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CONGRESSIONAL TESTIMONY

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"The American Energy Initiative"

Chairman Whitfield, Ranking Member Rush, and Members of the Subcommittee: My name is Jack Spencer. I am the Research Fellow for Nuclear Energy Policy at The Heritage Foundation. The views I express in this testimony are my own, and should not be construed as representing any official position of The Heritage Foundation.

Thank you for inviting me to testify before the Subcommittee on Energy and Power of the Committee on Energy and Commerce regarding the very important legislation introduced by Congressman Nunes, "An Energy Roadmap for America's Energy Future."

As we sit here today there are approximately 440 commercial nuclear reactors operating around the world. One hundred and four of them are operating in this country alone. With the exception of a few highly publicized and, I might add, often misunderstood accidents, these reactors have operated safely, cleanly, and to the benefit of society.

This is not to suggest that no problems have ever arisen as the accident in Fukushima, Japan makes abundantly clear. It is merely to acknowledge the good track record of nuclear power.

That is why, despite the recent accident in Japan, the introduction of the Energy Roadmap remains so important. U.S. demand for electricity is expected to increase by 31 percent over the next 23 years.[1] The United States must build 30 to 50 reactors just to maintain the 20 percent contribution of nuclear to America's energy mix. This alone does not justify reactor construction, but because nuclear power is emissions free, domestically produced, and affordable, expanding nuclear power must be a serious consideration.

Market Success Cannot Be Subsidized

Of the world's 440 reactors, 104 operate in the United States. Nuclear is among America's least expensive electricity sources, emits nothing into the atmosphere, and has a safety record that includes no injuries, much less fatalities. Despite these facts, no new plants have been ordered in the U.S. for three decades.

Given what we know about nuclear energy, there must be some underlying problems that would make investment in this proven technology so scarce. Indeed, today, despite all of the benefits of nuclear power, the industry insists that it will not build new plants without backing from the U.S. taxpayer.

Providing taxpayer support has been the approach of most politicians in recent years. They recognize that nuclear energy has many benefits, and to show their support they propose subsidies. In fact, looking at most of the proposals in recent years, one might conclude that Washington thinks that it can subsidize nuclear energy into commercial viability. Essentially, doing so was the basic premise behind the Energy Policy Act of 2005 (EPACT) proposals. That legislation put forth a series of subsidies to build five or so nuclear plants. That was supposed to help the industry get off the ground so that they could begin privately building plants. While the legislation instigated a series of permit applications to build new plants and even site work at one location, it has not brought about the advertised nuclear renaissance. Indeed, since the 2005 law passed, quite the opposite has occurred.

Instead of helping the nuclear industry to reestablish itself in the marketplace, the law has merely led to a proliferation of requests for additional taxpayer support. Since EPACT 2005, Congress has introduced a virtual parade of legislation to broaden the federal government's support for the nuclear industry. These proposals would increase capital subsidies, use taxpayer money for such activities as workforce development and manufacturing improvements, empower the Department of Energy to decide which technologies should move forward, and create mandates that essentially dictate that nuclear power is used.

[1]U.S. Energy InformationAdministration, Annual Energy Outlook 2011, April 26, 2011, at *http://www.eia.gov/forecasts/aeo/MT_electric.cfm* (June 1, 2011).

One of the basic problems with using subsidies to promote an industry is that it allows both industry and government to ignore the underlying problems, from a business or government standpoint, that give rise to the need for subsidies to begin with. This perpetuates those structural issues and creates a cycle where industry becomes dependent on federal government—and that is where the nuclear industry is today.

U.S. nuclear power is being held back by two major issues: nuclear waste management and an antiquated regulatory approach. The Energy Roadmap addresses both of these areas.

REFORMING SPENT NUCLEAR FUEL MANAGEMENT

Despite growing political and public support for nuclear power, progress toward actually building any new plants has been a struggle. While the blame for this stagnation often goes to inefficient government subsidy programs, the real problem lies in why those subsidies are necessary to begin with. Chief among these structural problems is the nation's incoherent nuclear waste policy. Ultimately, the lack of a pathway to waste disposal creates substantial unpredictability for nuclear investors. That risk must be offset to allow investment to move forward.

This was a problem prior to the Obama Administration. The federal government was legally obliged, according to the Nuclear Waste Policy Act (NWPA) of 1982, as amended, to begin collecting nuclear waste in 1998. Despite collecting approximately $30 billion (fees plus interest) from electricity ratepayers and spending nearly $10 billion, it has not collected one atom of nuclear waste. The one bright spot was the progress on Yucca Mountain made by President George W. Bush's Department of Energy (DOE).

The Obama Administration's anti-Yucca policy destroyed this progress. It ignored existing statute, such as the NWPA and the Yucca Mountain Development Act of 2002, which stated clearly that Yucca Mountain shall be the location of the nation's nuclear materials repository. It unilaterally requested the withdrawal of the DOE's permit application for Yucca to the Nuclear Regulatory Commission (NRC). Questions over the legality of this policy are currently under review by the courts.

Meanwhile, in October 2010, former advisor to Senator Harry Reid and current NRC Chairman Gregory Jaczko ordered a stop to all Yucca-related NRC activities. He argued that his authority to close out the Yucca program was derived from President Obama's 2011 budget request. The problem is that neither the House nor the Senate passed that proposed budget. Further, the order ignores the fact that the NRC's own Atomic Licensing and Safety Board agreed unanimously that the DOE lacked authority to withdraw the application. The chairman's actions were so unusual and contentious that fellow NRC commissioners were compelled to publicly denounce the decision.

The combination of federal promises to store nuclear waste, the Obama Administration's policy, and the NRC's actions has resulted in a complete lack of direction on nuclear waste management and a dereliction of responsibility on the part of the federal

government. This creates substantial government-imposed risk on the nuclear industry, which is the primary obstacle to an expansion of U.S. nuclear power.

Yucca Matters

Regardless of the number or type of new reactors built or the technology used to manage the spent nuclear fuel, a geologic repository is critical to the long-term success of nuclear power in the United States. The reality is that some of the byproducts of nuclear fission will last a long time, necessitating a place where they can be stored safely. According to all analysis conducted thus far, Yucca Mountain is adequate for that purpose.[2]

Since entering office, the Obama Administration has worked to end the Yucca Mountain nuclear program. It has promised to develop non-Yucca options for nuclear waste disposal. These options include recycling nuclear fuel and opening interim storage facilities. Both could play critical roles in any American nuclear power renaissance, but they simply cannot eliminate the need to open the Yucca Mountain repository.

The United States generates about 20 percent of its electricity from 104 nuclear power reactors, and these reactors in turn have generated more than 65,000 tons of spent nuclear fuel.[3] Commonly referred to as waste, this spent fuel is in fact a potentially valuable resource.

Although politicians and the public have begun to accept that nuclear power is a clean and affordable source of energy, questions remain about how to manage spent fuel. There are at least three solutions to this problem.

1. The spent fuel could be put directly into Yucca Mountain for permanent storage. While politics has made this impossible to date, no scientific, safety, or technological reason prevents it. Volumes of data attest to the repository's safety.[4] These data have been generated by numerous sources, including both private and public entities, and more studies are being conducted.
2. The U.S. could reprocess spent nuclear fuel, which still contains fuel that could be recovered and used again for future power generation. This could be achieved through numerous methods. Some technologies have already been commercialized abroad, and others are being researched and developed. These technologies will enable more efficient use of uranium resources and could

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[2]Jack Spencer and Nicolas Loris, "Yucca Mountain Remains Critical to Spent Nuclear Fuel Management," Heritage Foundation *WebMemo* No. 2131, May 1, 2008, at *http://www.heritage.org/Research/Reports/2008/05/Yucca-Mountain-Remains-Critical-to-Spent-Nuclear-Fuel-Management*.

[3]The Nuclear Energy Institute, "U.S. State by State Commercial Nuclear Used Fuel and Payments to the Nuclear Waste Fund, April, 11, 2011, at *http://www.nei.org/filefolder/US_State_by_State_Used_Fuel_and_Payments_to_NWF.xls* (May 31, 2011).

[4]U.S. Department of Energy, *Draft Supplemental Environmental Impact Statement for a Geologic Repository for the Disposal of Spent Nuclear Fuel and High-Level Radioactive Waste at Yucca Mountain, Nye County, Nevada*, October 2007, at *http://nepa.energy.gov/nepa_documents/docs/deis/eis0250F-S1D/* (June 1, 2011), and U.S. Department of the Interior, U.S. Geologic Survey, *Yucca Mountain as a Radioactive Waste Repository*, 1999, at *http://geopubs.wr.usgs.gov/circular/c1184/C1184.pdf* (June 1, 2011).

drastically reduce the amount of high-level nuclear waste. In the end, however, some byproduct will still need to be placed in permanent geologic storage.

3. The spent fuel could be stored on an interim basis at shorter-term storage facilities. This option also has advantages. Simply allowing the spent fuel to decay over time decreases its heat load, making it easier to store for the long term. Shorter-term storage would also provide time to develop new technologies that would improve long-term management of spent fuel.

Both recycling and interim storage would provide flexibility, but geologic storage in Yucca Mountain will still be necessary.

Yucca Is Not Enough

The accumulated sum of high-level nuclear waste stored at more than 100 sites in 39 states already exceeds the legal limit of Yucca's capacity.[5] Furthermore, America's reactors are producing approximately 2,000 tons of spent fuel annually.

The first problem with Yucca Mountain is that the applicable statute artificially constrains Yucca's capacity to 70,000 tons of waste. This includes 7,000 tons of space set aside for military waste. Unlike the commercial waste currently stored around the nation, defense waste is not recyclable and has no use. Therefore, for defense purposes alone, it is critical to open Yucca. These caps were decided nearly three decades ago when most believed that nuclear power had little future in the U.S., but with nuclear power likely to expand in coming years—perhaps dramatically—the current program for managing America's nuclear waste is infeasible.

The actual capacity of Yucca Mountain is much larger. Numerous bills have been offered in recent years to repeal the artificial 70,000 ton capacity restraint and replace it with a more scientifically calculated cap.[6] The Department of Energy calculates that the Yucca repository could safely hold 120,000 tons of waste.[7] Some believe the capacity is even greater. According to the Department of Energy, the expanded capacity of Yucca Mountain would likely be adequate to hold all of the spent nuclear fuel produced by currently operating reactors.[8]

Yet even with the expanded capacity, Yucca Mountain could not hold all of America's spent fuel if the U.S. adds nuclear capacity. According to one analysis, assuming 1.8 percent growth in America's nuclear capacity after 2010, the U.S. would fill a 120,000-ton Yucca by 2030. At this growth rate, the U.S. would need nine Yucca Mountains by the end of the 21st century.[9]

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[5]Samuel W. Bodman, U.S. Secretary of Energy, letter to Speaker of the House Nancy Pelosi, March 6, 2007, at *http://www.energy.gov/media/BodmanLetterToPelosi.pdf* (June 1, 2011).
[6]Two recent examples are the Nuclear Waste Policy Amendments Act of 2008 (S. 2551) and the Nuclear Fuel Management and Disposal Act (S. 2589, 109th Congress).
[7]Bodman, letter to Speaker of the House Nancy Pelosi.
[8]*Ibid.*
[9]Phillip J. Finck, Deputy Associate Laboratory Director, Applied Science and Technology and National Security, Argonne National Laboratory, statement before the Subcommittee on Energy, Committee on Science, U.S. House of Representatives, June 16, 2005, at *http://www.anl.gov/Media_Center/News/2005/testimony050616.html* (June 1, 2011).

The possibility of carbon constraints and other anti–fossil fuel restrictions raises the prospects of much more nuclear power in the United States. While Yucca Mountain will play an extremely important role in America's spent fuel management system, a more practical approach would use recycling, interim storage, and other tools to manage spent fuel.

Interim Storage

Spent fuel is highly radioactive when it is removed from the reactor. All radioactive materials decay, but while some lose their radioactivity within fractions of a second, others take hundreds of thousands of years. However, most stabilize within an intermediate period. The radioactivity of spent nuclear fuel falls to about 1 percent of its original levels within a year and to 0.1 percent within 40 years.[10] This characteristic makes interim storage an important element of spent-fuel management.

Although the United States has a de facto interim storage system because the federal government has not fulfilled its legal obligation to take possession of and dispose of America's spent fuel, it does not fully integrate interim storage into its spent-fuel regime.

Interim storage could be integrated in a number of capacities. It could be done on-site. Under this system, the fuel would be removed from a nuclear reactor's cooling pools and placed in an on-site facility before it is moved to another location for permanent storage or further processing, as is done in some other countries, including Finland.

Spent fuel could also be collected and stored at one or multiple off-site locations. These could be co-located with other spent-fuel processing facilities. Yucca Mountain could be an optimal location for an interim storage facility. Either way, interim storage has some advantages that spent-fuel managers would find attractive.

First, permanent geologic storage is a scarce resource. Although a geologic storage facility's capacity is often expressed in terms of volume, the primary limiting factor is heat load. Radioactive material gives off heat as it decays. The more it has decayed, the less heat it will give off, allowing more to be stored in any one place. Thus, allowing the fuel to decay for a few decades at an interim storage facility would ultimately allow storage of more spent fuel in a long-term geologic storage facility, even without further processing.

Introducing interim storage would allow far more flexible use of Yucca Mountain. However, adding interim storage to the U.S. spent-fuel management regime cannot eliminate the vital role of the Yucca Mountain repository. Opening Yucca must remain a top U.S. priority.

Second, interim storage frees cooling pool capacity. When spent fuel rods are removed from the reactors, they are placed in cooling pools. After a reactor's pools are full, absent some other option, it would essentially be forced to shut down, because there is nowhere else to put spent fuel rods.

This is a problem in the United States, where plants were built with spent-fuel pools

[10]Posiva Oy, "Spent Nuclear Fuel," at *http://www.posiva.fi/en/nuclear_waste_management/what_is_nuclear_waste/spent_nuclear_fuel* June 1, 2011).

under the assumption that the spent fuel rods would be removed and stored off-site. However, the politics of Yucca Mountain has prevented the U.S. from executing its spent-fuel management strategy as planned. U.S. plants are facing the real possibility of filling their cooling pools. Interim storage should be an option in the U.S. as part of a comprehensive spent-fuel management regime along with permanent geologic storage and recycling.

Many types of interim storage are used throughout the world. For instance, Sweden operates multiple waste storage facilities including one where used fuel is stored under water in an underground cavern, whereas the Czech Republic stores its fuel on reactor sites. In the U.S., interim storage would likely be applied in multiple ways due to the diversity of U.S. nuclear power plants.

Recycling

The current U.S. policy is to dispose of all spent fuel permanently. This is a monumental waste of resources. To create power, reactor fuel must contain 3 percent to 5 percent enriched fissionable uranium (U–235). Once the enriched fuel falls below that level, the fuel must be replaced. Yet this "spent" fuel generally retains about 95 percent of its original fissionable content, and that uranium, along with other byproducts in the spent fuel, can be recovered and recycled.

Many technologies exist to recover and recycle different parts of the spent fuel. The French have been successful in commercializing a process. They remove the uranium and plutonium and fabricate new fuel.

Other technologies show even more promise. Most of them, including the process used in France, were developed in the United States. Some recycling technologies would leave almost no high-level waste at all and would lead to the recovery of an almost endless source of fuel. However, none of these processes has been successfully commercialized in the United States, and they will take time to develop. Until the future of nuclear power in the U.S. becomes clearer, it will be impossible to know which technologies will be most appropriate to pursue in this market.

Ultimately, the private sector should make these decisions, as long as it conforms to regulations protecting public health and safety. Valuing spent nuclear fuel against the costs of permanent burial is a calculation best done by the companies that produce spent fuel and provide fuel management services.

Breaking the Yucca Impasse

The Energy Roadmap establishes a pathway to determine whether or not Yucca is suitable as a repository and puts forth a plan to find an alternative site if one is necessary. This is of critical importance. The legislation reiterates that Yucca Mountain shall remain the site of a radiological materials repository until determined otherwise by technical and scientific data, and it sets a 90-day timeline for the Nuclear Regulatory Commission to make such determinations. Should the determination be made that Yucca is not a suitable site based on scientific and technical analysis, the proposal sets forth a process to determine an alternative site. Further, it lifts the statutory limitations on what Yucca can hold and relies instead on technical analysis to determine Yucca's limits.

Opens the Door to Real Reform of Waste Management Policy

The Energy Roadmap also directs the Department of Energy (DOE) to report back to Congress on the feasibility of establishing an organization outside of the DOE to manage the Yucca repository and removing the fee that ratepayers pay to the federal government for used-fuel management services. Removing the fee would allow a market-based system to emerge for used-fuel management, and this is where the Energy Roadmap introduces the possibility of an innovative approach to nuclear waste management.

The success of a sustained rebirth of nuclear energy in the U.S. depends largely on disposing of nuclear waste safely. New nuclear plants could last as long as 100 years, but to reap the benefits of such an investment, a plant must be able to operate during that time. Having a practical pathway for waste disposal is one way to ensure long-term plant operations. Establishing such a pathway would also mitigate much of the risk associated with nuclear power, but as long as the federal government is responsible for disposing of waste, it is the only entity with any incentive to introduce these technologies and practices.

The problem is that the federal government has never been able to fulfill its current waste disposal obligations, much less introduce new and innovative methods of waste management. Although the Department of Energy under its current leadership has opened the door to reform, it is unclear that such reform will help the long-term prospects of nuclear energy. Administrations come and go, but inflexible rules and bureaucracies that oversee waste management seem to endure forever, making it impossible for the government to respond effectively to a rapidly changing industry. When it does attempt to respond, it often acts in ways that make no business sense and are inconsistent with the actual state of the industry.

Many of these efforts culminate in large government programs. While some of these programs have some near-term benefit insofar as they demonstrate political support for nuclear power, encourage private and public research and development, and develop the nuclear industry, they inevitably do more harm than good. They are run inefficiently and are often never completed. They cost the taxpayers billions of dollars and are often not economically rational. Furthermore, they often forgo long-term planning, and this leads to unsustainable programs that ultimately set industry back by providing fodder for anti-nuclear critics and discouraging progress in the private sector.

A New, Market-Based Approach

Introducing market forces into the process and empowering the private sector to manage nuclear waste can solve the problem, but this will require major reform. The federal government will need to step aside and allow the private sector to assume the responsibility for managing used fuel, and the private sector should welcome that responsibility.

The primary goal of any strategy for used-fuel management should be to provide a disposition pathway for all of America’s nuclear waste. The basic problem with the

current system is that every nuclear power plant needs a place to put its waste, and Yucca Mountain is potentially not big enough to hold it all under the current used-fuel management regime.

In other words, permanent geologic storage capacity is a scarce resource on which the industry depends. If used-fuel management were a market-based system, this storage capacity would carry a very high value. A new system should price geologic storage as a scarce resource and fold any costs into a fee for emplacing nuclear waste in Yucca Mountain.

Reforming Waste Management Finance

The key to this new approach will be to transform how waste management is financed. Once market-based pricing is in place, the fee that nuclear energy consumers pay to the federal government for waste management should be repealed, which the Energy Roadmap demands that the DOE consider. Under the current system, consumers pay for waste disposition through a flat fee, called the mill that is paid to the federal government at the rate of 0.1 cent per kilowatt-hour of nuclear-generated electricity. This fee as currently assessed has no market rationale. It is simply a flat fee that ratepayers pay to the federal government. It has never been changed, not even for inflation, and it is not a reflection of any actual services provided.

Comment [s1]:

In a market-based system, instead of paying a pre-set fee to the federal government to manage used fuel, nuclear power operators would pay a fee for service. This could include simply paying to place used nuclear fuel into geologic storage or for a more complex suite of processing services. These waste-management costs would then be folded into operating costs, which would be reflected in the price of power. This cost might be higher or lower than the current fee; more importantly, it would reflect the true costs of nuclear power.

The idea would be to set a rational pricing mechanism for emplacing nuclear waste in a geologic repository. The price could be based on a formula that considers a set of relevant variables, including heat content of the waste, predicted production of used fuel, repository capacity, and lifetime operation costs. Each of these variables would help to determine the price of placing a given volume of waste in Yucca at any specific time.

As the repository is filled, the fee to emplace additional fuel would obviously increase. The fee could also increase, depending on the formula, as new plants are constructed or old plants' licenses are renewed, because they would produce additional used fuel, thereby increasing the demand for repository space. Prices would be lower for waste that radiates less heat. Prices would fall if Yucca's capacity is expanded or if waste is reduced through alternative processes.

This would create a market for repository space. The fee could be structured in a number of ways. One example would be to charge a floating fee according to a predetermined formula. Under this scenario, the fee would shift constantly as the price variables change.

For example, a volume of waste with lower heat content would cost less to emplace than a similar amount with a higher heat profile. An alternative to a floating fee might be one that resets at timed intervals, such as once a year.

A pure market solution could also work where repository managers simply set the price for emplacement based on what operators are willing to pay, much like how shoes or a new truck is priced.

Nuclear power operators could then decide, given the price to place waste in Yucca, how to manage their used fuel. As the price to access Yucca goes up, so will the incentive for nuclear operators to do something else with their used fuel. This should give rise to a market-based industry that manages used fuel in the United States.

The market would dictate the options available. Some operators may choose to keep their used fuel on site to allow its heat load to dissipate, thus reducing the cost of placing that waste into Yucca. Companies may emerge to provide interim storage services that would achieve a similar purpose. The operators could choose options based on their particular circumstances.

As prices change and business models emerge, firms that recycle used fuel would likely be established. Multiple factors would feed into the economics of recycling nuclear fuel. Operators would make decisions based not only on the cost of placing waste in Yucca, but also on the price of fuel.

If a global nuclear renaissance does unfold, the prices for uranium and fuel services will likely rise. This would place greater value on the fuel resources that could be recovered from used fuel, thus affecting the overall economics of recycling. Instead of the federal government deciding what to build, when to build it, and which technology should emerge, the private sector would make those determinations.

Some nuclear operators may determine that one type of recycling works for them, while others may decide that a different method is more appropriate. This would create competition and encourage the development of the most appropriate technologies for the American market.

Create a Market for Waste Management Services

Such a market for repository space could give rise to a broader market for geologic storage. As waste production causes Yucca's storage costs to rise, companies could emerge that provide additional geologic storage at a lower price. This additional space would in turn reduce the value of the space available in Yucca. These additional repositories would set their prices however they deemed appropriate.

Alternatively, as Yucca fills, nuclear operators may decide to develop additional geologic storage facilities in a joint venture. While this may seem unlikely, given the problems associated with opening Yucca Mountain, other communities may be more receptive to

hosting a repository once a reliable safety record is established and the economic benefits of hosting a repository are demonstrated. The federal government would still take title to any waste placed in future repositories once they are decommissioned.

It is impossible to predict how a market might evolve, but unlike the government-run process that led to the Yucca Mountain site—a process mired in politics—private entities would establish the path forward by working with government regulators. Private entities would also be able to pursue their plans without having to contend with as much of the bureaucratic inertia that accompanies government-run operations.

Most importantly, this system would encourage the introduction of new technologies and services into the market as they are needed, as opposed to relying on the federal government. New technologies would not be hamstrung by red tape or overregulation. This system would also allow for the possibility of no expansion of nuclear power. If the U.S. does not expand nuclear power broadly, there is probably no reason to build recycling or interim storage facilities.

Getting the Federal Government as Far from Yucca Mountain as Possible

As permanent geologic storage is commoditized, the problem then becomes one of establishing responsibility for managing that scarce resource. Leaving that responsibility with the government provides no benefits—other, perhaps, than political benefits. No overarching need mandates that the government must manage Yucca Mountain or used nuclear fuel. Furthermore, leaving this responsibility in the hands of government comes with all kinds of pitfalls, including inflexibility, inefficiency, politics, and being subject to annual appropriations, to name a few. Similarly, a public–private partnership is not necessary and has no inherent advantages, again, other than perhaps political.

Instead, a completely new organization should be established to manage Yucca Mountain. The new organization's purpose would be to ensure that Yucca is available to support the commercial nuclear industry's need for long-term geologic storage in a way that benefits Nevada and to set the fee for placing radiological materials in Yucca. This fee would be the primary mechanism for managing access to the repository. Its one operating mandate should be to remain open to receive radiological materials either until a second repository is opened or until the last commercial nuclear power plant ceases operations.

The federal government should not be part of the management team; however, local and state government could. The new entity could be organized in any number of ways. It could take the form of a nonprofit organization that is independent of but represents the nation's nuclear energy producers. Such a structure would ensure that no operator receives preferential treatment and that it functions as a service to all nuclear operators. It also would prevent a profit-seeking entity from holding a monopoly over a key asset on which an entire industry depends. The entity could also be a public–private partnership with, perhaps, the state of Nevada being a majority partner. The federal government

would provide oversight through the Nuclear Regulatory Commission (NRC) and other appropriate agencies.

The new organization should be created as soon as possible and immediately commence a transition plan, which would coincide with the NRC's review of the Department of Energy's application for a Yucca Mountain construction permit. During the transition period, the new organization would work with the Department of Energy's Office of Civilian Radioactive Waste Management to move the application for the Yucca construction permit through the NRC. If the license is granted, the new organization would take control of Yucca operations, which would include overseeing Yucca construction and preparing for long-term operations.

Protecting the Taxpayer from Cleanup Costs

The NRC requires that each nuclear plant operator establish a funding mechanism to ensure that resources will be available to decommission the plant once operations cease. This is achieved either through guarantees from its parent company or by establishing a decommissioning fund. This protects the taxpayer from the financial obligations of plant decommissioning if the operator becomes financially unable to carry out that responsibility.

A similar funding mechanism should be required for new plant licenses and life extensions to cover the costs of waste disposal once the mill is repealed. This could be included in the decommissioning fund or set up as a separate entity. It would not be a payment to the federal government and would always be controlled by the nuclear operator. The monies set aside should be adequate to finance the geologic disposal of any used fuel held on-site in dry storage. This guarantees that waste disposal funds will be available, even if the operator becomes insolvent.

Growing Support of Market-Based Waste Management

The idea that the market may ultimately hold the answers to the nation's nuclear waste dilemma is gaining ground. For example, Tim Echols, a Georgia state public services commissioner, recently published an op-ed in the *Atlanta Journal-Constitution* supporting the idea. Echols argues that market forces must be brought to bear if we are ever to solve the nuclear waste issue. More recently, the Center for Strategic and International Studies, the Federation of American Scientists, the University of Illinois Champaign–Urbana and The Heritage Foundation authored a report entitled "U.S. Spent Nuclear Fuel: A Market-Based Solution." This document, like Echols' op-ed, articulates the need to introduce market forces into nuclear waste management and, significantly, was published by group of experts who represent a diversity of political views.

Most telling, however, are the foreign countries that have embraced private-sector responsibility for nuclear waste management. Swedish utilities, for example, are responsible for waste management and have developed a comprehensive management

regime that includes geologic storage. Similarly, Finnish nuclear waste producers are responsible for managing their nuclear waste.

REGULATORY REFORM

The Energy Roadmap also would reform how new reactors are permitted. The current permitting process to build new reactors is a product of a streamlining effort established by the Energy Policy Act of 1992, but it is still proving to be slow and unpredictable. The Nunes legislation would create a second permitting track that would allow for a permit to be issued in approximately two years.

To be eligible, applicants must:

- Construct a reactor with a design that has already been certified by the Nuclear Regulatory Commission (NRC);
- Build the new reactor on or adjacent to a site where reactors already operate;
- Not be subject to any NRC actions to revoke operating permits; and,
- Have submitted a completed combined construction and operating license permit application that has been docketed by the NRC.

The expedited process would entail the issuance of a draft Environmental Impact Statement (EIS) within 12 months of the application being docketed, and the final EIS would be issued within 18 months. Further, hearings over contested application issues would begin once the draft EIS is issued rather than after the final EIS. This would allow the NRC and applicant to resolve contested licensing issues within 24 months of the application being docketed. The bill also calls for the Safety Evaluation Report—NRC's application technical review report—to be completed within 18 months of the application being docketed. While such timeframes would be tight, with close coordination between the applicant and the NRC, it should allow for a significantly shortened process.

The bill also begins to break down one of the primary obstacles that new reactor technologies face in entering the marketplace: a lack of regulatory support. The current NRC does an outstanding job of regulating large light-water reactors, 104 of which operate in the U.S. today, but it performs inadequately in developing regulations that would allow new technologies into the marketplace.

Without this regulation, new technologies are effectively banned. Customers are hesitant to buy reactors that the NRC will not regulate, and the NRC does not want to put its resources toward a reactor technology that has no customers. The result is that new nuclear technologies are at a severe disadvantage.

To begin changing this, the Roadmap directs the NRC to develop a set of guidelines for technology-neutral nuclear plant designs. Instead of mandating that a specific nuclear technology be wedded to a specific plant design, the new guidelines would allow other nuclear reactor technologies to be used in a nuclear power plant, a significant step toward building a more diverse and competitive nuclear industry.

It also gives the NRC a 90-day deadline to "transmit to the Congress a report containing recommendations, including personnel and resource requirements" needed to establish a predictable regulatory program for small modular reactors. Like other elements of the bill, this provision moves away from the subsidy-first mentality that consolidates market power in Washington to a market-based vision that allows the actual commercial value of a technology to determine its ultimate success.

Finally, the proposal allows provisional certification of new reactor designs. While the provision does not eliminate or reduce any requirements for reactor design approval, it would allow a reactor plant permit applicant to move forward with the permitting process. In issuing provisional certification, the legislation would direct the NRC to consider such factors as whether a design is commercially viable in other markets or if it has been certified in other countries.

That concludes my testimony.

I look forward to your questions.

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