Countering The Existential EMP Threat
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October 21st was 51st Anniversary of Pres. Kennedy’s TV Address Advising the Nation of Soviet Nukes/Missiles on their Way to Cuba

• A Sober “Duck and Cover” Moment
  – U.S. introduced a Blockade, went to DEFCON 2 and threatened retaliatory response against USSR;
  – Behind the scenes negotiations—including agreement to remove our missiles from Turkey and for the USSR not to deploy missiles/nukes in Cuba
  – The Soviet ships stopped and the construction in Cuba halted and reversed
  – Secretary of State Dean Rusk said Khrushchev “blinked” in the face of U.S. resolve

• We “dodged a bullet” but did not know how close we came to disaster
  – After the Cold War, we learned there were already ~100 nukes in Cuba and Castro wanted them to stay
  – Khrushchev refused; nukes removed by the end of 1962
  – Had we understood Khrushchev’s deception, there might have been no deal
  – Your guess is as good as mine if they had not been removed
  – Between being lucky and smart, rather be “lucky” every time!

Today, we are again courting disaster by ignoring an existential threat from the South—again from distant powers! How lucky will we be?
Today, we are on the brink of another threat “from the South” . . .
To which we seem just as oblivious as we were in 1962!

• A Wake Up Call: Last June’s intercept of a North Korean ship carrying from Cuba to & through the Panama Canal nuclear capable SA-2s and other technology illustrates the “Cacophony of Proliferation”
• Of greater concern, Iranian (or terrorist) missiles could be launched from ships off our coasts, especially in the Gulf of Mexico and/or from Latin America, e.g., Venezuela
• North Korean or Iranian Satellites could carry nukes over the South Pole to attack the U.S.

MILITARY CARGO HIDDEN UNDER SUGAR ON FREIGHTER

Tracked by U.S. satellites, a North Korean freighter was intercepted on July 31 by Panamanian forces as it approached the Panama Canal. After resistance by the crew, the ship was boarded and searched. In its hold, smaller tanks of bromine traces were discovered in letters, seals, and inside components.

The Chong Chon Gang
• North Korean freighter
• Built in 1977
• Maximum speed 8 knots (7 mph, 11.3 kph)

Where the ship has been since January

April 22
Russia

Vietnam

China

North Korea

Panama

S. America

Mediterranean

Venezuela

North Korea used 3-stage southward into polar orbit

High Altitude EMP Poses an Existential Threat

• The electromagnetic pulse (EMP) from nuclear explosions high over the United States
  – Would have little immediate effect—except possibly extending the Northern Lights all the way to Florida
  – But could shut down the electric power grid—within a year, leading to death of several hundred million Americans
• Might deter North Korea, but should not count on deterring Iran—the Mullahs want to hasten the return of the Mahdi and might not shrink from the risk of retaliation to create a US holocaust
• And we are doing little to nothing to protect against this threat
  – Need effective ballistic missile defenses, and to harden the electric power grid

We are currently defenseless against these threats from the South!

EMP Area By Bursts At 30, 120, & 300 Miles

We need effective defenses and a hardened electric power grid!
The EMP Threat well understood from Cold War tests:
1962 Starfish Prime High Altitude Test

- A “wake-up call”
- 1.5 megaton explosion, 240 miles above Johnston Island in the South Pacific
- Damaged test instrumentation
- Killed three satellites immediately, and 7 more died in the next few months
- Electrical damage 900 miles away in Hawaii
- Today’s electronics would have experienced much more catastrophic damage
- Weapon designs can be more lethal, too—and at much lower yields

Led to a major effort to harden our strategic systems—but we did little or nothing to harden our civil critical infrastructure

Hardened our Strategic Systems and their Supporting Command, Control and Communications Systems to EMP

- Major hardening of our strategic retaliatory systems
  - ICBMs and SLBMs, Strategic Bombers, and Supporting BMC3 systems
  - But not civil critical infrastructure
- Associated classification constraints kept info closeted—at least to most
- Key 2008 release by Congressionally appointed EMP Commission (Reports on High Frontier webpage)
  - Included Soviet testing info, which was in some ways more revealing than our own
- Key Bottom Line Conclusion:
  - EMP from a single burst 200-300 miles over the US could shut down most if not all US electrical systems, possibly indefinitely
  - Return US just-in-time economy to 19th century operations without agrarian support

Up to 60-90-percent of all Americans could perish within a year—for an idea of that existence, see Bill Forstchen’s “One Second After”

E-4B Airborne Command Post
Most Concerned if Iran mates Nuclear Weapons to any of its many Ballistic Missiles

- Iranian authorities—the Mullahs—say they intend to destroy the US (the “Great Satan”) and Israel (the “Little Satan”) and kill as many of us as possible
  - This is a theological goal for all Jihadists, suggesting scenarios involving collaboration with terrorists
- Our missile defense efforts have focused on threats from North Korea over the North Pole
  - Ground-based sites in Alaska and California
  - Congress considering an East Coast Missile defense site to improve defense against Iran
- Two other EMP attack scenarios are even more troublesome—Iran (or North Korea) could launch:
  - Short or medium range missiles from vessels off our coast and detonate warheads 200-300 miles over the U.S.—EMP would kill no one immediately, but within a year several hundred million Americans could die
  - A nuclear armed satellite over the South Pole to be detonated over the US at 200-300 miles altitude
  - Iran has practiced both scenarios
- The “Red Line” is if/when Iran gets nuclear missiles
  
  Americans need to wake up to this well known (even to terrorists) threat & demand that their Representatives provide for the common defense!

SecDef should consider Aegis Capabilities Against ICBMs from the North in 2014 Report to Congress

- S. 1197 directs SecDef to report in 2014 on how sea-based defenses can help counter:
  - ICBMs from the North,
  - Threats from vessels off our coasts,
  - Other threats from the South
- With SM-3 IA&B and TYP-2 radars in MA & NC
  - Potential coverage of Eastern Seaboard
  - Single TYP-2 in MA would enable North East to DC defense
- SM-3 IIA (planned to be ready to deploy by 2018)
  - Single TYP-2 would enable defense of US East of Mississippi
- Future faster SM-3 (with lighter KKV) could defend entire US

Charts from Ret. VADM J.D. Williams, who helped me begin Aegis BMD in 1992
Possible Quick Fix to Threats from the South: Aegis Ashore Sites Around the Gulf of Mexico

- Began construction of Romanian Site last week
  - Operational by 2015 with SM-3 Block IB interceptors
- Aegis Ashore site operational in Poland by 2018
  - Will have SM-3 Block IIA interceptors
- Site spacing around Gulf coasts depends on interceptor speeds
  - Last year focused on Mississippi—Pascagoula where Aegis ships are built
  - This year focusing on Florida—beginning in Panama City/Tyndall AFB
- Plan to go to Texas next year—Corpus Christi?

Aegis Ashore employs Aegis BMD shipboard components as “football size” ground-based interceptor system—no additional R&D cost

Need Effective Ballistic Missile Defenses ASAP—First from the Sea and then from Space!

- Aegis BMD Ships, now deployed around the world
  - 16 in the Pacific—to have a similar number in the Atlantic
  - Have about 80 seaworthy, available for upgrades if needed
  - Excellent test record—28 out of 34 attempts
  - On average day last year, 2 Aegis ships along east coast—4-6 in port
  - System chosen to shoot down a dying satellite in 2008
  - With preparation can shoot down satellites coming at the US from over the South Pole—if they are not too high
- Aegis ships usually do not go into Gulf of Mexico
  - But system components can be deployed on land—just move the radar, launchers, and command & control to a pad
  - Just like “Aegis Ashore” being deployed in Romania (2015) and Poland (2018)—why not at military bases on the Gulf?
  - Took message to Mississippi last year, this year to Florida
- The most effective defense would be deployed in space
  - Was most effective defense system developed during SDI era against missiles of all ranges greater than a few hundred miles
  - But was killed by Clinton administration in 1993 & not revived
  - “Clementine” mission to the Moon “space qualified” the essential technology; now have more advanced technology

These missile defense systems would defend against southern attack scenarios—and be inter-netted into a global defense capability
Natural Existential Threat—Massive Geomagnetic Disturbance Caused by Major Solar Emissions

• The Sun periodically emits giant clouds of electrons and gamma rays—
  - Some reach Earth in a matter of minutes
  - Interaction with Earth’s geomagnetic field can create wide-area catastrophic effects on electronics
  - Solar maximum every 11 years or so . . . 2012-2014 is such a period

• Past maxima caused serious problems
  - Discussed in June 2012 National Geographic
    • 1859 Carrington Event—caused fires in telegraph stations and shut down undersea telegraph
    • 1989 solar storm shut down Quebec power grid serving 6-million subscribers
    • If 1921 event were repeated today, would turn out lights over half of North America

• Major International Meeting last June
  - Growing awareness of problems among at least 10 nations—Lloyds of London gets it!
  - Israel and UK most organized and prepared
  - USA needs to get organized—but reluctant

What will it take for US Leaders to take this threat seriously and undertake an effective response before a “Big One” occurs?

Mother Nature’s Existential EMP Threat: A Rare, but Certain to Occur, Carrington Event!

The 1859 “Carrington” event caused fires in telegraph offices & destroyed the then new undersea telegraph cable

• Such a major event is thought to occur about every century or so—and we’re due!
• Today, a Carrington event could shut down most US electronic infrastructure, including the electric power grid
• The technology to harden the grid is available and affordable, but the U.S. powers that be are not acting to protect the American people.
• The Insurance Industry takes it seriously—See the Lloyds of London “risk” analysis result for North America presented at 2013 summer international meeting in Washington

Failure to protect the power grid, which will likely fail catastrophically in the case of a modern Carrington event, would send us back to an 18th century existence without the benefits of an agricultural society.
If Defended Against Ballistic Missile “EMP” Attack, Should also be Protected against Solar Storms, and . . .

• The EMP from a high altitude nuclear explosion is more threatening
  – Has higher frequency components than from solar storms—these components are similar to lightning, but over a much larger area; highest will burn out electronics
  • Millions of small computers, ubiquitous in critical infrastructure regulating flow of electricity, controlling gas pipelines, operating traffic lights, automobiles, etc.
  • With proper planning, they could be replaced if damaged by EMP
  – The low frequency components are similar to the solar storm and couple into the long lines that interconnect critical infrastructure . . . Like the electric power grid
    • Large Transformers in the power grid are critical elements—each is tailor made for its power station, and cannot easily be replaced
    • No longer built in the US—have to be shipped from Germany or South Korea
    • Alternative measures is a challenge for electrical engineers
• If the defense is effective in shooting down an attacking nuclear weapon before it detonates, then all these effects will be countered
• But since no defense is perfect, the critical infrastructure should be hardened to the EMP effects in case of failure—especially the power grid
• In that case, the solar storm threat also will be accommodated

Hardening the electric grid deserves top priority, as recommended by the congressionally mandated EMP Commission in 2004 and 2008, and validated by four other major reviews. Two congresses have failed to pass legislation enabling the needed initiatives—and advocates are trying again in the current Congress.

Bottom Lines and Recommended Action

• EMP poses an existential threat from even short range nuclear-armed ballistic missiles, especially if launched from the Gulf of Mexico
• Another threat from the South is the possibility of a satellite launched from over the South Pole to detonate its nuclear warhead over the U.S.
• In case of the threat from rogue states or terrorists,
  – The Navy’s Aegis BMD system can provide an effective defense if trained and ready crews operate it near enough to where attacking missiles are launched
  – On a random day last year along the east coast, 2 Aegis ships & 4-6 in port—e.g., for maintenance
  – Aegis ships do not normally operate in the Gulf of Mexico—leaving the US with a soft underbelly vulnerable to this threat—as well as others from the South, e.g., such as from Venezuela.
  – In that case, the same Aegis Ashore system American taxpayers are buying for deployment in Romania and Poland can be deployed on military bases around the Gulf of Mexico—possibly as soon as 2015 (Romania’s scheduled deployment)
• In case of a threat from over the South Pole, empower the Navy BMD to see what they can do—remember they shot down a dying satellite in 2008
  – Space-based defenses are needed to provide a comprehensive solution
• In case of the threat from Mother Nature (Geomagnetic Storms)
  – Appropriate hardening and reconstitution planning can protect our critical infrastructure—should begin with the electric power grid
• In both cases, a grass roots effort is needed to press the powers that be to provide for the common defense and protect our way of life.

The powers that be need to take these threats seriously, provide for the common defense and protect our way of life—by building truly effective defenses and hardening the electric power grid. These are important engineering and political challenges. For more information on the threat and possible responses, see www.highfrontier.org and its links to others who are already engaged in this important fight. Help Gulf Coast states play a leading role!
Local and State Initiatives are Very Important

| • Maine offers an important precedent |
| • Maine owes a lot to a committed member of the state legislature |
|   – Last year, Andrea Boland (D-Sanford) became the Champion of LD-131 (An Act to Secure the Safety of Electrical Transmission Lines)—to harden to both manmade and natural EMP effects—anticipated cost is 1-3 percent of construction and expansion underway |
|   – After 6-months advocacy, LD-141 passed unanimously in the House and with only three dissenting votes in the Senate |
| • This is the first major success for those who have been fighting to get grass roots Americans to take this existential threat seriously and to deal with it. |
| • Hopefully, other states will find local authorities who also will take the initiative to follow Maine’s pattern |
| • The U.S. Federal Energy Regulatory Commission (FERC) promised to provide, free of charge, a study of the most cost-effective options for protecting Maine’s electric grid. |
| • The North American Electric Reliability Corporation (NERC) is supposed to ensure the reliability of the electric grid and develop/enforce reliability standards. |

Dr. Ernest Moniz, Secretary of Energy, promised Senator Murkowski during his confirmation hearing to look seriously into what his department can do to deal effectively with both man-made and natural EMP threats—others should follow!

LD-131 directs Maine’s Public Utilities Commission (PUC) to examine how to mitigate the effects of geomagnetic disturbances from solar storms and nuclear EMP on Maine’s electric power grid. The PUC is to identify the system’s most vulnerable components, potential protective measures, costs, and implementation schedules.