FUTURE POWER STATIONS IN THE UNITED KINGDOM: DESIGNING FOR LOW DOSES

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Objectives: Discuss the Sizewell 'B' nuclear power station nearing completion and the potential steps that can be taken to improve operator doses on future PWR plants in the U.K.

Comments: Nuclear Electric is currently building its first commercial PWR station, Sizewell 'B', in Suffolk, England. It is based upon the Westinghouse Standard Nuclear Unit Power Plant (SNUPPS). With Sizewell 'B' nearing completion, Nuclear Electric is already looking to the design of any further stations to be built in the UK. These future plants are likely to be Sizewell 'B' replicas but attention would still be given to reducing operator doses further.

An assessment of the operator doses for Sizewell 'B' concluded that for the planned 12 month fuel cycle the annual dose would be 1.97 man-Sv (197 man-Rem). The maximum individual dose was calculated to be 8.5 mSv (0.85 Rem). This was a conservative estimate because it did not reflect all the source reduction steps taken for the plant.

Remarks/Potential for dose limitation: The Sizewell 'B' design was effectively frozen in the mid to late 1980's. However, since then significant improvements has been made in the operation of PWRs and radioactive source reduction. The following are considered to be the most important features for consideration for future plants:

- Adoption of an 18 month fuel cycle	(97 man-Rem)
- Adoption of Zircaloy fuel grids	(76 man-Rem)
- Adoption of high pH chemistry	(57 man-Rem)
- Stellite removal	(35 man-Rem)

The items listed can provide both significant financial advantages and greater operational flexibility in achieving the low dose targets.

References: Willcock, A., "Future Power Stations in the United Kingdom: Designing for Low Doses," *1993 Radiation Exposure Management Seminar*, Westinghouse, Pittsburgh, Pennsylvania, 1993.

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