Australian ITER Forum

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Date: 14/12/2005

Ancillary submission to the Parliamentary Inquiry into developing Australia's non-fossil fuel energy industry

The Australian ITER Forum seeks to update the Parliamentary Inquiry on developments in the International Thermonuclear Experimental Reactor (ITER) project, and respond to queries of nuclear proliferation and fusion waste, which have been raised in submissions to the Parliamentary Inquiry. The Australian ITER Forum also submits two recommendations to the Parliamentary Inquiry.

Update on ITER project.

On December 6, 2005, India was accepted as the seventh full ITER partner, joining the European Union, the U.S.A, the Russian Federation, South Korea, Japan and China. Discussions with Brazil have advanced, with the possibility of subsidised access to Niobium, a superconducting metal, offered as a partial subscription. The ITER partners are anxious to formalize the ITER legal entity, and commence construction in Cadarache, in the South of France. Once the ITER legal entity is formalized, and contracts awarded, additional minor partners will only be able to enter the ITER project under the terms of the ITER legal entity, with diminished benefit. The window of opportunity for Australia is hence quickly closing.

Magnetic Confinement Fusion offers zero proliferation risk.

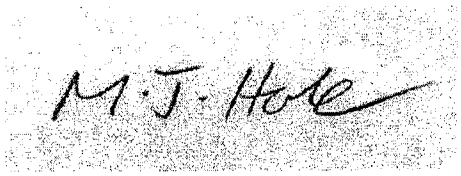
Magnetic confinement fusion can not be used as a weapon, or in weapons development. Present-day and planned magnetic confinement fusion experiments, such as ITER, use magnetic fields to continuously confine matter at the extreme environments necessary to achieve nuclear fusion. At worst, a loss of magnetic confinement would result in the confined material striking the first wall of the confinement vessel, possibly damaging the first wall. A high design priority is to ensure that the first wall can withstand this damage.

Fusion offers very low-level radioactive waste.

First generation fusion power plants will consume a deuterium-tritium (D-T)fuel mixture. Deuterium, which is abundant in water, is a stable isotope of hydrogen, and can be easily extracted by electrolysis. Tritium is an unstable radioactive isotope of hydrogen, not normally found in nature. Generation of tritium fuel will occur on the first wall of the fusion power plant, by neutron activation of the stable element Lithium. As the neutrons are generated by the fusion reaction itself, all radioactive stages of fuel preparation are wholly confined to the interior of the fusion confinement vessel. Unlike fission, the products of fusion of D-T fuels are not radioactive. Rather, radioactivity is generated indirectly, by neutron activation of the first wall and vessel structure. By using low activation steel alloys in vessel

construction, the entire facility can be recycled after 100 years of decommissioning. This time-scale can be reduced if advanced materials are used. Next generation fusion experiments will burn a deuterium-deuterium mixture, offering even further reduced radioactivity.

Recommendations:
1 – Australia negotiates a subscription to ITER as a matter of urgency.
2 – A national or international centre be established to consolidate Australia's research efforts in fusion related research



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