DEFENSE RESEARCH

U.K. Agency Spawns Private High-Tech Behemoth

The latest "product" of Britain's Defence Evaluation and Research Agency is actually a high-tech company that will be the country's largest

NORWICH, U.K.—Mobile phones were the last thing on the minds of scientists at Britain's Defence Evaluation and Research Agency (DERA) as they developed flat-panel displays for tanks and other military hardware. But their seminal contributions over decades to the technology behind today's ubiquitous hand-held devices is exactly the sort of success that British officials are hoping to repeat—again and again—in the commercial world starting next month.

On 1 July most of DERA will step out from under the umbrella of the Ministry of Defence (MOD) and become the country's largest independent science and technology company in a compromise intended to appease Britain's most important defense ally, the United States. But there are questions about whether the shift ultimately could weaken national security or undercut other U.K. defense R&D contractors.

The new $1.05 billion entity, called QinetiQ (pronounced like "kinetic"), will be owned by the U.K. government but directed by an independent board. Its mandate will be to develop and market ideas and technology for customers around the world. Its 6500-strong scientific staff is headed by current DERA chief Sir John Chisholm, a former industry executive. The company comprises some three-fourths of DERA, and what's left, to be called the Defence Science and Technology Laboratory (DSTL), will remain in the clutches of the MOD and undertake work deemed too sensitive for a commercial outfit. DSTL will retain the Porton Down chemical and biological research facility, the naval research center at Portsdown, and some of the armaments research facility at Fort Halstead. QinetiQ will be located at Farnborough, south of London, and at Malvern in western England.

The privatization is intended to unfetter DERA's scientific workforce from its military masters, who had cut research spending in half over the last decade. Its past achievements include novel technologies ranging from carbon fiber, Chobham tank armor, and ground-penetrating synthetic aperture radar to the world's biggest trimaran warship and software to block e-mail distribution of computer viruses. Last year a group of scientists formed DERA'S first spin-off company, ZBD Displays, to commercialize a liquid crystal display for mobile phones. The technology, called zenithal bistable display, allows the display to retain its image even when the power is turned off, using less power and, thus, requiring smaller batteries.

CREDIT: DERA

Catching a wave. The *RV Triton*, the world's largest trimaran warship, is based on technology developed by British military scientists.

The new company is intended to foster more such ventures. "DERA in the past has been one of those smart-arse organizations that's an expert on how everybody ought to do everything," says John Mabberley, one-time head of Britain's nuclear weapons program and past chief of DERA's commercialization arm. "But, of course, most people want solutions, not advice." Mabberley is helping set up the company's U.S. office in space overlooking the Pentagon, building ties to its most important foreign customer.

Despite being firmly rooted in military research, QinetiQ officials point to several civilian projects already under way as examples of the new outfit's diversity. These include a joint venture with Ford Motor Co. to exploit DERA's holographic imaging technology to create full-scale digital models of prototype cars, and links with British audio technology company NXT to exploit and market flat loudspeaker and speech recognition technologies.

The government's original plan, advanced in 1998, was to privatize all of DERA, which was created in 1995 as an amalgam of several defense labs. That stance stood in stark contrast to that of the previous government, which had insisted that the defense sector should not join a wave of other privatizations. But the plan was scrapped after strong objections from U.S. officials and replaced with the current compromise. "We share some fairly sensitive information on a government-to-government basis, and we were concerned that the same mechanisms would not be in place with a private company" that may compete with U.S. firms, says a former Pentagon official involved in the negotiations. DERA's technical director, Adrian Mears, says he was "surprised" at how sensitive the U.S. has been to issues of information leakage. "But they are an important ally, and we have gone to great lengths to meet their needs."

Also no great fan of QinetiQ is the U.K. Parliament's bipartisan Select Committee on Defence, which opposes what it calls "the misguided change of status for DERA." The committee worries that the new structure might weaken national security by failing to provide the government with adequate independent advice.

For its part, British industry worries that QinetiQ's close government ties may give it an unfair advantage. "All that DERA has to offer is knowledge," says Alan Sharman, head of the Defence Manufacturers Association, who points out that DERA is not allowed to make anything. "Is that fair competition for industry, since this knowledge was gained for free at the taxpayers' expense?" At the same time, he says that any U.S. hesitancy to share information with DSTL will make it harder for British companies receiving government contracts to remain leaders in advanced military technology. Indeed, the former Pentagon official expects the U.S. government to proceed cautiously. "If the new company looks like it's trying only to maximize shareholder value by selling its technology to the highest bidder, then the U.S. skepticism

will increase," the official says.

DERA veterans are upbeat about the transition. They believe that the noncommercial arm will continue to provide top-notch scientific advice to the U.K. government. "It's going to be very much business as normal at DSTL," predicts Martin Earwicker, DSTL's new chief. They also expect the commercial wing to thrive. "A lot of people within QinetiQ might be nervous about the change, but that's natural," says physicist Cliff Jones. Jones is part of the five-member team that moved from DERA to ZBD Displays, which hopes its phone displays will become part of every teenager's electronic fashion wardrobe. From his vantage point, going from a government job to one in the commercial sector "is quite a pleasant experience," he says.

–ANDREW WATSON

Andrew Watson writes from Norwich, U.K.

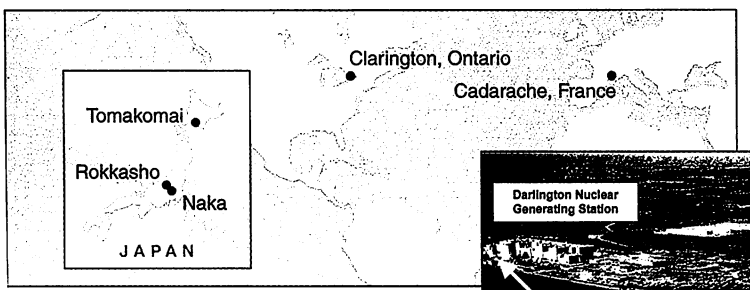
FUSION SCIENCE

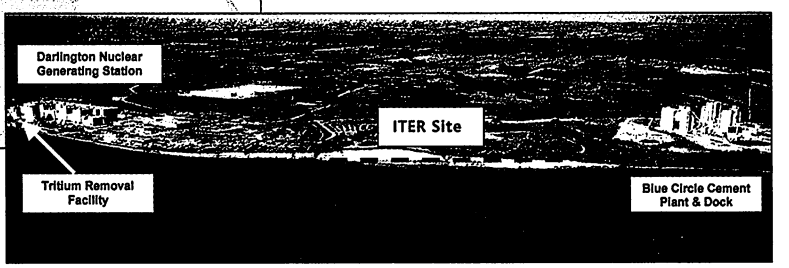
Canada Bids to Host International Reactor

The three partners in the proposed International Thermonuclear Experimental Reactor are weighing a surprise offer from upstart Canada

TOKYO AND OTTAWA—Canada has made a surprise bid to host the International Thermonuclear Experimental Reactor (ITER), a move that signals the start of serious political jockeying among the three partners over a site for the $5 billion fusion project. If nothing else, last week's offer demonstrates that plans to harness the nuclear fusion process that fuels the sun are moving forward despite a conspicuous lack of interest on the part of the United States.

ITER began in 1986 as a joint project of the United States, European Union (E.U.), Japan, and the Soviet Union. Over the next decade, worries about the cost and technical feasibility of the project gradually eroded political support in the United States. Although the design phase was extended and the project scaled back, the United States formally dropped out in 1998.





Site specific. Canada wants ITER on the shores of Lake Ontario *(right)*, next to a tritium-making facility; Japan and Europe *(above)* have other ideas.

But the rest of the world is moving ahead. As the design of the scaled-down reactor nears completion, the next big hurdle will be selecting a site and dividing up responsibilities and contributions to build it. The formal proposals will include in-kind contributions, with the host country or region picking up at least 25% of the cost in return for an expected economic and scientific bonanza. The E.U. is expected to offer a site in southern France next to Cadarache, the main French nuclear power research facility, while Japan has three sites under consideration (see map). Russia's continuing economic woes since the collapse of the Soviet Union greatly diminish its chances.

But Canada's sudden bid has opened up the race. Its offer, presented to ITER partners at their latest meeting on 7 June in Moscow, lifted their spirits. "From the beginning we wanted ITER to be a very broadly international project, so we're very happy to see Canada express such interest," says Hidetoshi Nakamura, director of the Office of Fusion Energy in Japan's Ministry of Education, Science, Technology, Sports, and Culture.

The proposal comes from a coalition of Ontario-based businesses, in particular Ontario Hydro, that set up a nonprofit entity, ITER Canada, to lobby for the site. The national government has declined to put up any money, but it has endorsed the bid. "For Canada, it'll be something of a technological gold mine sitting in the middle of the country," says Peter Barnard, head of ITER Canada.

Its novel mechanism for financing ITER calculates that the site, formerly earmarked for a nuclear power reactor, is worth $650 million. The site is on the north shore of Lake Ontario, an hour east of Toronto and adjacent to the Darlington nuclear power station. The Ontario provincial government has pledged $200 million over 30 years for operations. And the tritium needs will be supplied by Ontario Hydro at a projected value of $450 million, in return for ITER buying all its electricity from the utility. The proposal also includes a $1 billion bridge loan to cover construction and infrastructure costs, to be repaid by Japan and Europe.

Canada also hopes that a site in a major city, Toronto, that is roughly halfway between Europe and Japan, may help entice the U.S. government to reconsider its role in the project. "The assumption is that the U.S. is going to view ITER more sympathetically if it's in Canada than if it were in northern Japan or central Europe," says Barnard.

That's unlikely, however, according to Department of Energy officials, who say that the die has been cast on the United States' role. But Stephen Dean, head of the private Fusion Power Associates in Gaithersburg, Maryland, believes Canada's move could help prove to a skeptical Congress that "the partners are serious about building ITER."

ITER officials have their own concerns, starting with the assumption that the host country or region would make a strong long-term financial and political commitment. "In Canada's bid, the country itself is not proposing to take a central role in the project," says Nakamura. But officials say they are taking the Canadian plan seriously. The proposals are due by the end of the year, says Jean-Pierre Rager, head of fusion activities at the European Commission in Brussels, "and then we will begin to talk."

Japan is hoping that its offer to pay at least 50% of the construction costs will make it an attractive suitor. The three sites vying for the prize are Tomakomai, on the northern island of Hokkaido; Rokkasho, in Aomori Prefecture at the northern tip of Honshu; and Naka, in Ibaragi Prefecture about 100 kilometers north of Tokyo. France offered the Cadarache site to the E.U. last year, and Rager says they are now working on the details of the E.U. proposal.

A decision on the site and conditions for participation is expected in the spring of 2003. If all goes smoothly, construction could begin in 2005 and be completed by 2013.

–DENNIS NORMILE AND WAYNE KONDRO

Wayne Kondro writes from Ottawa.

CREDIT: (BOTTOM) ITER