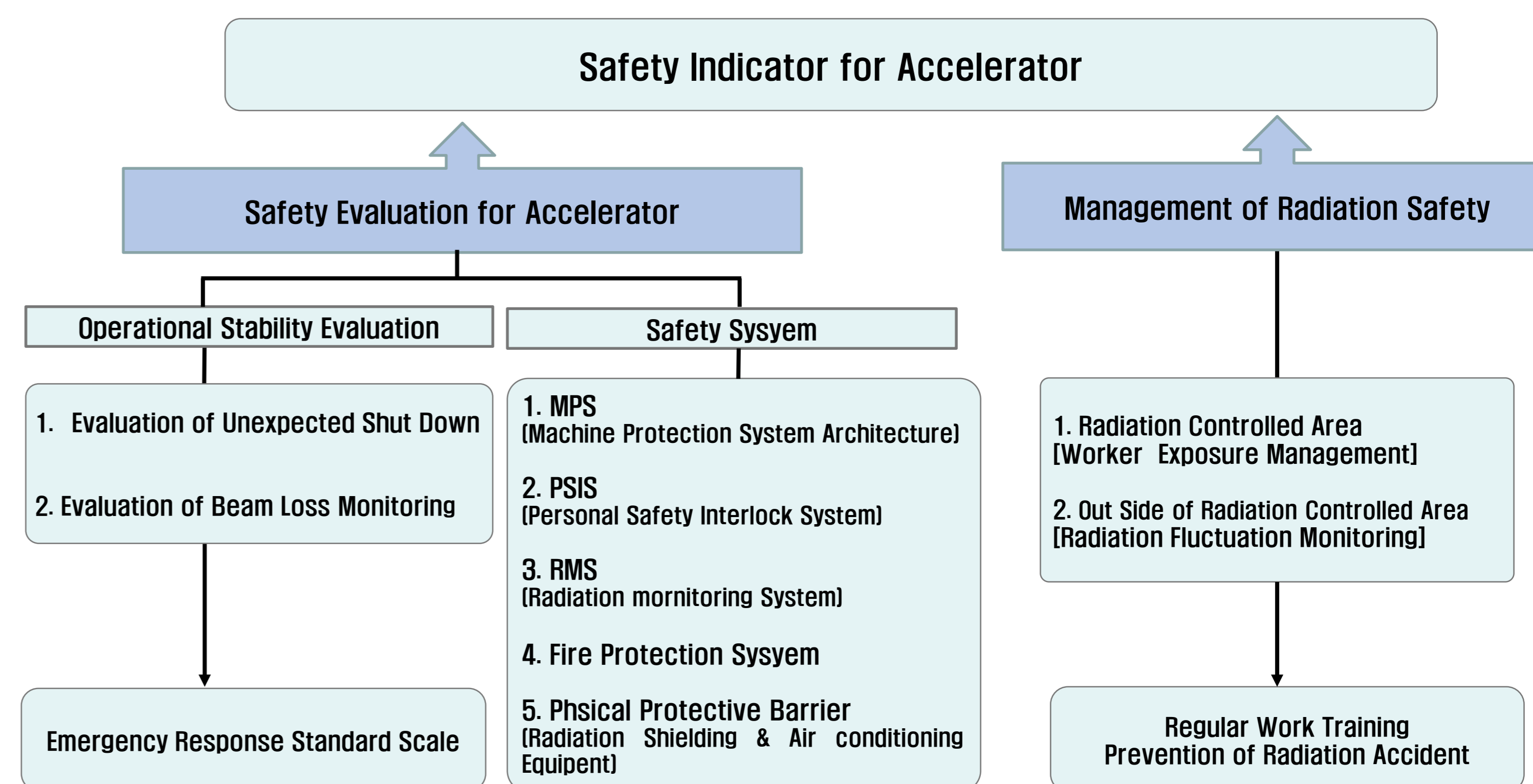
- (1) collective effective dose and trend
- (2) environmental radiation monitoring
- (3) radiation safety program,
- (4) the ratio of personnel and quota in safety division



Safety Culture Awareness of group

The safety culture scale is composed of the following :

- (1) safety culture awareness level of members measured using survey
- (2) personal responsibility : compliant
- (3) effective communication : safety-related meetings
- (4) safety values and behaviors leadership : the ration of personnel and quota in safety team, safety-related prize, etc.
- (5) leaning opportunity: operation experience, self checking, training



Conclusion

The huge nuclear utilization facilities are operating by establishing the safety systems to manage and suppress various risk accompanying the operation of the facility and that is afforded to maintain the function. The safety status of the facility can be diagnosed by monitoring the soundness of these systems, the safety awareness level of the members, and above all, the stability of the accelerator. Each factor for the indicator could be defined and quantified so that the condition of the facility could be directed in a safe direction. What has not yet been studied is how to define the interconnection relationship of each factor in the indicator because the importance of the each factor in indicator is different.

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