



## Australian and New Zealand Society of Nuclear Medicine Limited

ABN: 35 133 630 029

Committee Secretary  
Joint Standing Committee on Treaties  
Parliament House  
Canberra ACT 2600  
E: [jsct@aph.gov.au](mailto:jsct@aph.gov.au)

Dear Sir/Madam,

### **re: Reprocessing Nuclear Fuel – France**

I make this submission to the Committee on behalf of the Australian & New Zealand Society of Nuclear Medicine (ANZSNM), “the Society”, in my capacity as the current President. The ANZSNM is the peak organisation representing the majority of clinical, scientific and technical staff providing nuclear medicine imaging and therapy services in Australia & New Zealand.

Nuclear Medicine is a medical specialty that uses radioactive compounds, termed ‘radiopharmaceuticals’, for the diagnosis, monitoring and treatment of a wide range of diseases including cancer, dementia, bone disorders, mental illness, renal, endocrine and cardiovascular disease amongst many others. Nuclear medicine practices are present in large and small hospitals and private imaging practices throughout both metropolitan and regional Australia & New Zealand. It is estimated that one in every two Australians will undergo at least one nuclear medicine procedure in their lifetime.

The majority of the radioactive compounds used in nuclear medicine come from a nuclear reactor. Other radiopharmaceuticals are manufactured in a cyclotron, a type of particle accelerator. Whilst there is some recent research, particularly from Canada, attempting to manufacture the main radiopharmaceuticals required by nuclear medicine practices (Molybdenum-99 and its daughter product, Technetium-99m) in the cyclotron, as opposed to the traditional process using the nuclear reactor, it remains technically challenging and unproven, especially for industrial-scale production.

The radioactive half-lives of many of the compounds used in nuclear medicine are short, typically lasting only a couple of hours. This makes importing these from overseas difficult. Additionally, importing is expensive due to the heavy lead shielding of the transportation containers that must be used and their passage may be subject to disruptions to air travel caused by storms and other natural phenomena. For these reasons it is highly desirable to have a local source for producing the radioactive compounds required.

In Australia, the OPAL nuclear reactor at ANSTO (Lucas Heights, Sydney) produces the majority of the radioactive compounds used locally. OPAL uses low-enriched uranium (LEU) as its fuel source which is far less amenable to incorporation into the production of weapons-grade radioactive material. ANSTO estimates that its products are used in 45 million medical procedures annually. A consequence of this medical radiopharmaceutical production process is that a small amount of low-to-medium level radioactive waste is produced which must be stored for some months or years. The larger hospitals involved in cancer therapy using radioactive

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compounds also accumulate and stockpile radioactive waste, although their half-lives of weeks-to-months means that this waste can often be managed at the hospital site before disposal when it has sufficiently decayed so as to be considered non-radioactive. Many nuclear medicine compounds used in everyday practice for imaging decay away to negligible levels after one day or less and present no storage or radioactive waste disposal issues.

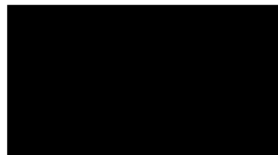
One of the rapidly growing areas of promise in Nuclear Medicine today is the use of radiopharmaceuticals for cancer therapy, which is based on the concept of a highly targeted radioactive 'magic bullet'. The Society anticipates significant future expansion of ANSTO's activities to satisfy demand which should improve the local supply of these agents. In so doing it is possible that even more radioactive waste may be produced.

The Society offers the following specific comments to the Committee:

- we acknowledge that the operation of the OPAL nuclear reactor, part of the role of which is to produce radiopharmaceuticals, also contributes radioactive waste from the fuel rods in the reactor. Therefore, we view this waste derived from the nuclear fuel cycle as a by-product of the production of radiopharmaceuticals for use in medical procedures;
- ANSTO has an extremely good reputation in both operational safety and reliability of delivery of these short-lived medical radiopharmaceuticals. In contrast, the USA for example has not, until recently, had its own domestic supply of reactor-produced radionuclides for use in medicine;
- Australia & New Zealand have for many years offered nuclear medicine procedures and treatments to the citizens of France's protectorates in the South Pacific under the programme "CAFAT" (*Caisse de Compensation des Pr, stations Familiales des Accidents du Travail et de Pr, voyance des Travailleurs de Nouvelle Calédonie*). Therefore, it seems entirely appropriate that France partners with Australia in the reprocessing of nuclear fuel from OPAL.

The Society therefore supports the ongoing role of OPAL in the production of radiopharmaceuticals for the domestic and international market. The nuclear waste from the reactor that is consequently produced is ideally treated by reprocessing and long-term secure storage. The proposal to undertake such reprocessing in a country such as France with a large domestic nuclear industry seems both appropriate and logical.

Yours sincerely,



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