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Reliability of Consumer Goods

On a recent visit to the United States, Mstislav V. Keldysh, president of the U.S.S.R. Academy of Sciences, remarked favorably on the reliability of U.S. technology. Since most of us have had occasion to complain about the quality of our consumer goods, this was a welcome but unexpected remark. In recent years there have been frequent recall campaigns for automobiles and warnings of defects in other products, and the impression is rife that quality of goods and workmanship has been deteriorating. Such an impression is not totally accurate. Although there seems to have been some decline in workmanship, industry is improving many products. This is being achieved through better designs, through designs that take into account possibilities of human failures, and through widespread use of computers, both for control of in-process materials and for testing of assemblies and subassemblies.

The industrial quest for reliability does not arise from some newfound altruism. It comes rather from pressures now being exerted by consumers. For their part, consumers are outraged at the cost and unreliability of repairmen and want goods that are dependable in the first instance. A company that sells defective goods faces possible damage suits as well as bad public relations.

Prospects for further improvement in reliability are good. Techniques and approaches that were developed to meet exacting reliability requirements of such items as computers, jet planes, and space vehicles are now being transferred to the civilian economy. Virtually every major company has a sizable group assigned to quality control and reliability. A sample of their work can be seen in a volume* distributed by the Institute of Electrical and Electronics Engineers (IEEE).

Not all the techniques of aerospace are transferable to consumer goods. The superlative reliability of space vehicles was achieved through painstaking, repeated tests of each individual component, subassembly, and assembly. Further assurance of reliability was obtained through redundancy. Those who have worked with space vehicles say that any desired degree of reliability can be obtained, though at great expense.

Few consumers are willing to pay the prices that excellence would entail. Nevertheless, much improvement can be obtained without excessive increase in cost. An engineer from one of the largest automobile companies has told me of new complex machines that turn out parts having great precision; performance of the machine is constantly monitored by automatic means.

The IEEE symposium volume provides many examples of efforts to improve reliability. One is a description of procedures to be used in checking reliability and quality of electric ranges. The program is expected to provide a computer evaluation of on-line tests and assurance both that proper tests have been set up, run, and passed and that results have been permanently recorded. This record on each unit, combined with a history through warehousing and field service, is intended to yield a total story of the unit's performance. The summation of these data would be fed back to the plant, resulting in corrective actions and improved performance.

The current efforts to improve reliability are important, and they merit the attention and good wishes of all. It seems possible that reliability and longevity of consumer goods can be substantially enhanced without sharp increases in costs. Thus we may be able to maintain or improve our present standard of living while diminishing industrial use of energy and cutting the consumption of scarce raw materials.—PHILIP H. ABELSON

* *Proceedings of the 1972 Annual Reliability and Maintainability Symposium* (Institute of Electrical and Electronics Engineers, Inc., New York, 1972).