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## Microwave use as Soviet arms held likely

By The Associated Press

A newly declassified United States Defense Intelligence Agency report says extensive Soviet research into microwaves might lead to methods of causing disoriented human behavior, nerve disorders or even heart attacks.

"Soviet scientists are fully aware of the biological effects of low-level microwave radiation, which might have offensive weapons application," says the report, based on an analysis of experiments conducted in the Soviet Union and Eastern Europe.

According to the study, this research work suggests "the potential for the development of a number of antipersonnel applications."

Microwave beams are the electronic basis of radar and are used widely for relaying long-distance telephone calls. Other common sources of microwaves include television transmitters.

A copy of the study was provided by the agency to the Associated Press in response to a request under the Freedom of Information Act. The Pentagon agency refused to release some portions of the study, saying they remain classified on national security grounds.

The report made no direct mention of the Soviet microwave bombardment of the U.S. Embassy in Moscow where, despite strong American protests, the radiation continues, though at reduced levels.

Up to now, the view most widely accepted among State Department officials in Washington has been that the Russians appear to be using the microwave beams to foil sophisticated U.S. electronic intel-

ligence-gathering equipment at the embassy.

The State Department issued an administrative notice November 12 declaring Moscow "an unhealthful post," but no link officially was drawn between this move and the radiation situation. Department spokesmen insist that medical tests have found no adverse health effects attributable to the microwaves.

The Soviet Union has denied beaming any radiation at the embassy, contending that the microwaves are simply part of the normal background radiation found in any major city.

The Pentagon agency's report, distributed within the government last March, said that one biological effect which could offer antipersonnel uses is the phenomenon known as "microwave hearing."

"Sounds and possibly even words which appear to be originating intracranially [within the head] can be induced by signal modulation at very low average power densities," the study said. It added that "combinations of frequencies and other signal characteristics to produce other neurological effects may be feasible in several years."

The report concluded that Soviet research in this area "has great potential for development into a system for disorienting or disrupting the behavior patterns of

military or diplomatic personnel; it could be used equally as well as an interrogation tool.

"One physiological effect which has been demonstrated is heart seizure," the report said.

It said that this has been accomplished experimentally in frogs by synchronizing the pulses of a microwave signal with the animal's heartbeat and beaming the radiation at the chest area.

The document added that "a frequency probably could be found which would provide sufficient penetration of the chest wall of humans to accomplish the same effect" — heart attacks.

The report said that another potential antipersonnel use of microwaves could be based on their effect on the blood-brain barrier, which regulates the exchange of vital substances between brain cells and the circulatory system.

As the result of this, it said, "an individual could develop severe neuropathological nerve disorder symptoms and either die or become seriously impaired neurologically."

According to the Pentagon analysis, Soviet researchers have found that persons exposed to low-level microwave radiation "experience more neurological, cardiovascular and hemodynamic blood circulation disturbances than do their unexposed counterparts."