News and Comment

Navy's Big Dish: Zooming Costs, Reduced Need, Bring End to Plans for Biggest Radio Telescope

The Defense Department, under prodding from congressmen who were alarmed at the growing cost, has canceled construction of what was to have been the world's largest movable radio telescope.

The device was originally priced at $79 million, but now, after 4 years and $95 million worth of construction and purchasing orders, the completion cost is estimated at over $200 million; however, it is said that this is only a guess and that $300 million could be the ultimate price. The Defense Department explains that money is a secondary reason for the cancellation. The main reason is that the department has found that it no longer needs the telescope. According to a Defense announcement, the need that was felt when the telescope was conceived in 1954 "has been substantially reduced by major advances in science and technology not foreseen at that time." While the cancellation decision was in the works, spending was held down to $1 million a month, the Department said.

The telescope thus will not bring in any information about the heavens, but its demise has produced some revelations of interesting and odd things here on earth, notably involving the financial never-never land of military research, development, and construction. This is a multibillion area over which Defense Secretary McNamara and his research and development director, Harold Brown, are seeking to establish tight reins; the telescope case suggests the immensity of their tasks, and illustrates the rule that, once born, R&D ventures have a way of obstinately hanging onto life and are disposed of only by direst means.

The telescope was a Navy project evolving from research in radio astronomy conducted by the U.S. Naval Research Laboratory. Since it was one of the few space efforts alloted to the Navy, that service looked upon it with considerable pride and was not at all reluctant to tell the world about the unique and monumental piece of hardware that it was going to construct. Precisely what this hardware was expected to do was a military secret, but it appears that electronic snooping inside the Soviet Union was one of its missions. (The Defense Department announcement referred to "classified research in ionospheric physics, space communications, navigation and radio astronomy.") Not at all classified were the physical features of the telescope itself, which was to have a reflecting dish 600 feet in diameter, capable of being aimed precisely at any point in space, and constructed to maintain its parabolic configuration under extreme wind and temperature conditions. The reflector was expected to weigh 20,000 tons; the supporting structure, another 10,000 tons. The dish—slightly over 7 acres in area—was to be faced with aluminum panels, 50 feet by 50 feet, secured to hydraulic jacks which were electronically controlled to adjust the position of the panels and thus maintain the desired shape of the surface of the dish. The Navy proudly pointed out that nothing like the telescope had ever been built before.

Although the decision to build the telescope was made in 1954, it was not until 1957 that detailed studies actually got under way. A feasibility study that was completed the next year produced the pleasant news that the telescope was possible to put together. The Navy then searched for a site and decided upon the vicinity of Sugar Grove, West Virginia, a wooded, sparsely settled area, almost free of man-made electrical interference, a prime requirement for the telescope's site.

Work at the site got under way shortly afterwards, although the final designs had not yet been completed. The Navy explained that "due to the known urgent military and research requirements" it was decided to proceed "concurrently with design and construction." Almost at once the telescope encountered a stream of unforeseen and perplexing problems. According to an engineer who headed a major phase of the project, "We had to keep making it heavier to meet the requirements for stability, but every time we increased the weight in one place, we had to increase it in some other, so that the whole thing started to balloon. Every time we made a move we found we needed another thousand tons of steel."

As the weight rose, the costs rose, too, and the Navy found it necessary to go to Congress to explain that the original estimate of $79 million was not being borne out. The first request for additional money, $17.8 million, came in 1960. It was followed last year by a request for an additional $36.6 million, accompained by assurances that the problems of the big telescope were well in hand. In their account Navy officials attributed their difficulties to the necessity for speed. "The subcontract for steel," they explained, "was awarded in March, 1959, in advance of detailed design, based on a calculated assumption as to the size of the main structural members. It soon became apparent that further refinement of these assumptions was necessary before detailed structural design could be completed. As this design refinement proceeded, it became evident that the tonnage of steel required would exceed the original engineering estimate."

The House appropriations committee, which was becoming increasingly skeptical of the project, set a $135 million ceiling on the project last summer and demanded that the Defense Department "bring order out of a situation which is rapidly becoming chaotic."

The ceiling, if maintained, actually was a death warrant for the telescope, since it was obvious that even $135 million could not meet the cost. Construction tapered off, and emphasis was placed on design work. (At that point, a considerable amount of construction had already been completed, including a 17,000-cubic-yard concrete foundation, as well as most of the turntable on which the telescope would be placed. In addition, a 550-ton pintle bearing had beet installed. Its function was to transfer horizontal wind forces up to 12.7 million pounds from the

structure to the foundation. The Navy said it was the largest ever built and cost over $1 million. Also completed were the shell for a 55,000-square-foot underground laboratory, access roads, a 25-mile gas pipeline, and an on-site plant for fabricating the reflector plates.)

While the Navy was tapering off construction, the economically depressed West Virginians were laying plans to make the big dish a tourist attraction, as well as the symbol for the state's centennial next year. To help them, the Area Redevelopment Administration bestowed upon the state its largest grant to date, $1.4 million, to assist in the construction of tourist facilities. The grant came 3 weeks before the Department of Defense cancelled the project, and it has been suspended until a decision is made about the remains of the Sugar Grove radiotelescope. The Defense Department says it is looking into whether other government agencies would like to carry on the project, but as might be expected, no takers have appeared. The Navy, not too long ago, was eager to publicize its giant telescope and even conducted press tours at the site. All inquiries are now referred to information officers who have very little to say.—D. S. GREENBERG

Tobacco and Health: PHS Sets Up Rules for Study Committee

The Public Health Service last week announced some rather unusual ground rules for the selection of the committee that will conduct its inquiry into the health effects of tobacco. The rules were worked out by the PHS at a meeting with representatives of federal agencies, nongovernmental professional groups, health organizations, and the tobacco industry.

The object of the inquiry is to make a scientific determination, a goal that would seem to make professional competence the overriding consideration for membership on the inquiry committee. However, the subject of health and tobacco is so deeply involved with economic and political considerations that it was decided that candidates must not only be scientifically qualified, but must also have remained outside of the public debate on tobacco and health. According to a PHS announcement, "Scientists who have already taken a strong public position pro or con will not be considered." A Public Health spokesman acknowledged that this was an unusual criterion, "but under the circumstances we feel it is the best thing to do."

He said no decision has been made on whether views expressed in professional journals constitute a "public position," but felt confident that in any event, there is a sufficient number of publicly uninvolved, qualified scientists to carry out the committee's work. This will consist of reviewing existing studies to determine "the nature and magnitude of the health hazard." The PHS also said, "the study will be concerned not only with tobacco but also with all other factors, which may be involved, such as air pollution, automobile exhausts, and so forth."

The committee will consist of approximately 12 scientists selected from a list of 150 with recognized standing in fields including biochemistry, cancer biology, pharmacology, public health and preventive medicine, social and behavioral sciences, statistics, and surgery.

Surgeon General Luther L. Terry said he will make the final selection, but membership on the committee may be denied "for whatever reason" by representatives of organizations that consulted with the PHS on the formation of the committee and the selection of the 150-member list. These organizations are: The American Cancer Society, the American College of Chest Surgeons, the American Heart Association, the American Medical Association, the Tobacco Institute, Inc. (an industry-sponsored agency for research into tobacco and health), the Food and Drug Administration, the National Tuberculosis Association, the Federal Trade Commission, and the Office of Science and Technology.

None of the committee members will represent any organization or group, Terry said, nor will selections be made of scientists participating in similar studies about to be undertaken by the Council on Drugs of the American Medical Association and the American Thoracic Society.

The committee is expected to begin work in mid-September and to report back to the surgeon general in about 6 months. Terry said a second phase of the study, titled "recommendations for action," will be undertaken after delivery of the report. He added that "No decision on how the second phase is to be conducted will be taken until phase one is completed. It is recognized," he continued, "that different competencies may be needed in this phase and that many possible recommendations for action extend beyond the health field and into the purview and competence of other agencies."

The effort to create a committee that is beyond reproach reflects the Kennedy administration's concern over the political power of the tobacco states. The White House, which worked closely with the PHS in the development of the tobacco study, is acutely aware that tobacco constitutes a large piece of the economic foundation of six southern states heavily represented in influential positions in Congress: North Carolina, Kentucky, Virginia, South Carolina, Tennessee, and Georgia. Tobacco crops alone brought these states more than $1.1 billion last year, and their congressional delegations have consistently battered attempts to bring the federal government into the controversy over tobacco and health.

The genesis of the forthcoming PHS study was in the growing accumulation of presumptive evidence that points to cigarette smoking as a factor in lung cancer and other ailments. These findings led Terry's predecessor, Surgeon General Leroy E. Burney, to conclude in 1959 that "the weight of evidence at present implicates smoking as the principal etiological factor in the increased incidence of lung cancer." Similar conclusions have led a number of European nations, notably Great Britain, to undertake campaigns to persuade the public against excessive smoking.

In this country, the Federal Trade Commission, which has jurisdiction over cigarette advertising, has been pressuring the Public Health Service to provide it with the sort of clean-cut scientific statement against tobacco that would support an FTC position for further curbs on tobacco advertising. At present, the FTC prohibits health claims in cigarette advertising, but elements within the agency would like to go one step further and require tobacco advertising and packages to carry a warning against excessive use.

The Administration in its current troubles with the business community is not inclined to take on the tobacco industry, but under the pressure of scientific findings and positive action across the Atlantic, it sees no alternative to taking some action to determine the public health hazard; hence, the creation of the PHS's carefully selected committee.—D.S.G.