Workshop on
" International Workshop on Application of Advanced Plant Information Systems for Nuclear Decommissioning and Life-cycle Management "

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Group Discussion Summary

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The group shared **experience with the creation of 3D models intended for use in developing plant information models (PIMs) of facilities to be decommissioned**. This experience suggested there is broad acceptance of the advantages of developing 3D models to aid decommissioning planning, for facilities ranging from nuclear power plants, fuel cycle facilities and research reactors. In the case of nuclear power plants there was evidence of increasing acceptance of the benefits of using a complete PIM to support the detailed planning of decommissioning of the entire facility. For nuclear fuel cycle facilities current experience suggests the models are used more selectively, e.g. to assist planning the dismantling of specific plant items, including for training of personnel who will implement the dismantling of the items in question.

Two approaches to model development were being followed: (1) establishing the model from existing 2D drawings, photographs and other documentation already in existence, followed by use of laser scanning to provide confirmation of the accuracy of the model; and (2) establishing the model directly by laser scanning.

The first option has been used successfully to create the basis for a PIM for a nuclear power plant recently shutdown in Spain. The approach offered important advantages in cases where accurate drawings were available:

- Supplementary information about the plant being modelled (e.g. the system of which a specific component formed part and the material of which it was comprised) could be directly associated with individual objects, e.g. through linkage with a separate database containing such information;

- Detail not visible to the laser beam are directly included in the model, e.g. the thickness of piping covered by insulation or buried in concrete.

- Laser scanning provided a means of subsequently validating the completeness and accuracy of the model.

- The total resource requirement to establish the model (e.g. 15000 hours for a typical PWR) was in line with resources needed to compile information into a form needed to support decommissioning by traditional means.

The second approach (i.e. beginning with a point cloud developed by laser scanning) has been used in modelling selected areas of larger facilities and also for modelling of smaller facilities. In this case, the completeness of the model may be checked against other available information, including drawings. If the model is intended to form the basis for a PIM, additional information (from drawings etc.) will in any case need to be associated with the modelled objects. Newly available scanning tools enabled both the plant configuration and the radiological situation to be quickly modelled; feedback from the early use of such equipment was very positive and it is likely that their use will become commonplace.

It was noted that the use of 3D models, coupled with the use of virtual reality, to support training of personnel was gaining increasing acceptance. The creation of such virtual environments for training was still used only in selected situations (e.g. high dose environments) due to its cost. These included situations with the potential for significant exposure of workers, in which case technologies using virtual reality (e.g. to show the location of radioactivity) were also beginning to be used to provide increased safety of workers.