Hi all,

Below is my review of the the NRC document titled Protecting Our Nation (NUREG/BR-0314, Rev. 4, August 2015)

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Forward by the Chairman:

It took the NRC 6 years to update security after 9-11, and 12 years before additional theft and diversion rules were imposed (and even those are too weak)...and they still haven't shut down all the Fukushima-style reactors in America (there is no way to make them safe). That's why the NRC is called a "captured" (by the nuclear industry) agency.

Chairman Burns writes about entering the Digital Age, but can only claim the NRC has "made significant efforts to address these threats" and that in 2013 a Cyber Security Directorate was created. In reality, new digital threats against nuclear power plants (and the grid that powers those plants) continue to emerge almost daily.

If the NRC is really committed to responding to change, it's time for them to shut down ALL the nuclear power plants, since there is no way to properly protect them or manage the waste they produce.

Executive Summary:

The Executive Summary starts by claiming the NRC has been effectively managing nuclear security, emergency preparedness and incident response. TMI proved that was not true. 9-11 and Fukushima confirmed it's still not true. The Summary claims nuclear power plants are "safe, robust structures designed and built to withstand hurricanes, tornadoes, floods, and earthquakes" but that ignores that fact that each of these can be "beyond design basis" events, at which point "mitigation" becomes the only option. As for security, a worker at San Onofre was recently sent home for being drunk on the job. How did THAT happen?

On page 5 the Summary claims a "high level of realism in force-on-force inspections" but the reality is the plants are simply NOT secured against more than a few lightly-armed attackers, are not protected against airplane strikes, drone strikes, or a high-level insider or multiple insiders helping the attackers.

The Summary further claims that the NRC ensures "safe and secure transport of spent fuel" but since the required road and rail infrastructure needs trillions of dollars in improvements to carry the loads, that's just wishful thinking (or propaganda) on the part of the NRC. It is impossible to have safe transport on today's transportation infrastructure. The "Design Basis Threat" is far too weak to be considered realistic (it's exact level is classified, but a detailed research effort by the Union of Concerned Scientists revealed the maximum threat was approximately 3 to 5 assailants).

The NRC's claim that the 31 non-power reactors (NPRs) they license are less risky is dubious at best. Many of these are on campuses where security is lax, doors have been left open, walls are easily penetrated, and airplane strikes...well, those are a threat everywhere but especially at the NPRs. Many of them still use highly-enriched uranium, a terrorists' dream material.

Design Basis Threat for Radiological Sabotage:

It is a simple fact that if the NRC simply "works with national experts and analyzes classified and other sensitive information to establish this DBT" based on "the capabilities and activities of adversary groups" they are playing the game wrong. Any group planning an attack on a nuclear facility will adjust its attack envelope accordingly to overcome the expected level of resistance. They will NOT play be the rules established by the NRC. If they need drones, they'll use drones. If they

need mortars, they'll use mortars, etc.. The NRC does not required nuclear facilities to be protected against significant threats, only INsignificant ones.

It is noteworthy that in the NRC's own drawing of the "Components of Security" only three security officers are shown. One guard tower is shown, and while it is true that, for example, at San Onofre there are at least half a dozen "iron coffins" (guard towers), it is well-known that at any one time, most of these towers were unoccupied even when the plant was operating, and undoubtedly even fewer are occupied now that the plant is closed.

Force-on-Force Security Inspections:

In the photo, the simulated attackers are standing in short grass, easily visible, and much farther away from the plant than people can legally be at San Onofre, where it is perfectly legal to go right up to the sea wall, about 100 feet from the spent fuel storage facility.

Fuel Cycle Facilities:

It took the NRC until 2012 to create a cyber security paper (a "roadmap") for fuel cycle facilities. By this time thousands of malware programs had been released over several decades.

Spent Fuel Facilities:

First sentence, the NRC uses the word "effectively" as in: "[Spent fuel] can no longer effectively sustain a chain reaction." The word they should use is: "profitably." They also did not rewrite the amount replaced periodically, which is now often 1/2 of the high-burnup fuel, instead of 1/3 of the lower burnup fuel (the period is correspondingly longer, about two years instead of about 18 months). This indicates the document was not sufficiently updated to current standards. The next sentence implies that the radioactivity ceases after a period of time in the spent fuel pools, which is incorrect. It only decreases, but takes many millennia before it ceases (billions of years for the uranium-235 and U-238).

"Many [spent fuel pools] are located below ground level" is a reversed way of saying that the incredibly dangerous and stupidly-designed Boiling Water Reactor GE-built Fukushima-style spent fuel pools are located ABOVE the reactors! That crazy situation is reason enough to shut down ALL such reactors.

The document next claims that the pools are protected from large aircraft strikes. That's absolutely untrue. Small aircaft, perhaps. Not large ones, and certainly not from a suicidal pilot who has flipped the plane on its back and entered a steep dive directly into the pool, having practiced the maneuver thousands of times on a flight simulator beforehand. The 9-11 pilots hit their marks very precisely.

The NRC's definition of "robust" in reference to dry casks is entirely subjective. No proper test has ever been done on a fully-loaded dry cask (even one with "dummy" fuel in it) and anyway, the standards for drop tests, impact tests, fire tests etc. are all far too weak to simulate real-world conditions. They claim that the casks are protected against "aircraft impacts" but did NOT use the word "large" prior to "aircraft" this time. The impact test -- a single test on a single cask design -- was done with a light fighter jet empty of fuel, and probably with its engine removed (the jet was on a rail, not in actual flight).

The NRC claims that they: " always required ISFSIs to have an onsite physical security system." This claim does NOT necessarily mean that humans capable of armed responses sufficient to prevent sabotage are always on site -- it could (and probably does) refer to allowing remote monitoring of the ISFSI.

Always behind the eight ball, new security procedures had to be implemented after 9-11, and were being updated again as of the time the document was produced (2015).

Transportation:

If the NRC numbers are accurate, fewer than 2,000 shipments of spent nuclear fuel have been made, all since 1979. It can also be assumed that many of these shipments were of relatively small quantities, for example, melted fuel from Three Mile Island, and MOX experimental fuel assemblies from various reactors. Furthermore, the infrastructure has deteriorated significantly since 1979, and terrorist capabilities and weapons have significantly increased, therefore earlier

successful shipments are of no value in evaluating whether the NRC and the nuclear industry is capable of transporting more than 10,000 fully-loaded dry casks not once but at least twice, first to a "temporary" storage location, and then, presumably, to a permanent site (not likely to be Yucca Mountain, and no other site is being considered).

Due to "heightened" security measures after 9-11, local communities will probably NOT be informed that a shipment of nuclear waste is going to pass through their area.

Design Basis Threat for Theft or Diversion:

The quantities of radioactive materials that require Category I protection are very large. A dirty bomb could be made from MUCH smaller quantities (see footnote 3 of the report).

The NRC claims to have incorporated:

3) The potential for attack on facilities by multiple coordinated teams of a large number of individuals

But the words "potential for..." implies that protection against such attacks has NOT been implemented, since the NRC clearly could decide the "potential for" such attacks is low and can be discounted. Similarly, the NRC can (and presumably does) discount suicide attacks, employee threats, large fires (caused, for example, by airplane strikes), etc. etc.. Nothing in the NRC's DBT rulings clearly requires proper protection against any significant, possible threat. Only against what the NRC deems are "potential" threats.

As proven on 9-11, terrorists are perfectly capable of exceeding expected threat levels. Indeed, that's their "job."

Security Core Inspections:

With reference to the photo on page 23, I suspect all those fake weapons are at a central facility, and are never all used in one simulation.

Cyber Security:

Yeah, right. I bet numerous NRC-licensed facilities are already poisoned with the Stuxnet virus, although fortunately it is not designed to attack those facilities.

Nuclear Preparedness and Response:

Note that Emergency Preparedness exercises are NOT conducted at closed nuclear sites, despite the presence of millions of pounds of extremely toxic spent nuclear fuel.

Also note that the "generic distance out" is at most 10 miles, while serious impacts and statistically-significant health effects can occur hundreds of miles from the facility.

HAB (hostile action based) exercises are only conducted on an 8-year cycle. In the past 8 years, terrorists have learned to use drones, for instance. Such a long cycle is hazardous to the nation's health.

Incident Response:

NRC admits here that there is such a thing as a "beyond Design Basis Threat."

International Safety and Security:

The NRC has accepted the IAEA's recommendations for international shipments. These, however, represent a "lowest common denominator" approach, rather than the NRC setting a higher standard because they can.

Conclusion:

Despite a aviation security program in place for more than half a century, the nation was wholly unprepared for the events of 9-11. As I write this, a level-4 hurricane ("Michael") is less than 100 miles from a nuclear plant and heading right towards it, but the plant is remaining open. Drone attacks have yet to be considered by the NRC, because there is no defense against a drone swarm, with each drone carrying several pounds of high explosives.

The nation remains in extreme danger from a power source for which there is no solution to the waste problem, and which is more expensive than dozens of other better, benign energy solutions. The NRC's job is to keep America safe, and in this they are failing completely. Instead of shutting down old, decrepit reactors, the NRC has never, not once, refused a request for a license extension. Such extensions are now being made for 80-year terms, and reactor companies are replacing hundred-million dollar parts in anticipation of approval, and forcing ratepayers to pay for these upgrades either way.

Since 90% of the NRC's funding comes from the utilities they regulate, it is basic job security for the NRC to keep licensing them.

The above notes written October 10, 2018 by Ace Hoffman, Carlsbad, California
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