The question at issue is how good the quality of work at a $20-million-a-year national center should be. In a little-read document known as the Blue-book, which contains the proposals whereby UCAR sold itself and the concept of NCAR to the federal government, the following undertaking is given: "It is not sufficient, although quite necessary, that the Institute be characterized by superb intellectual strength." Some 13 years later the JEC report, comparing NCAR scientists against the highest standards, concludes: "There is every indication that,

One Breeder for the Price of Two?

The Atomic Energy Commission has estimated that development of a commercially attractive liquid metal fast breeder reactor (LMFBR), designated by President Nixon as the nation's "highest priority" energy R & D project, could end up costing twice the $2.5 billion the AEC said it would cost just 18 months ago. The new, unofficial price of $5.1 billion appears to reflect a more realistic calculation of expenditures—including direct subsidies to utilities—necessary to bring the breeder to a point of wide commercial acceptance by the mid-1980's. The figure may also indicate an urge in the AEC to embark on an even more ambitious R & D program now that the White House has promised to set aside a $10 billion bonanza for energy research and development over the next 5 years.

The LMFBR's tentative new price emerged recently from the Federal Power Commission's advisory task force on energy conversion R & D. The task force, in turn, is part of a larger technical advisory committee the FPC organized last December to survey broadly the "needs and consequences" of energy R & D. While this might seem a bit far afield of the FPC's duties as a regulatory agency, one of the commission's responsibilities is to encourage the development of new sources of energy, and it therefore considers such inquiries to be within its ken.

Officially, at least, the $5.1 billion cost estimate was the product of deliberations by the energy conversion task force, a heterogeneous group spanning a spectrum from federal energy authorities to utility executives, and including one environmentalist, Thomas B. Cochran, a physicist with the Natural Resources Defense Council in Washington, D.C. Cochran and other members of the task force, however, say the new cost estimate can be attributed entirely to the AEC, and thus would seem to accurately represent its intentions. Indeed, the $5.1 billion estimate was presented to the group for the first time in a 13 September briefing by the task force's chairman, Merrill J. Whitman, an AEC official. As assistant director of program analysis, Whitman is centrally involved in long-range projections of the AEC's R & D costs.

Attempts to reach Whitman by telephone, for an elaboration of his estimate, were unsuccessful. An AEC spokesman, however, while not disputing the accuracy of the figure, said that it "cannot be compared" to the $2.5 billion estimate used in a published cost-benefit analysis of the LMFBR last year* because the new number had been derived from "certain bases that were different from those used by the AEC in the past."

The 1972 estimate of $2.5 billion (which assumed commercial introduction of the LMFBR in 1986) included only those R & D costs incurred directly in the breeder program, according to the spokesman. In contrast, he said, Whitman's estimate includes another $1 billion for "general" R & D that would indirectly benefit the LMFBR. There are also additional allowances in the $5.1 billion figure for inflation and the "increased cost of hardware and high performance fuel." In short, it appears that building the breeder will cost a lot more than the AEC has previously believed or brought itself to admit.

It is worth noting at this point that the LMFBR program has already rung up some extraordinary cost overruns, particularly at the AEC's Hanford, Washington, site. Here, the total cost of a new experimental sodium-cooled reactor called the Fast Flux Test Facility (FFTF) has been rising during construction from an initial estimate (in 1968) of $87.5 million to a current estimate of around $200 million. The FFTF project has also cost another $300 million or so for related hardware and R & D, and there is reason to believe that, by the time the project is completed next year, the grand total for the FFTF may top $600 million.

Whitman's calculations of breeder program costs also allow $200 million for a second "demonstration" breeder reactor plant, although Congress and the White House have authorized construction of only one such plant—a 350- to 400-megawatt facility to be built near Oak Ridge, Tennessee, at a cost of $700 million (of which utilities have pledged to pay $240 million).

Finally, tucked away in the $5.1 billion price is $90 million that would be spent in direct assistance to utilities, to help them buy their first four commercial breeder power plants. Up until now, the AEC has not openly broached the possibility of directly subsidizing the first such plants, although the General Electric Corporation, among others, reportedly has indicated that subsidies might be essential to the ultimate commercial success of the LMFBR. In any case, the practice of paying potential customers to buy a strange new product has ample precedent. During the late 1950's and the early 1960's, the AEC spent tens of millions of dollars in direct assistance to utilities to induce them to buy the early light-water nuclear power plants. As an added inducement, General Electric, Westinghouse, and other vendors found it necessary to drastically underprice their first nuclear plants and recoup their losses by raising the prices later.

Reactor vendors, unlikely to stand still for a similar financial beating on their first breeder plants, may thus be counting on some generous assistance from the federal government, above and beyond the gift of LMFBR technology itself.—ROBERT GILLETTE

* *Cost-Benefit Analysis of the U.S. Breeder Reactor Program*, WASH-1184 (Atomic Energy Commission, Washington, D.C., January 1972).