

# 174: A 3D digital-based training system of safety assessment to reduce exposure and prevent accidents during decommissioning of nuclear facilities

KwanSeong Jeong

Korea Atomic Energy Research Institute, Daedeok-daero 989-111, Yuseong-gu, Daejeon, Korea  
Ksjeong1@kaeri.re.kr

## 1. Background and Goal of the present work

Decommissioning workers need familiarization with working environments because working environment is under high radioactivity and work difficulty during decommissioning of nuclear facilities.

On-the-job training of decommissioning could effectively train decommissioning workers but this training approach could consume much costs and poor modifications of scenarios. The efficiency of virtual training system could be much better than that of physical training system.

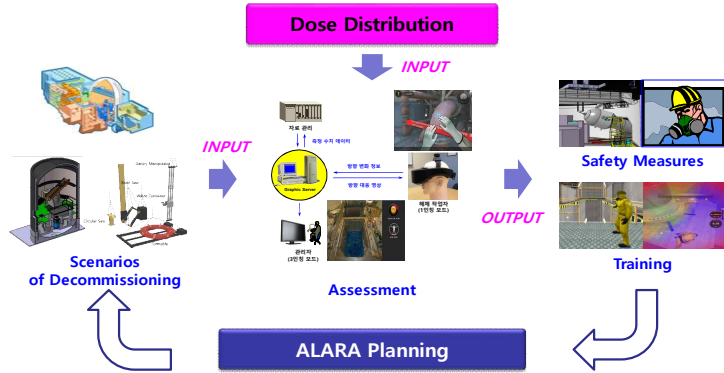
This work was intended to develop the training system to prevent accidents for decommissioning of nuclear facilities.

## 2. Development of the safety assessment system based on virtual environment

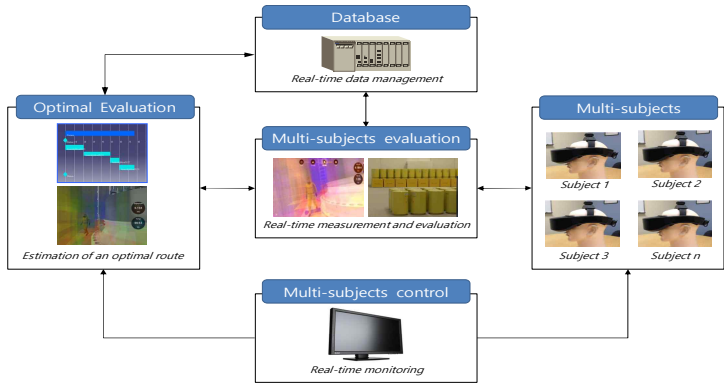
The safety assessment system was developed under virtual environment and concurrent working based on networked environment.

The features of the system are real-time measurement and evaluation of personal exposure dose and of collective exposure dose during movement of a trajectory. And the innovative features are real-time changing, simulating and assessing a trajectory and are operations of simultaneous multi-subjects under networked environment.

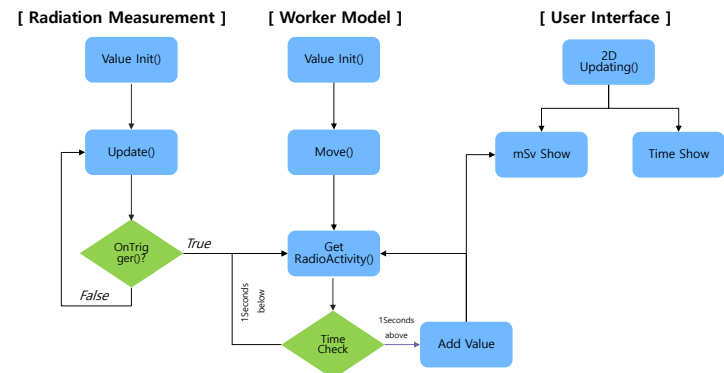
### 2.1. Concept of the system



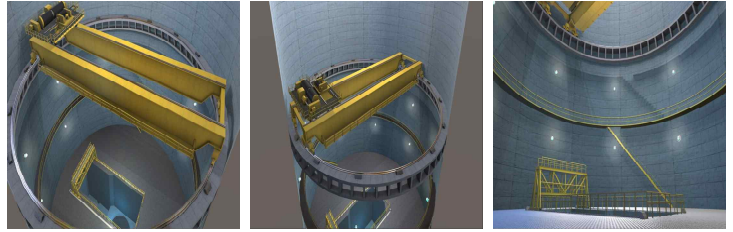
### 2.2 Configuration of the system



### 2.3 An algorithm of real-time measuring worker's exposure

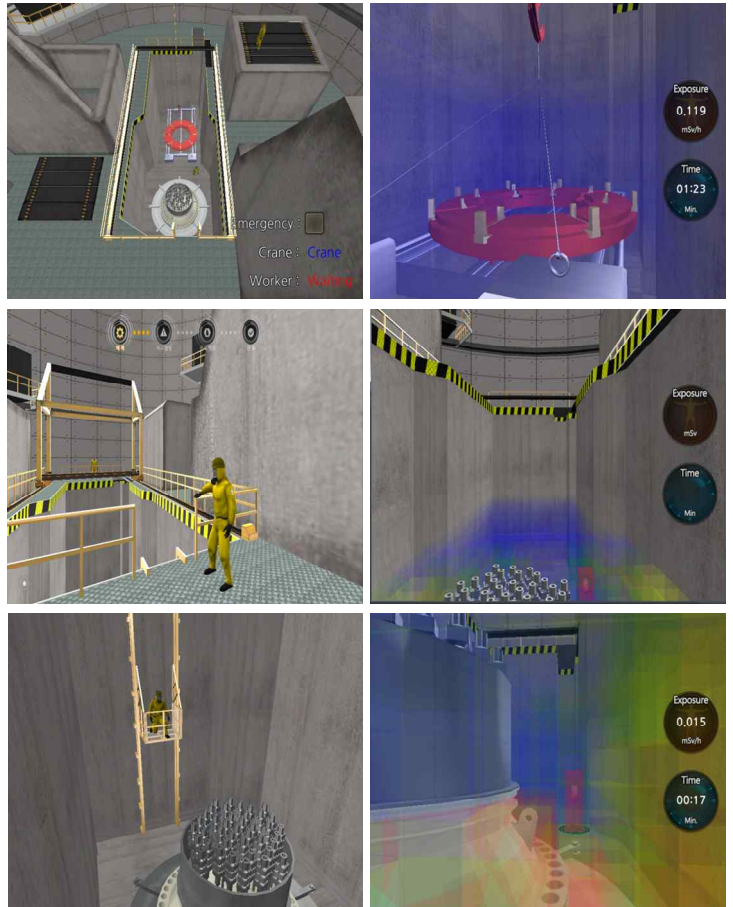


## 2.4 3D mapping in virtual environment of the system



## 3. Application and feasibility test of the system

The virtual decommissioning environment to test feasibility test of the developed system is 3-dimensional graphic simulation and real-scale workplace in the containment of a nuclear power plant. In virtual decommissioning environment, several subjects can enter into and move in a virtual workplace.



## 4. Conclusion

The system has the features of arbitrarily changing direction in a workplace and of real-time measuring personal dose and collective dose in a workplace under virtual networked environment.

### 4.1. Competitive features of the system

- Real-time changing direction of workers in a scenario
- Real-time measuring and assessing personal and collective exposure dose

### 4.2. The innovative features of the system

- Real-time changing, simulating within a scenario
- Operations of simultaneous multi-subjects under the network environments

### 4.3. The system could be utilized as a ALARA training tool

- To prevent workers from accidents
- To operate and maintain in life cycle of a nuclear facility