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## Progress Report on Engineering Education

The need for action to meet the national crisis in engineering education remains acute. That is a chief conclusion of a follow-up report on the National Engineering Action Conference (NEAC) held last April.\* The report was based in part on a survey of 32 engineering deans conducted by the Project on the Engineering College Faculty Shortage.† The deans agreed, usually by large margins, that:

- The engineering faculty shortage remains critical.
- Engineering schools are still losing faculty to industry, though at somewhat lower rates.
- Engineering faculty salaries are being raised.
- Graduate enrollment is noticeably increasing.
- Equipment and facility problems are beginning to be addressed.

Much remains to be done. As noted in a recent report,‡ the present dangers to the quality of engineering education have been masked by the abilities of the students accepted by the engineering schools. Admissions officers now have the dubious luxury of being even more selective. Thousands are being turned away as the engineering schools struggle to maintain educational quality by balancing resources against enrollments.

While the nation strives to upgrade industrial productivity, expand employment, and bolster national security, the engineering schools are being forced to forgo invaluable opportunities to produce young engineers with educations commensurate with their talents. Between 1975–1976 and 1980–1981, the ratio of students to faculty at most institutions shot up 30 to 50 percent. In overcrowded lecture halls, students are seen but not heard. In crammed laboratories, where experimental work deteriorates into mere demonstration, students may look but not touch. And with grossly inadequate capital budgets at the schools, students can read about state-of-the-art equipment but almost never use it.

There are, however, tangible signs of progress. At the state level, the Project on the Engineering College Faculty Shortage has cataloged more than 50 initiatives proposed to state governments by local academics, industry, and the professional societies. Almost half of these have brought funding by state governments, and many entail joint funding with industry. A similar catalog shows that industry has committed at least \$75 million to meeting the problem in the form of faculty grants, fellowships, equipment donations, and university-industry cooperative research agreements. To this can be added IBM's new \$50 million program to support education in manufacturing systems engineering. At the federal level, write-off provisions in the Economic Recovery Tax Act of 1981 have stimulated equipment donations to colleges and universities. And the National Science Foundation and the Department of Defense have expanded their programs-in-aid to engineering education.

In short, within this diverse, pluralistic nation, the movement to protect the quality of engineering education is gaining momentum. But the needs still far outweigh the resources being applied. In the few months since NEAC, perhaps the most hopeful sign is the growing realization that all the sectors involved can and must help resolve the situation. Many models exist, including the "action examples" produced by NEAC and those collected by the Project on the Engineering College Faculty Shortage. In reaching our pressing national goals, success will depend to a great degree on how widely and well these models are translated into further action.

—EDWARD E. DAVID, JR., *President, Exxon Research and Engineering Company, Florham Park, New Jersey 07932*

\*E. E. David, Jr., *Science*, 30 April 1982, p. 465.

†Sponsored by the American Association of Engineering Societies and the American Society for Engineering Education.

‡Prepared by the National Association of State Universities and Land-Grant Colleges.