



Union of Concerned Scientists

Citizens and Scientists for Environmental Solutions

Statement Submitted by David Lochbaum to the Subcommittee on National Security, Emerging Threats, and International Relations, U.S. House of Representatives

Mr. Chairman and Members of the Subcommittee, I appreciate this opportunity to provide you with our views on the important public policy issues associated with nuclear power plant security. I have been the nuclear safety engineer for the Union of Concerned Scientists since October 1996. I worked for over 17 years in the nuclear power industry prior to joining UCS. As a Shift Technical Advisor, I stood – albeit very nervously – inside the control room at the Browns Ferry nuclear plant as the deadline for a phoned-in bomb threat approached and then passed without incident. I authored the investigative reports into a series of mysterious shutdowns of the Browns Ferry reactors caused by a group of workers tampering with vital safety equipment to sabotage the plant.

Today's open Congressional hearing, as with many others that preceded it, demonstrates that nuclear plant security issues can be responsibly discussed in public – a fact ignored by the U.S. Nuclear Regulatory Commission (NRC). The NRC has essentially closed its doors to the public on this important topic since 09/11. That's unacceptable and we urge the Congress to compel the NRC follow its lead by including the public in policy discussions.

Nuclear Plant Security Hazard is Real

Nuclear industry representatives and NRC officials often state that any attack on a nuclear power plant would not and could not harm people living and working outside its fences. Those statements mislead the public, undermine confidence in nuclear plant security preparedness, and are disrespectful to the thousands of Americans working long hours to prevent a successful attack. The truth is that a successful attack on a nuclear plant would be one of the worst disasters in American history. The utter fallacy of their statements is perhaps best revealed by two facts. First, the nuclear industry and the NRC urged Congress to renew Price-Anderson federal liability protection for nuclear power plants. If an attack could not cause harm outside nuclear plant fences, owners could get private insurance coverage and would not need Price-Anderson. Second, the nuclear industry claims to have spent more than \$1 billion upgrading nuclear plant security since 09/11. No one spends that kind of money on pseudo-hazards.

Security Steps Taken

UCS acknowledges that the NRC embarked on a campaign before 09/11 to upgrade nuclear plant security requirements and their implementation. In two policy papers supplied to the Commissioners in June 2001, the NRC staff enumerated many proposed revisions to the nuclear plant security regulation (10 CFR 73) and how the agency would better enforce it. The NRC staff prepared these policy papers following a lengthy series of monthly public meetings. Thus, the NRC had a solid foundation to build upon when the tragic events of 09/11 forced reconsideration in light of this new threat to our homeland.

With the pre-09/11 preparation and post-09/11 perspective, the NRC issued a series of orders to plant owners requiring them to take steps to make their facilities less vulnerable to attack. The NRC also revamped its own processes for determining the adequacy of security measures. The steps we like the most:

- The frequency of NRC-evaluated force-on-force security testing was increased to once every three years from once every eight years.

NOTE: UCS shares the concern expressed by the Project on Government Oversight (POGO) about the obvious conflict-of-interest in having Wackenhut employees serve as both the attackers and defenders during force-on-force tests as currently planned by the Nuclear Energy Institute. The NRC must not permit this farce.

- Access authorization procedures for plant workers were upgraded to prevent unescorted access *before* the FBI fingerprint check results come back, to require background checks to be updated every five years, and to restrict access by temporary workers with only cursory background checks.
- The number of adversaries in the design basis threat (DBT) was increased and many of the unrealistic limitations on their weapons and tactics were removed or lessened.

NOTE: UCS shares the concern expressed by virtually every public interest group that the modest increase in the number of adversaries may be insufficient because it remains far below the DBT level developed by the Department of Energy after 09/11 for its nuclear facilities with comparable hazards.

- Minimum standards for training and qualifications of security force personnel were established to ensure these personnel are capable and equipped.
- Working hour limits for security force personnel were mandated to protect these workers from impairment by fatigue.

The steps taken by the NRC since 09/11 made it less likely that an attack against a nuclear power plant will be successful. But the nuclear plants have not, by any stretch of the imagination, been made invulnerable. We must not gamble that our enemies are too inept to exploit the vulnerabilities. September 11th reminded us the stakes from losing this gamble are tragically high.

Security Steps Remaining

Nuclear plants are vulnerable to attack from the land, the water, and the air. Additional steps must be taken to reduce all three vulnerabilities.

Land-based attacks can come from within the security fences, from outside the fences, and from a combination of inside and outside attacks. The NRC reduced the threat of insider sabotage by revising access authorization procedures after 09/11, but two additional low-cost measures must be taken. First, access to vital areas¹ must be controlled better. The United States military applies the “two-person” rule for entry into areas containing key components of the atomic arsenal to make theft and tampering less likely. Likewise, the “two-person” rule for access to vital areas and/or expanded use of in-plant security monitoring cameras will lessen the likelihood of sabotage by insiders at nuclear plants. Many vital areas (e.g., the electrical switchgear rooms and the instrument rooms) are low-traffic areas that can be further protected by the “two-person” rule. Other vital areas (e.g., the control rooms) are high-traffic areas that are better protected by monitoring using in-plant cameras. These low cost measures² would further reduce the likelihood of insider sabotage by better controlling access to areas containing vital equipment.

The second low-cost measure against insider sabotage involves expanding the evaluation process for proposed procedure revisions and hardware modifications to formally include sabotage threat. Currently, proposed changes are formally evaluated per 10 CFR 50.59 to verify that safety levels will not be

¹ The NRC terms the land under and around a nuclear plant the owner-controlled area. The subset of that area demarked by the inner security fences is the protected area. The rooms within the plant containing equipment necessary to protect the nuclear fuel are vital areas. Most workers perform their assigned duties outside of the vital areas.

² UCS has not quantified the cost implications of these measures, but qualitatively compared them to practices currently in place at nuclear power plants. There are confined space entry requirements that a worker from entering a tank or other area alone or unmonitored where conditions may pose a health hazard. There are security cameras used to monitor exterior perimeters. The extension of these existing measures to better protect vital areas is relatively inexpensive.

compromised. If the formal evaluation cannot determine that safety levels will be maintained, then NRC approval of the proposed changes is required. This evaluation process must be expanded to ensure that proposed changes that do not lessen safety levels also do not make it easier for insiders to sabotage the plant. For example, continued plant operation with one of two redundant emergency pumps intentionally disabled a few days for maintenance might be justified from a safety perspective based on the small chance of an accident occurring during that brief period along with the high reliability of the remaining pump. But continued plant operation might not be justified in this case from a security perspective without taking compensatory measures to protect the remaining pump from sabotage during the brief period. This low cost measure³ would further reduce the likelihood of insider sabotage.

The best protection against land-based attacks originating outside the fences involves periodic, meaningful force-on-force security tests at a realistic DBT level. The NRC has adequately addressed the periodicity by increasing the testing frequency to once every three years. The NRC must address the meaningfulness by not allowing Wackenhut – or any other private company – from supplying both the attackers and defenders in a security test. There is a clear conflict-of-interest that must not be permitted. The NRC must address the realistic DBT level by increasing the current modest level to at least the level established by the DOE following 09/11 for its nuclear facilities.

Limiting access to plant information protects against external land-based attacks by impairing the ability of outsiders to identify targets and devise tactics. The NRC imposed additional restrictions, as recently as August 4, 2004, on public access to information after 09/11. But UCS met privately with the NRC staff in May 2004 to point out a significant loophole. The beefed-up access authorization steps mandated by the NRC following 09/11 only apply to nuclear plant workers who are granted unescorted access privileges. There are literally thousands of nuclear plant workers with ready access to sensitive plant information that do not get unescorted access and therefore are not subject to background checks. It remains easy for our enemies to get these jobs and obtain blueprints, scale drawings, calculations, risk assessments, upcoming equipment outage schedules, and other information extremely useful in planning and executing an attack. The NRC must plug this loophole. It makes little sense to restrict public access to information while allowing the equivalent of uncontrolled, unmonitored, unfettered drive-thru service at the plants themselves.

Water-borne attacks seek to disconnect the nuclear plant from its adjacent lake, river, or ocean and prevent cooling of essential equipment and irradiated fuel. Very little has been done to protect nuclear plants from water-borne attacks. The United States Navy reacted to 09/11 by installing floating barriers around ships at anchor in U.S. ports. For example, the Navy placed floating barriers, provided by Dunlop Industries of Scotland at a cost of \$10,000-15,000 per section, around its submarines in Groton, Connecticut as protection against its DBT. The NRC must require similar protective measures for the intake structures at nuclear power plants.

Air attack threats must be resolved via the same process the NRC applied to fire hazards following the near-disastrous Browns Ferry nuclear plant fire in 1975. The NRC required owners to analyze their plants area by area to verify that a fire disabling all of the equipment inside one area left sufficient undamaged equipment in the other fire to safely shut down the reactor. The NRC must also require owners to analyze their plants aircraft impact area by impact area to verify that an aircraft disabling all of the equipment inside one area leaves sufficient undamaged equipment to safely shut down the reactor and prevent damage to spent fuel. During this analysis, results may reveal an unacceptable vulnerability that must be resolved by either making the impact area more robust or ensuring survival of necessary equipment in other areas – replicating the resolution process used during the fire hazards analyses. UCS and the

³ This measure would be relatively inexpensive because it is a small expansion to the existing safety evaluation process. The current process requires a formal evaluation of the potential impact of proposed changes upon fire protection, chemical interactions, seismic loads, etc., would require minor effort to also cover the potential impact on insider sabotage prevention.

Mothers For Peace of San Luis Obispo jointly petitioned the NRC to make this happen, but our petition seems to have disappeared into some regulatory black hole.

It must not be forgotten that all of the steps taken and all of the remaining steps – even if taken – only protect against an attack up to the DBT level. Per 10 CFR 50.13, the so-called “enemies of the state” regulation, the U.S. government is responsible for dealing with attacks above the DBT level. The federal government resources that would be deployed to prevent or respond to an attack against a nuclear plant on our coastlines are different than those deployed in event of an attack against a nuclear plant in Kansas. In this regard, protection above the DBT level is analogous to the emergency planning requirements contained in 10 CFR 50.47. A large-scale accident at a nuclear power plant challenges the resources and surpasses the authority of its owner to cope with areas outside of the facility’s fences. The plant owner is required to have procedures to interface with local, state, and federal entities so they can make informed decisions necessary to protect downwind populations. During mandated biennial exercises, the NRC evaluates the plant owner and the Federal Emergency Management Agency (FEMA) evaluates the local, state, and federal entities on the effectiveness of their emergency planning measures.

A comparable process must be used to periodically demonstrate that the federal government could adequately prevent or respond to attacks above the DBT level. The frequency need not be as often as once every two years as in the emergency planning arena and the Department of Homeland Security would replace FEMA in evaluating offsite response. But periodic exercises would assure that necessary lines of communication were established and that roles and responsibilities were clearly understood so that the federal government’s response to an imminent or actual attack on a nuclear plant was not an *ad hoc* effort.

Prior to 09/11, the NRC’s security focus was on ensuring the irradiated fuel in the reactor was protected from damage by sabotage. That focus was incomplete. Many U.S. nuclear power plants have more than five times as much irradiated fuel in spent fuel pools and spent fuel dry casks as is in the reactor. There are substantially fewer barriers that saboteurs must penetrate in order to successfully damage spent fuel and, correspondingly, there are fewer barriers protecting the public from radioactivity emanating from damaged spent fuel. It is essential, therefore, to also assure that spent fuel is adequately protected.

Today, spent fuel at U.S. nuclear power plants is woefully protected. Spent fuel pools are filled to overflowing with irradiated fuel. Spent fuel dry casks are stored out in the open in direct light-of-sight to areas easily accessible by the public and people contemplating harm. In fact, the current scheme of spent fuel storage maximizes the risk from both accidental and intentional damage to spent fuel and could hardly be made less safe or less secure. By maintaining the spent fuel pools at or near full capacity, the risk is kept as high as possible.⁴ Transferring irradiated fuel assemblies into dry casks stored on open-air concrete pads merely adds risk to the maximized spent fuel pool risk.

The responsible thing to do would be to minimize the inventory of irradiated fuel in the spent fuel pools by transferring fuel discharged from the reactor more than five years ago into dry casks emplaced within earthen berms or other protective devices. The risk reduction from emptying the spent fuel pool would more than offset the increased risk from dry cask storage, resulting in an overall tangible reduction in risk profile at the plant site. UCS joined a coalition of local and national organizations in petitioning the NRC last month to reduce the spent fuel storage risk at the most vulnerable nuclear plants – the boiling water reactors with Mark I containment designs. The NRC must take steps to adequately protect spent fuel.

These recommended steps would further reduce the vulnerability of nuclear power plants to attack. Even if fully implemented, they will not render nuclear plants invulnerable to attack. But at least these steps will allow the federal government to sincerely tell the American public following a successful attack, should one occur, that every reasonable step had been taken to protect them. Right now, Americans cannot be honestly given that assurance despite the NRC’s steps since 09/11.

⁴ The risk factors are described on page 15 of U.S. General Accounting Office report GAO-03-426, “Spent Nuclear Fuel: Options Exist to Further Enhance Security,” July 2003.

Public's Right to Know

One of the first steps taken by the NRC after 09/11 was to bar the public from meaningful participation in policy discussions about nuclear plant security. The NRC has not yet retreated from this mis-step.

UCS supports the need for NRC to restrict public access to certain security information and that these restrictions are larger now. In fact, UCS identified materials containing security information in the NRC's electronic library both before and after 09/11 that we felt unsuitable for public consumption. We alerted the NRC to these materials and they have been pulled from the public arena. UCS actively supports the NRC's need to restrict public access to certain information.

Today's hearing demonstrates beyond reasonable doubt that open public discussions of nuclear plant security policy issues can be conducted responsibly. The NRC must learn this lesson and emulate this practice to begin repairing the damage inflicted by its mis-step. The American public is not the enemy. The NRC must stop treating the public as its enemy. The NRC cannot expect the American people to trust it when it displays a lack of trust in the American people.

Conclusion and Recommendations

Despite the steps taken by the nuclear industry and NRC since 09/11, nuclear power plants remain vulnerable to attack by land, by sea, and by air. There are additional steps that must be taken to reduce, but still not eliminate, these vulnerabilities. The American public cannot be honestly assured that all reasonable measures to protect them until after the following additional steps have been taken:

1. The "two-person" rule and/or expanded in-plant use of security monitoring cameras must better control access to vital areas.
2. The evaluation process for proposed procedure revisions and hardware modifications must formally assess whether protection against sabotage is affected by the planned changes.
3. The NRC must not allow the same company to supply both the attackers and the defenders in its force-on-force security tests.
4. The NRC must increase its DBT level to a realistic level comparable to the level established by DOE for its nuclear facilities after 09/11.
5. The NRC must either require background checks for nuclear plant workers with access to sensitive plant information or prevent workers without background checks from accessing sensitive plant information.
6. The NRC must require water barriers around intake structures at nuclear plants.
7. The NRC must require protection against aircraft hazards via a method like the one it employed to protect against fire hazards.
8. The federal government's ability to prevent or respond to an attack above the Design Basis Threat (DBT) level must be periodically demonstrated similar to how emergency planning preparedness for each nuclear plant site is periodically demonstrated.
9. The NRC must require adequate protection for spent fuel by requiring owners to transfer fuel discharged from the reactor more than five years ago into dry casks emplaced within earth berms or other protective devices.
10. The NRC must re-engage the public in security policy discussions.

Mr. Chairman and Members of the Subcommittee, I sincerely thank you for holding this open hearing and listening to public interest perspectives on this important topic.

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