tating" effect on weapons procurement. Because DOD persistently underestimates the amount of inflation it will encounter each year (recently by as much as 7 percent), the weapons buyers have been running short of cash each year. It is virtually impossible to cancel a program once it has been launched. Thus, economies are made by stretching out production schedules, making for greater inefficiency and driving costs even higher.

Perry's solution is not to train managers in greater fiscal self-discipline, but to seek an automatic cost-of-living increase for procurement, so that funding will always keep pace with inflation. As he says, if DOD can give this benefit to employees and pensioners, why not give it to the weapons as well? This is not an idea likely to provoke a storm of protest in the Pentagon.

Whether or not the new DOD chiefs relish the prospect, Perry thinks their first chore will be to bring a sense of reality into the weapons procurement process.—ELIOT MARSHALL

Energy, Security, and War

Sharply contrasting views are presented in two recent studies that focus on national security as it relates to energy. A book put together at Harvard calls for massive oil stockpiling to insulate the country from possible oil cutoffs, whereas a study for the Federal Emergency Management Agency (FEMA) urges decentralization of the country's energy systems in order to reduce vulnerability to attack.

The Harvard book, *Energy and Security*, edited by David A. Deese and Joseph S. Nye, deals with narrower issues than its title implies. The book, a report of Harvard's Energy and Security Research Project, says that the United States has placed too much emphasis on reducing foreign oil imports and not enough on reducing the country's "vulnerability"—that is, the damage that might be done by a cutoff of oil. It states that few long-term policies—such as price decontrol, the synthetic fuels program, conservation, or coal conversion—will significantly reduce the country's near-term vulnerability. Thus, it urges large increases in both strategic and industrial petroleum stocks. The book says the long lead time required for development of synthetic fuels will prevent them from changing the picture during the 1980's, and "a dollar invested in synthetics is worth much less, in the short run, than a dollar invested in stockpiles." The book dwells at some length on the political situation related to energy in both oil-producing and oil-consuming countries and advocates various measures to deter crises in the Persian Gulf area. It also proposes that the U.S. government develop more detailed strategies for dealing with oil emergencies. But basically, the emphasis is on increasing the stocks of the United States and its allies, with an eye toward the ultimate creation of an international strategic petroleum reserve.

> ". . . centralization of our energy systems is increasing our nation's vulnerability, in the name of decreasing it."

A more frightening question, that of the ability of America's energy network to withstand an enemy attack, is addressed in *Energy Vulnerability and War*, done for FEMA. Asserts Wilson Clark, the energy consultant who headed the study team, "the increasing centralization and energy/materials intensity of our energy systems is increasing our nation's vulnerability, in the name of decreasing it." Although the national petroleum reserve is not discussed in the report, Clark says stockpiling petroleum in a few locations is just the kind of centralization of resources that supplies an inviting target. Drawing from the experience of World War II, the report notes that Germany was crippled when its main synthetic fuel and electricity plants were decimated at the end of the war, whereas it would have been impossible to destroy Japan's network of small, decentralized hydropower facilities.

Clark's report calls the U.S. energy system "highly centralized" and notes that the trend has been toward large size and consolidation in power plants. The proposed Allen-Warner Valley Power System in southern Nevada and Utah, which is to comprise two large power plants and a coal slurry pipeline to the nearby Alton coal field, represents the type of concentration the report decries. Both nuclear plants and synthetic fuels facilities are also regarded as by nature centralized. The report concludes that this country can reduce both its vulnerability to oil import cutoffs and its vulnerability as a target by moving toward dispersed, decentralized, renewable energy supplies. Various forms of energy conservation are discussed at length, including cogeneration—the use of waste heat to power industrial processes—and home insulation. Another study is quoted to the effect that $10 billion a year, over a decade, supplied as interest-free loans for home insulation, would save the country 75 percent of the heat content of the oil now imported into the United States. This was contrasted with the $88 billion synfuels program, which is not expected to replace more than 15 percent of imported oil by 1990.

The report claims that the widespread use of electronics makes us more vulnerable than ever before to a nuclear attack. The reason is the little-remarked phenomenon of electromagnetic pulse (EMP) which occurs when a nuclear bomb is detonated at high altitudes. The EMP is a microsecond burst of electromagnetic energy, a hundred times more powerful than a lightning bolt, which can incapacitate solid-state electronic equipment (vacuum tubes are less vulnerable). Two years ago, the Office of Technology Assessment, in a nuclear war scenario, postulated that in a "limited" strike the Soviets could wipe out the American petroleum industry with 80 MIRV'd missiles. Now, says Clark's report, it appears that "one or two well-placed nuclear warheads detonated in the upper atmosphere could cause failure in the entire national power grid, including destroying the sensitive control facilities at modern electric power plants."—CONSTANCE HOLDEN

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