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“HR___, The Nuclear Waste Policy Amendments Act of 2017”

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Committee on Energy and Commerce

Subcommittee on Environment

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SUMMARY OF UCS TESTIMONY

- Nuclear waste disposal presents both political problems *and* technical problems. The best way to tackle the political problems is to first ensure that the technical problems are resolved to the greatest extent possible by using rigorous, peer-reviewed science.
- The best way to break the nuclear waste logjam is to create a new process for repository site selection that is more equitable than the flawed process that led to the selection of Yucca Mountain. Once a level playing field is established, Yucca Mountain then should compete with other candidate sites.
- The benefits of adding consolidated interim storage facilities to the waste management system may not outweigh the risks, either for spent fuel from operating reactors or from shutdown reactors.
- UCS believes that spent fuel can be managed safely at reactor sites for decades, provided that the unacceptable risk of spent fuel pool fires is reduced by expediting transfer of spent fuel to dry casks, and that the security of dry cask storage is enhanced.
- Congress should not micromanage the NRC's procedures for evaluating and adjudicating amendments to repository applications that could have a significant impact on repository safety and security.

Good morning. On behalf of the Union of Concerned Scientists, I would like to thank Chairman Shimkus, Ranking Member Tonko, and the other distinguished members of the Subcommittee for the opportunity to provide our views on the future of nuclear waste management and disposal policy in the United States.

The Union of Concerned Scientists (UCS) has more than 500,000 supporters, united by a central concern: that we need sound scientific analysis to create a healthy, safe, and sustainable future. UCS is neither pro- nor anti-nuclear power, but has served as a nuclear power safety and security watchdog for nearly fifty years. Combating the threat of global climate change is one of our priorities, and we have not ruled out an expansion of nuclear power as an option to help reduce greenhouse gas emissions—provided that it is affordable relative to other low-carbon options and that it meets high standards of safety and security. These considerations apply as well to the management and disposal of spent nuclear fuel, which contains long-lived, highly radioactive fission products and weapon-usable plutonium. It is critically important that spent fuel be managed safely and protected from terrorist attack until it can be buried in a geologic repository. But a sustainable nuclear waste disposal strategy must also have broad public acceptance.

To that end, we appreciate the interest of the authors of the discussion draft of the bill that is the subject of today's hearing to move the ball on nuclear waste disposal. However, we disagree with the draft bill's limited scope and its Yucca Mountain-centric approach. The U.S. needs a comprehensive strategy that addresses all aspects of this problem, including the safety and security of spent fuel transportation and spent fuel storage, both at and away from reactor sites.

And it needs to at least try to find an approach for repository siting that could facilitate local and regional cooperation, rather than heighten already entrenched opposition. In contrast, the discussion draft goes in the wrong direction with a heavy-handed attempt by the federal government to resolve disputes by overriding state authority instead of promoting dialogue and cooperation. The state of Nevada, predictably, is already crying foul. While it may be unrealistic to hope for an all-inclusive “consent-based” siting approach, as first proposed by the 2012 Report of the Blue Ribbon Commission on America’s Nuclear Future, there is surely a way to develop a process that at least is perceived by all stakeholders as fair, even though they might not all agree with the outcome.

UCS strongly supports the development of geologic repositories for direct disposal of spent fuel. However, we do not have the geological expertise on staff to assess the technical suitability of the Yucca Mountain site, or for that matter, any other potential site in the United States. With regard to political suitability, we concur with the assessment of the 2012 Blue Ribbon Commission (BRC) Report that the process by which Yucca Mountain was selected was flawed and contributed to the erosion of trust in the program that caused it to stall. Congress should pursue a different and less adversarial approach that will be more likely to lead to selection of sites that are both technically suitable and publicly acceptable. Once a process is in place, Yucca Mountain could then compete with other repository proposals on a level playing field.

Many people believe that nuclear waste disposal is only a political problem, and not a technical problem. In fact, it is both. One should not underestimate the technical challenges of designing

and building a repository that will effectively isolate nuclear waste from the environment for hundreds of thousands of years. The foundation of such an effort is good science. One of the best ways that Congress could improve the prospects for a geologic repository is to fully support the scientific work needed to establish the technical basis for its safety and security.

In the case of Yucca Mountain, there are nearly three hundred technical contentions that would have to be adjudicated before the Nuclear Regulatory Commission (NRC) Atomic Safety and Licensing Board. These contentions raise many important safety and security issues, and the viability of Yucca Mountain depends critically on their resolution. However, technical staff members within the Department of Energy (DOE) with expertise on these issues have no doubt moved on to other things since DOE terminated the Yucca Mountain project in 2010. Even if the DOE gets all the resources it needs now, it will take time to reconstitute the expertise it will need to successfully defend its application against these technical contentions.

A comprehensive strategy for nuclear waste management must also address the safety and security of spent fuel storage at reactor sites. Even if Yucca Mountain were to receive a license tomorrow, constructing the repository and transportation infrastructure will take time, and large quantities of spent fuel would likely remain at many reactors for decades to come. Also, for all operating reactors, there will be a need to store recently discharged spent fuel on site.

While spent fuel in principle can be managed safely and securely at reactor sites, the NRC has failed to take steps to remediate a dangerous situation that exposes millions of Americans to needless risk: the potential for fires in dangerously overloaded spent fuel pools. If an earthquake or a terrorist attack were to damage a spent fuel pool at a U.S. reactor, causing it to rapidly lose its cooling water, the spent fuel could heat up and burn, releasing a large fraction of its highly radioactive contents into the environment. The consequences of such an event would be truly disastrous. A recent Princeton University study calculated, using sophisticated NOAA computer models, that a spent fuel pool fire at the Peach Bottom nuclear plant in Pennsylvania could heavily contaminate over 30,000 square miles with long-lived radioactivity and require the long-term relocation of nearly 20 million people, for average weather conditions. Depending on the wind direction and other factors, the plume could reach anywhere from Maine to Georgia. The impact on the American economy would be profound, and likely far worse than the estimated \$200 billion in damages caused by the much smaller release of radioactivity from the damaged Fukushima Daiichi plant.

The consequences of such a fire would be greatly reduced if nuclear plants thinned out their spent fuel pools by transferring the older fuel to dry storage casks. Yet the NRC has refused to require nuclear plants to do so, insisting in the face of all evidence that the risk is tolerable. And the industry will not voluntarily spend the money to buy additional dry casks, despite their modest cost in relation to the potential economic damages from a pool fire.

To this end, we urge Congress, as part of any nuclear waste management reform package, to address the unacceptably high risk of a spent fuel pool fire by either requiring nuclear plants to thin out their densely packed spent fuel pools by expediting transfer to dry cask storage, or by creating strong incentives for nuclear plants to do so on their own, such as a reduction in future Nuclear Waste Fee assessments. This requirement would have a valuable side benefit by adding good jobs in the dry cask storage construction industry.

While the risk of a large radiological release is greatly reduced when spent fuel is moved from high-density pools to dry casks, it does not go down to zero. One must also be concerned about sabotage attacks on dry casks, whether in storage or in transit. Indeed, during security reviews that it ordered following the 9/11 attacks, the NRC discovered ways to sabotage dry casks to cause significant radiological releases. Accordingly, it began developing new requirements for protecting dry cask storage facilities—both at reactor sites and at centralized sites—from sabotage. However, in 2015 the NRC delayed development of these new requirements for at least five years, citing resource constraints. Any new nuclear waste legislation should contain provisions to ensure that these vulnerabilities are promptly addressed.

We note that the discussion draft would expand the DOE's authority to build and/or store waste at consolidated monitored retrievable storage facilities, either DOE-owned or privately owned, although from our reading it would not allow use of the Nuclear Waste Fund for such activities. UCS remains unpersuaded that such facilities are useful additions to a comprehensive waste management strategy, and in fact may even be detrimental. The argument for consolidating spent fuel from shutdown reactors is more compelling than for fuel from operating reactors, but for

either case UCS has yet to see an analysis demonstrating that the benefits of interim storage clearly outweigh the additional costs and risks associated with siting and licensing new storage facilities and the extra transportation that would be required. An alternative that might be more desirable would be to arrange to ship spent fuel from each shutdown reactor to the nearest operating reactor that has the space to accommodate it, thus eliminating the need to license greenfield facilities, capitalizing on existing infrastructure and reducing transport distances. Congress should provide benefits to any reactor site that was willing to accept spent fuel from other sites.

One of the biggest disadvantages of consolidated interim storage facilities is that they could derail efforts to develop geologic repositories and hence would become de facto permanent disposal facilities. This is the reason why the Nuclear Waste Policy Act imposed tight constraints on monitored retrievable storage (MRS). In this regard, we note that the discussion draft would weaken the NWPA's critical linkage between an MRS facility and a geologic repository by allowing the DOE to move forward on multiple monitored retrievable storage facilities after the NRC makes a decision on Yucca Mountain, even if that decision were to deny construction authorization. Thus the draft would allow the DOE to give up on the search for a geologic repository should the NRC reject Yucca Mountain, and to focus only on interim storage. This would be the wrong outcome, for both environmental and security reasons. There need to be alternative sites for geologic disposal, and the time to start looking for them is now.

Spent fuel left indefinitely in a retrievable storage configuration will eventually become an attractive material for terrorists seeking to obtain nuclear weapons. Spent fuel contains

plutonium which can be extracted by reprocessing. However, for many decades after removal from a reactor, spent fuel is highly radioactive and very difficult for terrorists to steal and reprocess. But as the fission product cesium-137 decays away over time and the spent fuel becomes less radioactive, it will be easier to steal and reprocess, making the plutonium it contains more accessible. Under the NRC's rules, after the radiation dose rate from spent fuel decreases below a certain threshold (100 rem per hour at 3 feet), physical protection measures for spent fuel would have to be increased to the same strict standard that applies to separated plutonium. This would require a significant security upgrade for spent fuel in retrievable storage. Some commercial spent fuel will reach this point as soon as seventy years after being removed from the reactor. This is one reason why the nation must focus on the goal of building a geologic repository for spent fuel and making it irretrievable as soon as it is safe to do so. Once spent fuel is sealed within a deep underground facility, it will be much harder for terrorists to steal.

Section 122 of the Nuclear Waste Policy Act, which would allow a repository to remain retrievable "for the purpose of permitting the recovery of the economically valuable components of ... spent fuel," e.g. for reprocessing, has always been problematic. UCS has long opposed reprocessing because it separates plutonium and other materials that could be used in nuclear weapons, greatly increasing the risks of nuclear terrorism and proliferation, yet provides no benefits for radioactive waste management. In fact, reprocessing actually worsens the radioactive waste disposal problem by increasing the complexity and volume of nuclear wastes requiring geologic disposal. And it costs a lot of money to boot.

Section 122 of the NWPA is a relic of the thoroughly discredited notion that the plutonium and uranium in spent fuel may be economically valuable energy resources. In fact, separated plutonium is far more expensive than low-enriched uranium to use as reactor fuel, and it is highly unlikely that this will change in the foreseeable future. U.S. taxpayers may have to spend upwards of \$30 billion if the DOE decides to go forward with a plan to use 34 metric tons of excess weapons plutonium as reactor fuel, because nuclear utilities would never pay for it. And a repository would still be needed for the spent plutonium fuel in any event. The only customers willing to pay for spent fuel would be terrorists seeking the plutonium it contains.

In light of this, we do not support Section 406 of the discussion draft, which would provide for sharing “any economic benefits derived from the retrieval of spent nuclear fuel pursuant to this section” with the State and affected local entities. This provision contributes to the erroneous impression that the spent fuel sent to a repository could become a windfall for the host community, and could encourage efforts to maintain the repository in a retrievable condition, which as explained above would be a bad idea on security grounds.

Another part of the discussion draft that we are concerned about is Section 203, which would modify the application procedures for Yucca Mountain. Specifically, the proposed changes would remove the current statutory cap on the allowable nuclear waste quantity of 70,000 metric tons of heavy metal. In addition, they would require the NRC to consider a DOE application to amend a construction authorization “using expedited, informal procedures” and to make a decision on the amendment application within 18 months. Presumably, these provisions would force the NRC to make a quick decision no matter how significant the proposed changes to the

repository. For instance, upon receiving a construction authorization for a 70,000 metric ton facility per its current application, the DOE could then immediately request an amendment to triple the capacity, and the NRC would have to expedite its evaluation. But such a capacity increase would be a radical change to the Yucca Mountain design, and could have a major impact on the repository's performance, raising new safety issues that would require extensive analysis. Congress should not be in the business of imposing arbitrary constraints on the length of time that the NRC—an independent agency— can take to conduct reviews and the hearing procedures it uses.

The United States can afford to allow the NRC to take its time in reviewing the safety of Yucca Mountain and for the DOE to locate and characterize other possible repository sites. Provided that nuclear plants thin out their high-density spent fuel pools by expediting transfer to dry casks, and other necessary upgrades are carried out, spent fuel can be stored safely and securely at reactor sites for many decades. There is no urgent need to rush forward with a less-than-optimal approach for the long term.

Thank you for your attention. I would be happy to answer your questions.