

## Windscale 1957 accident

**Polonium not a hazard?**

EVEN when release of polonium-210 is taken into account, less than 33 deaths will be caused by radioisotopes released during the 1957 fire in a reactor producing materials for nuclear weapons at Windscale, North-West England. So concludes the National Radiological Protection Board (NRPB) in its revised assessment of the consequences of the fire, published this week in response to a claim that the number of deaths had been grossly underestimated because NRPB had forgotten to take polonium release into account. The revised assessment of population dosage, 2,000 man-sieverts, is an increase of 67 per cent on the earlier estimate, still too small for health effects to be detectable.

At the time of the fire, which burned for two days, polonium for weapons use was being manufactured in No. 1 pile by irradiating bismuth. Tritium was also being produced. Official investigations of the fire considered only the fuel fission products that were released, and NRPB's original assessment was based on those reports (see *Nature*, 7 April, p.470). The revision was prompted by an article by John Urquhart, of the University of Newcastle, published earlier this year in *New Scientist*. Urquhart claimed that the inclusion of polonium in the assessment would increase estimated population dosage several hundred times and suggested that around 1,000 deaths would result from the fire.

Urquhart's article produced some red faces at NRPB, since there are references to the polonium released in the fire in the open scientific literature. For its revision NRPB has been given access to several studies on the fire that have hitherto been classified. Five nuclides not considered in the earlier report are examined, though only polonium-210 makes a significant contribution to effective population dosage. The inclusion of polonium leads to a figure of 33 for the estimated number of "health effects" (fatal cancers and hereditary defects), compared to 20 in the earlier assessment. It is, however, stressed that these figures are upper limits, because they assume a linear relation between dosage and mortality. The revision also reveals that 135,000 curies of tritium and some plutonium were released.

The discrepancy between NRPB's new conclusions and the estimates of Urquhart are due mainly to their different models of polonium transport in the environment; Urquhart based his calculations on an earlier NRPB study that has also since been revised. The increase in the number of health effects which follows from NRPB's revision is within the range of accuracy claimed in NRPB's initial assessment. Urquhart is still not happy, however: measurements in 1957 of alpha activity in milk published by, *inter alia*, NRPB's

director, Mr H J Dunster, show levels that are 500 times greater than the revised assessment predicts. This inconsistency is dismissed by NRPB as "spurious". Urquhart says that NRPB is "rewriting history": as only two measurements were made of alpha activity in foodstuffs near Windscale, there is no more reason to reject Dunster's figures than any other. Urquhart called on Dunster to resign unless NRPB can explain why the published results of its own director were dismissed in favour of another measurement that fits

## US nuclear safety

**Who-does-what dispute***Washington*

A LAWSUIT filed by US environmentalist groups last week has exposed an embarrassing jurisdictional argument between the Department of Energy (DOE) and the Environment Protection Agency (EPA) over who should be responsible for environmental health and safety at nuclear research facilities.

The suit, brought by the Natural Resources Development Council (NRDC), challenges a long-standing claim that DOE nuclear facilities are exempt from the provisions of the Resource Conservation and Recovery Act (RCRA), which regulates the storage and disposal of hazardous wastes. The EPA, which administers RCRA, has also challenged DOE's exemption — although it is trying to change DOE's mind by persuasion and not by litigation.

What has brought the issue to the surface is mounting criticism of the way hazardous wastes have been spilled by DOE's Y-12 plant at Oak Ridge, Tennessee. Operated for the department by Union Carbide, Y-12 is primarily a production facility for nuclear weapons components. Inquiries by the Tennessee department of health and environment and by a congressional committee have resulted in evidence of widespread pollution by Y-12 and the "loss" of some 2.4 million pounds of mercury.

Most of the discharge of mercury apparently took place between 20 and 30 years ago, and the process that used mercury was stopped in the 1960s. But mercury is believed still to leak into a creek that flows through an adjacent neighbourhood, and NRDC says that Y-12 still disposes "haphazardly" of other toxic substances which are contaminating ground water and creeks that flow into the Clinch River.

The Tennessee health and environment department has persuaded Oak Ridge to agree to cooperate in a long-term plan to clean up the site and reform waste management precautions. As a first step, the plant will close four unlined waste disposal ponds which, according to the state authorities, have caused leakage of hazar-

more closely with models of polonium transport used in the assessment.

Dr Gordon Linsley, who is co-author of the NRPB assessments, replies by pointing to other inconsistencies in Dunster's data and says there are independent reasons for believing them to be wrong by at least two orders of magnitude: it could be simply that the units are incorrectly specified. Linsley acknowledged that Urquhart had performed a public service in drawing attention to polonium but is disturbed that he has still not presented detailed calculations for peer review in a recognized scientific journal. Urquhart's plan is to publish his work in a new journal to be edited by himself.

**Tim Beardsley**

dous substances into the headwaters of a nearby creek.

The NRDC, however, does not believe that by agreeing to some of the remedies proposed by the state DOE has gone far enough. It wants a court to confirm that Y-12 is in violation of the Clean Water Act and the RCRA regulations, so that the remedies can be legally enforced and the RCRA provisions applied to other nuclear facilities for which the DOE has claimed exemption.

It will be far from easy to resolve the legal issues. Although Congress clearly intended RCRA to apply to all federal agencies, the act says that its provisions can be waived when they conflict with activities authorized under the Atomic Energy Act — activities that include virtually all nuclear research production. DOE argues that applying RCRA to its facilities would duplicate the department's own regulations, while NRDC claims that RCRA would strengthen, not conflict with them.

One ironic consequence of the NRDC suit may, however, be to force EPA and DOE to close ranks. At present, EPA would like to see RCRA applied to non-radioactive and some mixed waste produced by DOE plants, while leaving DOE in complete control of radioactive wastes. The prospect of a court hearing with public attention focused on differences between the two agencies, is likely to hasten moves towards an agreement between them.

Meanwhile, Congress will join the debate on Oak Ridge next month when Representative Albert Gore's investigations and oversight subcommittee issues a report on an investigation into pollution at the plant. Gore, a Tennessee Democrat, is more concerned about cleaning up Oak Ridge than he is about the jurisdictional argument between EPA and DOE. His committee is therefore expected to recommend the appointment of an external scientific panel to oversee remedies at the plant but remain silent on RCRA.

**Peter David**