

# ***“EMP 101” A BASIC PRIMER & SUGGESTIONS FOR PREPAREDNESS***

***By***

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## ***WHAT IS AN EMP?***

EMP is shorthand for Electro Magnetic Pulse. It is a rather unusual and frightening by-product when a nuclear bomb is detonated above the earth's atmosphere. We all know that our atmosphere and the magnetic field which surrounds our planet is a thin layer which not only keeps us alive, but also protects us from dangerous radiation from the sun. On a fairly regular basis there are huge solar storms on the sun's surface which emit powerful jets of deadly radiation. If not for the protective layer of our atmosphere and magnetic field, those storms would fry us. At times though, the storm is so powerful that enough disruptive energy reaches the earth's surface that it drowns out radio waves and even shorts electrical power grids. . .this happened several years back in Canada.

View the detonation of a nuclear bomb, two hundred miles straight up as the same thing, but infinitely more powerful since it is so close by.

As the bomb explodes it emits a powerful wave of gamma rays. As this energy release hits the upper atmosphere it creates an electrical disturbance known as the Compton Effect. The intensity is magnified. View it as a small pebble rolling down a slope, hitting a larger one, setting that in motion, until finally you have an avalanche.

At the speed of light this disturbance races to the earth surface. It is not something you can see or hear, in the same way you don't feel the electrical disturbance in the atmosphere during a large solar storm.

For all electrical systems though, it is deadly.

### ***WHAT HAPPENS WHEN THIS “PULSE” HITS THE SURFACE?***

Those who might remember ham radio operators, or even the old CB radios of the 1970s can recall that if you ran out a wire as an antenna you could send and receive a better signal. The wire not only transmitted the very faint power of a few watts of electricity from your radio, it could receive even faint signals in return. As the Pulse strikes the earth's surface, with a power that could range up to hundreds of amps per square yard, it will not affect you directly, at most you'll feel a slight tingling, the same as when lightning is about to strike close by, and nearly all the energy will just be absorbed into the ground and dissipate. The bad news, however, is wherever it strikes wires, metal surfaces, antennas, power lines it will now travel along those metal surfaces (in the same way a lightning bolt will always follow the metal of a lightning rod, or the power line into your house.) The longer the wire, the more energy is absorbed, a high tension wire miles long will absorb tens of thousands of amps, and here is where the destruction begins as it slams into any delicate electronic circuits, meaning computer chips, relays, etc. In that instant, they are overloaded by the massive energy surge, short circuit, and fry. Your house via electric, phone and cable wires is connected, like all the rest of us into the power and communications grids. This energy surge will destroy all delicate electronics in your home, even as it destroys all the major components all the way back to the power company's generators and the phone company's main relays. In far less than a milli second the entire power grid of the United States, and all that it supports will be destroyed.

### ***WOULDN'T CIRCUIT BREAKERS AND SURGE PROTECTORS STOP IT?***

This is where the effect of EMP starts to get complex. All electricity travels, of course, at the speed of light. The circuit breakers that are built into our electrical system or the ones you buy to plug your own computer in to, are designed to “read” the flow of current. If it suddenly exceeds a certain level, the breaker snaps and takes you off line, thus protecting everything beyond it. More than a few of us have found out that when you buy a cheap surge protector for ten or twenty bucks sure it will snap off, but the surge has already

passed through and fried your expensive plasma television or new computer. Unlike a lightning strike, or other power surge, an EMP surge is “front loaded.” Meaning it doesn’t do a build up for a couple of micro-seconds, allowing enough time for the circuit breaker to “read” that trouble is on the way and shut down. It comes instead like a wall of energy, without any advance wave building up as a warning. It therefore slams through nearly all commercial and even military surge protectors already in place, and is past the “safety barrier” and into the delicate electronics before the system has time to react.

### ***WHAT ABOUT CARS?***

Here is more bad news regarding EMP. If you own a 1965 Volkswagen bug or Mustang you’re ok. . .there are no solid state electronics under the hood, it still has an old fashion carburetor, the radio still might even have tubes rather than transistors. However, even that is in question. In 1962 both we and the Soviets detonated nuclear weapons in space (saber rattling during the Cuban Missile Crisis) and it is reported that a number of cars. . .their ignition systems a thousand miles away from the detonation were fried because of EMP. (Check out a few of the more “tech head” links on this site for detailed explanations). From about 1980 on, cars increasingly went solid state and by the 1990s were getting ever more complex computers installed. Consider a visit to the mechanic today. He runs a wire in under the hood, plugs it into his computer and within seconds has a full diagnostic, types in what his computer is suppose to do, the problem is solved and you are handed a rather large bill. Great modern conveniences from airbag sensors, to fuel injectors and all of it more and more dependent on computers. At the instant the “Pulse” strikes, the body of your car and the radio antenna will feed the overload into your vehicle’s computer and short it out.

Some police departments are even now experimenting with using a specially designed bumper on their car for high speed chases. If they can brush up against the car they are pursuing the officer just hits a button, and through his bumper a high energy surge will be released, flooding into the car being pursued and shorting out its computer system. Result. . .whether you are being chased by the police with this new device, or an EMP burst has been fired off. . .your

car will essentially be a useless hunk of metal that will slowly roll to a stop. In that instant, most of America will be on foot again.

### ***AND PLANES?***

This is a terrifying aspect of an attack that no government report has publicly discussed along with the potential casualty rate in the first seconds after an attack. Commercial airliners today are all computer driven. In fact, from lift off to landing, a pilot no longer even needs to be in the cockpit, a computer can do all of it if need be. When the pilot pulls back on the “stick” it is no longer connect by wires stretching all the way back to the tail and the elevator assembly. Instead, his motion is read by a computer which sends a signal to an electrical servo-motor in the tail, which then moves the tail. In short, the entire plane is computer driven. It is estimated that at any given moment during regular business hours, somewhere between three to four thousand commercial airliners are crisscrossing the skies. (There is a fascinating site you can find via Goggle that shows typical air traffic around the world during a twenty four hour period. From dawn til way after dusk, the entire USA is one glowing blob of commercial flights crisscrossing our sky). All of them would be doomed, the pilots sitting impotent, staring at blank computer screens, pulling on controls that no longer respond as the plane finally noses over and heads in.

Somewhere between 250,000 to 500,000 people will die in the first few minutes. . .more than all our battle casualties across four years of World War II

### ***AREN'T WE PREPARING? ISN'T THERE REPLACEMENT EQUIPMENT IN PLACE AND TRAINED PERSONNEL READY TO REACT?***

The frightening answer is **no**. This author has spent over four years researching this topic, interviewing scores of personnel from Congressmen and Generals, to your local police chief and sheriff. At your local level, since 9/11, first responders have received hundreds of hours of training and briefings on all sorts of terrorist scenarios. Only

a few have told me that they even discussed the topic for more than a few minutes at an official level. As to emergency stockpiles of supplies and crucial replacement parts, there is nothing in place.

### ***WHY NOT?***

EMP, has managed to “stealth” its way on to the highly dangerous list and few, except for a small number of personnel in the Pentagon, various research labs, and men like Congressman Bartlett (R., MD) who heads the Congressional Investigative Committee on EMP, are aware of it. For one it has a certain “sci-fi” sound to it, which makes many dismiss the potential before the discussion has even started. Second, the only way to truly evaluate the threat and demonstrate it is to detonate a nuclear weapon, something we have not done since the full test ban went into effect decades ago. It is therefore not “visible” to us, the way another airliner smashing into a skyscraper is now forever imprinted on our national psyche, feared, and prepared for. Next, with all the competing issues and threats in the world, EMP simply does not have a “constituency” of influence. Only a few members of Congress, our military and scientific community are issuing the warnings. There are no Hollywood stars placing themselves in front of cameras with this as their cause, the few times it has been used in popular movies, it has been portrayed inaccurately, often absurdly.

And finally, the impact is so overwhelming that it triggers a psychological sense of helplessness, and therefore why bother, since if it happens we are finished. It is the same response that happened between the 1950s-60s. When first confronted with the threat of a nuclear attack, tens of billions was spent to prepare, in fact our Interstate Highway system was initiated in the mid 1950s as a national defense effort to provide avenues of escape from cities in the event of nuclear war, a means to bring in emergency supplies and to move our military. Plans were issued to citizens on how to build bomb shelters and all children were drilled in what is seen now as the absurd “duck and cover.”

Something happened though by the mid-1960s. The threat was no longer fifty to a hundred small atomic bombs dropped from bombers, it was now a rain of thousands of hydrogen bombs, delivered within minutes by ballistic missiles. In this atmosphere of overkill,

attempting to prepare seemed ridiculous, futile. The standard phrase became “the living will envy the dead,” so why bother? Civil defense finally became an object of derision, the realm of a few survivalist nut cases.

That threat is still there, and to this day our nuclear forces stand ready to respond, which has indeed been the only defense left. . .”if you nuke us, we’ll nuke you,” a policy known as “mutual assured destruction,” a zero win game.

EMP is different, it is not a rain of thousands of bombs, needing a vast and powerful military to deliver it, which means Russia and China are the only real threats in that realm. . .but unless seized by madness, their leaders know such an attack, within minutes would be met with thousands of bombs annihilating their country as well. It is a balance of terror that has now endured for nearly sixty years.

An EMP attack is different since it only requires but one nuclear weapon, detonated 300 miles above the middle of the United States. One bomb. The launch could even be done from a container ship somewhere in the Gulf of Mexico and in that instant, the war is already over and won.

An analogy. Aircraft carriers existed in 1941 but few saw them as a true strategic threat. Most in the military and their civilian leaders saw the role of carriers as platforms for launching scout planes, spotting targets, and acting always in support of the trusted and proven battleship. No one seriously considered the potential of putting half a dozen such carriers into one group and launching a full out attack in the opening minutes of a war. We all know what changed that belief forever, but by then, it was too late for the nearly 3,000 Americans who were killed on that Day of Infamy. The next Day of Infamy will be infinitely worst.

### ***WHO WOULD DO THIS AND WHY?***

Given the hatred and fanaticism of some of our enemies today, if they can obtain but one nuclear bomb, the temptation will be there. It does not even have to be a nation such as Iran or North Korea. . .it could be a terrorist cell who with enough money buy the components and then destroy their definition of “the great Satan.”

## ***WHAT WOULD HAPPEN AFTER THE ATTACK?***

Unless you are in a jet liner, plummeting to earth, or caught in a massive traffic jam of stalled vehicles on the interstate, you might not even know anything has changed. Sure the power is off, but we've all been through that dozens of times. You call the power company. But the phone doesn't work and that might be slightly more unnerving. You might go to your car to drive around and see what happened and then it becomes more unnerving when the car does not even turn over, nor any other car in your neighborhood.

Twelve hours later the food in your freezer starts to thaw, if it is winter and you don't have a wood stove the frost will start to penetrate in to your house, if summer and you live in Florida your house will be an oven. And that will just be the start.

Law enforcement will be powerless without radios, cell phones, and squad cars, unable to know where there is a crisis and how to react. The real horror show within hours will be in hospitals and nursing homes. They're required by law to have back up generators, but those generators are "hot wired" into the building so power can instantly kick in if the main system shuts down. That "hot wiring" means the Electro Magnetic Pulse will take out the generators and their circuitry as well.

If you are familiar with what happened in New Orleans after Katrina, multiply that ten thousand times over to every hospital and nursing home in America. Nearly everyone dependent on life support equipment in ICUs will be dead within hours. Nearly everyone in nursing homes dependent on oxygen generators, respirators, etc., will be dead or dying while depending on the time of year temperatures within plummet or soar.

As to medical supplies, not just in hospitals but across the nation to every local pharmacy, they are all dependent on something called Fed Ex. As we have perfected a remarkable system of instant delivery, guided by computers, local inventories have dropped to be more cost efficient and even for reasons of security with controlled substances, which to ordinary citizens means pain killers. Supplies will run out in a matter of days. Those of us dependent on medications to control asthma, heart disease, diabetes, and a host of other ailments which a hundred years ago would have killed us shortly after the onset. . .will

now face death within days or weeks, unless the national power grid comes back on line quickly and order is restored.

### ***HOW LONG WOULD IT TAKE?***

Here is the bottom line of the entire issue and why the threat of a single EMP weapon is so dangerous. There is the serious potential that we might never be able to restore the system. One might ask why? It just means replacing some circuit breakers, pulling out fried chips in our cars and replacing them with new ones etc.

It is not that simple. The infrastructure America has developed since the beginnings of the Industrial Age, is now so vast, intricate and fragile, that it is like a delicate spider web, which if touched by a flame can instantly vanish.

A few examples to illustrate what might seem an extreme statement.

The incredibly complex system that creates electricity, starting from a hydro-electric dam, a glowing nuclear reactor, or coal fired plant, leaps through hundreds of circuit breakers, perhaps thousands of miles of wiring, across high tension lines to sub stations, and finally to the outlet your computer is plug into. This single line will now have hundreds of breaks in it, each one having to be replaced.

Any of us who have lived through a major disaster such as a hurricane, ice storm, or tornado, and then gone several days without power know the sequence, how much longer the wait seems to be, and then finally the welcome sight of a power company repair truck turning on to your block. . .and that truck might be from a power company five hundred miles away. All our disasters have ultimately been local in nature, Andrew in Florida, Katrina in Louisiana and Mississippi or one this author went through with Ivan in North Carolina. The disaster is local, even if fifty thousand square miles are affected, help streaming in from neighboring states, caravans of power trucks, each carrying not just experienced crews, but laden down with all the replacement parts necessary to put electricity and phone service back into your house. When Ivan hit my town, dumping 30 inches of rain, wiping out the power grid and water supply, in less than twelve hours thousands of gallons of bottled water had arrived from Charlotte, power companies from Alabama, Tennessee and Virginia were arriving, the special parts needed to replace my town's shattered water

main from the reservoir were air lifted in by a national guard unit.

Consider though if the entire nation is “down.” Quite simply there are not enough replacement parts in the entire nation to even remotely begin the retro-fitting and replacement of all components. Every community will be on its own, struggling to rebuild. . .on their own.

Example two. A member of your family has type one diabetes and if you do have that in your family you know that failure to properly monitor and treat can result in death within a matter of weeks at most. Start with the testing kit. If it is one of the new electronic digital models, changes are a small hand held unit, not plugged into the grid will in fact survive. If it is an older kit that still uses testing stripes and you are running short of those stripes of paper, you already have a problem.

Where does insulin come from? In an earlier age it was literally made from the ground up pancreas of sheep and horses. Today it is manufactured via genetically altered bacteria and cells. There are several such factories across the nation which do this, producing millions of vials a day.

We are not even going to get into the complexity of where do the vials, the rubber seals and such come from. But with the shut down of power the factory goes dark and the complex environmental controls to insure the proper safety of the bacteria “batches” is now off line. Within days it will cease to function for that reason alone.

But it will most likely already be off line. What of the workers? Will the next shift show up when cars no longer run? Unlikely. And those on the job? No matter how dedicated most must leave within a day to see to their own families and chances are not return.

Of the hundreds of thousands of vials waiting in refrigerated containers for shipping, what happens to the coolant? And where are the trucks to move it? If the insulin is, in fact, already in the “pipeline” so to speak, if aboard a Fed Ex plane we already know that tragic fate. If on a highway it will be stalled. . .and so on to your local pharmacy where the few vials in the current inventory will be snatched up by panicked customers within hours and then hoarded away, regardless of the need of others. And even then, how will you keep the insulin temperature stabilized and when that fails, how swiftly does

the potency drop?

But one other factor, the syringes to inject the medicine. Any of us over 45 or so can recall the dull terrible needles in our doctor's offices. (As a child I recall my grandmother boiling my diabetic grandfather's needles.) After use they were stuck back into an autoclave (powered by electricity) and carefully sterilized. . .and then came the disposable syringe. Where does that needle come from. Again a long back track to an oil field, to a cracking plant, to a factory that, in sterile conditions turns the plastic into the barrel of syringe, to a mine where ore is turned into steel which is milled at remarkable tolerances into a needle point. . .and again shipped and shipped again and finally to your house.

The point of these few examples is that in an age not so long ago, nearly all that we needed for our lives was produced locally, and then came railroads, which could link a farmer's wife in Nebraska, via a catalog and telegraph to the Sears office in Chicago for that new set of dishes or a replacement part for a threshing machine. . .to our complex web of today. Few of us ever realized that with each advance in convenience and the latest new gadget or necessity we took another step towards dependence which in a global market today means that the chip needed to repair an important computer might be made in Japan, and ordered via a sales rep at a desk in India, and yet we expect it to arrive within two days and see nothing remarkable about that. Globalization with all its benefits and woes for some workers here, has made us infinitely more dependent on a global network of communications and transportation. . .that fragile spider's web.

There is the true nightmare of EMP. Once the entire system collapses, how and where does anyone build it back when that one crucial part you need is in a warehouse in Shanghai or Seoul and you don't even have means to even ask for that part.

***YOU MENTION IN YOUR BOOK THAT 90% of AMERICANS MIGHT DIE WITHIN A YEAR. ISN'T THAT FEAR MONGERING?***

When such numbers were discussed during the height of the Cold War, the numbers were indeed real, as they are now with the use of but one weapon to create an EMP burst.

The tragic thing is how we can discuss such numbers now in a society where the entire nation went into stunned mourning after nearly 4,000 died on 9/11.

*The death of an individual is a tragedy. The death of a million a statistic.*

The first few million deaths are tragically obvious. Those aboard commercial flights, and even most private flights, those in nursing homes, hospices, and hospitals.

The next few million are obvious as well. Those with severe ailments requiring careful daily medication or treatment, such as those awaiting transplants, people undergoing dialysis, those with severe heart ailments both known and not yet realized. We are used to emergency response within minutes when we snap open a cell phone and call 911. The stress, fear, even the unaccustomed physical exertion of someone having to walk ten miles to get home will trigger heart attacks, strokes, etc. We are a "hot house bred" generation, in fact several generations now. Our water supply is carefully controlled and delivered instantly and on demand, hundreds of gallons of it a day. Our food, wrapped in sanitary packages has expiration dates stamped on it. Where will you get drinkable water in a city after but several days? Frankly when was the last time any of us had to live without a flush toilet and anti-bacterial hand wash by the sink? Food that starts to thaw, which we were always cautioned to throw out, food in a refrigerator that is now at room temperature. . . do you throw it out or risk eating it? If your house is fully electric how do you cook it properly?

These few questions alone lead to a clear path straight to an entire nation heading into gastro-intestinal ailments within a week to ten days at most. Any of us who have traveled overseas, especially to third world countries have weathered them and survived. . . thanks in part to modern medications once back safe home in the USA. But we are now the third world country. Very young children and the elderly can die in less than a day from severe dehydration and electrolyte imbalance. Without plenty of clean water and modern waste removal, the problem gets far worse, especially in temporary refugee centers.

Compound this with the fact that by the end of the week millions

of Americans will be on the road. . .walking. The tragic lawlessness we often see in the wake of a large disaster will most certainly explode given that police are near powerless to react in an organized manner and national guard units will not even be mobilized since how do they mobilize if no vehicles run and all communications is still down.

Millions, many of them the most vulnerable will make the choice of abandoning the cities rather than try and fight to find a gallon jug of water or a few cans of soup. Beyond this fear, summer or winter many urban dwellings will be unlivable. The multi million dollar condo on the 40<sup>th</sup> floor is now a nightmare 400 foot hike straight up, lugging whatever water or food you might get. They will be unheated, or roasting ovens, designed of course with perfection climate control. . .that no longer works. Many will be driven, as well by the false hope that relatives out in the suburbs or better yet “out in the country” will of course have plenty of food and be willing to share.

Our interstate highways will become nightmare paths of exile as our largely urban population tries to fan out to find food that once was shipped in.

Millions could and will die on that road. Where do they get safe water? The nearby stream or river is now a dump for raw sewage since purification plants are off line. Once stricken on the road by the results after drinking this water, where does one get help, basic medication, more water to keep you hydrated.

Within a month the next level of die off will be in full development. Those who survive the initial onset of illnesses from polluted water and food, and survive, will nevertheless be weakened, knock down a level. Even if they do get lucky and have food stockpiled, or find a source, chances are it will not be balanced at all and the first onset of nutritional imbalance will lower the immulogical system even further.

Now is the time that more serious diseases will appear. Pneumonia, especia lly in the winter due to exposure. More exotic and dangerous types of food poisoning such as salmonella due to a complete collapse of sanitation. Various forms of hepatitis, even diseases not heard of in a generation or more. . .measles, scarlet fever, and tuberculosis.

In addition, the number of injuries will have soared. Few of us today are truly use to the back breaking kind of manual labor of the

19<sup>th</sup> century. Even most laborers today use modern equipment to do 99% of the actual work. Unfamiliar with axes, shovels and saws, people will break bones, cut themselves, or just suddenly die from strain. And waiting now are the infectious diseases where an ordinary cut, once treated with a few stitches instead becomes an avenue for gangrene, a rusty nail is again a threat of tetanus.

And finally, violence against ourselves. At what point do we begin to kill each other for food, water, shelter? At what point does a small town mobilize, barricade itself in and make clear that any who enter will be shot because there is not enough food to share, and any new stranger might be a carrier of yet another disease.

By sixty days true starvation will be killing off millions and by 120 days mass starvation will be the norm. Those lucky enough to be in rich farm producing areas, with the knowledge of how to gather food by hand, and then preserve it, will have a temporary surplus, but even then, if they do not ration it out wisely, as did our colonial forefathers, they too will starve before the next crop is in the ground come spring.

Months later, yes help from old allies might be flooding in, but how to move it, distribute it and at the same time provide medical aid and also rebuild the electrical grid, step by step will still be overwhelming tasks.

As said before, “the death of a million is a statistic.” Our statistic could very well be that in a year’s time, nine out of ten Americans will be dead. Dead from but one weapon, our global position shattered forever as we revert back into a third rate power, if we even still survive as a united system of states.

### ***IS THERE ANYTHING THAT CAN BE DONE BEFORE IT HAPPENS?***

Not a wide eyed sci fi novel or something sensationalistic, or even something set long after the event, like the book “The Road.” But instead it was my goal to write a novel like the classic “Alas Babylon,” or the more well known “On the Beach.” To do something that might trigger a response, any kind of response. It was my good fortune,

while researching for the book that I met Captain Bill Sanders of the Navy, one of our country's leading experts on EMP and Congressman Bartlett who heads the Congressional committee that issued a little known report on the threat of EMP. Both of them provided me with valuable information, which I must always emphasize was not classified, and encouraged me to get the story "out there."

I therefore wrote the novel from the perspective of a single dad with two daughters, living in small town in North Carolina. .and what he will do, and finally must do to try and keep his daughters alive. And yes, it is very autobiographical. I am a single parent of a teenage girl, and I live and teach in a small North Carolina mountain town that is the actual setting for my story.

My greatest frustration and something I hope my novel will stir is the realization that only a minimal effort, to start, could radically cut the number of casualties after such an attack, perhaps by a full magnitude from over 250 million dead to less than 25 million dead. .which is still a horrific number.

An off the shelf purchase of hand held two way radios by every local police, fire, sheriff, and emergency response department in the country would mean, that if then properly stored along with a large stock pile of batteries that within minutes after an attack, a nation wide network of communications would be back up and running. This can not be emphasized enough, that proper communications and what the military calls "command and control," will go a long step towards maintaining public order.

Another inexpensive step is just simple training. We are a nation that sadly has become entirely dependent on someone "up the ladder" passing orders as to what to do. Very few of us today are conditioned to think and act independently. This has to be reversed in the event of an EMP strike. Every first responder should be trained to be able to recognize an EMP hit, and in coordination with their local departments, have a plan in place as to what to do first, and then next, and then after that. This author would recommend a first step being the seizing of supplies at every veterinarian's office in the country. That might sound strange, but vets are most likely the only ones in your community that have a full array of surgical equipment,

anesthesia and pain killers. Armed with this equipment, medications seized from pharmacies, dentist offices and doctor's offices, and then set up at a local school, staffed by local doctors and nurses, would mean that each community has made a major step towards tending its injured, ill and elderly.

Other training would be oriented towards how to organize a community, locating vehicles that still run, and retro fitting those vehicles, that had minimal electronics in them, so that law enforcement, medical, and fire control have transportation.

A next step would be public education for all citizens, similar to the programs in place during the 1950s. How to recognize an EMP strike and then what do you do? After Katrina we have learned to now start educating our citizens that they must rely upon themselves and their own good judgment, and not expect government to come instantly to the rescue. Contrast the chaos in the days before Katrina to the orderly evacuations when Gustav hit New Orleans this year.

But a week's worth of emergency food stockpile and water, just recycling used milk and soda bottles, filling them with sterile water and storing them away could buy a precious week's worth of time, nation wide. A few simple medical supplies such a sterile bandages and just a basic family first aid manual. Simple things even our grandparents, still living on farms knew, about how to insure water is safe, where to put a privy pit, and properly store any food that might last long term. If a family member has a serious illness or condition keep a full level of medicine on hand and not wait until the bottle is empty before refilling. This alone could be a life saver for millions, buying extra weeks or a month or two.

Above all else educate to a post EMP survival. To turn to community organization, to help and rely on neighbors and not some distant agency, to have a plan in place to help local nursing homes with the elderly, to have an entire community, be it a neighborhood in a city, or a small town in the Midwest, ready to take care of itself and insure public safety and law while the nation gradually stitches itself back together.

Ironically these were plans already put into place across America of the 1940s and 1950s, this author can recall receiving civil defense booklets at school to take home to my parents and my father

was the local civil defense coordinator for our neighborhood just outside of New York City. We took the threat seriously and we acted as Americans, to prepare, with the memories of WWII still fresh in our minds. This preparedness fell away. . . it should be restored.

The next step, which will cost more, will be crucial as well. The analogy is simple. We all know that America's industrial might literally saved the world from Nazism and Japanese Imperialism once we got into the war. But that industrial might did not appear overnight. It took over two and a half years of build up after Pearl Harbor before we went fully on to the offensive with D-Day in Europe and the push towards the Japanese main islands in the Pacific. What truly saved us though was not the effort after Pearl Harbor but the effort BEFORE Pearl Harbor. We did not want to fight, we were about the most reluctant nation on earth in 1940 when it came to getting into the war. . .but we did have the wisdom to start the build up then. . .building factories, training millions to work in them and millions more to learn how to fight. If we had not done that in the two years prior to Pearl Harbor nearly any historian will tell you. . .we would have lost World War II.

In this post industrial age power is no longer steel plants, mills, factories and yet more factories. It is now precision electronics, communications, computers. . . and the heart blood of all that is electrical power.

Congress has estimated that a full retro fit to our power grid to withstand a large scale EMP strike could cost up to half a trillion dollars. . .and the chances of that bill ever passing is remote to say the least.

And yet, there is another path at a fraction of the cost. Stockpiling of key components overseas. Any major component being manufactured today for our electrical grid, that could be destroyed by an EMP strike, we should make but one more of each and then store those components at military bases overseas. Within hours of a hit on the continental United States, military aircraft outside the strike zone can be lifting that precious cargo back to the mainland and the rebuilding can begin.

Of late, our nation's railroads have launched an advertising

campaign which is actually true, that in terms of tons per mile, our railroads are still the most effective means of moving goods. For an investment not much more than the cost of a couple of B-2 bombers, or a squadron of F-22s, several hundred diesel electric locomotives could be pulled off line, their components hardened to withstand an EMP strike, then parked inside silos and bunkers at military bases across the country. Within hours after an EMP strike these powerful machines could already be at work. It will be laborious at first, for every other train in the country will have stalled on the lines. They have to be shunted off the main lines, switches reset by hand. . .but once cleared, a single train could move ten thousand tons of food to a stricken city and on the return run, evacuate thousands to where the food is out in the countryside, or back to military bases. Within weeks a nationwide transportation grid could be up and running again. . .yet another factor that will reduce fatalities even more.

A further step would indeed be a logical stockpiling of crucial medical equipment and supplies, especially medications with long shelf lives or can be frozen while in storage overseas or in underground facilities.

The final step in training and preparation. . .our own military. The power generation capacity aboard a modern aircraft carrier can supply a medium size city, a destroyer or frigate a large town. Attention should be focused on training our military, especially our Navy whose overseas forces and ships would be unaffected by a strike on the continental United States to return to save America. Within a few weeks both coasts, studded with several hundred ships could become focal points for rebuilding, as replacement components, food and medicine are moved in via ships, loaded aboard trains and distributed into the heart land.

It is a war. It is a war in which we will take casualties undreamed of in our worst nightmares. . .but it can be survivable if we act and prepare now.

***IS THIS MERELY A SCI FI STORY OR IS IT REAL?***

An editor of Aviation Week and Space Technology, after reading this author's novel declared. "It is not a question of if it will happen. . .it is merely a question of when."

Across six thousand years of recorded history mankind has known war. Across six thousand years humanity has tended to focus its best minds on the technology of war, to speak bluntly how to better kill our neighbors. Never has a weapon been invented that it has not ultimately been used. And ironically so many "new" weapons, when first revealed are declared to be so horrible as to render war unthinkable. And all have ultimately been used.

Given the fanaticisms of some of our enemies today, some of whom believe that the creation of the Apocalypse will be their own fulfillment of a religious destiny, it would be madness not to think that such an attack within the next two decades is not just possible but in fact likely.

It is time to think about what to do, and how to prepare before it happens. Reacting the day after the next "Day of Infamy," or "One Second After," it will be too late.

*William R. Forstchen*  
*Author of "One Second After"*

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