

to participate. According to a State Department official, although several agencies are asking about the status of their programs, there has not been a formal move to put the programs back on track. "It is painful and difficult to arrange exchanges," he said. There is interest but "no flurry of scientists has lined up."

—JEFFREY L. FOX

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## NAS Study Casts Doubt on Existing EMP Protection

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A committee of the National Academy of Sciences has reported that electronic systems can, in theory, be protected against electromagnetic pulse (EMP) from high-altitude nuclear explosions, but the panel says it is "uncomfortable" with one of the shielding methods currently employed.\* One implication is that military communications systems may still be vulnerable to disruption.

The committee notes that the magnitude of the EMP effect was not predicted until after atmospheric nuclear testing was halted in 1963, and thus there has been no opportunity to gain first-hand knowledge of the phenomenon. Some EMP effects were, however, noticed in Hawaii during a series of nuclear tests in the Pacific in 1962. Street lighting was disrupted and burglar alarms were tripped.

Growing concern about EMP during the 1970's has, however, prompted measures to test vital systems and shield them against damage. Among the consequences of lack of protection are disruption of military command and control systems and damage to a vast range of electronic equipment including weapons systems, telephone equipment, computers, and automobile ignitions.

The committee, which concerned itself exclusively with military systems, concluded that adequate protection is possible by shielding electronic equipment in copper-lined buildings or boxes, with electrical connections using fiber optics rather than metal wiring wherever possible.

An alternative approach, involving

\**Evaluation of Methodologies for Estimating Vulnerability to Electromagnetic Pulse Effects*, Engineering Board, National Academy of Sciences, 2101 Constitution Avenue, NW, Washington, D.C. 20418.

the use of heavy-duty components and electrical shock absorbers to "harden" systems against EMP is currently widely employed. But the committee says it is "skeptical" of this method because there have been unpredictable failures in testing.

Asked whether this means that the committee believes that military systems are currently poorly protected, John M. Richardson, the Academy staff member who directed the study, said that the committee deliberately refrained from making an assessment of the current state of protection.

One of the chief recommendations of the study is that testing of components and systems under simulated EMP should be stepped up. One such test, planned by the Navy to monitor the effect of EMP on communications equipment, is, however, currently on hold because of fears of environmental damage. The test was to take place on the Chesapeake Bay in Maryland, but following protests from state officials, the Navy has promised to produce an environmental impact statement before going ahead.

The committee was chaired by John R. Pierce, emeritus professor of engineering at California Institute of Technology, and the study, which took 2 years, was conducted for the Defense Nuclear Agency.

—COLIN NORMAN

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## Soviets Tighten Rules on Contacts with Foreigners

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Soviet authorities appear to be making concerted efforts to further limit dealings between Soviet citizens and foreigners visiting the U.S.S.R. One likely effect is to reduce informal contacts between American scientists and their Soviet counterparts.

A series of incidents in Leningrad involving U.S. citizens in recent months prompted the U.S. State Department on 6 August to issue a travel advisory warning Americans that they risk detention and denial of access to U.S. officials if they visit that city. In one instance, an American academic on his way to a private meeting with a Soviet scholar was arrested and held by police for two hours. A State Department spokesman said that the American was told "that a new Soviet

law which took effect on 1 July did require that foreigners be granted access to their consular representatives unless they were being deported.

In July, the State Department in Washington issued a broad analysis noting that the Soviets had tightened the laws on internal security, among the provision on state crimes was that "has placed sweeping authority in the hands of the authorities." According to the analysis, the definition of state secret has been broadened to include the concept "work related secret." As a result, Soviet citizens face the possibility of criminal charges if they provide virtually any kind of information to a foreigner without official authorization." Some observers here note that if the law is applied rigorously, Soviet scientists would not be able to discuss their work with foreigners.

Before laws on state crimes were enforced they require implementation of legislation in the separate Soviet republics. Until that occurs, it will not be possible to gauge their impact. Knowledgeable observers here say that Soviet laws are often put on the books but are not available if policy requires it may be selectively enforced.

The State Department analysis comments:

"How these changes in the criminal code will be implemented in the post-Andropov period remains to be seen. Their very existence, however, is likely to have a chilling effect on contacts between Soviet citizens and foreigners and so affect those who travel to the U.S.S.R. as tourists or to meet relatives or who engage in business exchange or academic activities."

A less portentous change already in effect seems likely to cut into informal contacts between visiting American and foreign scientists and their Soviet counterparts. A change in the rules passed by the Supreme Soviet on 25 May prohibits Soviet citizens from providing foreigners with "housing or means of transportation or . . . other services in violation of established regulations." One source interpreted here as being aimed at discouraging Soviet citizens with private automobiles from transporting foreigners and from inviting them to stay overnight in their homes.

Violations of the rule are punished by fines ranging from 10 to 50 rubles (the average monthly salary is al