

Overview of the Blue Ribbon Commission on America's Nuclear Future

June 2011



BLUE RIBBON COMMISSION
ON AMERICA'S NUCLEAR FUTURE

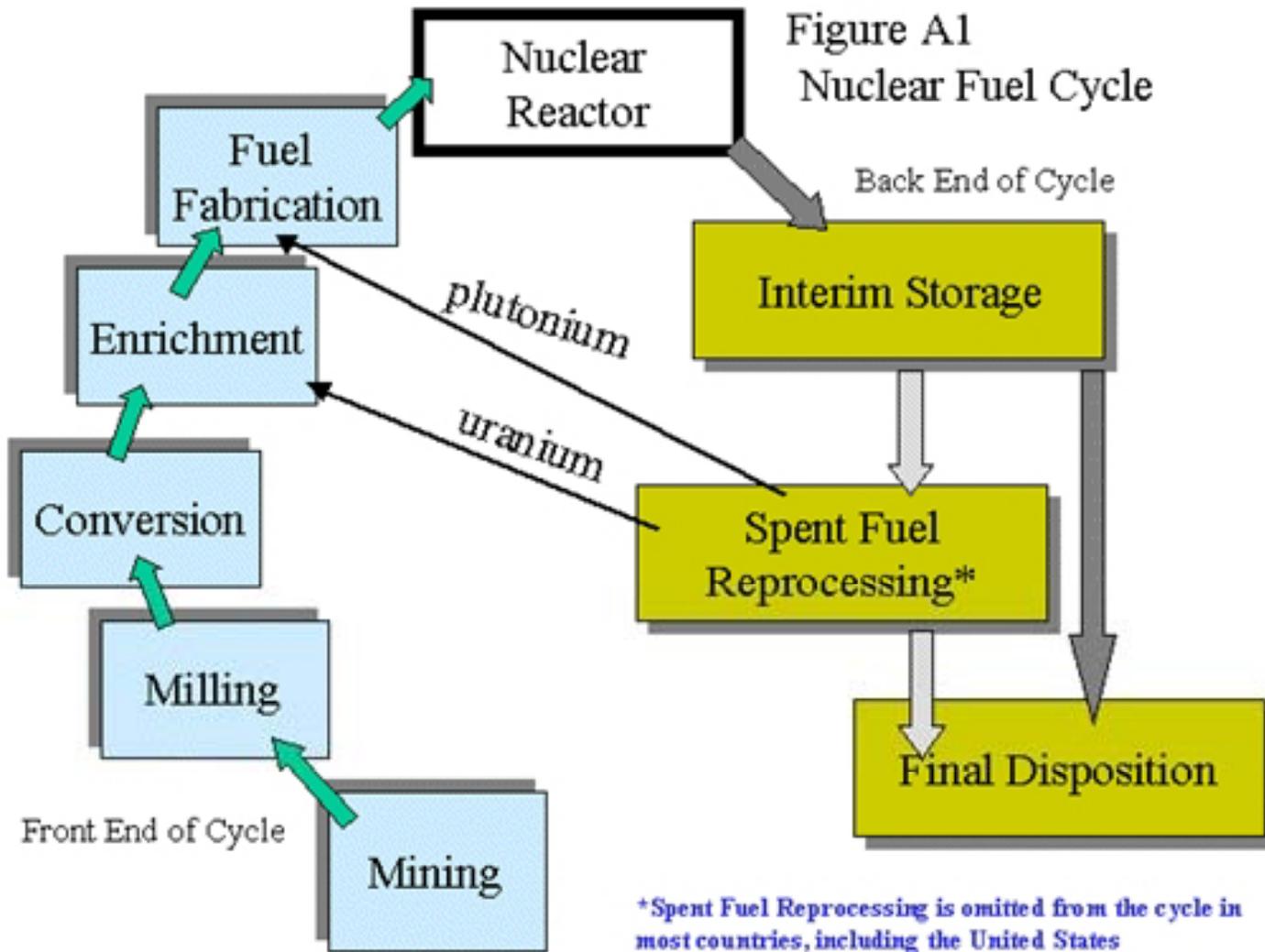
Origins and Charter

- The Blue Ribbon Commission on America's Nuclear Future was established in accordance with the provisions of the Federal Advisory Committee Act and as directed by the President's Memorandum for the Secretary of Energy dated January 29, 2010: Blue Ribbon Commission on America's Nuclear Future
- This Commission is chartered under the authority of the U.S. Department of Energy and will deliver its recommendations to the Secretary of Energy
- The purpose of the Commission is to conduct a comprehensive review of policies for managing the back end of the nuclear fuel cycle and recommend a new plan



Members

- **Lee Hamilton**, Co-Chair - Director of The Center on Congress at Indiana University, former Member of Congress (D-IN)
- **Brent Scowcroft**, Co-Chair – President, The Scowcroft Group, and former National Security Advisor to Presidents Gerald Ford and George H.W. Bush
- **Mark Ayers**, President, Building and Construction Trades Department, AFL-CIO
- **Vicky Bailey**, Former Commissioner, Federal Energy Regulatory Commission; Former Indiana PUC Commissioner; Former DOE Assistant Secretary for Policy and International Affairs
- **Albert Carnesale**, Chancellor Emeritus and Professor, UCLA
- **Pete V. Domenici**, Senior Fellow, Bipartisan Policy Center; former U.S. Senator (R-NM)
- **Susan Eisenhower**, President, Eisenhower Group, Inc.
- **Chuck Hagel**, Distinguished Professor at Georgetown University, Former U.S. Senator (R-NE)
- **Jonathan Lash**, President, World Resources Institute
- **Allison Macfarlane**, Assoc. Professor of Environmental Science and Policy, George Mason Univ.
- **Richard A. Meserve**, President, Carnegie Institution for Science, and former Chairman, U.S. NRC
- **Ernie Moniz**, Professor of Physics and Cecil & Ida Green Distinguished Professor, MIT
- **Per Peterson**, Professor and Chair, Dept. of Nuclear Engineering, Univ. of California – Berkeley
- **John Rowe**, Chairman and Chief Executive Officer, Exelon Corporation
- **Phil Sharp**, President, Resources for the Future; former Member of Congress (D-IN)



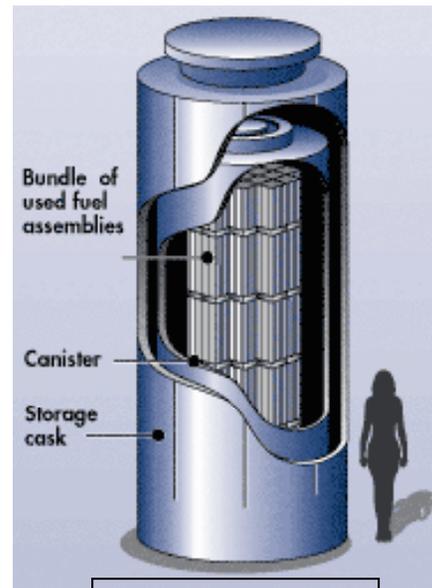
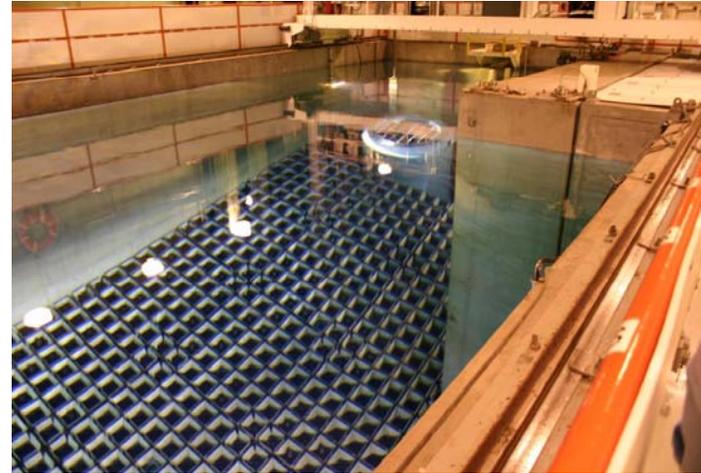
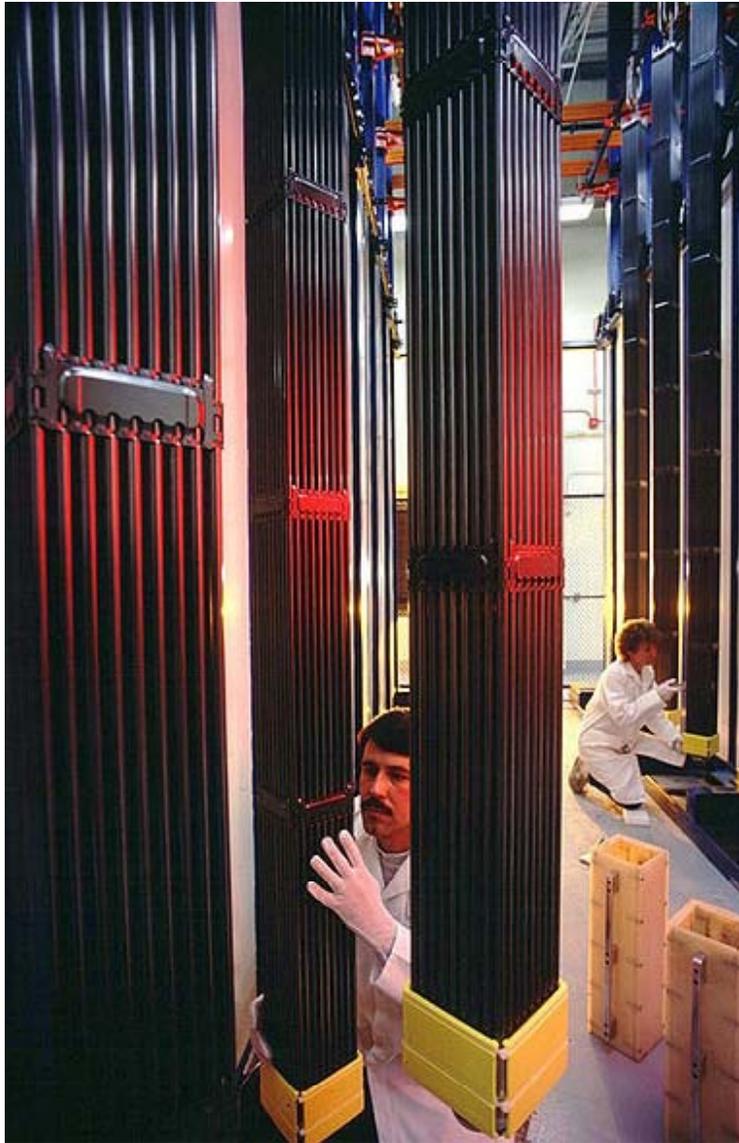
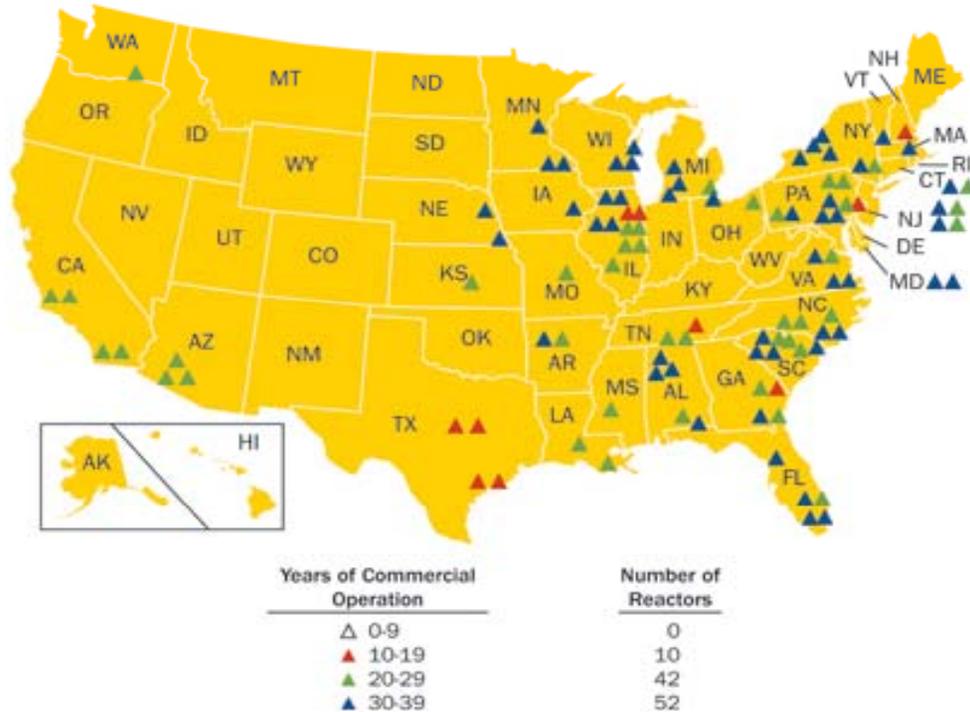


Image from NRC web site



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U.S. Commercial Nuclear Power Reactors—Years of Operation



Source: U.S. Nuclear Regulatory Commission

Table 1. Status of Decommissioned Commercial Nuclear Power Reactor Sites in the U.S.

Plant	State	MTHM Stored at Site	MTHM in Pool Storage	MTHM in Dry Storage	Number of Casks	DOE Estimated Casks	Total Casks (Actual Plus Estimated)	Average MTHM/Cask
Big Rock Point	Michigan	68	0	68	7	—	7	8.3
Haddam Neck ^a	Connecticut	412	0	412	41	—	41	10.1
Humboldt Bay ^a	California	29	0	29	5	—	5	5.8
LaCrosse ^b	Wisconsin	38	38	0	5	—	5	7.6
Maine Yankee	Maine	542	0	542	60	—	60	9.0
Rancho Seco	California	228	0	228	21	—	21	10.9
Trojan	Oregon	359	0	359	34	—	34	10.6
Yankee Rowe	Massachusetts	127	0	127	15	—	15	8.5
Zion 1 & 2 ^c	Illinois	1,019	1,019	0	—	106	106	9.6
TOTALS		2,813[*]	1,057	1,756[*]	188	106	294	—

NOTE: ^aDry storage underway in 2008. Holtec canister has capacity of 80 assemblies (five canisters for the 390 assemblies).

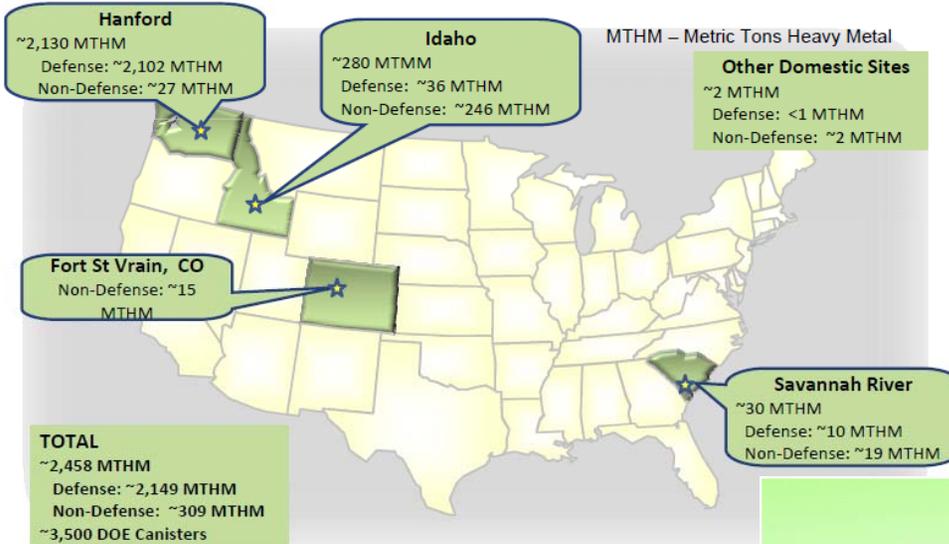
^bDry storage contract entered with NAC for five NAC-MPC canisters. Dry storage schedule indicates target completion by the end of 2010.

^cDecommissioning contract entered with EnergySolutions. Canisters estimated using FuelSolutions W21 capacity. Target schedule for completion is 2013.

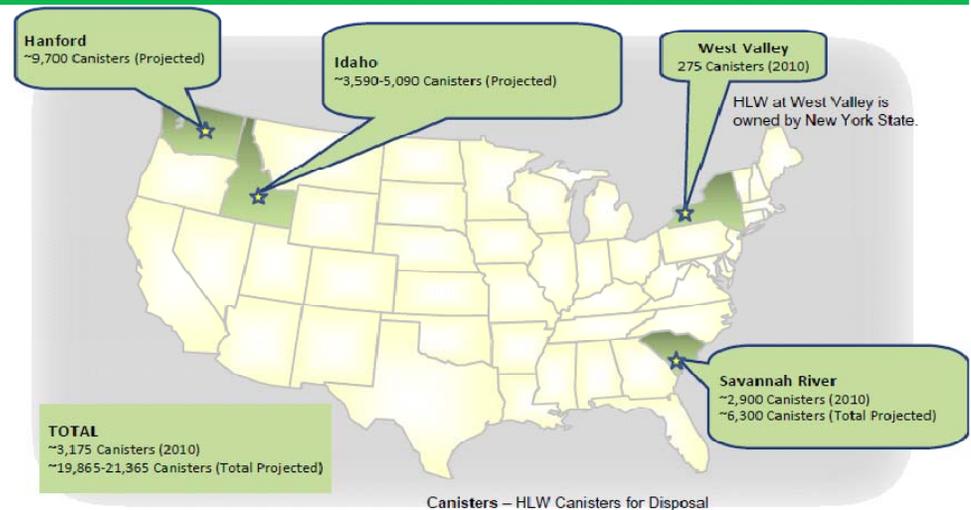
DOE = U.S. Department of Energy; MPC = multipurpose canister; NAC = Nuclear Assurance Corporation.

^{*}Totals might differ from sums of values due to rounding.

Current SNF Inventory (2010)



2010 DOE HLW Inventory



Activities to Date

- Full Commission meetings/Commissioner site visits:
 - March – Where are we and how did we get here?
 - May – Getting the issues on the table
 - Three subcommittees formed – Reactor & Fuel Cycle Technology; Transportation & Storage; Disposal
 - July – Hanford visit: a community's perspective
 - September – Crosscutting issues
 - Governance, siting, international implications, ethical & societal foundations
 - November – International perspectives, working with the states, expert advice
 - January – Visits to SC/ GA (Savannah River) and NM (WIPP)
 - February - Visits to Japan, Russia and France; meeting on crosscutting issues
 - Organizational form and scope, siting, financial considerations
 - May – NRC/DOE reviews post-Fukushima; discussion of draft subcommittee recommendations to the full Commission



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R&FCT Subcommittee

- Formed to answer the question: “Do technical alternatives to today’s once-through fuel cycle offer sufficient promise to warrant serious consideration and R&D investment, and do any of these alternative technologies hold significant potential to influence the way in which irradiated nuclear fuel is stored and disposed?”
- Subcommittee Membership:
 - Pete Domenici – Co-Chairman
 - Per Peterson – Co-Chairman
 - Al Carnesale
 - Susan Eisenhower
 - Allison Macfarlane
 - Richard Meserve
 - Ernie Moniz
 - Phil Sharp
 - *Lee Hamilton - Ex Officio*
 - *Brent Scowcroft - Ex Officio*



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T&S Subcommittee

- Formed to answer the question: “Should the US change the way in which it is storing used/spent nuclear fuel and high level waste while one or more geologic repositories are established?”
- Subcommittee Membership:
 - Richard Meserve – Co-Chairman
 - Phil Sharp – Co-Chairman
 - Mark Ayers
 - Vicky Bailey
 - Al Carnesale
 - Pete Domenici
 - Ernie Moniz
 - John Rowe
 - *Lee Hamilton - Ex Officio*
 - *Brent Scowcroft - Ex Officio*



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Disposal Subcommittee

- Formed to address the question “How can the U.S. go about establishing one or more disposal sites for high-level nuclear wastes in a manner that is technically, politically and socially acceptable?”
- Subcommittee Membership:
 - Chuck Hagel, Subcommittee Co-Chair
 - Jonathan Lash, Subcommittee Co-Chair
 - Mark Ayers
 - Vicky Bailey
 - Susan Eisenhower
 - Allison Macfarlane
 - Per Peterson
 - John Rowe
 - *Lee Hamilton, Ex-Officio*
 - *Brent Scowcroft, Ex-Officio*



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Summary of input to-date

- March 2011 – issued staff “What We’ve Heard” report
 - Summarizes major themes heard thus far in seven broad areas:
 - Program Governance and Execution
 - Nuclear Waste Fee and Fund
 - Approach to Siting
 - Reactor and Fuel Cycle Technologies
 - Transport of Spent Fuel and HLW
 - Storage of Spent Fuel and HLW
 - Disposal System
 - Available at www.brc.gov
 - Comments welcome
 - brc@nuclear.energy.gov



Disposal Subcommittee – draft recommendations

- **1. The United States should proceed expeditiously to develop one or more permanent deep geological facilities for the safe disposal of high-level nuclear waste**
 - The Subcommittee further concludes that geologic disposal in a mined repository is the most promising and technically accepted option available for safely isolating high-level nuclear wastes for very long periods of time.
 - Nuclear materials that require long-term isolation exist and we have benefited from the activities that produced them. There is no ethical basis for abrogating responsibility for their safe, long-term disposition to future generations.



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Disposal Subcommittee – draft recommendations

- **2. A new, single-purpose organization is needed to develop and implement a focused, integrated program for the transportation, storage, and disposal of nuclear waste in the United States**
 - The Subcommittee believes it will be crucial for a new waste management organization to have (1) a focused and well-defined mission, (2) the financial and institutional means to deliver on its commitments, and (3) sufficient independent authority—subject to appropriate financial, technical, and regulatory oversight—to provide institutional and programmatic stability over time



Disposal Subcommittee – draft recommendations

- **3. Assured access to the balance in the Nuclear Waste Fund (NWF) and to the revenues generated by annual Nuclear Waste Fee payments from ratepayers and utilities is absolutely essential and must be provided to the new nuclear waste management organization**



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Disposal Subcommittee – draft recommendations

- **4. A new approach is needed to site and develop nuclear waste management and disposal facilities in the United States in the future. We believe siting processes for all such facilities are most likely to succeed if they are:**
 - (1) **Consent-based**—in the sense that affected communities have an opportunity to decide whether to accept facility siting decisions and retain significant local control.
 - (2) **Transparent**—in the sense that all stakeholders have an opportunity to understand key decisions and engage the process in a meaningful way.
 - (3) **Phased**—in the sense that key decisions are revisited and modified as necessary along the way rather than being pre-determined in advance.
 - (4) **Adaptive**—in the sense that process itself is flexible and produces decisions that are responsive to new information and new technical, social, or political developments.
 - (5) **Standards- and science-based**—in the sense that the public can have confidence that all facilities meet rigorous, objective, and consistently-applied standards of safety and environmental protection.



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Disposal Subcommittee – draft recommendations

- **5. The current division of regulatory responsibilities between the U.S. NRC and the EPA is appropriate and should continue. In addition, we urge that new, site-independent safety standards be developed by the two agencies in a formally coordinated joint process that actively engages and solicits input from all the relevant constituencies**



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Disposal Subcommittee – draft recommendations

- **6. The roles, responsibilities, and authorities of local, state, and tribal governments (with respect to facility siting and other aspects of nuclear waste disposal) must be an element of the negotiation between the federal government and the other affected units of government in establishing a disposal facility. All affected levels of government (local, state, tribal, etc.) must have, at a minimum, a meaningful consultative role in important decisions; additionally, states and tribes should retain—or where appropriate, be delegated—direct authority over aspects of regulation, permitting, and operations where oversight below the federal level can be exercised effectively and in a way that is helpful in protecting the interests and gaining the confidence of affected communities and citizens**
- **7. The Nuclear Waste Technical Review Board should be retained as a valuable source of independent technical advice and review**



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Transportation & Storage Subcommittee

– draft recommendations

- **1. The United States should proceed expeditiously to establish one or more consolidated interim storage facilities as part of an integrated, comprehensive plan for managing the back end of the nuclear fuel cycle. An effective integrated plan must also provide for the siting and development of one or more permanent disposal facilities**
- **2. Recognizing the substantial lead-times that may be required in opening one or more consolidated storage facilities, dispersed interim storage of substantial quantities of spent fuel at existing reactor sites can be expected to continue for some time. The Subcommittee has concluded that there do not appear to be unmanageable safety or security risks associated with current methods of storage (dry or wet) at existing sites. However, to ensure that all near-term forms of storage meet high standards of safety and security for the multi-decade-long time periods that they are likely to be in use, active research should continue on issues such as degradation phenomena, vulnerability to sabotage and terrorism, full-scale cask testing, and other matters**



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Transportation & Storage Subcommittee

– draft recommendations

- **3. Spent fuel currently being stored at decommissioned reactor sites should be “first in line” for transfer to a consolidated interim storage facility as soon as such a facility is available**
- **4. A new integrated national approach is needed to revitalize the nation’s nuclear waste program. A new organization charged with developing one or more permanent disposal facilities should also lead the development of consolidated storage and transportation capabilities**



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Transportation & Storage Subcommittee

– draft recommendations

- **5. Although the regulatory standards may differ, the general principles that the BRC recommends for the siting and development of permanent disposal facilities should apply to the siting and development of interim storage facilities, and to planning for transportation needs. Processes used to develop and implement all aspects of the spent fuel and waste management system should be science-based, consent-based, transparent, phased, and adaptive. They should also include a properly designed and substantial incentive program**
- **6. The current system of standards and regulations governing the transport of spent fuel and other nuclear materials appears to be functioning well, and the safety record for past shipments of these types of materials is excellent. However, planning and coordination for the transport of spent fuel and high-level waste is complex and should commence at the very start of a project to develop consolidated storage capacity**



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Transportation & Storage Subcommittee

– draft recommendations

- **7. To successfully implement a new strategy for managing the back end of the fuel cycle, a new organization will need reliable access to financial resources. The Subcommittee recommends that the Administration and Congress take action to provide full access to the Nuclear Waste Fund for the purposes for which it was intended, including funding consolidated interim storage and transportation as an integral part of broader waste management efforts. Ongoing litigation between DOE and the utilities regarding fuel acceptance should be resolved expeditiously.**



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Reactor & Fuel Cycle Subcommittee

- **Central Conclusion #1 - Advances in nuclear reactor and fuel cycle technologies may hold promise for achieving substantial benefits in terms of broadly held safety, economic, environmental, and energy security challenges. To capture these benefits, the United States should continue to pursue a program of nuclear energy RD&D both to improve the safety and performance of existing technologies and to develop new technologies that could offer significant advantages in terms of the multiple evaluation criteria listed in our charter.**



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Reactor & Fuel Cycle Subcommittee

- **Central Conclusion #2 - No currently available or reasonably foreseeable reactor and fuel cycle technologies including current or potential reprocess or recycle technologies have the potential to fundamentally alter the waste management challenge this nation confronts over at least the next several decades.**

Put another way – we do not believe that new technology developments in the next three to four decades will change the underlying need for an integrated strategy that combines safe, interim storage of spent nuclear fuel with expeditious progress toward siting and licensing a permanent disposal facility.



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Reactor & Fuel Cycle Subcommittee – draft recommendations

- **1. The U.S. government should provide stable, long-term RD&D (research, development, and demonstration) support for advanced reactor and fuel cycle technologies that have the potential to offer substantial benefits relative to currently available technologies in terms of safety, cost, resource utilization and sustainability, the promotion of nuclear nonproliferation and counter-terrorism goals, and waste storage and disposal needs.**
- **2. The Subcommittee concurs with the recent findings of the President’s Council of Advisors on Science and Technologies (PCAST), and recommends the need for better coordination of energy policies and programs across the federal government; for a substantial increase in federal support of energy-related research, development, demonstration, and deployment; and for efforts to explore new revenue options to provide this support.**



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Reactor & Fuel Cycle Subcommittee – draft recommendations

- **3. A portion of the federal nuclear energy RD&D resources should be directed to the U.S. Nuclear Regulatory Commission (NRC) to accelerate development of regulatory frameworks and support anticipatory research for novel components of advanced nuclear energy systems. An increased degree of confidence that new systems can be successfully licensed is important for lowering barriers to commercial investment.**
- **4. The United States should continue to take a leadership role in international efforts to address global non-proliferation concerns. This could include: support for multinational, industrial-national, scale fuel cycle facilities, joint efforts with other countries to improve security and accountability technologies and protocols for nuclear materials and capabilities, and improvements in existing multilateral agreement frameworks.**



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Schedule and Next Steps

- Charter requires draft report by 7/29/11 and final report by 1/29/12
- Commissioning papers to explore areas where more information is needed
 - Paying close attention to the situation in Japan
- Outreach effort to solicit feedback on draft Commission report
- Other visits and meetings as necessary



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Contact Us

- We always welcome written input – submit to brc@nuclear.energy.gov
- Follow the work of the Commission – www.brc.gov
 - Meeting information
 - Webcasts/video archives
 - Comments
 - Commissioned papers



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