Energy & National Security

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Why the U.S. Isn’t Funding A Promising Energy Technology

On Nov. 11, 2005, the day his small fusion reactor exploded in a shower of sparks and metal fragments, even physicist Robert Bussard didn’t know what he had achieved. For 11 years, the U.S. Navy quietly funded Bussard’s research. It was a small project with a very simple goal: deriving usable energy from controlled nuclear fusion. Funding ran out at the end of 2005 and Bussard was supposed to begin the next phase of his project by the end of April 2006. He kept postponing that in an effort to find a new set of investors. He completed low power tests in September and October and began high power testing of the reactor in November.

After four tests Nov. 9 and 10, an electromagnetic coil short-circuited, an electrically charged gas cloud formed at the heart of the reactor, Bussard said, and brought his tests to an end.

“Fighting Monday, we tried to tear the lab down. We had line to remove the data that was stored on the computer. But early December, the company said it could not accept the data. So we sent it and realized we still have it,” he said.

Bussard said he and his small team of scientists had shown that nuclear fusion can be harnessed to create a source of clean, near-infinite energy. But 11 years later, no one has been able to move the next step in his research. Bussard, who is in his 80s and has heavy equipment that is now out of the long-term budget, has achieved a record of success by using the fusion nuclear. He would believe that a tiny company based on one of today’s key pieces could solve the riddle that has escaped literally thousands of researchers?

Don Gay
Former U.S. navy engineer

with distortions, not known — in November 2005 proved that the boron process will work.

The boron reactor would be similar to, but more powerful than, the reactor that blew up in 2005.

Bussard’s reactor design is built around six thin metal rings, joined to form a cube — one ring per side. Each ring, about a yard in diameter, contains copper wires wound into an electromagnet.

The reactor operates inside a vacuum chamber. When energized, the cube of electromagnets creates a magnetic field in which electrons are injected. The magnetic field spreads the electrons into a dense ball at the reactor’s core, creating a highly charged magnetic field.

To begin the reaction, boron 11 nuclei and protons are injected into the core. Because of their positive charge, they accelerate to the center of the electron ball. Most of them spiral through the core of the core and toward the opposite side of the reactor. But the negative charge of the electron ball pulls them back to the center. The process repeats, perhaps thousands of times, until the boron nucleus and a proton collide with enough force to produce fusion.

That fusion turns boron 11 into a highly energetic carbon 12, which promptly splits into a helium nucleus and a boron nucleus.
Quo Vadimus?
BACKUP SLIDES