

Congressman Roscoe Bartlett
ELECTROMAGNETIC PULSE
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The SPEAKER pro tempore (Mr. *Fitzpatrick* of Pennsylvania). Under the Speaker's announced policy of January 4, 2005, the gentleman from Maryland (Mr. *Bartlett*) is recognized for 60 minutes.

Mr. BARTLETT. Mr. Speaker, what I want to spend a few moments talking about this evening is something that will be new to most Americans. They will not have heard about this subject. Indeed, nobody knew about this until 1962; that is, no one in this country knew about it.

There was an experiment over Johnston Island out in the Pacific Ocean that was called Operation Starfish. It was part of a series of nuclear tests that were called the Fishbowl Series. This was a unique one. The others had all been at ground level or some little distance above the ground. This one was an extra-atmospheric, a detonation above the atmosphere.

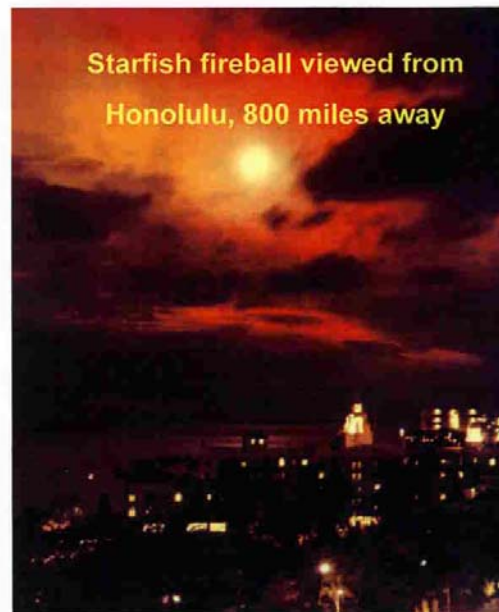
EMP Commission
Public Law 106-398,
Title XIV

EMP Threat: Historical Evidence

- STARFISH event, July 9, 1962
1.4 Megaton, 400 KM HOB,
Thor delivery vehicle, 800 nautical
miles from Honolulu

- EMP effects felt in Hawaii
 - coupling to Hawaiian electrical
transmission grid turns off nighttime
lights in Honolulu
 - Kanai telecom microwave outage

- Collateral effect: Sky swept clean of
of all commercial satellites within
six months



Nobody knew what was going to happen. It was the first time we had detonated a nuclear weapon in a test series above the atmosphere, and there were a number of ships and airplanes and radar, theater-like, that were tracking the missile that launched this nuclear bomb and noted its explosion. The explosion occurred about 400 above Johnston Island. That is well above the atmosphere.

Now, the Soviets have had very extensive experience with this kind of testing. This was our first and, indeed, our only experience with this. So our knowledge about this phenomenon comes from this single test, what we have learned from the Soviets and now the Russians and the number of simulations that we have done since that time.

There were no diagnostics to test the effects on Hawaii, which was about 800 miles away, because nobody expected there to be any effect there. Many of the instruments we were using for testing around Johnston Island were pegged; that is, they did not have enough capacity to register the effects that were produced by this extra-atmospheric explosion.

What happened in Hawaii may be open to some controversy, but there were some lights that went out. This was largely electrical. In those days it was not all of the electronics that we have today. A number of lights went out, and in the last couple of years, some of the evidence of what happened to that equipment was shown to a commission that I will talk about in a little bit that was set up in 2001 to investigate this phenomenon, and they submitted their report in 2004.

This phenomenon that we observed there that exceeded the capacity of the instruments at the test site, that went all the way, 800 miles away, to Hawaii, have been called electromagnetic pulse, EMP . We have learned since then that every extra-atmospheric explosion produces an EMP . You can develop a nuclear weapon, as we designed but as I understand never built and the Soviets both designed and have built, enhanced EMP weapons that limit the explosion but increased the electromagnetic effects.

What are the implications of EMP and why are we talking about it tonight? EMP could be probably the most asymmetric weapon that any adversary could use against us. By asymmetric, we mean a weapon that has a relatively small impact in terms of its local effect but could have an enormous impact on our military or our society because of its effect.

There are a number of asymmetric weapons. Terrorism is an asymmetric weapon. It does not cost them much money or take very big explosives, but it has a big effect on us. 9/11, of course, was a major asymmetric attack on us because those few people in those four airplanes have cost us billions and billions of dollars and totally changed our society. This is an example of an asymmetric attack.

Most Americans will not know about electromagnetic pulse and what it could do to our military, to our society, but I will guarantee my colleagues, Mr. Speaker, that all of our potential enemies know everything about EMP . In a little bit, I will show you some quotes from countries that could be our enemy that will indicate that they know all about EMP .

In 1999, I was sitting in a hotel room in Vienna, Austria. We were there near the end of the Kosovo conflict. There were ten Members of Congress there, several staff members, three members of the Russian Duma and a personal representative of Slobodan Milosevic. We developed a framework agreement for ending the Kosovo conflict that was adopted 8 days later by the G-8.

One of the Russians who was there was a very senior Russian. His name is Vladimir Lukin. He was the ambassador to this country at the end of Bush I and the beginning of Clinton. At that time he was chair of their equivalent of our Committee on International Relations, a very senior and very respected Russian. He is a little short fellow with short arms and stocky build.

He sat in that hotel room in Vienna for 2 days with his arms folded across his chest, looking at the ceiling. He was very angry. He said at one point, "You spit on us; now why should we help you?"

What he meant by that was that the United States, the Clinton administration at that time, had indicated to the Russians that they really were not needed to help resolve this conflict, that we were big boys and we would handle this on our own. It soon became obvious to the Clinton administration that the only country in the world that had the real confidence of the Serbs was Russia, and they were added to the G-7 to make the G-8, which 5 days after we came back resolved the Kosovo conflict with the framework agreement that we had developed there.

The next statement that Vladimir Lukin made was a startling statement. The chairman of our delegation was the gentleman from Pennsylvania (Mr. *Weldon*) who had been to Russia thirty-some times and he speaks some Russian and understands more. When Vladimir Lukin was speaking, he turned to me and said, "Did you hear what he said?" Yes, I heard what he said, but of course, I did not understand it; I just heard Russian words.

When it was translated, this was what he said, and by the way, he did not need a translator. Vladimir Lukin speaks very good English, but when you are talking with these folks, they frequently will speak in their native tongue so it has to be translated and then translated back to them when we speak so that gives them twice as long to formulate their answer. So if you do not know both languages, you are at somewhat of a disadvantage in dialoguing with them because they have twice as long to formulate an answer.

This was what surprised the gentleman from Pennsylvania (Mr. *Weldon*), and this is what he said: "If we really wanted to hurt you, with no fear of retaliation, we would launch an SLBM." [That's a submarine-launched ballistic missile.] "We would launch an SLBM. We would detonate a nuclear weapon high above your country, and we would shut down your power grid for 6 months or so."

Now, he made the observation that without fear of retaliation, because you would not know for certain where it came from, particularly today. Factor in the Cold War with only two superpowers, we absolutely would have known where it came from, but today, how would you know? There are many countries out there who can get a tramp steamer and a Scud launcher and a crude nuclear weapon and that is all it would take to produce an **EMP** attack because a Scud

launcher goes about 180 miles apogee, and that is plenty high. It would not cover all of the United States, of course.

The third ranking Communist was there, a handsome, tall, blond fellow by the name of Aleksandr Shabonov, and he smiled and said, “if one weapon would not do it, we have some spares.” I think at that time it was something like 7,000 spares that they had.

This was a very startling remark, and what it said was that the detonation of a single, large, appropriately designed nuclear weapon above our country could shut down our power grid and shut down our communications, he said, for 6 months or so. If that were true, and there is increasing evidence, as I will indicate, from the report that this commission gave us that it is true, that would mean that you would be in a world, Mr. Speaker, where the only person you could talk to was the person next to you unless you happened to have a vacuum tube handset, then you could talk because they are about a million times less susceptible to EMP than our current microelectronic systems, and the only way you could go anywhere was to walk.

Several years ago, we had a field hearing at Johns Hopkins University Applied Physics Lab [JHU-APL], and a Dr. Lowell Wood was there. I met Dr. Lowell Wood through Tom Clancy who lives on the eastern shore of Maryland and I know him. He has come to do several political events for me. I knew that he had done a book where EMP was a part of the scenario, and I knew he did very good research and he could tell me something about EMP. This was several years ago.

I called Tom Clancy and I asked him, and he said, gee, if you read my book you know all about EMP that I know, but he said let me refer you to the smartest man hired by the U.S. government. He referred me to a Dr. Lowell Wood from Lawrence Livermore Laboratory in California. We got his pager number. In those days it was pagers rather than cell phones that are so ubiquitous today, and I paged him, believing that he was in California. The pager signal went up to a satellite and back down, and he was in Washington, and within an hour, he was sitting in my office.

Dr. Lowell Wood at this field hearing out at the Applied Physics Lab out in Howard County made the observation that an EMP lay down would be the equivalent of a giant continental time machine that would move us back a century in technology. What this would mean, of course, is that we would have no more capability for moving around, for communicating to each other, for plowing our fields, for moving our equipment and our food around than we had 100 years ago.

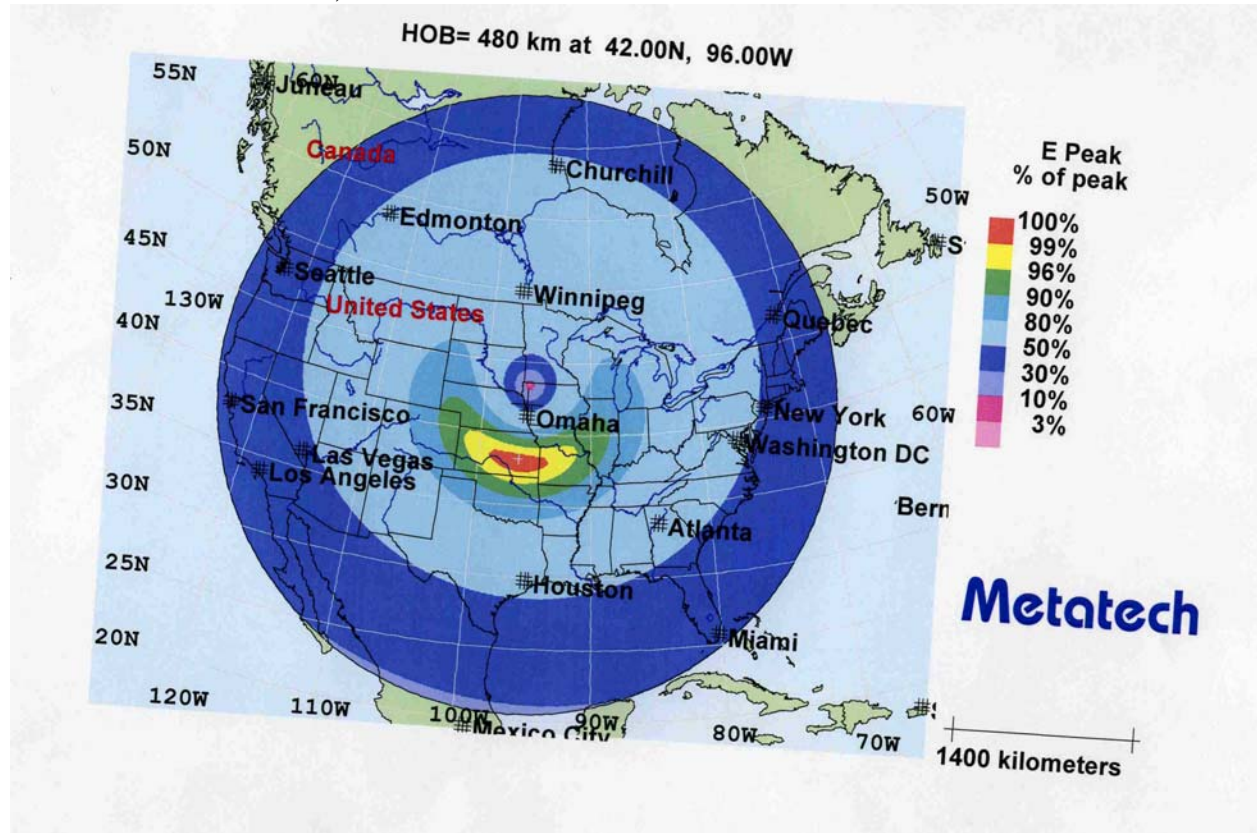
I said that, Dr. Wood, the population we have today, 285 million people and its distribution, largely in large cities and suburbia, could not be supported by the technology of a century ago. His unemotional response was, “Yes, I know.

[Time: 21:30]

The population will shrink until it can be supported by the technology.”

The point I am trying to make is this could be a devastating asymmetric weapon. It may not be known to most Americans. I suspect not one in 100 have heard of nuclear electromagnetic pulse, but I can assure Members that all of our potential enemies know a great deal about **EMP**.

The first chart shows the effects of a single nuclear weapon. This one is detonated in the northwest corner of Iowa, and it blankets all of the United States.



The colors here indicate the intensity of the pulse you get from that. The purple as you can see from the scale is 50 percent. So what this says is whatever the intensity was at ground zero, and we are several hundred miles above that, but the intensity at that level which is the red here in the center, will be half that out at the margins of our country.

This little smile here and the distortion here is due to the magnetic field of the Earth that bends the electrons that I will describe in just a moment.

What is this electromagnetic pulse? It is produced from strong gamma rays from the nuclear explosion which produce electrons that move at the speed of light. They move now to everything within line of sight. If you are about 300 or 400 miles high over the center of the country, Iowa or Nebraska, that will blanket all of the United States.

If the voltage is high enough, it will disrupt or fry these microelectronics.

Mr. Speaker, if you want to work on the inside of your computer, you need to be very careful that the static electricity that you produce just by rubbing your clothes together will not damage

it. You need to put a little wrist band on and ground yourself. At factories where most of these computers are made, and it is almost all women that I have seen there, this is one area where women do it better than men, and they are grounded to the floor. They have a metal anklet on, and they are grounded to the floor because static from just their movement could damage these very sensitive, very tiny microelectronics.

A little later I will show a chart that says the interview with some Russian generals have indicated that they have weapons that can produce 200 kilovolts per meter. They told us, and I cannot tell Members the exact voltage to which we have harkened, but I can say that the Russian generals told us they believe that this signal was several times higher than the voltage to which we had hardened. And even out at the periphery with 50 percent degradation, it was higher than we had hardened. By ``hardening" I mean we have put some buffers in there that would intercept this pulse, like the surge protectors that we have for our computers which we have for lightning which will do no good for **EMP** because this pulse has such a rapid rise time measured in nanoseconds.

This pulse will be through the surge protector before the protector sees it. If you are 200 kilovolts at ground zero, it is 100 out at the periphery, and that is probably enough to weld, to fry all of our microelectronics, which is why Vladimir Lukin said they would detonate a nuclear weapon high above our country, shut down our power grid and our communications for 6 months or so.

From chart 3, I want to give some quotes from potential enemies to indicate that I am not letting the genie out of the bottle this evening. They know all about it. Not one in 50 Americans may know about **EMP** , but I want to assure Members our potential enemies know all about **EMP**.

EMP
Commission POTENTIAL ADVERSARIES KNOW ABOUT EMP

- “Hypothetically, if Russia really wanted to hurt the United States in retaliation for NATO’s bombing of Yugoslavia, Russia could fire an SLBM and detonate a single nuclear warhead at high-altitude over the United States. The resulting EMP would massively disrupt U.S. communications and computer systems, shutting down everything.” –Russian Duma Leaders to U.S. Congressional Delegation (May 2, 1999)
- Chinese military writings describe EMP as the key to victory, and describe scenarios where EMP is used against U.S. aircraft carriers in a conflict over Taiwan
- A survey of worldwide military and scientific literature sponsored by the Commission found widespread knowledge about EMP and its potential military utility, including in Taiwan, Israel, Egypt, India, Pakistan, Iran and North Korea.
- Terrorist information warfare [includes] using the technology of directed energy weapons (DEW) or electromagnetic pulse (EMP). (Iranian Journal, March 2001)
- Iran has tested launching a Scud missile from a surface vessel, a launch mode that could support a national or trans-national terrorist EMP attack against the United States.

This first quote is the quote that I heard myself sitting in that hotel room in Vienna, Austria when Vladimir Lukin said they could shut down our power grid and our communications. That was May 2, 1999. There were 10 other Congressmen there and several staff members.

Chinese military writings describe **EMP** as the key to victory and describe scenarios where **EMP** is used against U.S. aircraft carriers in a conflict over Taiwan. It is not like our potential enemies don’t know about it. And they know that we know about it, so they feel free to put it in their public writings.

A survey of worldwide military and scientific literature sponsored by the **EMP** commission was set up, and they functioned for 2 years. They submitted a report and they are now continuously briefing additional entities, different organizations and people. They found widespread knowledge about **EMP** and its potential military utility, including in Taiwan, Israel, Egypt, India, Pakistan, Iran, and North Korea. Iran has tested launching a scud missile from a

surface vessel, a launch mode that could support a national or transnational terrorist EMP attack against the United States.

By the way, we thought that launch was a failure because the device was detonated before it reached land. Now, that is exactly what you would do if you were rehearsing an EMP attack. By the way, there is no way that a nuclear weapon could do anywhere near as much damage against a sophisticated country like ours by dropping it on one of our cities as you could do to our country by detonating it at altitude. And you would not know it happened unless you were looking at it.

We are totally immune to EMP. It will not hurt us or damage buildings. All it does is to knock out all of our microelectronics, which means all of our computers. For instance, your car has several computers. Indeed, if you have a new car, they cannot even work on it in a shop without hooking it up to a computer to tell what is wrong with the vehicle. So an EMP with a high enough pulse would fry the computers in the car. They would not run. If you happen to have an old car with a coil and a distributor, that is probably going to work. That is probably less susceptible to EMP.

This chart shows additional quotes: ``If the world's industrial countries fail to devise effective ways to defend themselves against dangerous electronic assaults, they will disintegrate within a few years. 150,000 computers belong to the U.S. Army. If the enemy forces succeed in infiltrating the information network of the U.S. Army, then the whole organization would collapse.

EMP
Commission POTENTIAL ADVERSARIES KNOW ABOUT EMP-cont

- “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...150,000 computers [belong] to the U.S. Army...if the enemy forces succeeded In infiltrating the information network of the U.S. Army, then the whole organization would collapse...the American soldiers could not find food to eat nor would they be able to fire a single shot.”

Electronics To Determine Fate Of Future Wars (Iranian Journal, December 1998)

- “Terrorist information warfare [includes] using the technology of directed energy weapons (DEW) or electromagnetic pulse (EMP).”
(Iranian Journal, March 2001)

- Terrorists have attempted to acquire non-nuclear radiofrequency weapons.

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The American soldiers could not find food to eat nor would they be able to fire a single shot." This is from Iranian Journal, December 1998.

“Terrorist information warfare includes using the technology directed energy weapons or electromagnetic pulse." This is from Iranian Journal of March 2000.

Terrorists have attempted to acquire non-nuclear radio frequency weapons. These are the weapons that would produce the directed energy effect. These produce a similar kind of pulse to **EMP** but does not have the broad spectrum. It only has part of the frequency involved. But if intense enough, if set up in this room, for instance, it could fry the computers in the cloak room which is not that far away. If it was set up in a van and went down Wall Street, if it were a really sophisticated device, it could take out all of the computers there, which would shut down our trading for quite a while if they were all taken down.

Some people might think that things similar to a Pearl Harbor incident are unlikely to take place during the Information Age. And this is a writing from China. Yet it could be regarded as a Pearl Harbor incident of the 21st century, if a surprise attack is conducted against the enemy's crucial information systems of command, control, and communication by such means as **EMP** weapons. Even a superpower, China says, like the United States, which possesses nuclear

missiles and powerful armed forces, cannot guarantee its immunity. In their words, an open society like the United States is extremely vulnerable to electronic attacks. This is May 14, 1996 from a Chinese journal.

Iran has conducted tests with Shahab-3 missiles which have been described as failures. I mention that because they detonated it before it reached the ground. That is exactly what they would do if they were planning for an EMP attack. Iran Shahab-3 is a medium-range mobile missile that could be driven onto a freighter and transported to a point near the United States for an EMP attack.

By the way, an EMP laydown is always an early event in Chinese and Russian war games because it is the most asymmetric attack that they could lodge against our country.

Just a little bit of a time line here. Operation Starfish occurred in 1962. In 1995, there was a very interesting event that nearly started World War III. It has been written up in several books now. Most people never knew about it, but the Norwegians launched an atmospheric test rocket. They are fairly close to Russia, and they told the Russians that they were launching this rocket; but in the bureaucracy of Russia, that did not get communicated to the right people and when they launched it, it was interpreted as a first salvo from the United States. You do not have very long to respond if your enemy is about a half hour away in terms of these ballistic missiles. The Russians came very near to launching a major salvo of missiles with nuclear warheads on them against our country. This was a very narrow brush with destiny that tells us how important it is that we understand the potential of these weapons and how they could be misunderstood by an enemy.