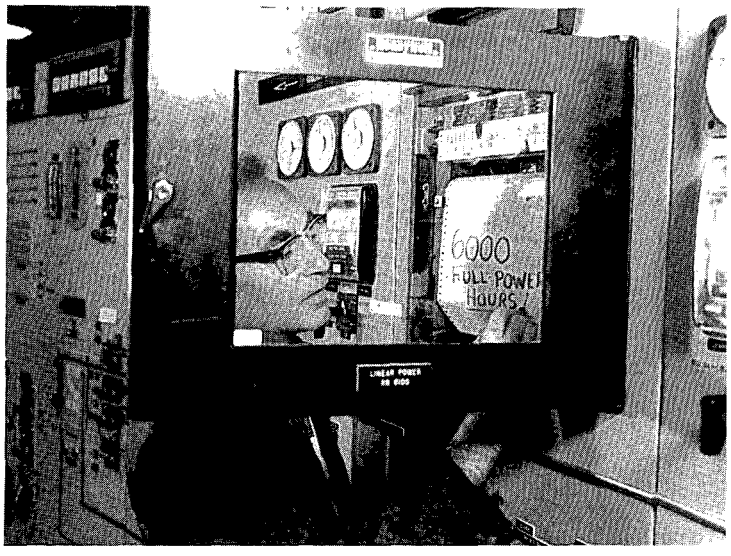
technology to ensure the operational integrity of fast breeder components.

Work on the breeder accelerated in 1972, when the AEC made Oak Ridge the site of the AEC's demonstration Clinch River Breeder Reactor Project. Laboratory efforts continued until Congress canceled the project in the mid-1980s, following more than a decade of political controversy and debate fueled by concerns about plutonium weapons proliferation and the gradual realization that the United States would not need a breeder reactor for at least 20 years because of the low cost and availability of uranium.



Alvin Weinberg at the control panel of the Molten Salt Reactor Experiment in October 1967 after it had operated 6000 hours at full power.

"Dark Horse" Breeder

"A dark horse in the reactor sweepstakes." That's how Alvin Weinberg once described the Laboratory's Molten Salt Reactor Experiment to Glenn Seaborg. Weinberg explained that if Argonne's fast breeder encountered unexpected scientific difficulties, Oak Ridge's molten-salt thermal breeder could serve as a backup that would help keep the AEC's research efforts on track.

Based on technology developed for the Aircraft Nuclear Propulsion project, an experimental molten-salt reactor was designed and constructed in the same building that had housed the aircraft reactor. Its purpose was to demonstrate key elements needed for a civilian power reactor. Operation of the Molten Salt Reactor Experiment (MSRE) using uranium-235 fuel began in June 1965 under the supervision of Paul Haubenreich. Program directors Herbert MacPherson, Beecher Briggs, and Murray Rosenthal successively supervised efforts to develop a molten-salt breeder reactor. In an uninterrupted six-month run, the MSRE demonstrated the practicality of this exotic breeder concept. Fuel salt was processed at the reactor, and all the uranium-235 was removed.

When the fuel was changed to uranium-233 in October 1968, AEC Chairman Seaborg joined Raymond Stoughton, the Laboratory chemist who co-discovered uranium-233, to raise the reactor to full power. "From here," said Rosenthal, "we hope to go on to the construction of a breeder reactor experiment that we believe can be a stepping stone to an almost inexhaustible source of low-cost energy."

Weinberg and the Laboratory's staff pressed the AEC for approval of a molten-salt breeder pilot plant. They hoped to set up the pilot plant in the same building that had housed the AEC's Experimental Gas Cooled Reactor until that project was suspended in 1966.

Argonne's fast breeder had the momentum, however, and Congress proved unreceptive to Laboratory requests to fund large-scale development of a molten-salt breeder. Appealing personally to Seaborg, a chemist, Weinberg complained: "Our problem is not that our idea is a poor one—rather it is different from the main line, and has too chemical a flavor to be fully appreciated by non-chemists."

Meanwhile, the Molten Salt Reactor Experiment operated successfully on uranium-233 fuel from October 1968 until December 1969, when the

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