

Preservation and re-use of nuclear knowledge in the UK nuclear industry

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The Nuclear Sciences and Technology Services group within British Nuclear Fuels plc (BNFL) has been developing a programme of work since 2001 aimed at preserving knowledge for current and future use within the UK nuclear industry.

The initial focus was on the key technologies for which knowledge needed to be preserved for current use and in order to keep the nuclear option open. The programme has been extended to incorporate operational knowledge of nuclear plants.

The main company knowledge base – Corporate Memory – is utilised to capture explicit knowledge and underpins the knowledge preservation process. Corporate Memory is a knowledge base containing 240,000 scientific and technical reports written over the last 60 years. These reports, written mainly by BNFL staff, cover company plants and projects. The knowledge base is being developed to encompass the UK nuclear industry, and includes reports from organisations such as UKAEA and AEAT that have worked in partnership with BNFL. Corporate Memory also preserves material published by BNFL in the public domain, typically conference papers and journal articles, which often present state-of-the-art descriptions of plants, processes and technologies.

The knowledge preservation process commences with the strategic identification of key specialists within each technology or nuclear plant. This is followed by an interview with the nominated individuals, who typically have 20-30 years experience within the UK nuclear industry. Each individual is asked during the course of a 1 hour interview to identify, from within their written output, those documents which contain knowledge regarded as being key for the future of the industry. By adding their specialist knowledge to the key documents, a permanent marker is inserted within database entries, which will assist future generations to identify important work undertaken by their predecessors. Specialist knowledge sets the context within which the work was carried out, along with the particular significance of the findings described.

Company reports represent one facet of knowledge. Knowledge of other sources of printed material, such as books, journals and external reports, are also elicited during the interview. Links may also be made to information systems that contain valuable additional sources of knowledge.

The people issue can prove critical. Often it is those individuals within a specialist field, who can be relied upon to provide expert advice or consultation, that are most valued in terms of their own tacit knowledge. They may still work within the organisation itself, but are just as likely to have retired or to be employed by other organisations in the field. As well as adding their names to the list of staff to be interviewed, a link may also be provided to their own – or their organisations – web-site.

All the knowledge extracted via the interview process is linked together within a knowledge package covering a particular technology – which may be further sub-divided – or nuclear plant. A knowledge package is a simple information system containing links to the sources of knowledge that have been identified during the knowledge preservation interview. It is

possible to customise the knowledge package template to provide the most effective working system for each subject.

Compiling knowledge packages from all those sources provides a comprehensive collection of knowledge on particular subjects, which can be utilised within the learning organisation. This knowledge can be re-packaged into modules for study, as BNFL seeks to broaden its knowledge base and to attract high calibre scientific and technical staff. Then the concept of a Virtual University starts to take shape, potentially encompassing staff at all levels within the organisation.

There are external beneficiaries from the knowledge preservation process. As BNFL concentrates its university contacts in key areas such as radiochemistry, particle technology, waste immobilisation and materials, an opportunity arises to extend involvement in the process through the development of e-rooms. Knowledge packages are shared with those academics that have joined with BNFL to populate its University Research Alliances (URA). The universities are encouraged to contribute their own published material, along with lecture notes and associated reading lists. Events, such as technology conferences, are captured on video. This generates a permanent record of the event and the knowledge shared during presentations and poster sessions, which can be linked into the appropriate knowledge package.

Over the 3 years that this programme of work has been undertaken some 230 interviews have been conducted, resulting in the identification of 1,700 key documents and the creation of 45 knowledge packages.