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ORGANIZATIONAL NAMES GO HERE

DATE: November xx, 2010

To: The Blue Ribbon Commission on America's Nuclear Future

From: the undersigned [ ] organizations –
see also a parallel statement signed by individuals at URL GOES HERE.

Dear Commissioners,

Thank you for this opportunity to address the "Key Questions" which have guided your inquiry into national radioactive waste issues and concerns.

This cover letter will provide some explanation of who "we" are and what common principles and concerns underlay our participation with the Blue Ribbon Commission on America's Nuclear Future. Additionally, it lists our major areas of concern, as detailed in the accompanying Answers to BRC Questions document.

We address you representing organizations with members who are directly impacted by industrial-scale nuclear operations, both civilian and military. We, our members and allies, are working diligently to contain, prevent and reduce harm to our communities – and we are here to remind you: there is no safe dose of radiation. In addition to consequences to the individual in the form of disease and death, loss of an individual always impacts a family and ultimately the community. Because ionizing radiation has the additional potential for causing genetic damage, we see our work as being on behalf of future generations.

While our government and its expert bodies recognize the truth that there is no safe dose of radiation,[1] that some fatal cancers can result from radiation exposures so small that they could not even be measured as a dose, we are inexplicably told that the contamination is safe. Our bodies, our air, our water, our food, the health and wellbeing of our children seem to be considered as "externalities" in the business case for nuclear energy, and are discounted in federal assessments of the negative health impacts of life at or down stream of nuclear weapons production sites.

The military industrial nuclear activities of the past seven decades have desecrated the earth at every step of the nuclear fuel cycle, vaporized whole cities in seconds, bequeathed agonizing death from radiation sickness, and as the nuclear age lumbers on has added new, man-made radioactive elements, regularly and accidentally, into the biosphere which sustains life on earth. Ending the industrial production of radioactive waste is our goal. There is a need for a substantial nuclear industry, not for building new reactors, but rather for environmental cleanup and creating enduring safe isolation of the radioactive elements and toxins from the biosphere.

[1] This fact is, among other places validated by the National Academy of Sciences Biological Effects of Ionizing Radiation reports, including the most recent -- BEIR VII.

Such nuclear expertise will be needed for safe and efficient programs of nuclear disarmament and weapons dismantlement, and in the electrical energy generation field (which has produced the most waste), a transition from nuclear power to efficient use of non-nuclear, sustainable and renewable energy. Major water systems are in peril of radioactive contamination, the Susquehanna, Columbia, Snake and Savannah Rivers to name four major examples. Research money and job creation should be for these ends, to control, contain and manage the nuclear elements already out of hand in our environment. Such scarce public resources should not be used to create more radioactive waste.

In our view we are faced with a double crisis: carbon and curies – and unless we cap both of these, there will not be a viable, healthy future for our society. It is a false logic that commends nuclear energy as a solution for carbon – investment in aggressive use of energy now wasted delivers up to twenty times more carbon displacement per dollar invested, compared to building new reactors. Even if there hypothetically were no impediments to new reactor construction, real world production capacity for new reactors is insufficient to make a significant difference in carbon emissions. The solution to carbon emissions and climate change will thereby be non-nuclear.

The very fact that a society made up of mammalian *Homo sapiens* has created a terrestrial-based hazard that will endure far longer than any society ever has, points to the enormity of the challenge we face together. The magnitude of the challenge should inspire the highest determination to achieve the best outcome. We work for this – not only for ourselves now – but for all those who will follow to live, work and play during the period of radiation hazard that we have, and currently are, creating.

The use of the inclusive term “we” is reflexive in our community; we do not seek to polarize or needlessly inspire blame and acrimony – however we must note that standing here, before this Commission, the term “we” is a bit harder. We respect the Commissioners and your service – but we must note once again, as was noted at your first meeting – there is no one on this Commission who truly represents us. There is not one among you who is from what we broadly refer to as “the grassroots.” Not one of you is the parent of a child suffering from illness that may be due to radioactivity in their air, food or water. And notably, none of us serve – as so many of you do -- on the Board of Directors of corporations which operate nuclear facilities.

Since a portion of the Commission’s business is to consider trust and how to inspire it – we note that the composition of this Commission would have been a good place to start. We do not assume, however, that this means that we cannot share the same goals and develop a trustworthy working relationship that will advocate for the most long-lasting and environmentally safe and sound paths to isolate the many forms of radioactive waste from the biosphere.

Isolation of radioactivity is our goal. You will find in our “answers” to the Commission’s “questions” that we recognize that there will be a number of steps – a process – to deliver isolation of radioactive waste from the Biosphere, including a whole lot of cleaning up! We ask that the Commission be unequivocal in sharing and supporting this goal of isolation in its recommendations.

If however the Commission does not share this goal of isolation of radioactivity from the biosphere, we ask you to make that clear, not only to your colleagues, but to our communities, who are currently impacted by radioactive waste. Please provide us with the detailed evidence and rationale that might lead you to conclude that more nuclear waste, more radioactive contamination of the biosphere, is sound public policy for our individual communities and the world as a whole, today and for future generations.

Our three main arguments, presented in greater detail in the accompanying Answers section, are:

1) Reduce and ultimately cease the production of radioactive waste; as a group of varied radioactive materials, they are a very long-term, real and present danger to human and all living genomes, which thereby needs to be isolated from the biosphere. Waste must no longer be assessed as an "externality" and the true cost must be seen to outweigh any advantage to these weapons and energy systems. There are other ways to resolve conflict and other ways to generate electricity.

2) Implement Hardened On Site Storage (HOSS) to provide adequate interim safeguards for the current inventory of high-level nuclear waste, as described in the "Principles for Safeguarding Nuclear Waste at Reactors" attached here. All other radioactive wastes should be treated from this same perspective of providing maximum/total isolation from the biosphere with a minimum of transportation. This approach is a one hundred year temporary solution to allow a complete and comprehensive plan to be developed to address all types of radioactive waste and inventories.

3) Pursue vigorous environmental protection and clean up activities to contain and remediate current radiological threats to the environment and communities, and to prevent future exposures, promulgating standards with a goal for zero release of radioactivity for storage and permanent isolation and zero exposure for operations; while mandating a series of concrete, enforceable steps to attain this goal.

Please accept the accompanying document that provides our consensus answers of more than 30 co-authors to the questions that you posed to us. This collaborative document is supported by the undersigned. Also included is discussion of questions that we feel to be of importance to the resolution of this vexing challenge of radioactive waste management. We look forward to your response to our written comments and oral presentation at the November 16-17, 2010, Washington, D.C. Blue Ribbon Commission Meeting.

Sincerely,

Questions: BRC Key Questions, Final Rev. 11/5/10
Answers: represent the views of the undersigned organizations

Reactor & Fuel Cycle Technology Subcommittee questions:

Key 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?*

No. Reprocessing is not a suitable alternative to the once-through fuel cycle because it creates larger volumes of radioactive waste and promotes nuclear weapons proliferation.[1] Radioactive wastes from reprocessing in the U.S. are currently causing significant problems such as threats to water quality at Hanford and West Valley[2] and the virtually stranded high-level tank wastes at Savannah River Site. Reprocessing does not obviate the need for permanent storage of radioactive waste. In addition, reprocessing would require construction of an expensive and dirty new infrastructure. We reject any form of reprocessing, or so-called "recycling" of irradiated reactor fuel. [3]

R&D should be focused on the isolation of existing irradiated fuel and other radioactive wastes from the biosphere rather than alternative technologies that would result in additional generation of more radioactive waste.

1. What are appropriate societal requirements for nuclear reactor and fuel cycle technologies?

Real societal requirements -- quantities of electricity sufficient to meet legitimate societal needs and functions -- are being misappropriated as justification for massive public investment in the revival of nuclear energy, and as a consequence, the production of ever more radioactive waste. Today we are collectively facing two unrelated crises resulting from the production of wastes that we "can't live with:" carbon from burning fossil fuels and radioactive waste from every aspect of splitting atoms. This Commission has heard much testimony that making more radioactive waste will address the problem of too much carbon. This is an unfounded assertion which has never been subject to a full analysis under the National Environmental Policy Act, where, with sufficient expert and public in-put the correct answer might be drawn: nuclear energy is not the most cost-effective, environmentally benign, or socially viable answer to the climate crisis. Indeed, a large public investment in nuclear energy would deny our society the resources to focus on averting global consequences from burning fossil fuels and other greenhouse gases.[4]

Our goal is a nuclear-free, carbon-free energy future.

The societal requirement for nuclear technology itself is **safety, security, health and environmental protection.** If these are not affordable, then nuclear technologies must be phased out. Included in those requirements should be a cradle-to-grave assessment of the safety,

health, economic and ecological aspects of the entire fuel chain, including uranium mining, milling, conversion, enrichment and fuel / weapon fabrication. Employing the precautionary principle, our commitment must be to prevent radiation exposures and both the accidental and the routine release[5] of radioactivity since there is no safe dose of radiation.[6]

The U.S. must devote its attention to safety issues with older nuclear power reactors such as corrosion and fatigue in aging of components, underground leaks and unsafe radioactive waste storage in fuel pools before examining the potential for new reactors. It is wholly inappropriate to pursue additional reactors while large safety issues loom with existing reactors and unsolved radioactive waste streams.

2. Are there reactor and fuel cycle technology alternatives that hold significant future promise to meet these societal requirements and to improve the way in which irradiated fuel is stored and disposed?

Irradiated fuel must be put into ***Hardened On Site Storage*** **(HOSS)**. Originally proposed by the safe-energy community in 2002, HOSS is now one of the widest points of consensus among communities impacted by nuclear energy – and supported by those near nuclear weapons production sites as well. Unfortunately, to date this proposal has been largely ignored by the industry and its regulators. A position statement "Principles for Safeguarding Nuclear Waste at Reactor Sites" is attached to this document, and is also available on the BRC website at: http://brc.gov/e-mails/May10/HOSS_PRINCIPLES_3_23_2010x.pdf

The key points of HOSS are:

1) Reduce density of irradiated fuel stored in fuel pools;
2) Reduce inventory stored in fuel pools by transferring it when feasible to dry storage that is hardened to make it more secure and safer--this includes lower density placement and the addition of earth barriers to protect the containers, as well as requiring the physical testing of all cask designs and inspection of each container prior to utilization;
3) Harden fuel pools since all irradiated fuel must be kept in wet storage for the first five years after discharge from the reactor core-- many pools are not currently in containment and need more robust physical protection from aircraft and other disruption;
4) Increase public and local regulatory participation in waste storage monitoring and decision-making including a commitment to an annual public review process;
5) Provide funding for local independent monitoring;
6) Prohibit reprocessing: The reprocessing of irradiated fuel has not solved the nuclear waste problem in any country, and actually exacerbates it by creating numerous additional waste streams that must be managed. In addition to being expensive and polluting, reprocessing also increases nuclear weapons proliferation threats.

Utilization of HOSS at existing reactors will cost-effectively deliver levels of safety, health and security superior to what exists with present dry cask systems by minimizing the possibility of, and lowering the impact of a fuel pool drain-down and fire, which has the likelihood of extraordinarily high cost to life and health; [7] and lowering security and sabotage risks. HOSS is a major step towards our goal of isolation of radioactivity from the biosphere.

There is currently no realistic technology alternative or roadmap for permanent disposition of military and civilian wastes already generated, and it will take time to develop safer strategies. "Zero waste" energy technologies such as solar and wind power should be the goal for the future.

With respect to reactor technology alternatives, reactor design has not appreciably matured since the 1970s. Many of the proposals offered as "new" are, in fact, technical failures from the past with no prospect for success in the future.[8] Some of the proposals for future reactor designs would make radioactive waste problems worse. For instance, deployment of many small nuclear reactors in communities would also proliferate radioactive waste in communities, increasing the challenges of security, safety, and environmental protection, while maximizing and distributing radiation exposure.

Plutonium powered designs are by definition more dangerous since this fuel is harder to control, and if control is lost, is twice a deadly as uranium fuel.[9] Similarly other novel fuel proposals perpetuate the problems because they all generate highly radioactive cancer-causing fission products requiring isolation.[10] Lighter, cheaper and safer renewable technologies have already overtaken nuclear power.[11] The nuclear industry focus must now shift, after decades of neglect, to decommissioning and radioactive waste management. Likewise, the federal government must address fissile materials including plutonium, which in our view is a waste.

At this point we wish to share our concerns and questions with the BRC concerning the issue of reprocessing irradiated fuel. We believe the HOSS approach to be superior than any consideration of reprocessing; and request that the BRC do a formal comparison between the two, considering such issues as: 1.) ease and cost of implementation; 2.) relative effects on the "back-end" waste streams, types and quantities of wastes generated and disposed of; 3.) relative safety and security issues; and 4.) proliferation effects.

We wish to make the BRC aware that reprocessing:

1. still results in the production of a significant if not greater volume of nuclear waste that is dangerous enough to require permanent isolation vs. volume of waste (high level waste/hlw) requiring permanent isolation from direct disposal of spent nuclear fuel(snf).
2. would, and has, created large amounts of Greater-Than-Class-C waste which is today an "orphan" waste insofar as there is no federal program for this material, and which is exempt from licensing for on-site storage at new reactors. Reprocessing would multiply this problem. In addition, so-called "low-level" radioactive waste is also generated in large quantities at reprocessing sites.[12]
3. would increase worldwide plutonium stockpiles. France and England are awash in plutonium because of its reprocessing, with estimates ranging from 130 to 180 metric tons between them as of the end of 2009. If neither France nor England can use its stockpile of plutonium, why are we interested in creating our own?
4. would create temptations for governments to create stored stockpiles of plutonium to make nuclear bombs. We wish to impress on the members of the BRC our grave concern, and that of many qualified scientists and arms negotiators that our use of reprocessed

commercial fuel will encourage more nations to do the same, creating significant new nuclear weapons proliferation risks. Already the recent historic record bears this out:

- Japan's previous Labor Party leader, Ichiro Ozawa's has threatened to use Japan's reprocessed plutonium stockpiles from commercial reactors to make nuclear weapons to deter China.
- The U.S. government's concerns that Iran's government could make nuclear weapons even as it claims to enrich uranium exclusively for nuclear power. Reprocessing would provide the Iranian regime another pathway to nuclear weaponry, via weapons usable plutonium extraction from irradiated nuclear fuel.

5. means that a large group of technically sophisticated people have access to plutonium. Are the members of the BRC aware that reprocessing makes plutonium easier to divert, by eliminating the self protecting lethal-dose of gamma ray emitters that act as a security protection in the current waste configuration.
6. creates a new accounting nightmare for plutonium stockpiles. The DOE is already not able to account for nearly 200 pounds of separated plutonium without a full commercial reprocessing infrastructure. We wish to impress on the members of the BRC how difficult it would be to keep track of all of the plutonium thus created; and how relatively easy it would be for enough bomb material to "disappear."
7. sets the conditions for a foreign or domestic terrorist to create a radiologic catastrophe here in the U.S.
8. results in severe radioactive contamination of the environment:
    - Military reprocessing in the U.S., at Hanford, Washington, Idaho National Lab, and Savannah River Site, South Carolina, has left behind radioactive wastes and radioactivity of the environment that will cost hundreds of billions of dollars over time to deal with, while risking such major water bodies as the Columbia River, Savannah River, Snake River Aquifer, and Tuscaloosa Aquifer.
    - Reprocessing commercial irradiated nuclear fuel is also environmentally devastating. At West Valley, New York, six short years of reprocessing activities, during which time only one year's worth of reprocessing was accomplished, has resulted in radioactive contamination of the surrounding soils and waters that threatens Lake Erie and Lake Ontario downstream, and which may cost more than $10 billion to clean up.
    - In France, the La Hague reprocessing facility discharges hundreds of millions of liters per year of radioactively contaminated liquid wastes into the English Channel via an underwater pipeline. The radioactive contamination of the seabed at the foot of the pipe is so intense that under British law, it would require deep geologic disposal. Radioactive contamination has spread with the ocean's currents as far away as the Canadian Arctic. A dozen European governments have pursued legal action to force France to stop radioactive dumping in the ocean.
    - Large-scale radioactive gaseous releases also occur. Similar environmental assaults have taken place at Britain's Sellafield reprocessing facility, where 1,000 pounds of ultra-hazardous plutonium have been dumped in the Irish Sea, traces of which have been found in children's teeth hundreds of miles away. The combined "routine" operations (that is not including the accidents) of La Hague and Sellafield, over the course of 70 years, are projected to result in more release of radioactive contamination to the environment than did the Chernobyl nuclear catastrophe. Of course, this environmental radioactive contamination will have consequences for

human health in this and many future human generations (we do not have any way to estimate the very real consequences for other species). Already at La Hague and Sellafield health impacts among workers and neighboring residents have been documented, including clusters of childhood leukemia, as well as stillbirths.

9. is a financial burden on the U.S. taxpayer. Are the members of the BRC aware that the costs of reprocessing U.S. irradiated nuclear fuel – in the tens to hundreds of billions of dollars – will almost certainly be paid by U.S. taxpayers, as the industry that profited handsomely from generating these wastes in the first place is not interested in paying for such "externality" costs? The French public, for example, pays an extra billion dollars per year to keep its reprocessing program going.
10. is a "surcharge" on nuclear power according to a November, 2007 Congressional Budget Office report, which concluded that reprocessing adds to the cost of nuclear power 25% more than the cost of direct disposal.

Given these factors, we would ask why the BRC would even consider reprocessing as a "solution" to nuclear waste versus HOSS until safer management is available?

3. What changes, if any, are needed in existing U.S. policy and international commitments for nonproliferation, and in U.S. regulations for safety, environmental protection, and physical security for facilities and materials, to meet these societal requirements?

IAEA's mission to encourage nuclear power internationally has, in actuality, promoted nuclear weapons development since many states have developed atomic weapons through reactor technology. The U.S. Nuclear Regulatory Commission is hampered by competing missions to both advance and regulate the dangerous technology.

We believe that nuclear weapons pose a threat in every dimension, and the possible use of a nuclear weapon against civilian nuclear power or nuclear weapons materials storage sites must not be disregarded. Nuclear reactors and the inventory of waste generated, particularly when stored in unprotected fuel pools and dry containers arrayed like bowling pins, are the largest "dirty bombs" on the planet. If detonated by a nuclear weapon, the consequences of such an event would be an unprecedented catastrophe for the whole planet. The Commission should support and call for the acceleration of the United States' effort to lead in the reduction and swift abolition of nuclear weapons, as well as the phase out of all nuclear weapons materials generation. Reprocessing would undermine these goals.

Regulations must be driven by protective safety standards; and the nuclear establishment's so-called standard "as low as reasonably achievable" must be abandoned. There must be no exemptions or setting of higher release levels by regulators for any situation.

U.S. federal radiation protection standards must be upgraded to protect the most vulnerable, that is children, born and unborn, women, those with compromised immune systems and the elderly, and to end the exceptional level of permissiveness that has been given to radiation compared with other hazardous substances. A standard of zero-release/zero-exposure should be promulgated for all aspects of radioactive operations and waste disposition. A zero release / zero

exposure standard should be established now for all new storage and permanent disposition of radioactive waste. For operating facilities zero release / zero exposure should be promulgated as the goal of a progression of tougher regulations over time and with real enforcement of these intermediate steps. For the record, the undersigned do not support allowing this industry to kill 1-in-a-million in this generation or future generations; however, this risk level would bring the regulation of radioactivity into line with the regulation of other hazardous materials as an intermediate step.[13] This would be a vast improvement over the current 1 fatal cancer per 286 "standard" or "reference" men[14] exposed (over a lifetime) – which already corresponds to much higher risk for women,[15] children and the unborn.[16]

Regulatory exemptions or setting of higher release levels should not be permitted. Allowing increased radioactivity in unlabeled, exempt transport, as is now allowed,[17] violates the principles of safety and health and makes it harder to detect radioactive contamination that could involve dirty bombs or illicit radioactive materials' transport.

Current and new programs allowing the deregulation of currently regulated radioactive wastes and materials must be stopped. Communities around the world are at risk because of operations in Tennessee[18] and Sweden[19] which result in the unrestricted release of materials contaminated with radioactivity with no further monitoring or labeling. The unsafe practice of releasing radioactive metals and other items to the open market where recycling into consumer and construction products is possible, or as is happening in Tennessee, disposal in municipal landfills, results in elevated risk of undisclosed radiation exposures to humans and our environment anywhere. Unrestricted release is documented in Tennessee, Sweden, UK, Germany, Russia and Ukraine. Most industrial radioactivity originates from production and use of nuclear fuel. Our national policy should be to limit the spread of radioactive materials. The designation of man-made radioactivity as so-called "below regulatory concern," "exempt," "at clearance levels" or excluded from regulation must be banned outright.

4. What should be the process to research, develop, demonstrate and commercially deploy these new technologies, what entities should have responsibility for the different phases of development, and how should this development be funded?

The question incorrectly presumes that the radioactive waste problem can be solved by reliance on new technologies, and that such technologies are deployable now, or soon could be. This is not the case. The focus should be on research of technologies that can effectively isolate the radioactivity already created from the environment for as long as it is a hazard. Development of nuclear reprocessing as favored by some in the nuclear industry (and it would seen, some on this Commission) would in fact perpetuate and worsen the problems we currently face – reprocessing expands the volume of radioactively contaminated stuff without lowering the total number of curies – in other words, it simply spreads it out. This does not reduce risk – it increases it.[20]

Development of existing technologies should be aimed only at greater safety, security, health and environmental protection such as development of HOSS at all sites where waste is presently stored. Under the Nuclear Waste Policy Act, the cost of storage of irradiated commercial nuclear fuel "off" the reactor sites would be covered by the Nuclear Waste Fund. The undersigned, with

some who dissent (and want to be sure that is noted), support the use of the Nuclear Waste Fund to cover the cost of HOSS storage at reactor sites. At the same time, implementation of HOSS must not become the pretext to generate more waste. Government support for the phase-out of nuclear power should be as thoroughly investigated by this, or another federally funded BRC, as equally viable an option as "the future of nuclear power in America;" there should be no further public investment made in the industry which has created this formidable set of problems.

Foreign-owned and operated companies are seeking a greater role in the U.S. commercial nuclear industry. Any such foreign involvement must scrupulously adhere to the Atomic Energy Act's explicit prohibition against foreign "ownership, control or domination" of a U.S. nuclear reactor. Because "control or domination" can be attained even without majority ownership, thorough and skeptical examination must be made in each case of foreign involvement. U.S. quality assurance and quality control standards must be met by any and all foreign entities involved in U.S. nuclear projects.

The so-called "new" nuclear power reactors (currently pending licensing) have not been shown to be safer, healthier or a better economic investment than other new energy sources such as harvesting and storing solar and wind energy.[21] No public funds should be expended or committed under the assertion that nuclear energy is a "solution" to the climate crisis[22] without a completing a thorough EIS analysis to support such an assertion.

Transportation & Storage questions:

Key question*: Should the U.S. change the way in which it is storing used/spent nuclear fuel and high level waste while one or more geologic repositories are established?*

This question cannot be answered as it is asked. The question should be: How should irradiated fuel be stored at existing locations and at decommissioned reactors and throughout the nuclear weapons complex? Answer: HOSS and security-enhanced fuel pools should be instituted at commercial reactors. Weapons facilities must devote all resources to exhuming, containing and treating decades-old waste, particularly the liquid wastes, and completely abandon development of new nuclear weapons.

The Blue Ribbon Commission has yet to attain the level of dialogue with currently impacted communities and the scientific research needed address the question of a geologic repository in a sound, reality-based way. The BRC has yet to attain an overall strategy, including a standard with integrity for a new repository program. Until these things have been accomplished, this will not be a productive process. BRC's mission should be to develop the outline for how to accomplish these processes and subsequently foster a national discussion about isolation of high-level waste, irradiated fuel and the other radioactive waste classes, and what it would take for a geographic area to voluntarily accept and partner in the development of such a site.

5. What role(s) should storage play in an integrated U.S. waste management system and strategy in the future?

Storage is a primary, required step. Existing and new storage must be made safer in terms of security and public safety and health; we again direct you to the Principles for Safeguarding Nuclear Waste at Reactor Sites.[23] All storage sites should have contingency plans in the event of a site emergency. It must be recognized that relocating waste away from the site of generation does not decrease the number of waste sites, but rather creates additional waste sites. In reality each shipment in transit is a "waste site" by definition. Gratuitous waste transports (to a site that is not permanent) increase risks and costs to the public. Transporting waste is expensive and inherently reduces security[24] and safety[25] while increasing radiation exposures,[26] uncertainty[27] and strong public opposition, compared to storage where it is now. If waste is to be transported, it must be to an end-point that significantly improves safety, security, reduces radiation and health risks and better provides for the isolation of radioactivity from the environment.

Centralization of radioactive waste storage has been mischaracterized by the nuclear industry as inherently "safer" and more "secure." All interim storage concepts for irradiated fuel have proposed using the same technology currently being deployed on reactors sites, above ground dry-cask storage. The nuclear industry also attests that radioactive waste is safe stored where it is on licensed commercial sites and federal facilities. Therefore the only apparent benefit to moving high-level waste to centralized interim storage would be the transfer of title and liability from the waste generators to the US taxpayer and to make room for more waste generation.

Radioactive waste from reactor operation, because there is no less dangerous option has to stay where it is at present, in 70+ congressional districts that are located in 30 states. This decentralization ensures a large group will continue to participate in any decisions about this hazardous material. The continued participation of the waste generators (many of which are very large corporate entities) is important. Making the waste the property of the U.S. taxpayer and centralizing it for "temporary" storage would isolate one congressional district, promote NIMBYism and discourage collective discussion and problem solving. Independent analysts have questioned whether such a site would actually be *temporary*[28] – and also whether it is credible that publicly administered funding would be forthcoming for long-term management at one site, compared to many.

6. Are there technical or regulatory uncertainties related to the ability to store existing and future used/spent fuel and high-level waste safely and securely for an extended period of time (100 years) and then transport it without difficulty to another location?

Yes. HOSS systems must be designed with a plan for extended timeframes that would include specific and complete plans for repair, unloading, repackaging, reloading and replacement of canisters.

Projections for how long the fuel rods will remain intact vary widely. Planning should assume a percentage of the stored rods may have structurally failed leaving only fuel pellets.

The radioactive waste problem is unprecedented in human history and defies all experience with human institutions, governments and industries. The mission to maintain focus, collective memory, and the will to attain a difficult goal — for 100 years, longer than a human life span for storage – and of course longer for a permanent repository — is more the purview of storytelling,

song and religion than the commercial, scientific and engineering disciplines associated with nuclear technology. Radiation and fissile elements pose the deepest environmental question humans have encountered and its solution will require long, engaged deliberation across all segments of society.

7. What should be the relationship between storage and progress on the development of disposal capability and possible advanced fuel cycles?

None. High-level waste isolation should be researched with the commitment to deliver isolation over the timeframe that the waste will be dangerous. Storage (HOSS) and or isolation should never be aimed at enabling new radioactive waste production. There should be recognition that ongoing radioactive waste production increases the size, cost and logistics of the existing nuclear waste problem-- and thus the safety, security, environmental, and health risks to current and future generations -- as well as degrading the health and safety of communities in uranium mining and other uranium fuel chain processing, enrichment, and other activity areas across the globe and in our nation. There is no way to make additional radioactive waste without additional radiation exposure. We have other, better options for making electric power.

8. How should needed storage be provided (who should be responsible, where should it take place, and who should pay)?

Hardened on-site storage (HOSS), wherever possible, should be at the site of generation, paid for by nuclear waste fund fees and the full financial and legal responsibility of the nuclear licensee. Nuclear weapons waste should continue to be the financial responsibility of the federal taxpayer. However there should be accountability and liability for contractors with practices which complicate or negate the isolation of these wastes.

9. What process(es) should be used to select new storage sites (if any), and what are the relative roles of federal, state, local, private, and tribal entities?

Existing sites not safe enough for radioactive waste storage, such as islands in rivers, sandy shores of lakes, earthquake areas, along rising tides etc. are the only circumstance where we support a relocation of waste. New storage sites, *if civilian energy i.e.*, away from reactor, should be established only for safety reasons. Any rationale that would promote waste removal from a site for safety reasons will also argue for immediate shutdown of the reactor which generated the radioactive waste; likewise with nuclear weapons production sites.

In addition, Executive Order 12898[29] and the principles of environmental justice[30] demand that the targeting of Native American reservations and communities for radioactive waste or disposal sites must stop, once and for all. This principle of environmental justice extends to other communities of color and low income communities. It is an environmental injustice that the now cancelled Yucca Mountain, Nevada dumpsite targeted lands belonging to the Western Shoshone Indian Nation according to the “peace and friendship” Treaty of Ruby Valley, signed by the U.S. government.

It is also an environmental injustice that the U.S. federal government, in the person of the Department of Energy's "Nuclear Waste Negotiator" from 1987 to 1992, and the nuclear power industry itself in the form of Private Fuel Storage, LLC, have sought to *export* our worst wastes to these tiny Indian Nations for centralized (so-called) "interim" storage sites for irradiated nuclear fuel, as at the Mescalero Apache Reservation in New Mexico, and at the Skull Valley Goshutes Reservation in Utah (the latter a licensed facility still under active targeting). The people, as opposed to the governments of these nations have stated that they see these actions as genocidal – they are not willing "volunteers." In addition, the industry's Nuclear Energy Institute has admitted that it is actively targeting additional Native American reservations for such facilities. Such immoral and illegal environmental injustice violations must stop.

In March, 2009, President Obama himself honored the efforts of Native American environmental justice activist Grace Thorp as an environmental heroine for successfully stopping such dumps targeted at Native American reservations, her own included.

10. What are the key issues affecting the ability to transport used/spent fuel and high level waste now and in the future at the scale that will eventually be required?

The key issues are safety, security and radiation exposure. The standard industry transportation concept presumes massive loads. Planning for a maximum size results in loads that would be too big and too dangerous, and the risk of failure is too great. Lax regulations currently would allow doses and exposures from routine (non-accident conditions) that are a public health threat. Waste must age and cool sufficiently before shipping to reduce dangers. Again, relocation of waste must be minimized and be done only if it improves safety, security, results in reduced radiation exposure and is acceptable to all affected communities along the way, and at the destination.

Highly radioactive shipments, federal in nature, passing nearby and even through major population centers, would be inherently high profile, potentially disastrous and targets for terrorist attack. Many interstate highways, most mainline railways, and numerous waterways (including both coastlines, the Great Lakes, and a number of inland rivers), targeted for shipments of irradiated nuclear fuel and high-level radioactive waste by truck, train, and barge, would put a large percentage of the U.S. population at risk from these hazardous radioactive wastes.

Erosion of regulator credibility and trustworthiness continues to be an unresolved issue that will most certainly poison any future attempts to transport HLRW under any circumstance. An example of a situation that has eroded trust is the repeated call for full-scale physical testing of transport containers with independent public review of this process. Currently, containers are only tested "on paper." Cask design and integrity issues still remain, especially for transport casks. Many feel that previous whistle-blower allegations concerning cask design and quality assurance program flaws were too easily glossed over; and have since been corroborated by retired NRC officials. An NRC pledge to due full scale cask testing, using designs that would actually be used in future transport, has not been fulfilled (reinforcing the point above). DOE's continued misuse and misrepresentation of the 1970s Sandia National Laboratory films of simulations of cask accidents done to verify computer models further call into question DOE's

credibility on the issue, since the casks in the films actually failed in two of the simulations reported as successful demonstrations of cask integrity. More recent tests of transport cask integrity to withstand easily obtainable 21st century munitions have resulted in the casks failing dismally. If these casks can't survive real world situations, they have no business being licensed to function in the real world, either.

This broad criticism extends to both NRC and DOE, and is even more complicated with the creation of agencies like Homeland Security, and the involvement of a Katrina-discredited FEMA. The issues raised here represent serious credibility issues that the assigned agencies need to resolve with the public before any further transportation of irradiated fuel is permitted.

Additional questions arise:
What obstacles exist to licensees providing safe storage for decades to a century? What will be required to extend isolation to the entire period the waste will be hazardous? How can state and local governments and the public effectively participate in monitoring storage, selecting a permanent repository, and transportation? How should short-term, mid-term and long-term storage be funded? What changes in federal law and regulations are needed to institute HOSS?

Disposal questions:

Key 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?*

QUESTION FOR THE BRC: Why is environmental acceptability not included in this list?

First, turn off the tap: cap with a firm limit the amount of radioactive waste that will need to be permanently isolated. We should start over with a technical process to develop health and safety standards with a goal of zero release – in other words actual *isolation* of radioactive waste from the biosphere. These standards must be developed with robust public involvement. These new standards and regulations must be publicly approved and in place before any siting program is considered. There must be informed consent and acceptance from all affected entities at every level of government, as well as the public, and the inclusion of independent technical experts as well as government and public oversight and appropriate regulation. Independent technical monitoring as well as government oversight and regulation must be ensured for the people in perpetuity. The key consideration must be permanent isolation of the radioactivity contained in irradiated nuclear fuel and high-level radioactive waste from the living environment for as long as it remains hazardous. Intervener or independent funding for all entities could ensure robust public involvement.

11. Is a disposal facility (or facilities) needed under all reasonably foreseeable scenarios?

As stated elsewhere, reprocessing is unacceptable. But even if reprocessing were carried out, high-level radioactive wastes, TRU, Greater-Than-Class-C and so-called "low-level" radioactive waste requiring permanent isolation and long-term management would still remain.

An isolation facility may be needed but should not be pursued until publicly acceptable standards are established and increased safety and environmental protection is assured that would justify the establishment of such a facility. Absent such standards and assurances, it is unlikely any effort to establish a new disposal facility can succeed.

The WIPP site in New Mexico is operating and managing an entirely different waste form (much less thermally hot plutonium contaminated wastes), and should not be considered for high-level waste or irradiated commercial nuclear fuel. In fact, problems at WIPP, such as hazardous carbon tetrachloride leakage, reveal that this site and facility is not operating safely for the wastes it already disposes.

12. If a permanent disposal system is needed, what are our alternative approaches for disposal?

See answers to questions 9 and 11. Publicly acceptable standards have never been established and then honestly determined if they can be met. The previous policy at Yucca Mountain, continually "lowered the bar" for compliance. That abandonment of protection resulted in destruction of public trust.

13. What process(es) should be used to select new disposal sites and what are the relative roles of federal, state, local, private, and tribal entities?

First: reject the notion of "disposal." Isolation of the waste is the goal. A disposal site may, or may not provide isolation.

We feel strongly that the commitment to a scientifically based program for the long-term isolation of radioactive waste must start with solid research that is open, transparent, and reviewed by independent analysts who are supported by an open grant process for interveners. A strong commitment should be made to include many disciplines, not only the typical engineering and geology teams.

This research and development should be accessible to the public, and there needs to be other avenues of engagement as well. Communities that are today bearing the burden of this industry are not only harmed, they are oppressed. This mistake must not be perpetuated. Many of us see engagement in the future of this program as a vehicle for ensuring that the ethical and visionary aspects of grappling with the unprecedented problem of radioactive containment are addressed. Without this vital step there will be no reconciliation.

A repository site can only be chosen if we have real regulations in hand and it can be shown that the site meets **all** aspects of the regulations. We support the idea of a "volunteer" site, however we will not support it until such an action is legally defined and that definition is protective of the most local interests and those living in the immediate area. As mentioned, Native American tribes, as well as other low income and people of color communities, cannot be targeted for radioactive waste disposal sites due to principles of environmental justice.

Yucca Mountain has "poisoned the well" in regard to public trust, confidence and acceptance of a siting process for a repository, and very likely for interim storage sites. There must be no rush. Whatever time is needed should be devoted to establishing public trust and confidence.

Trust is not the product of words-- it results from engagement and activity. Implementing HOSS at existing waste storage sites, adopting a zero-release/zero-exposure standard and moving ahead on a volunteer basis with good public participation, transparency and accountability and acceptance would be a good place to start in building public trust and confidence in a waste program.

Another opportunity to build trust would be a commitment to provide intervener funding for independent review and critical analysis of all proposals dealing with radioactive waste management. As many candid nuclear industry leaders have admitted over the years--well resourced public participation has repeatedly resulted in a better outcome than when there has been no such participation. Some societies require that the budget for a licensed project include 1% to fund the work of interveners.

A good place to start this would be with funding made available to non-industry affiliated independent experts and impacted community members to do a review of the BRC's draft report and enough time to make a meaningful contribution to the BRC's final report.

14. What are the essential elements of technically credible, workable, and publicly acceptable regulations for disposal (in geologic repositories)?

Zero release and a cap on the amount of waste needing such management. There is no safe dose of radiation. Any release must be assumed to create some number of excess cancers as well as other radiation health effects which include infertility, miscarriage, birth defects, reduced immune function and others.[31]

Second, that all regulations, laws, and standards are scrupulously followed, not modified, waivered, exempted or otherwise watered down and disregarded to fit political convenience or industry wants. Once these are agreed upon, they should be followed, unless a demonstrated and immanent threat to public health and safety should arise, and no other alternatives exist or are likely to be created in a timely manner.

15. What are the essential elements for a technically credible and publicly acceptable institutional system and process for regulating the safety of disposal?

Zero release and miniscule chance of human intrusion. International inspection and approval should be considered but **not** with a lower standard.

There must be a careful lessons-learned process after the grossly unproductive Yucca Mountain site selection debacle. The Yucca program and the Nuclear Waste Policy Act must be de-constructed and all parts of it examined.

For instance, problems increased when canister systems became the drivers of the repository design. This occurred twice during the program; first with the multi-purpose canister (MPC) and later the transportation, aging and disposal (TAD) cask systems. Waste handling was determined to be more difficult than expected so it transferred from the repository site back to the reactor site. That decision and others should be carefully examined.

Inappropriate radioactive waste definitions and classifications should be rewritten and a solid basis for isolation of radioactivity from the biosphere affirmed, as well as overcoming any institutional barriers to implementing HOSS at reactor sites.

Finally, once standards and regulations are mutually negotiated, politics – particularly Congress – should be minimized or removed from the final decision making. The final decision should be a reflection of the best science and technology, coupled with a legitimate and trustworthy public process for implementation.

Related questions arise:
What are the amounts of irradiated fuel that may be generated over the next several decades that could require disposal facilities?
What changes in federal law are needed?

Crosscutting Issues:

16. How much are the options considered recommended by the Commission likely to cost, and over what time period will these costs be incurred?

Bush administration's Global Nuclear Energy Partnership, which promoted reprocessing of commercial irradiated fuel was projected to cost $20 billion over 20 years. Since irradiated fuel reprocessing is proving worldwide to be uneconomic and a disaster for the environment there is growing public apprehension that high-level waste would most likely be moved with a stated intent to reprocess and then when the program is halted because it is inherently impractical, a de facto dump will have been created.

Producers of waste must be willing and able to pay the costs of doing business. If they are unable or unwilling to meet publicly acceptable safety standards, radioactive waste production must end. Under the present system, victims of radiation's health impacts pay, and society pays in increased insurance and healthcare costs since these illnesses are viewed as "externalities" to the business plan.

The billions of dollars that would be wasted on highly speculative, long-term reprocessing ventures could underwrite immediate security enhancements for vulnerable spent fuel pools and establish HOSS at reactor sites.

17. Who should pay for the options?

The producers should pay. The Nuclear Waste Fund is a form of such a payment insofar as those who got the benefit of the electric power have paid into a fund. If producers are outlasted by the waste, government must pay from a fund paid for, in advance by the producers at an expanded rate.

18. How should the funds be collected and distributed?

The Waste Fund worked in principle but licensees have been allowed to defer payment. The deferred payment option must be removed. The waste contracts are a deeply fraught problem (for instance the penalty fees being paid by the taxpayer) and worthy of extensive reconsideration – which would be simplified by a commitment to phase out commercial nuclear power waste generation. Congressional oversight and budgeting must be maintained. The Yucca Mountain experience would have resulted in far greater financial waste had appropriations not been limited by Congress.

19. What entity(es) should have responsibility for implementation and governance?

Federal, state and local governments must implement and enforce safety regulations. The public, including independent technical experts, must be allowed an active and meaningful role throughout any program in perpetuity. The public will likely demand stricter oversight than industry and its regulators. Tighter regulation must be accepted by the nuclear industry to better protect the environment and public.

20. How should each option be regulated?

Regulations must be meaningfully enforced by governments. The system must remain public and separate from private industry.

In our view new institutions to carry forward implementation of the research and public engagement on long-term disposition of the waste may be needed – and should be explored under a National Environmental Policy Act type process. The idea of a federally chartered non-profit corporation may be an institutional framework with the strengths of both public and private sectors, if set up properly. Success may depend on a new institution given the deep distrust the public has for not only the U.S. Department of Energy, but also for the U.S. Nuclear Regulatory Commission.

Additional Comments from Responders:

A. The only real solution to the problem of radioactive waste is to stop generating it in the first place. As President Obama himself has articulated, nuclear weapons should be abolished from the face of the Earth. This will not be achieved if nuclear weapons materials are produced and used on a daily basis at energy installations. Energy efficiency combined with renewable energy can and will provide ample energy for our economy.[32] Not only nuclear power, but coal, as well can be phased out and replaced with existing renewable, storage, and efficiency technologies.

B. Irradiated nuclear fuel storage in pools run the risk of catastrophic radiation releases from loss of coolant (water). The irradiated nuclear fuel densely packing these pools must be transferred, when ready (about five years), into robust, dry, above ground, dispersed hardened on-site storage configurations. HOSS principles set higher standards than are being met by current dry cask storage facilities. Current dry cask storage was not designed to withstand terrorist attacks, is also vulnerable to accidental radioactivity releases, and suffers from serious violations of quality assurance and control on both the design and manufacture of dry cask storage containers and installations.

C. As mentioned elsewhere, principles of environmental justice demand that Native American reservations and communities, as well as other peoples of color and low income communities, not be targeted for hazardous radioactive waste storage or disposal facilities.

D. The Commission must be clear about how they define the issues they are addressing and for what problems they are seeking solutions. Regarding irradiated fuel at commercial nuclear reactor sites: is the problem the waste or is it to find room for additional waste? A common analogy is the bathtub that is built without a drain. The faucet is on and the water is running over the sides. Is the solution to bail out the water to make room for more from the running faucet or is it to turn off the faucet and THEN make a plan for what to do?

E. As representatives of citizens groups with long term interest in and literally THOUSANDS of person-years already devoted to these issues, we ask that you dispense with the word "stakeholder." There is no clear or accepted definition of this term. It is much clearer to us and to you when you simply say who you are talking about--nuclear utilities, local officials, residents, everyone, etc. Anyone concerned about nuclear waste believes that they are a "stakeholder" but you may not be talking about them. Try to avoid all general terms such as "community," "interested parties," etc. Again, just state who you are addressing or talking about.

Final note:
Much of the comments offered here focus on high-level commercial waste, that is, irradiated reactor fuel however, in our view the Principles of Safeguarding Nuclear Waste through hardened on-site storage coupled with the Precautionary Principle should be applied to every radioactive waste situation throughout the nuclear fuel chain including the nuclear weapons complex. This process should be vetted with the local decision makers and those at risk of radiation exposures and implemented across the board for such disparate radiation problems as uranium mining wastes and mill tailings, uranium enrichment and fuel processing wastes, reactor operations, nuclear facility decommissioning, vast stocks of nuclear weapons waste, and tons of sensitive fissile materials. This process is step one in ensuring that this waste is isolated from our living environment, and will allow time for the development of more permanent disposition to be done well.

[1] proliferation
[2] West valley and Hanford cites on ground water
[3] Various ngo resources on problems of reprocessing
[4] Carbon-free nuclear free and lovins…others?
[5] Routine release brochure
[6] Olson presentation… and BEIR reports and Rosalie
[7] Fuel pool fires
[8] Breeders gen iv
[9] Mox increased dose
[10] Ieer psr thorium fact sheet
[11] Mighty mice
[12] Waste at West Valley
[13] superfund
[14] Brc policy
[15] Beir iii
[16] Rosalie?
[17] Brc in transport regs
[18] Out of control on purpose and others on processing
[19] Studsvick
[20] Increased volume of waste in reprocessing
[21] Vt law school report
[22] BRC mantra…other cites to this… and refute
[23] Attached to this statement and available at: http://brc.gov/e-mails/May10/HOSS_PRINCIPLES_3_23_2010x.pdf
[24] Security in transit
[25] Safety in transit
[26] Routine radiation in transit
[27] Two years in transit
[28] Temporary sites – not credible
[29] Targeting Indian lands is not only a violation of the principals of EJ, but also a direct violation of Executive Order 12898, " Federal Actions To Address Environmental Justice in Minority Populations and Low-Income Populations" signed by Clinton. This EO instructs all Fed agencies/contractors to ensure their policies, practices, etc. are designed to achieve environmental justice and do NOT disproportionately impact minority or low-income populations.
[30] Adopted by the First People of Color Environmental Leadership Summit, Oct. 27, 1991 in Washington D.C.
[31] Non cancer effects
[32] Carbon-Free and Nuclear-Free: A Roadmap for U.S. Energy Policy, by Arjun Makhijani, 2007.