

Thorium Reactors – A New Type of Nuclear Reactor

There's a long way between a fuel concept and a confirmed reactor design.

The A to Z of Materials
June 20, 2006

It's nuclear, but not as we know it. No risk of a Chernobyl-style meltdown, no weapons-grade by-products and a reactor that burns existing radioactive waste as well as old nuclear weapons.

Cosmos magazine profiles thorium reactors, a radical new type of nuclear technology that promises to deliver what conventional atomic power never could. Not only might it provide an answer to Britain's energy crisis, it burns old nuclear waste in the process, which security experts have warned is vulnerable to a major terrorist attack.

Energy is a hot topic in Great Britain and an innovative, greener and safer solution is desperately being sought. Cosmos breaks through the barriers to present a new side of the debate.

"The world is too complex, the decisions too important and the implications too far-reaching for us not to listen to the best scientific advice available. And there is a range of technologies out there – like thorium systems – that look really promising, and should be investigated. While we still have the time." – Wilson da Silva, Editor, Cosmos

In simply arguing for or against conventional nuclear power, precious time is being lost. The advantages that new technologies and scientific research have to offer are too great to overlook (amongst the political squabbling) if we are to find a solution to the growing global energy crisis, say the editors in their special 12-page report.

Thorium is a naturally occurring radioactive element that shares many properties with uranium. It is not active enough to maintain a chain reaction (which allows electricity generation) but can be induced to this state with a beam of protons from a particle accelerator. The beauty of this technology is that if any problems occur a switch can simply flicked, stopping the proton beam and ceasing the reaction. Meltdown is impossible.

Being a more 'gentle' material, thorium also leaves less waste than conventional uranium based reactors whose half-life is tens of thousands of years. Thorium reactor waste has a half-life of a mere 500 years, much less dangerous and much much simpler to store. To sweeten things even further, thorium reactors actually incinerate other nuclear waste, solving the problem of the growing stocks of current nuclear waste.

Oh yes, it also generates cheap, green electricity.