

NUCLEAR ENGINEERING

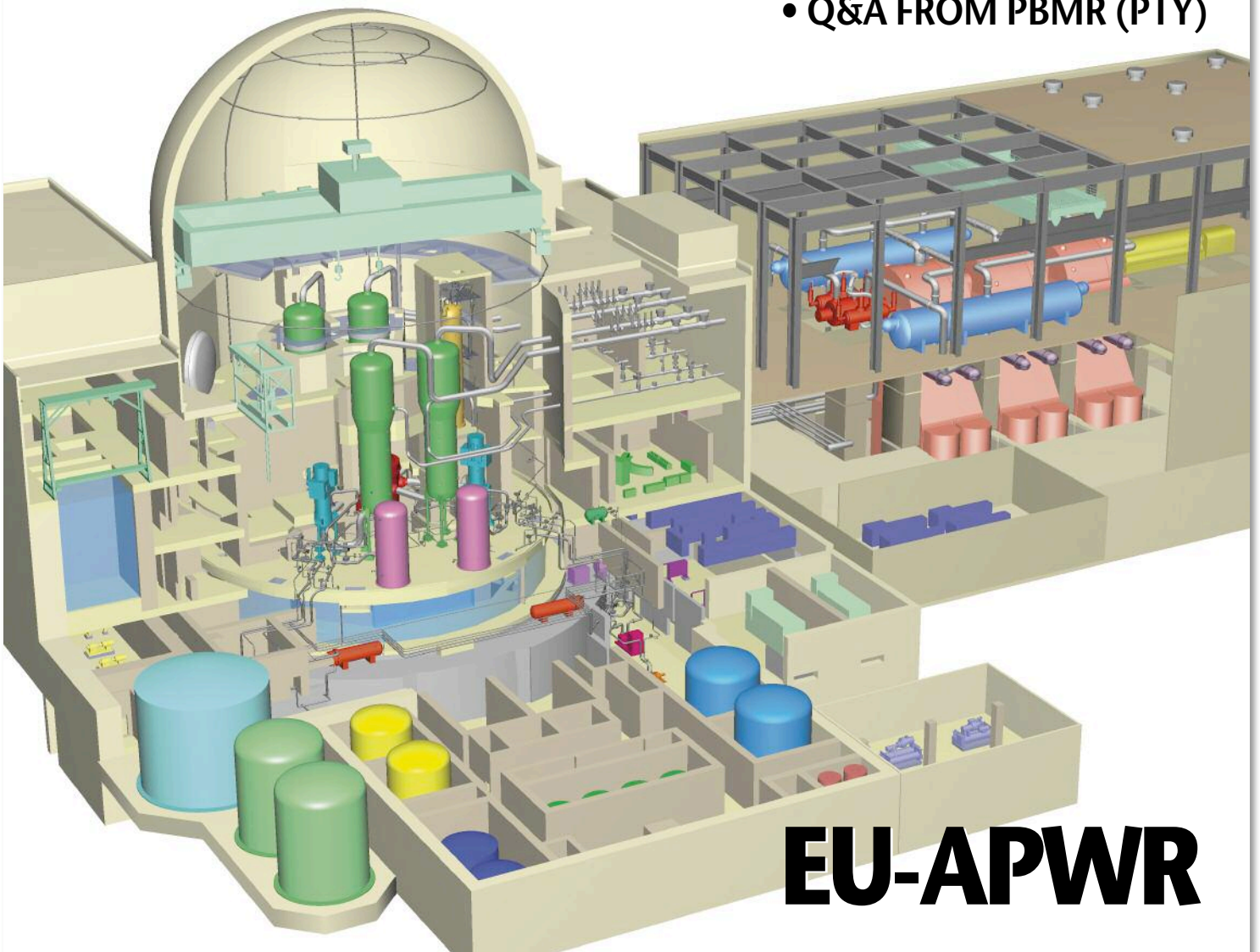
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EU-APWR

A TOUR OF MHI'S 1700MWE PLANT

UK lists exposures online

Increased use of external contractors reinforces the need for stand-alone dosimetry recordkeeping services. The UK government has introduced a new system called DORIS that includes a feature for self-service access via the web.

In the UK, radiation dose monitoring for classified workers is carried out by Approved Dosimetry Services (ADS) under the Ionising Radiations Regulations 1999 (IRR99). Dose assessment and dose recordkeeping are often seen as indivisible parts of an ADS, but in fact an ADS supplying dosimeters only keeps dose records if a recordkeeping service agreement has been set up.

An ADS provides a certified service in at least one of external, internal and accidental radiation dose assessment or recordkeeping. The IRR99 requires, however, that employers have both an assessment and a recordkeeping service for classified employees. These have been for the large part provided by the same organisation. IRR99 also requires recordkeeping for outside workers (classified persons who work in controlled areas designated by other employers).

DOSE MEASUREMENTS

The dose assessment function is responsible for the calibration and maintenance of devices that capture exposure information, as well as providing advice on dosimeter usage.

An ADS may offer a wide range of dosimeters from active electronic direct-reading to passive traditional film badges used where expected doses are low. In fact the traditional film badges are largely being superseded, for example by thermoluminescent dosimeters. The UK government Health Protection Agency (HPA) has been particularly active in moving TLD technology forward. "The new HPA TLDs are an important step forward because they provide a more accurate measure of the impact of radiation on tissues," said Phil Gilvin, personal monitoring services manager at the HPA. Besides the TLD, the HPA has also developed devices for specific clients in the nuclear and defence sectors, to measure neutron exposure.

DOSE RECORDKEEPING

The new structure of the industry creates a complex chain of suppliers, which is likely to increase the number of external workers who will need a radiation passbook. This means that ADS recordkeeping as stand-alone services will be of growing importance, but implementing the IT systems to support such services requires a rigorous quality based approach to system delivery.

The key to effective recordkeeping is an information system, but implementing a system compliant with IRR99 is demanding. For example, a dose record information system must be able to record and preserve dose measurements for up to 50 years; provide summaries to workers so they can keep track of their exposure (again these summaries must be kept for two years); submit annual summaries of recorded doses to the Health and Safety Executive's (HSE) Central Index of Dose Information; and warn when dose limits are approached or exceeded.

The recording of dose information is an area where particular care must be taken. Systems must be able to accommodate the growing precision of measurement devices, which for electronic dosimeters is now typically accurate to microsievert (μSv) levels, but also be capable of dealing with incorrect dose recording. This is dealt with in the same way accountants deal with incorrect ledger entries. These are reversed out as a special entry rather than being deleted.

The HPA has recently undertaken an upgrade of its dose recordkeeping information system. Gilvin of the HPA said: "One of the main drivers was to maintain service reliability, but the new system has the potential for new features to be added in the future." He added, "we have taken great care to make sure that every function of the old system, as well as the integrity of the dose record data, is preserved in the new system: the Dosimetry and Records Information System (DORIS). The new system has had to be comprehensively tested."

One of the new capabilities of the system is that it will be able to provide web access for self-service access to dose summaries. This is an important capability in the context of the nuclear renaissance and the expected increase in the number of outside workers. The HPA is well set to provide a standalone recordkeeping service to this growing group.

John Godfrey, project manager of system supplier Tessella said: "When undertaking work in the nuclear industry we expect to meet the most rigorous standards for system acceptance."

Godfrey also added: "The DORIS system also brought home once again the complexity of long term digital preservation. Technology obsolescence typically occurs within 15 years, yet many nuclear projects will need access to digital information decades later; digital preservation is a key issue for the industry," he said.

The screenshot displays the DORIS web application interface. At the top, there is a navigation menu with options like Home, Customers, Workers, Passbooks, Doses, Lab Files, Reports, and Administration. The main content area is titled 'Home :: Workers' and contains a search form with fields for NI Number, Surname, Forenames, Date of Birth, and Microfiche Ref. Below the search form is a 'Worker List' table with columns for Surname, Forenames, Initials, Date of Birth, and NI Number. The table lists several workers, including Einstein, Bohr, Smith, Rutherford, Brown, Jones, Curie, and Yuffe.

Surname	Forenames	Initials	Date of Birth	NI Number
EINSTEIN	ALBERT	A	01/01/1970	88104026
BOHR	NILS	N	01/01/1970	88104029
SMITH	A	A	01/01/1970	88104038
RUTHERFORD	ERNEST	E	01/01/1970	88104030
BROWN	C	C	01/01/1970	88104040
JONES	B	B	01/01/1970	88104039
CURIE	MARIE	M	01/01/1970	88104027
YUFFE	JAMES	J	01/01/1970	88104031