

Congress Weighs Closing Vandenberg

Technical problems and the hiatus in the space program have raised doubts about the future of the Pentagon's \$3-billion shuttle complex

WITH the remaining three space shuttles grounded for an undetermined period, sentiment is growing in Congress and at the Pentagon to close the program's West Coast launch site. Constructed at a cost of \$3 billion at Vandenberg Air Force Base, north of Lompoc, California, the launch complex is beset by technical problems and is increasingly viewed as irrelevant to the military's immediate plans in space.

Several members of the presidential commission investigating the shuttle, including Albert Wheelon, the executive vice president of Hughes Aircraft, have privately and publicly questioned the need for a West Coast launch capability in recent months. On 16 June, they received some key support from Senator Jim Sasser (D-TN), the ranking Democrat on an appropriations subcommittee for military construction, who had just returned from a visit to the site.

"The significant technical problems at Vandenberg lead me to believe a military space shuttle program is not necessary," Sasser said. "To that end, I have written the Secretary of Defense and urged that the Vandenberg shuttle facilities be mothballed." Two days later, Air Force Secretary Edward Aldridge acknowledged at a news conference that he is considering placing the site "in some kind of caretaker status until we are ready to launch," although he insisted that it would not be permanently shut.

The issue is a touchy one for the Air Force. Aldridge, who is responsible for the launch of all U.S. intelligence satellites, is personally skeptical of the shuttle's usefulness and campaigned vigorously last year for the development of a new fleet of expendable rockets, capable of transporting virtually every shuttle payload from either coast.

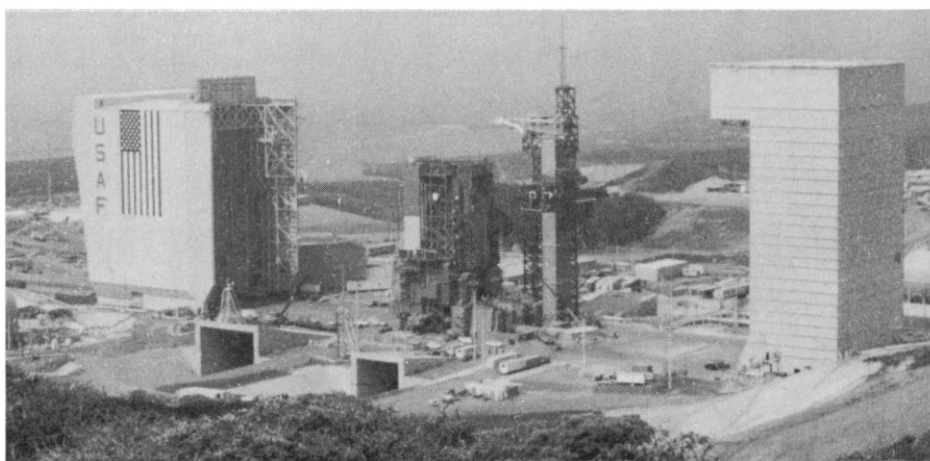
But victory came at a price. As a gesture to the National Aeronautics and Space Administration (NASA), Aldridge agreed not only to be a passenger on the shuttle's first flight from Vandenberg but also to support the agency's bid for a new shuttle vehicle, intended to replace the Challenger, which was destroyed last January. As Sasser and others note, a lengthy closure of the Vandenberg facility and the transfer of most

military payloads to the new fleet of expendable vehicles will virtually eliminate the need for a new vehicle. "We could save as much as \$3 to \$4 billion," Sasser says. This issue is presently under consideration at the White House.

The first shuttle flight from Vandenberg was originally scheduled for July, but a report prepared by the minority staff of the Senate appropriations subcommittee says that it would have been delayed even if the accident had not occurred in January. A potentially serious defect exists in the system for venting shuttle exhaust at the Vandenberg

fires have been noticed at the shuttle's Florida launch pad, but the problem was readily corrected because the exhaust is vented through open trenches.) At present, the Air Force is apparently considering 28 different solutions to the problem, including four that require substantial duct modifications. The most extensive would cost millions of dollars and delay the pad's availability by 1 year, until mid-1989.

Since the recent shuttle calamity, which the presidential commission linked partly to unusually low temperatures at launch, virtually everyone connected with the program



The military's West Coast "spaceport". Buildings at the Vandenberg shuttle complex are located so near each other that concerns have arisen about the impact of an accidental explosion on the pad. Pictured from the left are a \$40 million wind screen for launch preparations, the launch tower, and a service building.

berg launch pad, one of many problems that have cropped up over the past few years as the former artillery training camp has been transformed into what the Air Force calls its "West Coast Spaceport."

Specifically, it was recently learned that hydrogen gas can become trapped inside lengthy tunnel-like exhaust ducts and subsequently ignite, causing what Colonel Orlando Severo, the manager of shuttle operations at Vandenberg, calls "overpressure that could exceed specifications for the aft end of the orbiter." It could, in short, blow the tail apart, either during launch or immediately after an emergency engine shutdown. (Two buildups of hydrogen and brief

has been sensitized to potential weather problems. The complex at Vandenberg, situated on some hills overlooking a beautiful ocean stretch, is plagued by severe fog, which collects at night and lasts until late morning virtually every day during the summer. On the day that subcommittee aides visited, vision from more than half of the television cameras in the launch control center was obscured. Although the temperature is not subject to the extremes that occur in Florida, it often drops below 50°F, at which point the reliability of some of the shuttle's present components becomes questionable.

Finally, the accidental destruction in April

of a Titan rocket at Vandenberg, 6 to 8 seconds after its launch, has created some concern about the safety of the shuttle control center there. Smoking and burning debris from the Titan fell over a wider area than anticipated, according to the subcommittee report, with some of it barely missing the launch control room situated 1400 feet away.* Despite the use of air filters, the control room filled with smoke, and more than 100 people were trapped inside for nearly 6 hours. Although an explosion of the shuttle would be far more powerful than the one that wrecked the Titan, the launch control center at the shuttle complex is only 1200 feet from the pad—200 feet closer than the center at the Titan launch site. (Safety aside, it is so close that some of the computer equipment will be jeopardized by vibrations during routine launches, according to the subcommittee report, and may have to be relocated.)

Aldridge dismisses the weather concerns as “not pertinent. . . . I don’t have any doubt we can find four good days a year in California to fly under acceptable conditions.” But he acknowledges that an accidental explo-

*Eighty percent of the debris apparently fell within 1500 feet, with another 10% falling within 2100 feet. A chunk of solid rocket fuel bounced off the roof.

sion of the shuttle within the first few seconds of flight will probably jeopardize the safety of the 300 people in the launch control center. “We’ve made acceptable provisions for the safety of the crew inside that launch complex,” he says. “Unless there is a failure at a particular time in the launch, then the people in there are going to be very safe.”

Sasser believes that the existence of these potential problems offers a good reason to reconsider the use of Vandenberg. But a better reason, he says, is the fact that a West Coast launch pad for the new expendable rockets will be ready in the spring of 1989. “In my view, we should no longer plan to use manned space flight to deliver military payloads into space unless there is no other alternative,” he says. Given the likely delays in availability of the shuttle pad, the rockets will provide virtually identical capability at the same time for a much lower cost. Satellites in polar orbit could not be repaired or serviced in space, but this may not be important or economical in the near term.

Under one option outlined by the subcommittee staff, the shuttle complex would be placed in “operational” caretaker status, with a 40% cut in personnel, and a savings over 4 years of \$600 million. The first

launch would be delayed from 1988 to 1991. Under another option, the site would be placed in “facility” caretaker status, with a two-thirds reduction in staff, and savings of \$1.2 billion over the next 5 years. No launch would occur until late 1993. A third option, favored by Sasser, is virtually to shut the facility down through the mid-1990’s, saving \$1.6 billion over the next 5 years alone. “I like to think of it as placing the facility in ‘strategic reserve,’” Sasser says.

Aldridge replies that “all of the options are under consideration.” The issue will become clearer in late July, he adds, when tests are completed on the exhaust ducts. Also, more data will be available on the difficulty and expense of redesigning some classified military payloads so that they can fit on the new expendable rockets instead of the shuttle.

Sasser, for one, is skeptical that these costs will amount to much, especially “in the overall context of a new \$2- to \$3-billion orbiter and \$400 million a year to keep the Vandenberg facility operating.” He is anxious to let the Air Force take the first step and make its own decision, but if it falls short of a shutdown, he will offer legislation to force the Administration’s hand. ■

R. JEFFREY SMITH

U.K. Astronomers Split On Observatory’s Fate

A decision to move Britain’s oldest observatory to the University of Cambridge has created deep divisions in the scientific community

Few issues in recent years have created such bitter divisions within the British scientific community as a simmering debate over the future of the 300-year-old Royal Greenwich Observatory (RGO), currently based in the picturesque Herstmonceux Castle in the heart of the Sussex countryside, 40 miles to the south of London.

On 18 June, the Science and Engineering Research Council (SERC), which has been responsible for operating the observatory since the mid-1960’s, decided that the facility should be transferred to the University of Cambridge. This was one of three options—

the other two being a move to the University of Manchester, or a merger with the Royal Observatory Edinburgh—that had been short-listed at a meeting of the council in March (*Science*, 4 April, p. 19).

This will be the RGO’s second move in the past half-century. Just after World War II, it was shifted from its original location at Greenwich in London to a site in the countryside that promised better viewing conditions. There was no escape from British weather, however. And since the early 1970’s its role as an observatory has been wound down as new telescopes have been built at more favorable sites abroad—in

particular at La Palma in the Canary Islands, off the coast of Spain.

As a result, RGO’s responsibilities have shifted gradually toward one of managing the La Palma Observatory and coordinating the efforts of research astronomers distributed throughout 35 British universities and polytechnics. The SERC has argued that, because of this shift, the RGO should now be more directly linked to its “customer” community, hence the move to a university.

Then there is the question of money. Optical astronomy has fared relatively well in Britain in recent years, with commitments being made to new facilities on La Palma before the current budget restrictions came fully into force. But the future looks far less optimistic; indeed, many penny-conscious government officials are thought to consider the upkeep of Herstmonceux Castle an unnecessary public expense.

All the reasons put forward by the SERC for moving the RGO have been vigorously contested. Various members of the Royal Astronomical Society, for example, joined a coalition of local politicians and staff union representatives to argue that any attempt to merge the RGO with another institution, such as a university, could destroy both its unique identity and its role in stimulating