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US to halt nuclear fusion project

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Amidst a prolonged stalemate over where to build the world's largest nuclear fusion facility, the US is halting work on a homegrown fusion project. The decision caused concern among researchers at a fusion meeting earlier this week.

The US is pinning its hopes on ITER (International Thermonuclear Experimental Reactor), which aims to lay the groundwork for using nuclear fusion as an inexhaustible and clean energy source.

But the project has been stalled since December 2003 because its six members - the US, the European Union, China, Japan, South Korea, and Russia - cannot agree on where to build the facility. The EU, China, and Russia favour the French city of Cadarache, while the US, South Korea, and Japan back the Japanese town of Rokkashomura.

The deadlock has persisted even after both the EU and Japan sweetened their offers in June, each agreeing to pay half of ITER's estimated \$5 billion construction costs to host the reactor. And rumours have spread that some parties might splinter off to build the reactor on their own.

Now, the standoff has lasted so long that the US has reached a deadline on another fusion project. The deadline was set in 2002 by a committee advising the US Department of Energy (DOE) to proceed with a smaller project called FIRE (Fusion Ignition Research Experiment) if ITER negotiations had stalled by July 2004.

No backup

Planning for FIRE was actually begun in 1998, when the US Congress directed the DOE to pull out of ITER. Since then about 50 researchers have been working on a "preconceptual" design for FIRE. But the approximately \$2 million annual budget for this will come to an end in September.

In 2003, the US rejoined ITER, and now the DOE says FIRE will not serve as an alternative even if ITER falls through.

"We do not have a backup plan," Anne Davies, director of the DOE's Office of Fusion Energy Sciences, told **New Scientist**. "We are focused on making ITER work. If ITER doesn't work, we are going to have a lot of reassessing to do."

Davies said FIRE's use of copper magnets - instead of superconducting ones like ITER - was "dead-end" technology that would not lead as quickly to the goal of a fusion power plant.

She added that Congress would probably balk at building the \$1 billion FIRE reactor without international partners, and that such partners might not want to sign onto a project whose plan was already so well established.

Square one

FIRE's design team leader Dale Meade, a physicist at the Princeton Plasma Physics Laboratory, agrees that ITER should take top priority.

But during public comments at a meeting of the DOE's fusion energy sciences advisory committee near Washington, DC, this week, he urged the government to reconsider its decision to scrap FIRE as a backup.

"I was reminding them we were ready if called upon," he told **New Scientist**. If ITER negotiations fail, he says, "we might have to take a step back, but we don't want to go all the way back to square one".

Earl Marmor, a physicist at the Massachusetts Institute of Technology who has reviewed the FIRE design, says it is a viable alternative to ITER. If FIRE were pursued, he says, it would be best to do it with international participation, but he says ITER has proven how difficult that can be.

"ITER has been technically ready to move forward for at least a couple of years - it's really been a political holdup," he told **New Scientist**. "We're all hopeful ITER will succeed, but we're also rather impatient."

Maggie McKee

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