9-3 Development of Decommissioning Engineering Support System (DEXUS) —Database and Dismantling Work Simulation System (VRdose)—

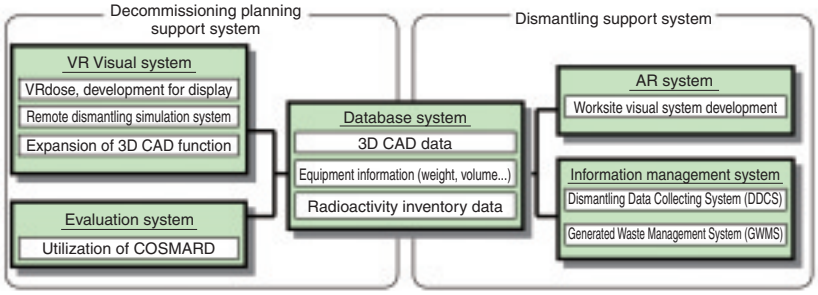

Fig.9-5 Structure of DEXUS

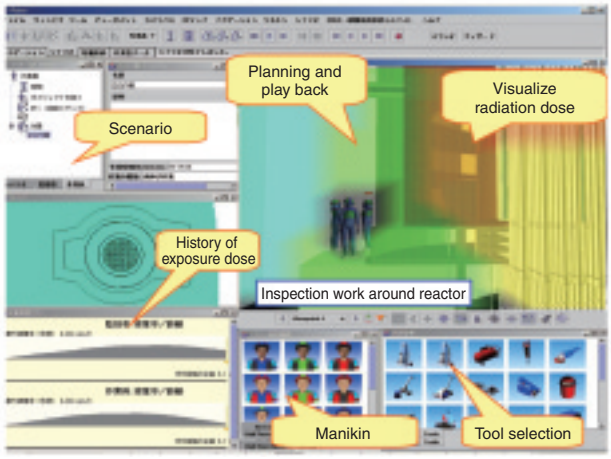

Fig.9-6 Userinterface of VRdose

In order to plan a rational decommissioning process with improved safety, reduced exposure dose and reduced waste generation, the Decommissioning Engineering Support System (DEXUS) has been developed in Fugen nuclear power station.

DEXUS consists of three subsystems; a Database System provides relevant data to a Decommissioning planning Support System and a Dismantling Support System.

Moreover, the Decommissioning Planning Support System consists of a VR Visual System and an Evaluation System. The Dismantling Support System also contains an AR Visual System and a Data Management System (Fig.9-5).

Here, the current status of the development of the Database System and the dismantling operation simulation system (VRdose) contained in VR Visual System in DEXUS are described.

(1) Database system

The Database System includes 3D-CAD data, equipment information, and radioactivity inventory data of Fugen. In particular, some 3D-CAD enhancing functions are added into for efficient planning, as follows.

1) A Coordination function between 3D-CAD and information such as specifications of equipment, pictures and diagrams for instruments and pipes (2D-CAD)
2) The function for cutting equipments in a 3D-CAD
3) The function for estimating amount of mass in a specified space in a 3D-CAD.

(2) VRdose

In the decommissioning of a nuclear power plant, many dismantling operations are executed by humans, excepting those for a reactor activated highly with radiation. Therefore, a prior determination of both the operation steps and the exposure dose is important to plan it appropriately, considering safety of the operation itself and reduction of exposure dose. VRdose has been developed in cooperation with the Institutt for energiteknikk (IFE) for this purpose (Fig.9-6). VRdose can evaluate the inside exposure and the outside exposure of the workers, simulating the behavior of the workers by a human model in VR space composed with 3D-CAD data and space dose data of Fugen. In addition, the system can be used for the education for workers before the work and PA for workers.

We are going to apply DEXUS to actual dismantling work in order to confirm and improve its performance.

Reference

Iguchi, Y. et al., Development of Decommissioning Engineering Support System(DEXUS) of the Fugen Nuclear Station, Journal of Nuclear Science and Technology, vol.41, no.3, 2004, p.367-375.