

VRdose Features

Calculates total effective dose and displays radiation levels based on input data

- Reads radiation data in an open XML format
- Data are obtained either from external computation systems or from measurements
- VRdose can also interpolate scattered data measurements

Presents user with interactive 3D virtual environment

- Rapid, easily comprehensible, visual overview of results

After opening a VRdose "project file" containing data

- User can freely navigate in a virtual environment
- View the facility from any angle...
- ...overlaid with 3D visualisation of radiation levels

Scenarios recorded on XML format

- Record, play back and edit work scenarios with teams of operators
- User can insert work tools for use in the scenarios

Visualises intake (nuclides) and external (γ) radiation

- As individual radiation species
- As combined total effective dose rate
- Intake dose estimates can take protection gear into account

Database connection

- Query objects in the VE for information (editable by the local VRdose database system manager)
- Operator information related to estimated and real life doses

Predefined viewpoints to facilitate navigation

Camera path recording

Configurable colour ranges for colour-coding the visualised data

- Linear, logarithmic, or exponential distribution

Save snapshots of the virtual environment

- Can be used to illustrate reports and presentations

Supports ISO VRML and X3D 3D geometry

Online user manual facility

Works on most popular operating systems, including Microsoft XP, Apple Mac OS X, and most varieties of Linux.

Institute for Energy Technology (IFE)

With over 550 employees, the Institute for Energy Technology is Norway's second largest technological research institute. The institute's activities in Halden have a strong foundation in international scientific cooperation for over forty-five years. More than 100 organisations in 20 countries participate in the OECD Halden Reactor Project, which IFE administers under the auspices of the OECD. IFE is a major international R&D centre for information, safety, and environmental technology.

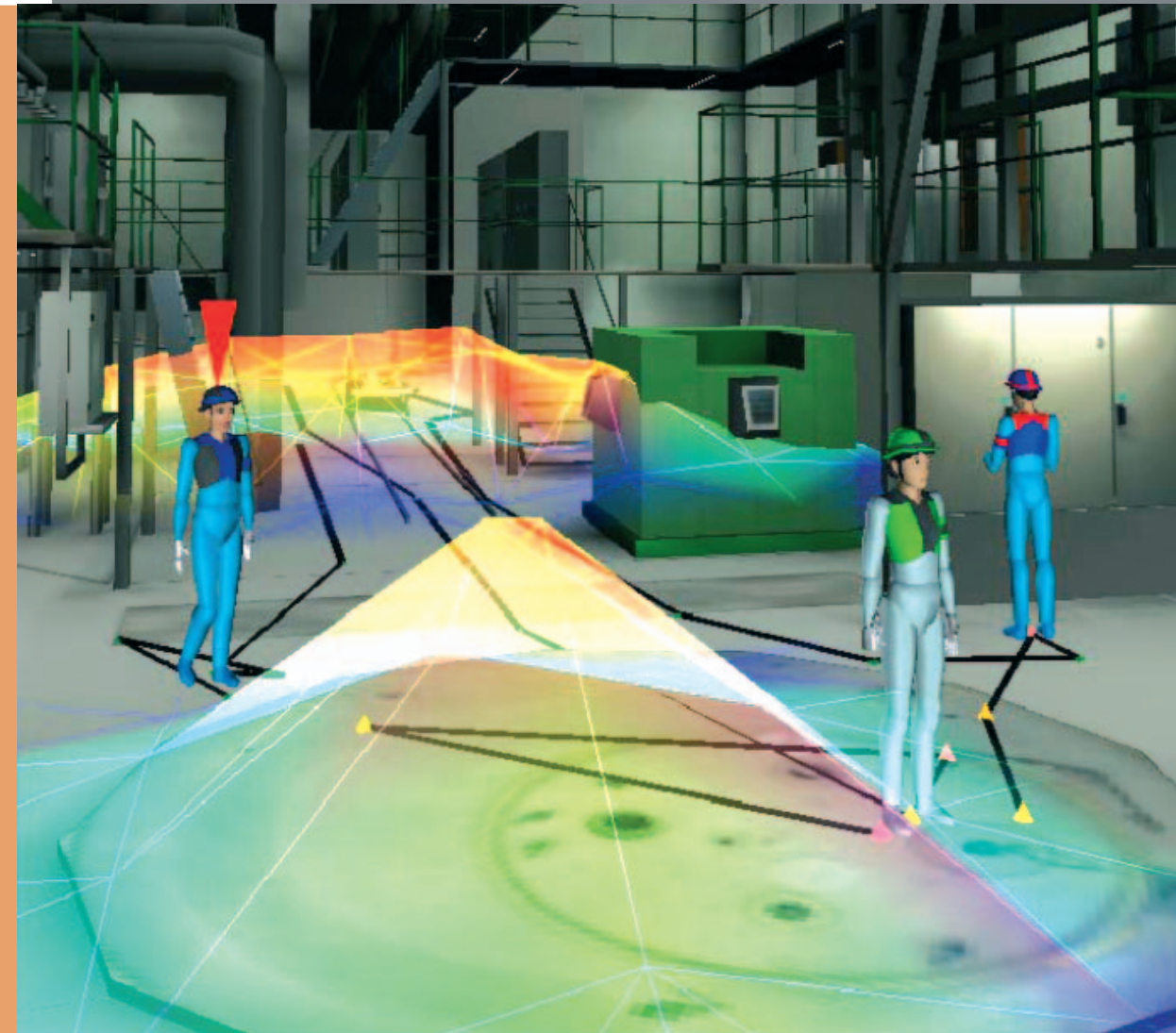
Halden Virtual Reality Centre (HVRC)

The Virtual Reality Centre at IFE was established in 1996 and builds on IFE's vast experience with advanced graphical visualisation technologies and human factors, accumulated since the early 1970s. Approximately half of HVRC's activities are research activities for the Halden Project. The remaining activities comprise of applied R&D, and consulting for individual customers.

Halden Virtual Reality Centre
Institute for Energy Technology
Visitors: Os Allé 7, 1777 Halden, Norway
Post: P.O. Box 173, N-1751 Halden, Norway
Tel: 69 21 22 00
Fax: 69 21 24 60
<http://www.ife.no/vr/> vr-info@hrp.no

Halden Virtual Reality Centre

Applying advanced visualisation technologies and human factors to real world challenges



Decommissioning, Outage & Maintenance
VRdose Software

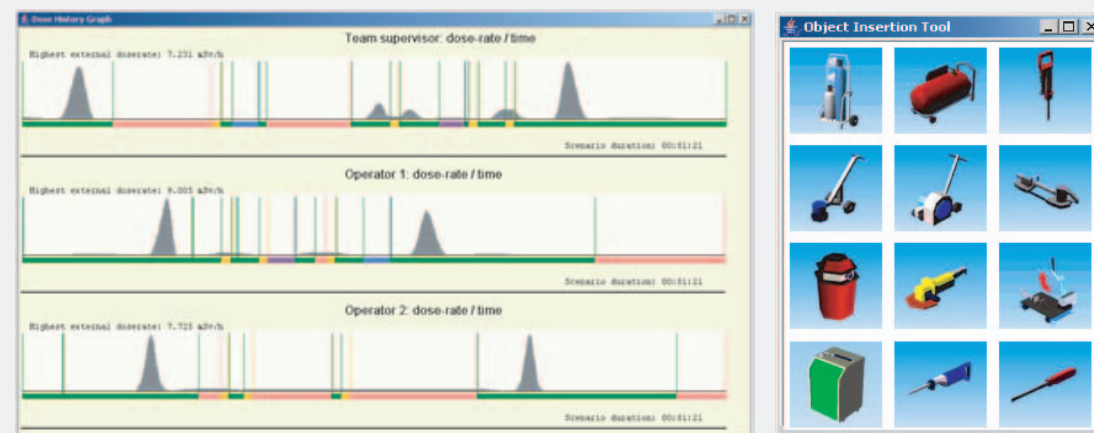
VRdose is a software tool that can display dose-rate distribution and give estimates of occupational doses for work scenarios in nuclear facilities

- Can be used to enhance the radiation awareness of operators and executive personnel
- Can be applied throughout the lifecycle of a facility: commissioning, planning and operation, training, as well as decommissioning
- Predictions can be calculated from measurements or using third-party radiation computation software

Background

The VRdose system has been developed by IFE and Japan Nuclear Cycle development institute (JNC) for use in the decommissioning of the Fugen Nuclear Power Station in Tsuruga, Japan. The primary focus of VRdose is on work planning in combination with radiation visualisation and occupational dose estimation.

By visualising radiation levels, VRdose enables its users to rapidly assess a situation, to provide better understanding of it, for design, training, or operations purposes. For example, providing staff with greater awareness of how the radiation distribution will be in a work area under certain conditions can help operators to limit their exposure to radiation by avoiding, or minimising, intermissions in hot areas.



VRdose Concept

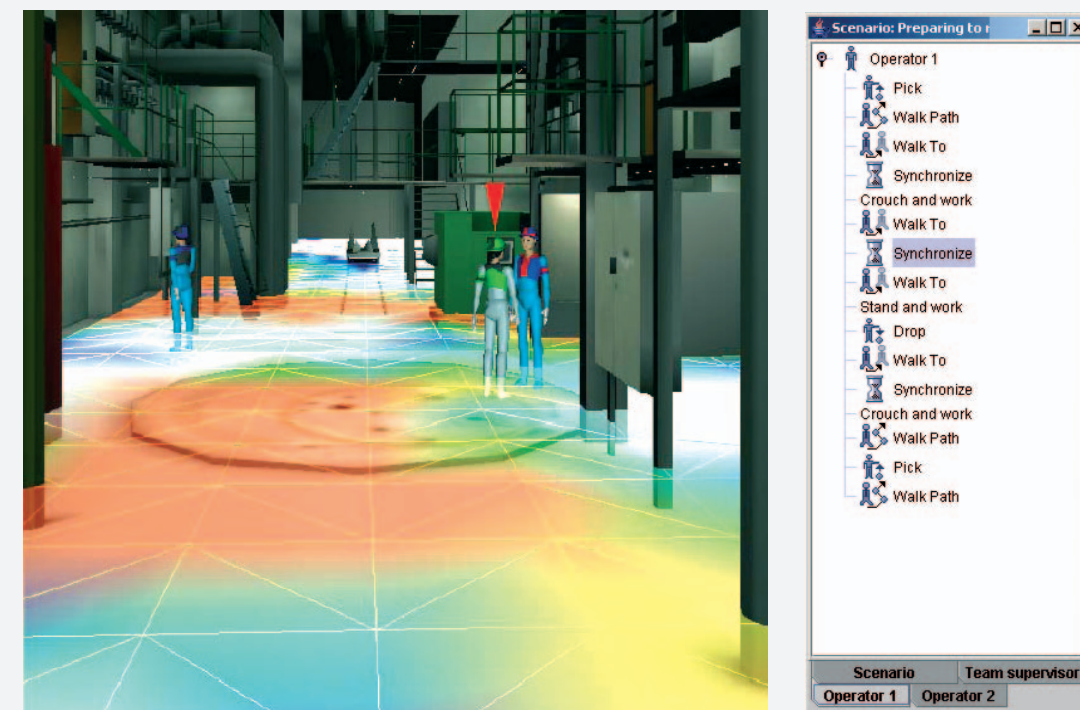
VRdose offers the user an interactive three-dimensional virtual environment that combines a visually realistic model of a facility with 3D visualisation of measured or computed radiation levels. Based on work scenarios, interactively recorded by the user, it calculates and displays the total estimated dose for each of the participants. Geometry for the work place, manikins, or work tools and equipment can easily be reconfigured or supplemented.

VRdose provides a rapid, easily comprehensible, visual overview of the results. Its purpose is to support rapid assessment of radiation environments, and to enhance the understanding and radiation awareness of operators, decision makers and stakeholders.

The software is modular, and can be tailored by IFE to meet the specific needs of new clients and environments.

VRdose has been designed primarily for desktop PCs, but also supports stereoscopic rendering on more exotic display systems. It has been developed using Java™ and Java3D technology and therefore runs on most common operating systems.

An XML-based file format is used for radiation data, camera paths and work scenarios, while the ISO VRML97 and X3D formats are supported for 3D geometry data. The present version of VRdose communicates with a relational database for information on inventory and staff.



Credits

The VRdose project has been carried out by IFE in cooperation with JNC.