

**STATEMENT
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**FOREIGN VIEWS OF
ELECTROMAGNETIC PULSE (EMP) ATTACK**

The EMP Commission sponsored a worldwide survey of foreign scientific and military literature to evaluate the knowledge, and possibly the intentions, of foreign states with respect to electromagnetic pulse (EMP) attack. The survey found that the physics of EMP phenomenon and the military potential of EMP attack are widely understood in the international community, as reflected in official and unofficial writings and statements. The survey of open sources over the past decade finds that knowledge about EMP and EMP attack is evidenced in at least Britain, France, Germany, Israel, Egypt, Taiwan, Sweden, Cuba, India, Pakistan, Iraq under Saddam Hussein, Iran, North Korea, China and Russia.

Numerous foreign governments have invested in hardening programs to provide some protection against nuclear EMP attack, indicating that this threat has broad international credibility. At least some of the new nuclear weapon states, notably India, are concerned that their military command, control, and communications may be vulnerable to EMP attack. For example, an Indian article citing the views of senior officers in the Defense Ministry (including General V. R. Raghavan) concludes: “The most complicated, costly, controversial and critically important elements of [nuclear] weaponisation are the C3I systems....Saving on a C3I system could be suicidal. With a no-first-use policy, the Indian communications systems have to be hardened to withstand the electromagnetic pulses generated by an adversarial nuclear first strike. Otherwise, no one will be fooled by the Indian nuclear deterrent.” (C. Rammonohar Reddy, **The Hindu**, 1 September 1998)

Many foreign analysts perceive nuclear EMP attack as falling within the category of electronic warfare or information warfare, not nuclear warfare. Indeed, the military doctrines of at least China and Russia appear to define information warfare as embracing a spectrum ranging from computer viruses to nuclear EMP attack. For example, consider the following quote from one of China’s most senior military theorists—who is credited by the PRC with inventing information warfare—appearing in his book **World War, the Third World War–Total Information Warfare**: “With their massive destructiveness, long-range nuclear weapons have combined with highly sophisticated information technology and computer technology today and warfare of the looming 21st century: information war under nuclear

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deterrence....Information war and traditional war have one thing in common, namely that the country which possesses the critical weapons such as atomic bombs will have ‘first strike’ and ‘second strike retaliation’ capabilities....As soon as its computer networks come under attack and are destroyed, the country will slip into a state of paralysis and the lives of its people will ground to a halt Therefore, China should focus on measures to counter computer viruses, nuclear electromagnetic pulse...and quickly achieve breakthroughs in those technologies in order to equip China without delay with equivalent deterrence that will enable it to stand up to the military powers in the information age and neutralize and check the deterrence of Western powers, including the United States.” (2001)

Some foreign analysts, judging from open source statements and writings, appear to regard EMP attack as a legitimate use of nuclear weapons, because EMP would inflict no or few prompt civilian casualties. EMP attack appears to be a unique exception to the general stigma attached to nuclear employment by most of the international community in public statements. Significantly, even some analysts in Japan and Germany—nations that historically have been most condemnatory of nuclear and other weapons of mass destruction in official and unofficial forums—appear to regard EMP attack as morally defensible. For example, a June 2000 Japanese article in a scholarly journal, citing senior political and military officials, appears to regard EMP attack as a legitimate use of nuclear weapons: “Although there is little chance that the Beijing authorities would launch a nuclear attack, which would incur the disapproval of the international community and which would result in such enormous destruction that it would impede post-war cleanup and policies, a serious assault starting with the use of nuclear weapons which would not harm humans, animals, or property, would be valid. If a...nuclear warhead was detonated 40 kilometers above Taiwan, an electromagnetic wave would be propagated which would harm unprotected computers, radar, and IC circuits on the ground within a 100 kilometer radius, and the weapons and equipment which depend on the communications and electronics technology whose superiority Taiwan takes pride in would be rendered combat ineffective at one stroke...If they were detonated in the sky in the vicinity of Ilan, the effects would also extend to the waters near Yonakuni [in Okinawa], so it would be necessary for Japan, too, to take care. Those in Taiwan, having lost their advanced technology capabilities, would end up fighting with tactics and technology going back to the 19th century...They would inevitably be at a disadvantage with the PLA and its overwhelming military force superiority.” (Su Tzu-yun, **Jadi**, 1 June 2000)

An article by a member of India’s Institute of Defense Studies Analysis openly advocates that India be prepared to make a preemptive EMP attack, both for reasons of military necessity and on humanitarian grounds: “A study conducted in the U.S. during the late 1980s reported that a high-yield device exploded about 500 kilometers above the ground can generate an electromagnetic pulse (EMP) of the order of 50,000 volts over a radius of 2,500 kilometers around the point of burst which would be collected by any exposed conductor. Such an attack will not cause any blast or thermal effects on the ground below but it can produce a massive breakdown in the communications system....It is certain that most of the land communication networks and military command control links will be affected and it will undermine our capability to retaliate. This, in fact, is the most powerful incentive for a preemptive attack. And a high-altitude exo-atmospheric explosion may not even kill a bird on the ground.” (**The**

Although India, Pakistan, and Israel are not rogue states, they all presently have missiles and nuclear weapons giving them the capability to make EMP attacks against their regional adversaries. An EMP attack by any of these states—even if targeted at a regional adversary and not the United States—could collaterally damage U.S. forces in the region, and would pose an especially grave threat to U.S. satellites.

Many foreign analysts—particularly in Iran, North Korea, China, and Russia—view the United States as a potential aggressor that would be willing to use its entire panoply of weapons, including nuclear weapons, in a first strike. They perceive the United States as having contingency plans to make a nuclear EMP attack, and as being willing to execute those plans under a broad range of circumstances.

Russian and Chinese military scientists in open source writings describe the basic principles of nuclear weapons designed specifically to generate an enhanced-EMP effect, that they term “Super-EMP” weapons. “Super-EMP” weapons, according to these foreign open source writings, can destroy even the best protected U.S. military and civilian electronic systems.

Chinese military writings are replete with references to the dependency of United States military forces and civilian infrastructure upon sophisticated electronic systems, and to the potential vulnerability of those systems. For example, consider this quote from an official newspaper of the PLA: “Some people might think that things similar to the ‘Pearl Harbor Incident’ are unlikely to take place during the information age. Yet it could be regarded as the ‘Pearl Harbor Incident’ of the 21st century if a surprise attack is conducted against the enemy’s crucial information systems of command, control, and communications by such means as...electromagnetic pulse weapons...Even a superpower like the United States, which possesses nuclear missiles and powerful armed forces, cannot guarantee its immunity...In their own words, a highly computerized open society like the United States is extremely vulnerable...to electronic attacks from all sides. This is because the U.S. economy, from banks to telephone systems and from power plants to iron and steel works, relies entirely on computer networks....When a country grows increasingly powerful economically and technologically...it will become increasingly dependent on modern information systems....The United States is more vulnerable to attacks than any other country in the world.” (Zhang Shouqi and Sun Xuegui, **Jiefangjun Bao** 14 May 1996)

Russian military writings are also replete with references to the dependency of United States military forces and civilian infrastructure upon sophisticated electronic systems, and to the potential vulnerability of those systems. Indeed, Russia made a thinly veiled EMP threat against the United States on May 2, 1999. During the spring of 1999, tensions between the United States and Russia rose sharply over Operation ALLIED FORCE, the NATO bombing campaign against Yugoslavia. A bipartisan delegation from the House Armed Services Committee of the U.S. Congress met in Vienna with their Russian counterparts on the Duma International Affairs Committee, headed by Chairman Vladimir

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Lukin. The object of the meeting was to reduce U.S. -Russia tensions and seek Russian help in resolving the Balkans crisis. During the meeting, Chairman Lukin and Deputy Chairman Alexander Shaponov chastised the United States for military aggression in the Balkans, and warned that Russia was not helpless to oppose Operation ALLIED FORCE: "Hypothetically, if Russia really wanted to hurt the United States in retaliation for NATO's bombing of Yugoslavia, Russia could fire a submarine launched ballistic missile and detonate a single nuclear warhead at high-altitude over the United States. The resulting electromagnetic pulse would massively disrupt U.S. communications and computer systems, shutting down everything." (HASC Transcript On Vienna Conference, 2 May 1999)

Iran, though not yet a nuclear weapon state, has produced some analysis weighing the use of nuclear weapons to destroy cities, as "against Japan in World War II," compared to "information warfare" that includes "electromagnetic pulse...for the destruction of unprotected circuits." An Iranian analyst describes "terrorist information warfare" as involving not just computer viruses but attacks using "electromagnetic pulse (EMP)." (Tehran, **Siyasat-e Defa-I**, 1 March 2001)

An Iranian political-military journal, in an article entitled "Electronics To Determine Fate Of Future Wars," suggests that the key to defeating the United States is EMP attack: "Advanced information technology equipment exists which has a very high degree of efficiency in warfare. Among these we can refer to communication and information gathering satellites, pilotless planes, and the digital system....Once you confuse the enemy communication network you can also disrupt the work of the enemy command and decision-making center. Even worse, today when you disable a country's military high command through disruption of communications you will, in effect, disrupt all the affairs of that country....If the world's industrial countries fail to devise effective ways to defend themselves against dangerous electronic assaults, then they will disintegrate within a few years....American soldiers would not be able to find food to eat nor would they be able to fire a single shot." (Tehran, **Nashriyeh-e Siasi Nezami**, December 1998 -January 1999)

Iranian flight-tests of their Shahab-3 medium-range missile, that can reach Israel and U.S. forces in the Persian Gulf, have in recent years involved several explosions at high altitude, reportedly triggered by a self-destruct mechanism on the missile. The Western press has described these flight-tests as failures, because the missiles did not complete their ballistic trajectories. Iran has officially described all of these same tests as successful. The flight-tests would be successful, if Iran were practicing the execution of an EMP attack.

Iran, as noted earlier, has also successfully tested firing a missile from a vessel in the Caspian Sea. A nuclear missile concealed in the hold of a freighter would give Iran, or terrorists, the capability to perform an EMP attack against the United States homeland, without developing an ICBM, and with some prospect of remaining anonymous. Iran's Shahab-3 medium-range missile, mentioned earlier, is a mobile missile, and small enough to be transported in the hold of a freighter.

We cannot rule out that Iran, the world's leading sponsor of international terrorism, might provide

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terrorists with the means to execute an EMP attack against the United States.

In closing, a few observations about the potential EMP threat from North Korea.

North Korean academic writings subscribe to the view voiced in Chinese, Russian, and Iranian writings that computers and advanced communications have inaugurated an “information age” during which the greatest strength, and greatest vulnerability, of societies will be their electronic infrastructures.

According to North Korean press, Chairman Kim Chong-il is himself supposedly an avid proponent of this view. (M.A. Kim Sang-hak, “development of Information Industry and Construction of Powerful Socialist State,” **Pyongyang Kyongje Yongu**, 20 May 2002)

The highest ranking official ever to defect from North Korea, Hwang Chang-yop, claimed in 1998 that North Korea has nuclear weapons and explained his defection as an attempt to prevent nuclear war. According to Hwang, in the event of war, North Korea would use nuclear weapons “to devastate Japan to prevent the United States from participating. Would it still participate, even after Japan is devastated? That is how they think.” Although Hwang did not mention EMP, it is interesting that he described North Korean thinking about nuclear weapons employment as having strategic purposes—nuclear use against Japan—and not tactical purposes—nuclear employment on the battlefield in South Korea. It is also interesting that, according to Hwang, North Korea thinks it can somehow “devastate” Japan with its tiny nuclear inventory, although how precisely this is to be accomplished with one or two nuclear weapons is unknown.

Perhaps most importantly, note that the alleged purpose of a North Korean nuclear strike on Japan would be to deter the United States. At the time of Hwang’s defection, in 1998, North Korea’s longest-range missile then operational, the No Dong, limited North Korea’s strategic reach to a strike on Japan. Today, North Korea is reportedly on the verge of achieving an ICBM capability with its Taepo Dong-2 missile, estimated to be capable of delivering a nuclear weapon to the United States.

In 2004, the EMP Commission met with very senior Russian military officers, who are experts on EMP weapons. They warned that Russian scientists had been recruited by Pyongyang to work on the North Korean nuclear weapons program. They further warned that the knowledge and technology to develop “Super-EMP” weapons had been transferred to North Korea, and that North Korea could probably develop these weapons in the near future, within a few years. The Russian officers said that the threat to global security that would be posed by a North Korea armed with “Super-EMP” weapons is unacceptable. The senior Russian military officers, who claimed to be expressing their personal views to the EMP Commission, said that, while the Kremlin could not publicly endorse U.S. preemptive action, Moscow would privately understand the strategic necessity of a preemptive strike by the United States against North Korea’s nuclear complex.

This concludes my statement. Thank you for the opportunity to share this information with the U.S. Senate and the American people.