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Status of the Decommissioning Engineering System Code Development of KAERI in 2014

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1. Introduction

Various information systems have been developed and used at decommissioning sites for planning a project, record keeping for a post management and cost estimation[1]. KAERI is the only expert group which has decommissioning experiences and KAERI is trying to develop computer code to converge all the data which has been accumulated during KRR-1 & 2 and UCP (Uranium Conversion Plant) decommission. KAERI DES supports two kinds of platform; web-based or application oriented program. This paper describes current status and features of KAERI DES application.

2. DES development scheme

This system consists of three major parts: compatible features with web-based DES [1], visualization function of radiological data and auxiliary functions. DES application includes five individual sub-systems of web-based DES, which are decommissioning facility characterization system, information system, work-unit productivity calculation system, cost estimation system and procedure establish system.

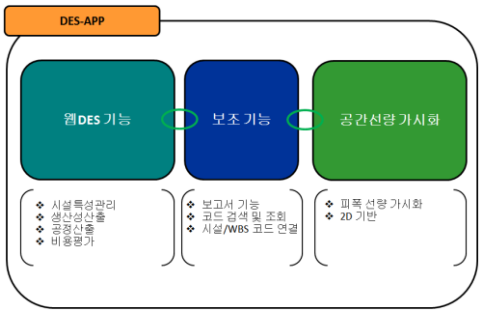

Fig. 1 KAERI DES schematic diagram.

Network independent management system was required in real application due to internet connectivity of site is not friendly in general. Highly advanced graphical user interface was devised in Windows operating system. Hardware requirement is that PC grade computers running MS Access software on Microsoft Windows 7 OS or higher.

3. Key Features of KAERI DES application

DES for Windows application program is going to have following features.

1. Network independent DBMS
2. User friendly graphical interface
3. Facility Code/WBS Code Search and Link
4. Report and print
5. Visualization of radiological data
6. Graphical Scheduling based on ISDC contents

Details of the key features will be discussed latter part of this paper.

3.1 DES Templet

One of the most prominent features in KAERI DES is templet function, which is pre-defined decommission scenario for given system by expert. Users can start their scenario with that and modify it based on user specific requirements. KAERI has raw decommission data for KRR-1 & 2 and UCP, therefore those will be added in near future.

Fig. 2 Templet Screen

3.2 Scheduling Tool

During the decommissioning projects for KRR-1 & 2 and UCP (Uranium Conversion Plant) at KAERI, an estimation of the amount of the dismantled waste and the relative project costs and the time schedule of the waste treatment were requested for the decommissioning project management. According to this needs, DES application offers a scheduling tool that user can organise by using intuitive drag & drop of sub-task bar.

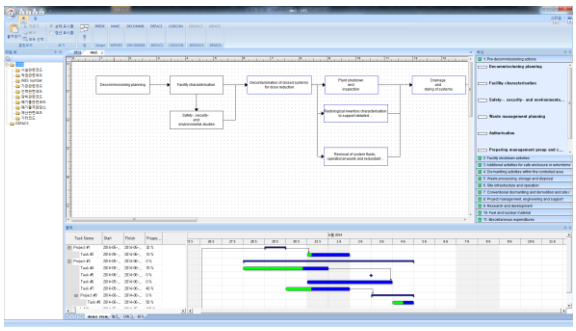

Fig. 3 DES Scheduling Tool

3.1 Code combining tool

In decommissioning data, there are the two major guide lines to organize decommissioning data, which are facility based code and work-breakdown structure based code. Facility based code means one distinctive code represents one physical facility in a nuclear reactor

system, such as reactor pressure vessel. It is a general approach to calculate volume or mass of a system. And work-breakdown structure based code is a code system based on unit work, for example, steel cutting or drilling. This system has advantages to calculate cost analysis, which should count man-power, technic and management. These two code should be combine to estimate radwaste amount and total cost. In DES application code combine tools help to link both two codes with 'drag & drop' of each item.

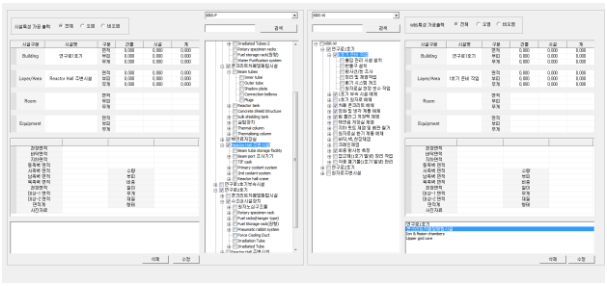

Fig. 4 DES code combining tool

3.3 Excel data conversion Tool

KAERI has acquired precious data in the process of decommissioning KRR-1 & 2 and UCP, which raw data has different type of data file. DES application has converter excel file format raw data to DES DBMS (Database management system) format. It makes users' work easy.

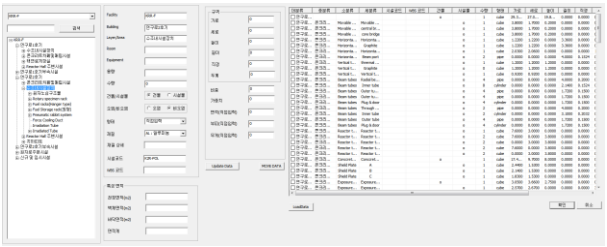

Fig. 5 Excel data conversion tool

3.4 Radiological data visualization

DES application offers 2D radiological data diagram in a reactor system. This feature is under developing and it is going to display actual measurement data of KRR-2 or nutronics calculation results, such as MCNP result contour.

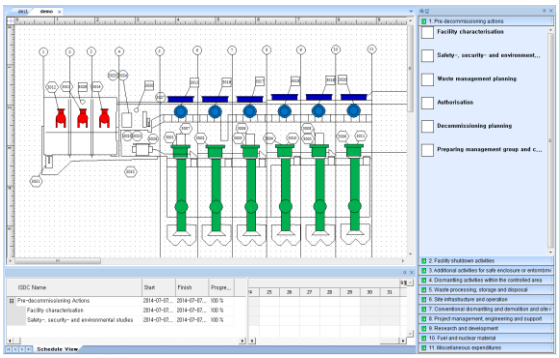

Fig. 6 radiological data visualization.

4. Future plan of KAERI DES application

KAERI DES application development project has been scheduled to be finalized at the end of 2014. Validation of cost estimation is required. Within the early October, major feature will be accomplished. And validation tasks are going to be performed with respect to KRR-2 (before December) and commercial nuclear power plant (before November).

5. Conclusion

As a responsible leading group of Korean decommissioning research field, KAERI has been developing DES application program, which is going to be an important mile stone of decommission industry in Korea. User friendly graphical interface and lots of actual data let people well understood on decommission cost evaluation. It is expected that continuous effort and funds will be delivered to this research.

References

[1] S. K. Park, S. B. Hong, et. al., "A Decommissioning Information Management System," the Korean Nuclear Society Spring Meeting Vol.1 (2007).