U.S. WEAPONS PROGRAM

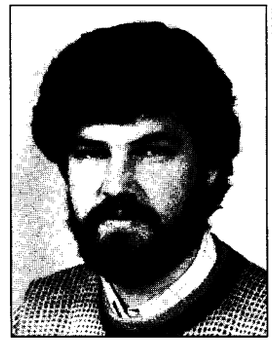
DOE Lifts the Veil of Secrecy From Laser Fusion

CHICAGO—For 30 years, U.S. research on inertial-confinement fusion (ICF) has been conducted in an intellectual fortress. Although well-funded, scientifically challenging, and important to both civilian energy and weapons research, the ICF program has suffered the stultifying effects of its classified status: rare publications in the open literature, few university collaborations, no graduate students, and no shop-talk at meetings.

The end of the cold war has prompted federal officials to reassess that policy. Last week Energy Secretary Hazel O'Leary announced a major change: the Department of Energy (DOE) will gradually declassify almost three-fourths of the remaining classified information on ICF (see sidebar below). Combined with previous declassifications that released about 25% of the material on hand, her decision should eventually leave just 20% of the information on ICF under wraps. The action "unties our scientists' hands," O'Leary said, and means that ICF researchers will soon be able to publish many of their results for the first time and to increase interaction with students, colleagues without security clearances, and foreign scientists.

"Science has always advanced by openness," says E. Michael Campbell, head of ICF at Lawrence Livermore National Laboratory, which includes experiments on the massive Nova laser (*Science*, 3 December, p. 1504). Campbell predicts widespread benefits to science when what he terms the "impressive and sophisticated" dataset from these experiments are made available. Edward Fuller, president of the American Nuclear Society, praised O'Leary as "a breath of fresh air at DOE" and foresees advances akin to the flowering of nuclear and plasma physics that followed the declassification of fission energy and Project Matterhorn (magnetic fusion) in the mid-1950s.

Others, though generally pleased, are more measured in their assessment of the impact of declassification. "There aren't any earth-shaking magic bullets that will come out," says Robert McCrory, director of the Laboratory for Laser Energetics at the University of Rochester, whose security clearance allows him to keep abreast of developments in the field. "What you're going to see is a lot of high-quality work that we've been doing for a long time but couldn't talk about."



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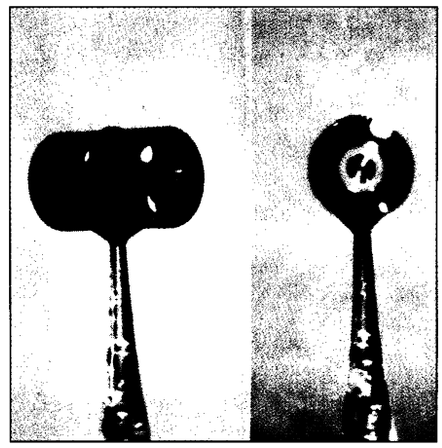
Open for business. Livermore's E. Michael Campbell welcomes the changes.

ICF's civilian goal is to explore the possibility of creating usable fusion energy by heating small pellets of deuterium and tritium with laser and particle beams. Eventually, researchers hope to generate more energy from the pellets than was used to ignite them. But the conditions inside a hot, compressed pellet can mimic those of a thermonuclear weapon—which is why ICF is also used to study the physics of nuclear explosions. As a result, much of the program has remained classified, despite several doses of partial openness over the past two decades. The earlier activity, for example, had resulted in declassifying so-called direct-drive ICF, in which laser or particle beams strike the fuel pellet directly.

The present declassification is expected to relate mainly to indirect-drive experiments. In this scheme, the beams first strike a gold shroud called a hohlraum, heating it to temperatures so high that it emits x-rays, which compress the pellet and start the nuclear reaction. The x-ray pattern is generally more uniform than the pattern from the original beams and therefore better suited to even compression.

O'Leary stressed that the information released would deal with conditions quite different from those inside weapons. "Believe me," says a classification officer in ICF, "if it was a short step [from typical ICF experiments to a bomb], the program would stay classified for a long time."

The declassification has already paid some dividends to civilian researchers in the



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Clearer view. This picture of a hohlraum target is the first ever released by a U.S. laboratory under new rules for ICF research.

An 'Openness Initiative'

The Department of Energy (DOE) last week promised to release 32 million pages of once-secret documents as part of a new policy bearing the slogan: "The Cold War's Over...And We're Coming Clean." Press coverage has focused on the revelations of 204 previously unannounced nuclear tests, the amount of plutonium stockpiled at certain DOE facilities, some details of radiation experiments on humans over the past half-century, and the amount of mercury used and released in weapons production. Those were jarring disclosures. But for researchers, the real news is that DOE hopes to reduce the amount of material that gets routinely classified in the first place.

Details of the new "Openness Initiative" will not be available until after DOE meets in February with its "stakeholders"—historians, environmental groups, state officials, and others with compelling reasons to obtain the information. The public meeting will discuss DOE's declassification priorities and possible reform of what O'Leary called the "badly outdated" 1946 Atomic Energy Act that dictates what DOE now holds secret. Changes are already in the works. DOE will double (from three to six) the number of employees reviewing Freedom of Information Act requests with the goal of reducing turnaround time from an average of 18 months to as little as 3. The agency also plans to lend up to six technical experts to the National Archives and Records Administration, where DOE estimates that 1000 linear feet of documents could be declassified. And it expects to improve public access to DOE facilities by consolidating classified programs to small restricted areas and loosening security elsewhere.

O'Leary has promised a progress report in 6 months. But the overall direction is already clear, says DOE spokesman Sam Grizzle. Evoking an old cigarette slogan, he explains that DOE intends to "classify less and enjoy it more."

–Christopher Anderson