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“Recommendations of the Blue Ribbon Commission on America’s Nuclear Future”

Before the

Subcommittee on Environment and the Economy

Committee on Energy and Commerce

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SUMMARY OF UCS TESTIMONY

- The Union of Concerned Scientists (UCS) commends the commissioners and staff of the Blue Ribbon Commission (BRC) for doing an excellent job in addressing an extremely challenging set of issues.
- UCS agrees with most of the eight recommendations in the BRC report.
- UCS strongly concurs with the BRC's conclusion that "no currently available or reasonably foreseeable reactor and fuel cycle technology developments --- including advances in reprocessing and recycling technologies --- have the potential to fundamentally alter the waste management challenge over at least the next several decades, if not longer." UCS believes that if the BRC had endorsed reprocessing, it would have sent the wrong message to the rest of the world, undermining efforts to control the growth of weapon-usable material stockpiles.
- UCS supports the consent-based siting approach and the creation of a new waste management organization that is independent of DOE, provided that its operations are limited to transport, storage and direct disposal of spent fuel and high-level waste.
- UCS is not persuaded that new legislation to facilitate the siting and development of consolidated interim storage facilities is necessary, either for spent fuel from operating reactors or from shutdown reactors.
- UCS believes that spent fuel can be managed safely at reactor sites provided that the Nuclear Regulatory Commission appropriately upgrades its requirements to minimize the safety and security risks associated with long-term (up to 100 years) storage at reactors.
- UCS supports limited taxpayer-funded nuclear energy R&D on improving safety, security and efficiency of existing nuclear plants and the once-through fuel cycle.

Good morning. On behalf of the Union of Concerned Scientists, I would like to thank Chairman Shimkus, Ranking Member Green, and the other distinguished members of the Subcommittee for the opportunity to provide our views on the recommendations of the Blue Ribbon Commission on America's Nuclear Future (BRC).

The Union of Concerned Scientists (UCS) is neither pro nor anti-nuclear power, but has served as a nuclear power safety and security watchdog for over 40 years. UCS is also deeply concerned about global climate change and has 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. However, the Fukushima Daiichi crisis has revealed significant vulnerabilities in nuclear safety and has shaken public confidence in nuclear power. Regulators around the world must seriously address these vulnerabilities in order to reduce the risk of another Fukushima in the future. Otherwise, the viability of nuclear power as a reliable electricity option will be in doubt.

Before proceeding, I would like to mention that although UCS supports the development of one or more geologic repositories for the direct disposal of spent fuel, UCS does not have a position on the suitability of the Yucca Mountain site, or for that matter, any other potential site in the United States. The UCS Global Security Program does not have the geological expertise necessary to evaluate site suitability. However, we concur with the BRC's assessment that the process by which Yucca Mountain was selected was flawed and contributed to the program's ultimate failure. UCS supports the BRC's call for a new, consent-based repository siting

approach that will be more likely to lead to selection of sites that are both technically suitable and broadly acceptable to the public.

UCS commends the BRC commissioners and staff for doing an excellent job in addressing an extremely challenging set of issues. The BRC's report is clear, well-written and compelling, and provides a comprehensive roadmap for moving toward achieving a national consensus on this highly controversial issue. And the BRC's exhaustive effort to conduct its business in a transparent way and to solicit and seriously consider public input was apparent. UCS staff had the opportunity to testify three times before the BRC and also to participate in more informal BRC-sponsored forums.

UCS has reviewed the eight recommendations in the final report and agrees with most of them. However, perhaps our greatest area of agreement concerns the absence of a recommendation. The BRC, after careful consideration, did not recommend that the United States reverse a 35-year precedent and proceed immediately with development of facilities for spent fuel reprocessing and plutonium fuel production and use. UCS strongly concurs with the BRC's conclusion that "no currently available or reasonably foreseeable reactor and fuel cycle technology developments --- including advances in reprocessing and recycling technologies --- have the potential to fundamentally alter the waste management challenge over at least the next several decades, if not longer."

UCS has long opposed reprocessing because it produces 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 contrast, reprocessing actually worsens the radioactive waste disposal problem. For instance, the Energy Department calculated in a 2008 draft environmental impact statement that a 50-year reprocessing program would only reduce the volume of high-level waste by 15,000 cubic meters compared to the once-through cycle, while generating an additional 400,000 cubic meters of greater-than-class C low level waste, a category of waste that itself will likely require deep geologic disposal.

UCS believes that if the BRC had endorsed reprocessing, it would have sent the wrong message to the rest of the world, undermining efforts to control the growth of weapon-usable material stockpiles. For instance, Japan is on the verge of restarting its reprocessing plant at Rokkasho-mura, a troubled \$20 billion project that has been buffeted by technical problems, massive cost escalation and, since the Fukushima accident, renewed concerns about its vulnerability to accidents and severe natural phenomena. Japan has already accumulated 45 metric tons of plutonium from overseas and domestic reprocessing operations, of which 10 metric tons—enough for more than one thousand Nagasaki-type nuclear weapons—is on Japanese territory. Japan will be unable to use any of this plutonium in its nuclear reactors for the foreseeable future because of public doubts about reactor safety in the wake of Fukushima, and the technical failure of the Monju experimental fast breeder reactor program. Thus Japan does not need to add to its stockpile of separated plutonium by resuming reprocessing. UCS appreciates that the BRC report will give no support to advocates of a reprocessing restart in Japan.

Concerning BRC recommendation 2, creation of a new congressionally chartered federal corporation for managing the disposal of spent fuel and high-level waste, UCS supports creation of a new entity that is independent of DOE, fully transparent in its deliberations and decision-making, and free of undue influence from any of the multiple stakeholders that it must serve. Most importantly, however, the entity's operation should be strictly limited to the activities recommended by the BRC: transport, storage and direct disposal of spent fuel and high-level waste, with limited research and development as needed to support the safety and security of those activities. The entity should not be given any authority to use the Nuclear Waste Fund or any other funds to conduct research, development or deployment of reprocessing plants or any other fuel cycle technology or facility not needed for direct disposal of spent fuel and high-level waste. In any event, the huge additional cost of such activities would require a significant increase in the waste fee assessment that would be unpopular among ratepayers.

One area where UCS disagrees with the BRC recommendations concerns its strong endorsement of prompt efforts to develop centralized interim storage facilities (Recommendation 5). UCS is not persuaded that new legislation and other actions to facilitate the siting and development of consolidated interim storage facilities are necessary, either for spent fuel from operating reactors or from shutdown reactors. The argument for consolidating spent fuel from shutdown reactors is more compelling than for fuel from operating reactors, but UCS has yet to see an analysis clearly demonstrating that the benefits of interim storage outweigh the additional costs and risks associated with siting and licensing new storage facilities and the additional transportation that would be required—even for spent fuel from shutdown reactors. 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.

It is not apparent that siting a consolidated interim storage facility would be any easier politically to achieve than siting a geologic repository. Prospective host communities for new centralized storage sites would likely demand significant incentives, such as new research and development facilities, in exchange for their acceptance. Such costly incentives would best be reserved for potential repository host communities, as there is unlikely to be enough funding to support multiple endeavors. Also, efforts to site interim storage facilities could distract from or even derail the far more important goal of finding a repository site. There was a good reason why the 1987 Nuclear Waste Policy Act amendments linked construction of a monitored retrievable storage facility to progress on licensing a repository; UCS does not support the BRC's proposal to sever that link. UCS also does not agree that the "flexibility" a retrievable interim storage facility could provide is necessarily a desirable property, should that flexibility facilitate reprocessing of spent fuel in the future. We believe that the principle of intergenerational equity requires that action must be taken today to preclude easy access in the future to the plutonium in spent fuel, which will become more vulnerable over time as the spent fuel radiation barrier provided by cesium-137 decays away. This can best be accomplished by direct geologic disposal of spent fuel as soon as practicable.

UCS believes that spent fuel can be managed safely at reactor sites provided that the Nuclear Regulatory Commission appropriately upgrades its requirements to minimize the safety and security risks associated with long-term (up to 100 years) storage at reactors. To this end, we

support the BRC's call for a new review by the National Academy of Sciences (NAS) of the safety and security issues associated with spent fuel storage, both in wet pools and in dry casks. This review should consider all that the NRC has—or hasn't—done since the 2006 NAS study on spent fuel security to address the risk of a zirconium fire and widespread fuel damage at densely packed spent fuel pools. As was the case at the time of the 2006 study, much of the information associated with this issue is classified. Now, however, there should be additional efforts to declassify the information necessary to fully inform Americans of the risks they face from overstuffed spent fuel pools in the event of a terrorist attack or severe accident. Any lessons learned from Fukushima, where the spent fuel pools were not nearly as full as those at U.S. plants, will have to be interpreted appropriately for the U.S. case.

Although a new NAS study would be useful for a number of reasons, we do not believe that more study is needed to support a new requirement by the NRC to thin out densely packed spent fuel pools by accelerating transfer to dry cask storage. With regard to addressing the potential risk of a zirconium fire in a spent fuel pool, NRC Chairman Gregory Jaczko commented at an October 2011 meeting that it “should be an issue we should have a handle on today, there really is no excuse for that. This came up in 9/11, we've done experiments so, I think if we do this the way we've always done things we will not get these things done in a reasonable period of time ...” In other words, NRC appears to already have sufficient information. All it needs now is the political will to follow through and do what is necessary to protect the public.

The NRC must also comprehensively address the potential sabotage threat to dry storage casks and transport casks. It must consider a wide variety of plausible attack modes that could lead to

significant radiological releases when setting its requirements for physical protection systems for dry cask storage facilities and spent fuel shipments.

With regard to BRC Recommendation 7, UCS supports a limited program for nuclear energy research and development. However, it does not support BRC's endorsement of a major DOE research and development program on spent fuel reprocessing and related technologies. UCS maintains that the proliferation, nuclear terrorism and environmental risks posed by reprocessing-based fuel cycles are so intractable that continuing to spend scarce taxpayer dollars on studying these systems is a clear case of throwing good money after bad. Instead, we believe that taxpayer funded R&D needs to focus on enhancing the safety, security and effectiveness of nuclear plants and the once-through fuel cycle, and the safe interim storage, handling, transportation and direct geologic disposal of spent fuel.

In the current and foreseeable fiscal climate, DOE should not continue to spend money on failed technologies, such as actinide-burning fast reactors, that cannot meet basic waste management objectives even if the systems were to perform perfectly. For instance, the BRC points out that "many decades to a couple of centuries" would be needed to decrease required repository space by 75% in a fast-reactor based closed fuel cycle, and that this is fundamentally due to the low rates of consumption of plutonium and other long-lived elements in fast reactors. We believe that this fact illustrates the futility of such approaches, as well as their incompatibility with the principle of intergenerational equity. DOE has already spent decades and many millions of dollars studying these systems even though their limitations were widely known. DOE also continues to research advanced reprocessing technologies that it calls "proliferation-resistant,"

even though the U.S. nuclear weapons labs have concluded there is little value to such approaches. Yet the BRC apparently ignores this history, specifically citing "fast-spectrum reactors ... capable of continuous actinide recycling" as a good example of potential "game-changing" technologies worthy of further R&D.

For this reason, an external, independent peer review process for DOE fuel cycle R&D should be established by an entity such as the NAS. Simply relying on a quadrennial internal review, as the report recommends, is not sufficient. The review should be based on clear and quantitative objectives and milestones, and should reject technologies without a realistic chance of achieving program goals, such as actinide "recycling."

Finally, UCS agrees with Recommendation 8 that U.S. leadership is an important factor in promoting safety, nonproliferation and security, and believes that the best approach is for the United States to lead by example. With regard to the nuclear fuel cycle, the most valuable signal the United States could send to the rest of the world is the demonstration that direct disposal of spent fuel in a nation with a very large nuclear power program is both politically and technically feasible. In addition, this would show the rest of the world that reprocessing spent fuel as a waste management strategy is neither necessary nor desirable.

UCS supports the concept of multi-national fuel cycle facilities with regard to those facilities needed for the once-through fuel cycle, such as uranium conversion, uranium enrichment and uranium fuel fabrication. However, UCS does not believe that a multi-national model could mitigate the profound proliferation and nuclear terrorism risks associated

with spent fuel reprocessing plants, MOX fuel fabrication plants and other facilities that produce or process separated weapon-usable materials.

In particular, the threats of sub-national diversion or theft would not be effectively addressed merely by adopting a multi-national approach, because they would be as challenging to control at a multi-national facility as they would at a national facility. Such arrangements would also involve the international transport of weapon-usable materials such as MOX fuel, presenting additional opportunities for theft.

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