

## **N148. ALARA/ALARP: Working Well Before ICRP 60?**

ALARA/ALARP (as low as reasonable achievable/practicable) appears to be working well, even before national regulations reflect the new ICRP recommendations. Increasing reliance is being placed on integrated management systems for controlling exposure. What impact will the ICRP's new recommendations (and particularly their subsequent directives) have on working practice? The BNES Conference on Occupational Radiation Protection (Guernsey, April 29 to May 3, 1991) considered this topical question. The most positive message from the conference as a whole was the encouraging context to which ALARA programs have been implemented and their success in achieving ALARP occupational exposures. The trend is toward lower average individual doses below the new recommended five-year average dose limit of 20 mSv/y. "Worldwide Doses Coming Down. The UNSCEAR 1988 report indicates annual worldwide average individual occupational exposure in the nuclear fuel cycle to be generally below 10 mSv. The indicative individual annual dose averages in the various fuel cycle stages are: 10 mSv for mining and milling; 2 mSv for fuel fabrication; 2-6 mSv for LWR operation; 2-3 mSv for HWR operation; 1-2 mSv for GCR operation; 2-7 mSv for reprocessing.

A number of interesting papers on how to introduce ALARA at the design stage and during operations were presented. Ralph Watts (AEA Technology) presented evidence of the reduction in the number of people receiving annual doses on the British SGHWR above 15 mSv. The trend has come about through: standard water-reactor-related dose-reduction methods; improvements in equipment segregation, permanent and temporary shielding, formalized work planning, and training (including full-scale mock-ups); special dose control techniques such as the Simultaneous Video and Dose recording system. "Charles Kinniburgh (NNC) suggested that a decimal-based hierarchical classification scheme be adopted for PWR tasks. This would make tracking and analysis of operational dose data at different levels of detail much easier. It could also help with more meaningful inter-plant comparisons of task-related data. Bob Anderson reported on the success of BNFL's structured approach to dose reduction, together with its stringent design targets, in reducing average reprocessing operational exposures. Here the emphasis in achieving ALARP exposures is on assessment through Dose Reduction Committees and Special Project Teams, supported by workforce involvement and prompt experience feedback. The strategy adopted by NNC (in work performed for Nuclear Electric), for demonstrating that the design of Sizewell B is consistent with the ALARP principle, was presented by Ian Currie. This involved the systematic review of the whole design using detailed checklists covering both layout and system design aspects. These were completed by design engineers against design criteria/guidelines, drawings, the 1:10 and 1:20 scale models, system specifications and information provided by radiological specialists. The radiological specialists were responsible for reviewing the completed checklists, raising actions/design issues and convening working level meetings to review areas of noncompliance with the ALARP requirements. The result of this procedure was an auditable record of the review, showing design consistency with ALARP principles.

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