



VISIPLAN NEWS

3D ALARA Planning tool Newsletter

May, 2004

NUMBER 1

Visiplan 3D ALARA planning tool



The VISIPLAN 4.0 - 3D ALARA planning tool is a dose assessment program for gamma radiation. It is a tool developed for the ALARA analyst or the person responsible for the dose assessment in ALARA pre-job studies.

Basic VISIPLAN 4.0 features

Geometry and source definition:

- Geometries defined in 3D wire frame (or through CAD interface)
- Geometries and trajectories can be viewed with a VRML browser.
- Database for standard materials
- Isotope database
- Geometry check capabilities
- Source strength determination from measured dose rate sets

Dose calculation

- Point-kernel with build-up correction
- Random sampling of volume sources with statistical error estimate on dose rate
- Error estimate for accumulated dose based on work duration uncertainties

First VISIPLAN USERS DAY:

Brussels, 23 June 2004: free access, registration needed!

See info and registration form on:

http://www.sckcen.be/sckcen_en/activities/conf/conferences/visiplan/index.shtml

THE VISIPLAN 4.0 IS NOW RELEASED...

The New version of Visiplan 4.0 has been launched in January 2004. We are convinced that with its added volumes and sources, the ALARA analyst can make better estimates with a more realistic representation of the environment.

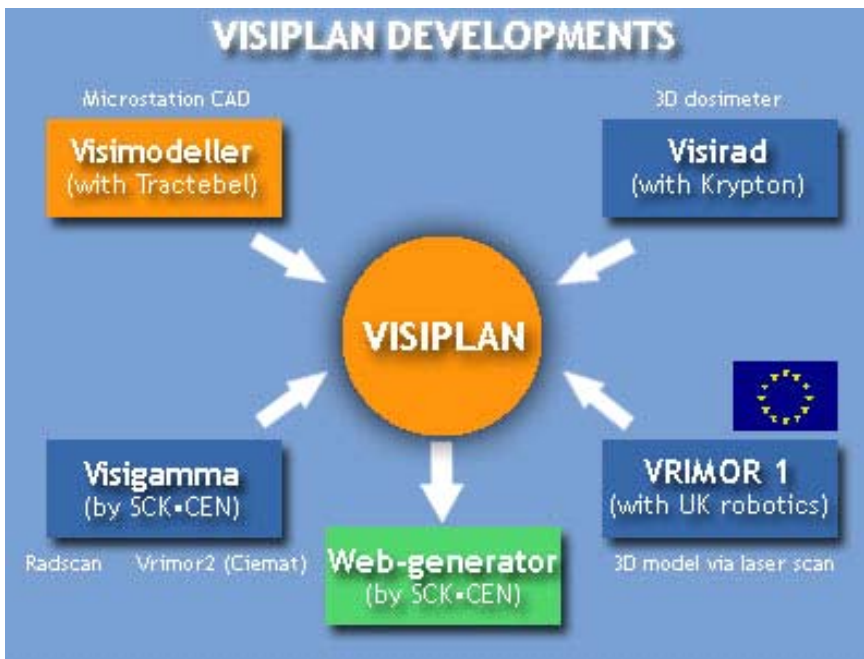
1. Visiplan 4.0 is rewritten from the previous version 3.X. All the flexibility of the older software was checked and improved to meet the ALARA analysts requirements. With its built-in output to MS-Word® and MS-Excel®, the analyst can report quickly and accurately the results of the analysis carried out.
2. The built-in computation core has been improved to increase the calculation speed.
3. To have a more realistic image, texturing is now available in VRML.
4. Geometric types of volumes and sources can now be changed quickly in edit-mode.
5. A set of new volumes are introduced like bend, wedge, sphere cap...
6. A web site generator ARGUS is added to the software to enable the generation of a report, including the dose prognoses and interactive Virtual Reality models of the environments.

What is Visiplan?

Introduction

ALARA dose assessment for work planning in complex nuclear installations is difficult. The aspects of geometry, source distribution and shield geometry play an important role in the dose prognoses. Also work organization, type and work duration are non-negligible aspects in ALARA considerations. *(continued on page 4)*

Collaborations & Developments



VISIPLAN can be used as a stand-alone tool for making 3D ALARA studies. But a wide variety of modules complete the VISIPLAN 4.0 planning tool.

VISIGAMMA

Interfacing the Visiplan input module with gamma cameras.

This product is presently in finalization stage (interface with EDR from Ciemat, with Cartogam from CEA).

VRIMOR

EC supported integrated project allowing to interface geometrical input data with a 3D model based on layer scanning system.

This has been developed together with different European partners (Z+F ltd, Ciemat, NNC, UPM).

WEB GENERATOR ARGUS

Output generator in HTML and VRML format, allowing easy exchange of results.

This module is included in the VISIPLAN 4.0 release.

VISIRAD (in development)

VisiRad is an easy-to-use and lightweight hand held dose rate measurement tool coupled with a 3D location detector allowing to map rapidly the dose rate field in complex environments. The resulting map can be used in VISIPLAN to determine source strength from the map.



VISIMODELLER

User friendly interface for the Visiplan geometrical input from CAD software package into Visiplan. This product is commercially available for interfacing with Bentley's Microstation® package.

(see also article on page 3)

The modelling of a complex and changing radiological environment is often a challenge for the analyst.

Often, a lot of time is spent to enter the environmental boundary conditions, (dose rate field, sources activity) and the geometrical input.

On the other hand, the output data have to be user friendly and readable by different stakeholders in the ALARA analysis process.

Therefore, we have built, in collaboration with industrial partners, a lot of input/output modules to save time and to make the problem solving process easier to the analyst.

Geometrical (via CAD package interface) and radiological input data (via Gamma camera results or simple hand held measurement tools) have been developed. For the output, HTML reports and VRML 3D screens allow to better interpret the results of the Visiplan calculations. All of these modules make the analysis simpler and easier to use.

Feedback & Questions

Contact information can be asked by sending an e-mail to:

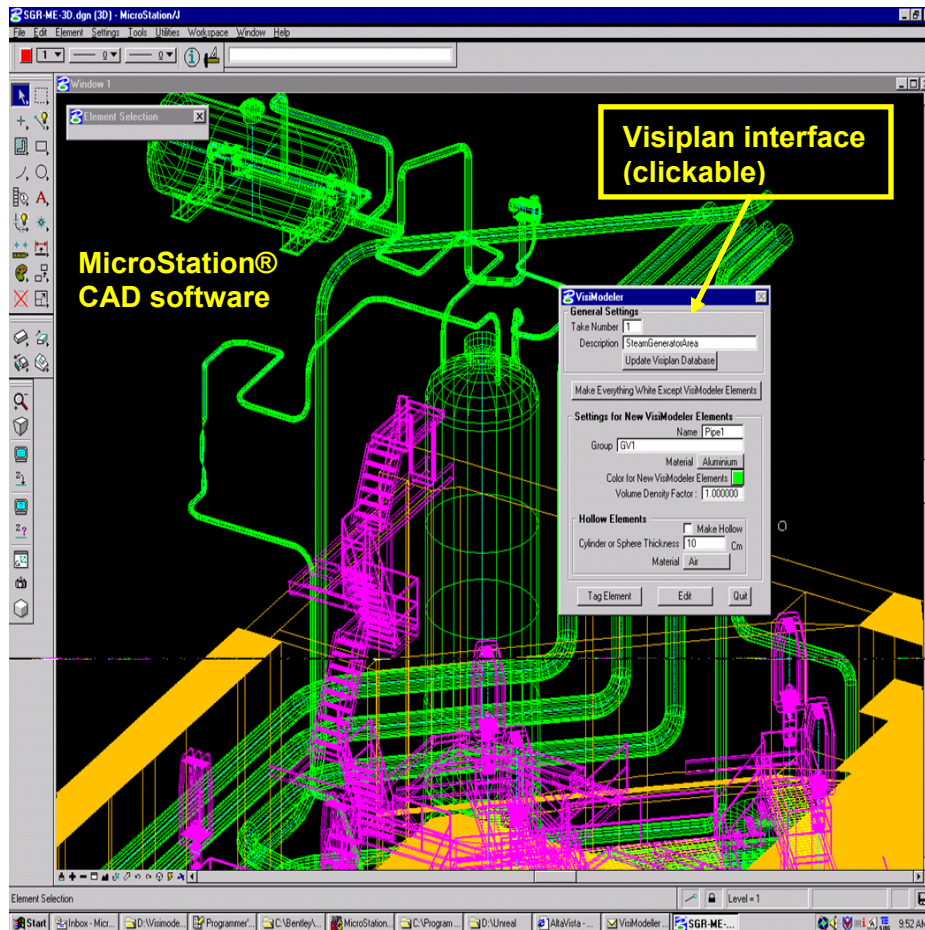
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Visimodeller: a user friendly CAD interface developed in collaboration with Tractebel Engineering

Features:

- Compatible with MicroStation SE, J/V7 for Visiplan 3.X and MicroStation V8 for Visiplan 4.0
- Compatible with Access 97 2000 (Visiplan 3.X) and Access 2002/XP (Visiplan 4.0)
- Creation of the majority of Visiplan's Objects is available (solid or surface)
- Automatic numbering of Visiplan's objects
- Create automatically Visiplan's sources: linear, solid or surface
- Compare the Visiplan's objects and non Visiplan's objects
- Create Visiplan database without conversion
- Large choice of materials



Visimodeller typical screen shot. The selection of geometrical elements from complex environments is made by simple click of the mouse.

Visimodeller is capable of converting a Microstation design into a format that can be read by Visiplan. With this tool, the analyst doesn't have to remake the model from 3D CAD-drawings.

The tool developed in collaboration with Tractebel Engineering is now available for Visiplan 4.0. Validation has been carried out for the steam generator replacement of a Nuclear Power Plant.

Tractebel Engineering

Tractebel Engineering, a member of the Suez Group, a global energy and services business, is one of the most important European engineering consultancies.

Website:
www.engineering.tractebel.com

APPLICATIONS

The Visimodeller tool has been used to convert the steam generator replacement of Tihange NPP into a live-model for Visiplan. The analyst does not have to spend time to redesign the whole project in Visiplan. Currently, time is an important aspect in ALARA analysis.

What is Visiplan ? (continued from page 1)

In order to structure and streamline this information we developed the VISIPLAN 3D-ALARA planning tool. This user friendly PC-based tool calculates a detailed dose account for different work scenarios defined by the ALARA analyst, taking into account worker position, work duration and subsequent geometry and source distribution changes.

VISIPLAN General description

The aim of the VISIPLAN software tool is to provide the ALARA analyst with a tool that allows a fast dose assessment for work planned in a radioactive environment. The calculations are based on a 3D model of the work place.

Reporting

- Standard MS-Office® package reports
- Using ARGUS for automatic web site generation of scenario results, including 3D models in VRML format and dose and dose rates on trajectories and grids
- Interactive geometric model in VRML format

All calculations are based on the point-kernel calculation technique using an infinite media build-up correction. The user is provided with a set of tools that allow him to perform a dose assessment and to investigate different work scenarios in order to reduce the doses to the workers.

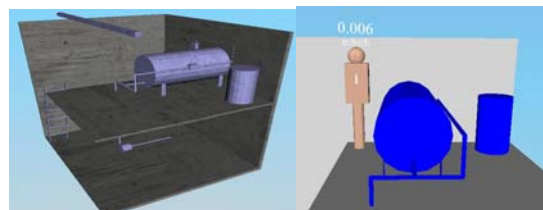
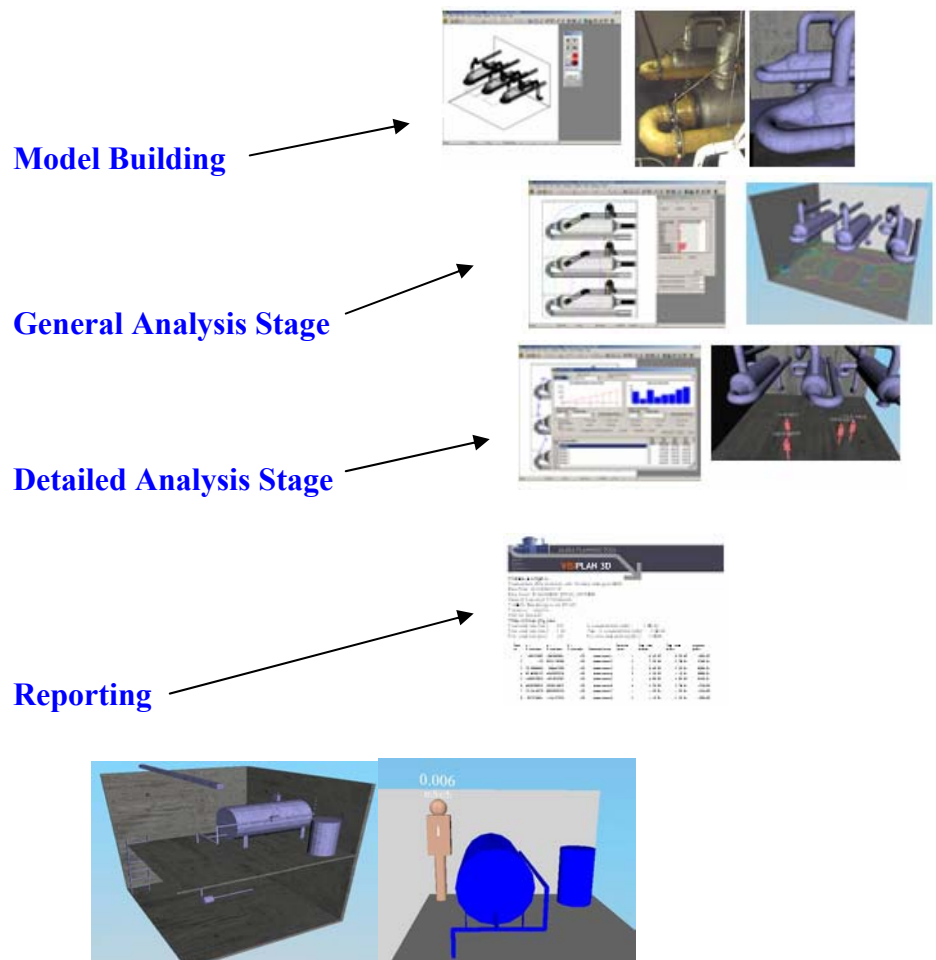
The VISIPLAN methodology is based on four major steps:

- the model building stage
- the general analysis stage
- the detailed planning stage
- the follow-up stage.

The VISIPLAN tool was applied to several ALARA studies at the SCK•CEN and in different nuclear installations. The applications ranged from decommissioning and maintenance to the installation of new devices.

Detailed Analysis

- Dose calculation for tasks and trajectories
- Dose calculation for scenarios
- Determination of collective and individual doses
- Scenario comparison



Examples of a 3D environment created in VRML. The new release 4.0 software has the capability to generate 3D environments texturing to give the surrounding a more realistic outlook.

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