

Did civil reactors supply plutonium for weapons?

Sir — We welcome the recent publication by the UK Ministry of Defence (MOD) of the first official inventory of the country's military plutonium^{1,2}. The report contains a remarkable admission²: "These figures show that the weapon cycle stockpile is in fact some 0.3 tonnes larger than the amount of plutonium the records indicate as available". Hence, the MOD was not aware of the existence of 60 bombs' worth of weapons-grade plutonium. The report does not attempt to identify the origin of this plutonium, simply quoting¹ "From unidentified sites, 0.37 tonnes", despite there being very few sources of weapons-grade plutonium.

We believe some calculations we published 15 years ago³ can help the MOD identify the source. In their early years (1963–72) the UK's civil Magnox reactors produced significant amounts of weapons-grade plutonium. In 1984 it was admitted that it was reprocessed at Sellafield in the same line, and at the same time, as the weapons-grade plutonium from military reactors⁴. British Nuclear Fuels Ltd, the plant operators, admitted that they called the weapons-grade plutonium "military" irrespective of origin⁴. It would have been consistent with these practices if all weapons-grade plutonium was shipped to the MOD's Aldermaston site. The government stated in 1983 that there was no weapons-grade plutonium in the civil stockpile⁵.

Today, the UK government refuses to quantify plutonium production from civil reactors for these early years. In 1985 we published an estimate of (0.36 ± 0.11) tonnes for the total weapons-grade plutonium produced by the UK civil reactors⁶. This agrees remarkably well with the MOD figure of 0.37 tonnes for plutonium of unknown origin. We conclude that about 11% of the

plutonium in UK nuclear weapons originated in civil reactors.

The MOD reports do not separate the transfer data into weapons-grade and non-weapons-grade plutonium, and there are no data on production in the country's dedicated military reactors at Calder Hall and Chapel Cross.

We call on the MOD to provide this information. Similar data have been made public in the United States³. The UK government is now in an anomalous position, having published the military stockpile while refusing to publish similar figures for civil plutonium. We request that they do so, and clarify the contradictory statements that have been made to Parliament about the fate of civil plutonium.

The Magnox reactors have entered their shutdown phase and are again producing significant amounts of weapons-grade plutonium. The UK government has recently decided to restrict information on plutonium production in civil reactors⁷. One hopes that history will not repeat itself.

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3. Barnham, K. W. J., Hart, D., Nelson, J. & Stevens, R. A. *Nature* **317**, 213–217 (1985).
4. Layfield, F. *Sizewell B Public Inquiry: Summary of Conclusions and Recommendations* (Department of Energy, London, 1987).
5. *Hansard 27-7-83*, cols 439–440 (1983).
6. *Plutonium: The First 50 Years* (Department of Energy, Washington DC, 1996).
7. Barnham, K. W. J., Nelson, J. & Stevens, R. A. *Nature* **395**, 739 (1998).