malfunctioned at critical moments—during landing and shortly before takeoff. The agency is presently examining the vulnerability of every space system component with TI parts. "If it's not in a critical path, if we have redundancy, we would feel very comfortable. If we don't have redundancy, we'll have to go in and replace it."

Like the Defense Department, NASA has no idea what all this will cost. DeLauer, at a press conference, said that "it's too early to tell" if criminal prosecution is possible, probable, or warranted. When asked if the Defense Logistics Agency should also have detected the breadth of the problem earlier than it did, the senior investigator says, "Yes. Absolutely. So could the Air Force, so could the Army, so could the Navy. Any one of them. They all knew about it [after the notification in January]. There were meetings with IBM, and all those guys were invited to participate."

Some government officials believe that in the long run, problems such as this can only be avoided through the use of standardized computer circuits, manufactured under rigorous government supervision, for virtually all military applications. Industry has resisted the idea, the officials say, because the creation of circuits like TI's with unique capabilities—as ostensibly proven in tests—is far more profitable. Competition is all but eliminated, because only one microchip supplier exists, both when the weapon is manufactured and when it is repaired. But some feel that recent highly publicized discoveries of microchip testing irregularities at several companies, in addition to TI, cannot help but motivate the Pentagon officials to press harder for standardization.

—R. JEFFREY SMITH

Universities Vie for DOD Software Center

The chance to operate a major software engineering center for the Pentagon has kindled keen competition among universities who regard the center as a high-technology plum. The winning proposal will bring a contract worth $103 million over 5 years to establish and run a facility to be called the DOD Software Engineering Institute (SEI).

The SEI idea is a product of growing concern within the military that, as software has grown more important, more complex, and more expensive, emerging software ideas and technologies are not being incorporated satisfactorily into the systems being developed for the Department of Defense (DOD). Establishment of SEI was put forward as a way to improve the transfer of new software technology to government and defense industry users and to help overcome a shortage of software professionals.

The center will take the form of a federally funded research and development center (FFRDC), operating as a nonprofit organization managed by a university or consortium of universities. Its independent status would permit the institute to perform classified work, which is proscribed for on-campus laboratories by many universities. SEI's relation to government agencies will be similar to that of Lincoln Laboratories, an MIT spin-off, which mainly does electronics R&D for the military.

The Pentagon has not identified the bidders who met the deadline for proposals in early August, but seven contenders confirm that they submitted proposals and made presentations to a DOD evaluation panel. The aspirants include several combinations and permutations of universities and nonprofit organizations.

The Texas Engineering Experiment Station of the Texas A&M University system is taking the lead in a group that includes the University of Texas at Austin as an affiliate plus the University of Houston at Clear Lake, hard by the Johnson Space Center; Prairie View A&M University; and, outside Texas, the University of Southwestern Louisiana and the University of Southern California. The University of Michigan has formed a consortium with three other Big Ten universities: Illinois, Ohio State, and Purdue. Ohio State is also a major partner along with Wright State University in Dayton in a consortium that includes the University of Dayton and Sinclair Community College, as well as the University of Central Florida. The University of Maryland has joined with IIT Research Institute to propose establishment of the institute in the Washington, D.C., area. Carnegie–Mellon University in Pittsburgh has put in a solo bid, but has the "support" of the other major research universities in Pennsylvania. Georgia Institute of Technology is another single institution entry. And Northeastern University in Boston has offered a further variation by bidding to operate the institute itself but including pledges of participation from senior researchers from Brown, Harvard, MIT, and the Wang Institute for Advanced Graduate Study.

Although the contract has only a 5-year term, creation of a new FFRDC implies DOD intentions to underwrite a long-term effort. SEI's mission, according to one DOD description is "to accelerate the transition of emerging or advanced software technology into use in the development of DOD weapons systems." University sources say that the center is not expected to do direct applications work, but to make it possible for the Pentagon to use the most sophisticated software systems to meet a wide spectrum of demands.

In this cause, SEI will be called on to survey the software field for state-of-the-art developments useful to DOD systems. DOD is asking that SEI create a "showcase environment incorporating these techniques and methods" to aid the transition of new software technology to industry users. SEI will be expected to establish a so-called software factory capable of providing software tools and reusable software parts that can be employed as building blocks in various DOD computerized systems. For the universities, snaring the institute is seen as a way to provide a major inducement in recruiting faculty and to offer challenging work for graduate students, as well as being an opportunity to push an institution to the forefront of an important and highly competitive field.

DOD is keeping the procurement process under tight wraps. It is known that congressional delegations have mobilized to press the case in behalf of their constituents and there is some anxiety among the applicants that political muscle rather than merit might prevail. The decision on the contract was originally scheduled for 1 November but has been delayed to late in the month at the earliest. Slippage is not unusual in such cases, but in this instance, the move beyond election day might reduce the intensity of political pressure.—JOHN WALSH