

manned cargo ship for space station materials and equipment, as well as manned planetary exploration, and the construction of a base on the moon.

The Pentagon, however, is resisting NASA's compromise, partly out of skepticism that the shuttle-derived vehicle will be ready by 1988, and partly out of a simple desire to control the program by itself. Several months ago, the House and Senate appropriations committees requested an assessment of the competing proposals by the National Academy of Sciences. The study, to be chaired by Robert Fossum, a former director of the Defense Advanced Research Projects Agency who is now dean of the school of engineering and applied science at Southern Methodist University, will be completed by 1 September.

Whichever rocket is built, the shuttle is in for some rough competition. Although intended primarily for the heaviest military payloads, the new rocket may also be capable of cheaply hoisting both lightweight and heavy commercial payloads. Separately, the Air Force is studying a plan to refurbish 56 old Titan II missiles for use with lightweight military payloads. And \$2.8 million in the Air Force budget is allocated to preliminary design of a manned spaceplane, similar to the shuttle but capable of lifting off from a conventional airfield on short notice and circling the globe in 90 minutes.

NASA officials are justifiably concerned that the potential withdrawal of the shuttle's single biggest customer will convey a strong, worrisome message to its commercial clients. Yet they can hardly deny that the shuttle has thus far failed to live up to its promise. "Somebody made a big mistake long ago," says the senior Reagan Administration official.

The ironies were noted by Representative Kenneth MacKay, a first-term Democratic congressman from Gainesville, Florida, during Aldridge's recent congressional testimony. "We have put the rest of the space research program back a decade trying to get the shuttle in gear, and find that the military basically sees good reasons why the shuttle [is] not a crucial thing. . . . Maybe this is the first time we have [had] . . . a realistic assessment of the shuttle system. Maybe we've designed a dinosaur. What will it be used for if you and the other commercial users decide that we're going to go to expendables? What will it be used for except an occasional recovery of something . . . for the Smithsonian?" Twenty billion dollars later, these are all good questions.—**R. JEFFREY SMITH**

Do Seminars Leak Navy Secrets?

In a memo that stung senior scientists working for the Navy, Vice Admiral R. A. Miller, vice chief of naval material, recently wrote that the government "does not want Navy Material Command personnel actively participating in non-Department of Defense sponsored symposia, conferences, or other similar forums on weapons and associated technologies related subjects." Taken literally, the memo seems to ban the discussion of weapons in almost any professional or educational setting. But it specifically targeted "commercially sponsored" seminars. There is some confusion as to how broadly it should be read.

The warning, issued on 2 April, inflames a sore subject at the Pentagon, the difference over how to manage sensitive but unclassified military information. As one Navy official says, it is a dispute between adherents of two approaches—"security by blockage and security by accomplishment." Some, including Admiral Miller, would have the military err, if it must err, on the side of secrecy.

The other approach assumes that the benefits of communicating with the outside world outweigh the risks. In a broad interpretation, this means employees should be allowed not only to give talks to professional societies, but even to moonlight as instructors at special seminars. The argument for the open approach is that the military gains more by sharing its expertise than by hoarding it. "The [electronics] community isn't going to miss us if we withdraw," says one official. "We're going to miss the community."

In this memo, Miller singled out four Navy civilian employees by name for unfavorable mention. All are leaders in their fields. They are Merrill Skolnik, superintendent of the radar division at the Naval Research Laboratory (NRL) in Washington and author of two classic texts on radar; Robert Hill, director of advanced radar systems in the Naval Sea Systems Command and a leader of many international conferences on radar; Stephen Mango, a NRL physicist involved in radio astronomy and remote sensing; and Richard Hu, a senior systems analyst in the AEGIS (shipboard missile) program office and a 25-year veteran in defense R&D. All were instructors in radar courses given at the George Washington University (GWU) program of continuing education in Washington, DC.

Miller saw these courses as confirming his view that there is "too much open source publication and discussion of information on our weapon systems. . . ." Miller wrote that these "are another example of the type of thing that contributes to the undesirable availability of sensitive information on Navy programs and capabilities."

Miller did not clarify the memo before *Science* press time. "The Admiral will not be available," said his assistant, Lieutenant Commander Bradford Goforth.

Meanwhile, the four Navy scientists have responded in different ways. All are stewing quietly, and Hill has resigned from the university faculty. He says that in the 10 years he has taught the course on radar fundamentals, there has "absolutely not" been any discussion of classified or sensitive data. He had no inkling that he would be cited as an example of an information leaker and is offended.

Hill is proud of his skill as a teacher: "One person told me that in a couple of hours I made him really understand how an antenna forms a beam—better than he had understood it in a year or more of studying at college." Teaching, he says, is "a great moral compulsion, a good thing to do. . . . I really thought that on balance, I was contributing to the increased strength of our security." Others mentioned in the memo are still teaching. One is said to be considering taking legal action if he is told to stop.

J. W. Perkins, director of GWU's continuing engineering education program, says: "This university would mutiny if we did teach anything classified." He advises all instructors—many of whom have security clearances—to be particularly guarded in what they say during informal question-and-answer sessions. With 570 courses in the catalog and 850 instructors, Perkins thinks a ban on military participation would be felt more sharply by the military than by the school.—**ELIOT MARSHALL**