Science in the News

Hanford and Stanford: $100 Million Project Approved; The PRDC Case: Private Safety and Public Power

The Joint Committee on Atomic Energy has approved the Administration's requests for $114 million to build the long-pending Stanford linear accelerator, and for $97 million to convert the Hanford plutonium reactor to produce electric power as well as plutonium. Both projects have been involved in political complications, and although they have nothing to do with one another, they had become tied together in the course of the political maneuvering.

The Stanford accelerator will be the most powerful atom-smasher in the world, and the most expensive. It will be housed in a tunnel 2 miles long near the Stanford campus, and will deliver a beam of electrons, carrying energies of up to 15 billion electron volts, to the target end of the tunnel. At some future time the machine could be stepped up to 45 billion electron volts. (A more detailed description of the machine and discussion of the political background appeared in *Science* for 22 April 1960.)

The so-called New Production Reactor (NPR) was approved by Congress in 1958 to provide additional plutonium for weapons. The Democrats, who controlled Congress and the Joint Committee, wanted a dual-purpose reactor to produce power for the federally owned Bonneville Power Administration, as well as plutonium. Bonneville is the Northwest's equivalent of TVA. The Eisenhower Administration, which took a dim view of public power, favored a single-purpose reactor. It was not clear at the time whether a dual-purpose reactor would be economically sound—that is, whether it would be cheaper to build a single-purpose reactor plus conventional power plants, which might be privately owned, or to build the dual-purpose plutonium-and-power reactor.

Over the opposition of the Administration the Joint Committee recommended—and Congress, after a floor fight, approved—an appropriation of $145 million for the NPR, of which $25 million represented the additional cost of designing and building the reactor so that it could be converted to dual-purpose operation. To actually convert the plant would cost about another $100 million, most of the money to be spent for generating equipment, and the decision as to whether conversion should be carried out would depend on the results of futher economic studies. In other words, the Democratic Congress was willing to gamble $25 million that the dual-purpose reactor would prove to be economically sound, as preliminary studies indicated, and the Administration, which was opposed to public power, was not so willing.

The Administration's opposition to public power heightened, in fact, the Democrats' interest in this particular proposal. During the Eisenhower Administration expansion of public power had virtually come to a halt, for although the Democrats had control of Congress for the last six Eisenhower years, they did not have a majority to pass a public power appropriation over the President's veto. In any case, Congress can only make money available; it cannot force the Administration to spend it. Here was a chance for the Democrats to force the Administration to move forward on public power whether it liked it or not, for the Administration wanted the new plutonium facility and Congress had specifically authorized only one type of reactor: the one convertible to power production. The extra $25 million would go mostly to pay for a more elaborate cooling system for the reactor, in which steam would be produced, which would then be cooled in the Columbia River. The cheaper alternative was to use the river water to cool the reactor directly. The indirect cooling system provided the option of using the steam to drive generating turbines.

The original studies prepared by General Electric, the contractor, suggested that the dual-purpose reactor would probably, although not clearly, be economically sound. This report came in April 1958 and provided the basis for investing the extra $25 million. After the money was voted, a second study, prepared for the AEC by an independent engineering firm, stated that the proposal was unsound. A year later, a study made by the Federal Power Commission concluded that it might pay to go through with the conversion, and then again it might not. The Joint Committee, which had less than complete faith in the Eisenhower Administration's estimates on questions involving public power, meanwhile had hired its own firm of consulting engineers and in August 1960 received a report confirming its view that the project was sound after all.

By this time the Stanford reactor had become involved in the picture, with strong voices on the Joint Committee encouraging the Administration to show more interest in Hanford if it wanted cooperation on Stanford and other AEC problems.

The Administration agreed to produce an updated FPC study of the feasibility of the Hanford project. In November 1960, after the election, the Joint Committee asked the Atomic Energy Commission for another review. The conclusion of both reports, submitted after the change in administration, was that the conversion to power would be clearly sound.

Party-Line Vote

Spokesmen for private power companies challenged this view, but the impression left by public hearings on the question several weeks ago was that there was indeed a sound basis for going ahead with the power generators, for even the minority members of the committee most strongly opposed to the project did not seriously challenge the favorable reports. There was a question as to how profitable the generating plant would be. A case could could be made for the view that the gains would be only marginal, and on this basis there was still opposition from opponents of public power. But there was never much doubt as to how the issue

was going to be resolved in the committee. The vote this week, on a nearly straight party line, endorsed the proposal, and although the bill faced a floor fight in the House, the project's supporters seemed fairly confident that the Administration would win.

At the same time the Joint Committee voted to support the full $114 million authorization for the Stanford accelerator; this the committee had refused to do last year on the basis of a number of mostly trivial reasons, one of them being resentment over the Eisenhower Administration's lack of sympathy for the Hanford project. What the committee did last year was to allow the Stanford project enough money ($3 million to go ahead to the point of actually beginning to move dirt. No one is quite sure how much this delayed the project; at the time the decision was made it was not completely clear, in fact, that the limited authorization would result in any delay at all, although it now seems that it may have cost six months. The committee saw no great harm in granting the project only a limited authorization last year, and it therefore allowed itself to be swayed by factors that would have had little or no influence had the life of the project actually been at stake. These included the official reasons cited by the committee—principally the desire to impress on the AEC the need for the best possible cost estimates, since in the past Congress had authorized money for accelerators only to learn later that the actual cost was going to be considerably larger than the original estimates. There were also unofficial reasons, such as the feeling that it might be just as well to delay final authorization until this year, when there might be a Democratic administration to take credit for the project, and a disinclination to provide Nixon with the occasion for dramatizing the Republicans' interest in science at a groundbreaking ceremony in the midst of the election campaign. Now the political campaign is over; both the White House and Congress are in the hands of the same party; and both Hanford and Stanford seem pretty solidly established.

The PRDC Case

Public versus private power was also an issue in another controversy involving, ostensibly, only the Atomic Energy Commission's handling of reactor safety problems. This week the Supreme Court handed down a decision which upheld the Commission's procedures for issuing construction licenses for large power reactors; these so-called developmental reactors always include a number of untried features, since at this stage in the development of atomic power there is no point in building a power reactor unless it incorporates substantial changes over earlier reactors. The case was described here in some detail on 5 May, at the time it was argued before the court.

The AEC uses a "two-step" procedure in dealing with these reactors: it issues a construction permit after it is satisfied that, among other things, there are no safety problems that are not likely to be resolved during the construction period. The company can then go ahead with advanced design and construction with the assurance that if the finished reactor meets the AEC safety standard it will be granted an operating license. The AEC standard is that there must be "no credible possibility of an accident that will release significant quantities of fission products" into the air. The decision to allow operation can be appealed to the courts if anyone who might be harmed by the reactor feels the AEC has acted improperly.

A group of unions challenged this two-step procedure. They said that once the AEC had permitted a corporation to invest perhaps $50 million in a reactor it would be under heavy pressure to let the reactor operate even if it fell short of the strict safety standard. Because of the danger of this influence, the unions felt that the same safety standard should be required when a construction permit is issued as would be required for the operating permit. Although this argument was brought to the attention of the courts, as well as the argument that reactors are so dangerous that extraordinary precautions are necessary to protect the public, the legal basis for the case had to be something different. For there is little legal basis for arguing that a construction permit cannot be issued because the AEC might behave illegally when the time came to issue an operating license, and equally little legal basis for arguing that the courts ought to take over the function of Congress and decide what public policy should be on questions of reactor safety.

For their main argument, then, the unions had to work out a line of reasoning to support a view that the Atomic Energy Act did not permit the AEC to use the two-step licensing procedure, and then to hope that the court would be sufficiently impressed by the dangers of reactors to, in effect, rewrite the law to fit the unions' view of what public policy ought to be.

Justices Black and Douglas found the unions' view convincing. Speaking for the two dissenters, Douglas called atomic reactions "the most awesome, the most deadly, the most dangerous process that man has ever conceived." Against this background, the two justices accepted the union's interpretation of the law.

The other seven justices saw "good reason" for the AEC's two-step procedure, and no basis for the unions' view that the procedure is illegal.

Meanwhile, the question of public versus private power was mentioned nowhere in the argument over the case, since it had nothing to do with the legal issues. Nevertheless, it was a central factor and perhaps the central factor in the entire affair.

If the unions' view was upheld it would pretty much end, for the time being anyway, the participation of private power interests in the development of atomic power: no one would be interested in building a large power reactor unless it incorporated substantial new design features, and it would be very difficult for such a reactor to meet the strict safety requirements for a preliminary permit unless it were located so far from population centers that it would have little market for its power. All power reactors now lose money (the Hanford plant will be an exception only because the power is a by-product of plutonium production), but plants which could not recoup a good part of their cost by selling power would lose a great deal more money. Probably only the government could afford to build them.

This does not mean that the AEC's critics are not genuinely concerned over the dangers of nuclear reactors. But it is doubtful that the case ever would have been fought if the almost equally emotion-charged issue of public versus private development of atomic power had not been deeply involved. Much of the strong feeling about the case stemmed from a conviction that the public was being put in danger in order to make it possible for private power interests to take over atomic power, a situation which, if true, would strike supporters of public power as especially outrageous after the possibilities of atomic energy had been developed only through vast public expense.—H.M.