# 1AC

## Plan

### The United States federal government should develop laser propulsion technology that disposes of nuclear waste materials into space beyond the Earth’s mesosphere.

## 1AC—Nuclear Leadership Adv

### Contention 1: Nuclear Leadership

### Global Nuclear use will inevitably increase—the question is whether the U.S. can take the lead on nonproliferation.

Rowley 8 (Anthony, The Business Times Singapore, “US official sees global push towards nuke power,” 5/23, lexis)

A MASSIVE global expansion of the role of nuclear power in generating electricity was forecast yesterday by US Assistant Secretary for Nuclear Energy Dennis Spurgeon during a visit to Tokyo. He was there for follow-up talks on the US-Japan joint nuclear energy action plan agreed last year between the two countries. He spoke as the price of oil touched new records, underlining the need for alternative energy sources. By the middle of this century, as many as 86 countries around the world could be using nuclear energy as a major power source compared with 31 at present, Mr Spurgeon suggested. This will require not only massive capital investment in new plants and expansion of the nuclear power industry but also a strong 'infrastructure' to prevent proliferation of nuclear weapons, he said. He acknowledged that the US needed to 're-establish' its own nuclear manufacturing capability, having allowed it to run down when nuclear power fell out of favour during a long period of low oil prices. Japan maintained a 'healthy (nuclear) research and development programme even when the US programme was declining', he said. 'Japan and the US will collaborate closely under the joint action plan, especially in the area of nuclear energy R&D,' he said, noting that Japan has achieved advanced technological capabilities in the nuclear fuel cycle and in areas such as liquid metal-cooled fast reactors. Japanese capital will also be welcome in financing the crash programme of 34 reactors that the US envisages building, he said. Nuclear power currently supplies 16 per cent of total US electricity generation needs and in order to raise this to 30 per cent by the year 2030, the US will require 30 gigawatts of new nuclear capacity, Mr Spurgeon said. If the US decides to raise its nuclear generation to a level where it can meet 50 per cent of total electric power requirement by the year 2050, that will require another 300 gigawatts of nuclear capacity. Given current problems of energy prices and energy security as well as the need to reduce the level of greenhouse gas emissions around the world, a global shift to nuclear power seems inevitable, he suggested. But it will be essential to build an infrastructure of nuclear fuel services in order to prevent a proliferation of nuclear weapons. Already, some 38 countries (including China, Japan and South Korea in Asia) are cooperating under the Global Nuclear Energy partnership (GNEP) to 'address infrastructure development and to provide reliable fuel services' for existing and new entrants to the nuclear power market. Japan's collaboration with the US under the joint action plan will be under the auspices of the GNEP. Nuclear safety concerns will be one of the issues addressed under the US-Japan action plan, Mr Spurgeon told BT after his formal briefing. The recent massive earthquake in China's Szechuan province and earthquake damage last year to a Japanese nuclear plant - the world's largest - had 'validated' assurances that reactors can be made quake-proof, he suggested. He also claimed that nuclear waste problems can be dealt with.

### Only the plan is a concise and workable approach to the nuclear waste issue—it creates an international consensus to follow the U.S. over reprocessing technologies.

Lyman 10 (Edwin S., Senior Staff Scientist Union of Concerned Scientists “LIMITING FUTURE PROLIFERATION AND SECURITY RISKS” Presentation to the Blue Ribbon Commission on America‟s Nuclear Future Reactor and Fuel Cycle Technology Subcommittee October 12, 2010, Washington, DC) MFR

Elimination of reprocessing would greatly reduce resource burdens on international and domestic safeguards and reduce proliferation and terrorism risks The U.S. could help to discourage reprocessing around the world by – Getting the domestic geologic repository program back on track and demonstrating the technical and political feasibility of direct disposal of spent fuel – Ensuring that domestic requirements for securing weapon-usable materials are set at the highest levels and based on conservative assessments of current and future threats – Being realistic about the low potential for technological innovation to significantly increase the “proliferation resistance” of reprocessing or the accuracy of material accountancy methods at bulk-handing facilities – Using its bilateral nuclear cooperation authority more effectively

### And space disposal sets the stage for the U.S. to take the lead in technological breakthroughs.

Coopersmith 99 (Jonathan, associate professor of history at Texas A&M University, specializes in the history of technology and the history of Russia. “DISPOSAL OF HIGH-LEVEL NUCLEAR WASTE IN SPACE” 1999 AIAA Annual Technical Symposium) MFR

Computer simulations and controlled tests, however, will not be enough. Key demonstrations -- exploding a launch vehicle with a mock cargo and sending a test capsule to reenter the atmosphere -- will be necessary to calm fears and prove the veracity of safety calculations. Minimum danger must be demonstrated, not assumed. An important but lesser consideration is the economics of space disposal. Space disposal will cost tens of billions of dollars -- but so have and will the existing plans for underground waste disposal. One estimate of the estimated cost of disposal is $400 a pound ($900,000/metric ton).xviii The difference is that the infrastructure for space disposal can be used for other purposes. Space-based disposal demands not only technical but institutional and political developments. The United States can launch its own national program, but a cooperative international effort could prove the better organizational approach because of the worldwide problem of nuclear waste and the array of available technologies to harness. International consortia might best allow the exploration of different technological paths.

### A successful waste disposal system sustains U.S. nuclear leadership and enables effective nonproliferation initiatives—other countries will let the U.S. handle their spent fuel.

Bengelsdorf 7 — Harold Bengelsdorf, consultant and former director of both key State and Energy Department offices that are concerned with international nuclear and nonproliferation affairs, 07 [“THE U.S. DOMESTIC CIVIL NUCLEAR INFRASTRUCTURE AND U.S. NONPROLIFERATION POLICY”, White Paper prepared for the American Council on Global Nuclear Competitiveness May, http://www.nuclearcompetitiveness.org/images/COUNCIL\_WHITE\_PAPER\_Final.pdf]

Importance of Resolving the Nuclear Waste Issue In this connection, one the of the most severe challenges facing the nonproliferation regime in the years ahead is to prevent the spread of sensitive nuclear fuel cycle facilities such as enrichment and reprocessing plants. The goal of establishing fuel leasing or cradle-to-grave programs by the U.S. is an important component of GNEP, and, if achieved, it could prove to be far more effective than other approaches in discouraging the spread of enrichment and reprocessing facilities. The countries that are likely to have the greatest interest in a cradle-to-grave program will be those with small or modest-size nuclear power programs that would likely face serious technical, economic and political problems in managing their spent fuel or disposing of their nuclear wastes. The ability of the United States to offer nuclear fuel leasing or cradle-to grave fuel cycle services to other states on a broad basis faces formidable hurdles. The U.S. Government is already in breach of its contract with domestic owners and operators of nuclear power plants to have begun acceptance of their commercial spent nuclear fuel in 1998 in fulfillment of its obligations under the National Waste Policy Act. The Yucca Mountain Project continues to face formidable legal, regulatory and budgetary obstacles that must be overcome if spent fuel is ever to be shipped to that site for disposal. In addition, the statutory limit that was established by Congress of 70,000 metric tons of uranium for the proposed Yucca Mountain repository is significantly less than the amount of spent fuel that will be discharged by the nuclear power plants that are presently operating in the U.S. during their lifetimes. Materially reducing the volume of waste that will have to be disposed of in the U.S. has been one of the major motivating forces behind the R&D objectives of GNEP to develop new advanced closed fuel cycles. However, even though Yucca Mountain may have the physical capacity to store more than 130,000 tons of spent fuel, Congress must take a separate action to authorize it to go beyond its present statutory limit. Aside from capacity limits, there remain numerous legal, technical and regulatory issues that must be resolved before the Yucca Mountain repository will become operational even for domestic spent nuclear fuel and high level radioactive waste. In the absence of legislative changes by Congress, the present statutory capacity of Yucca Mountain will be fully utilized to accommodate domestic civilian and government spent nuclear fuel and high level radioactive waste. All this suggests that the ability of the United States to resolve its own difficulties in managing its spent fuel and nuclear wastes will be crucial to maintaining the credibility of the U.S. nuclear power program and will be vital to implementing important new nonproliferation initiatives designed to discourage the spread of sensitive nuclear facilities to other countries.

### Continuation of worldwide reprocessing results in nuclear proliferation, collapse of the NPT, nuclear terrorism, and nuclear accidents—effective storage is key to solve.

UCS 11 (Union of Concerned Scientists, “Nuclear Reprocessing: Dangerous, Dirty, and Expensive” April 5th, http://www.ucsusa.org/nuclear\_power/nuclear\_power\_risk/nuclear\_proliferation\_and\_terrorism/nuclear-reprocessing.html) MFR

Reprocessing is a series of chemical operations that separates plutonium and uranium from other nuclear waste contained in the used (or “spent”) fuel from nuclear power reactors. The separated plutonium can be used to fuel reactors, but also to make nuclear weapons**.** In the late 1970’s, the United States decided on nuclear non-proliferation grounds not to reprocess spent fuel from U.S. power reactors, but instead to directly dispose of it in a deep underground geologic repository where it would remain isolated from the environment for at least tens of thousands of years. While some supporters of a U.S. reprocessing program believe it would help solve the nuclear waste problem, reprocessing would not reduce the need for storage and disposal of radioactive waste. Worse, reprocessing would make it easier for terrorists to acquire nuclear weapons materials, and for nations to develop nuclear weapons programs. Reprocessing would increase the risk of nuclear terrorism. Less than 20 pounds of plutonium is needed to make a simple nuclear weapon. If the plutonium remains bound in large, heavy, and highly radioactive spent fuel assemblies (the current U.S. practice), it is nearly impossible to steal. In contrast, separated plutonium is not highly radioactive and is stored in a concentrated powder form. Some claim that new reprocessing technologies that would leave the plutonium blended with other elements, such as neptunium, would result in a mixture that would be too radioactive to steal. This is incorrect; neither neptunium nor the other elements under consideration are radioactive enough to preclude theft. Most of these other elements are also weapon-usable. Moreover, commercial-scale reprocessing facilities handle so much of this material that it has proven impossible to keep track of it accurately in a timely manner, making it feasible that the theft of enough plutonium to build several bombs could go undetected for years. A U.S. reprocessing program would add to the worldwide stockpile of separated and vulnerable civil plutonium that sits in storage today, which totaled roughly 250 metric tons as of the end of 2009—enough for some 30,000 nuclear weapons. Reprocessing the U.S. spent fuel generated to date would increase this by more than 500 metric tons. Reprocessing would increase the ease of nuclear proliferation. U.S. reprocessing would undermine the U.S. goal of halting the spread of fuel cycle technologies that are permitted under the Nuclear Non-Proliferation Treaty but can be used to make nuclear weapons materials. The United States cannot credibly persuade other countries to forgo a technology it has newly embraced for its own use. Although some reprocessing advocates claim that new reprocessing technologies under development will be "proliferation resistant," they would actually be more difficult for international inspectors to safeguard because it would be harder to make precise measurements of the weapon-usable materials during and after processing. Moreover, all reprocessing technologies are far more proliferation-prone than direct disposal. Reprocessing would hurt U.S. nuclear waste management efforts. First, there is no spent fuel storage crisis that warrants such a drastic change in course. Hardened interim storage of spent fuel in dry casks is an economically viable and secure option for at least fifty years. Second, reprocessing does not reduce the need for storage and disposal of radioactive waste, and a geologic repository would still be required. Plutonium constitutes only about one percent of the spent fuel from U.S. reactors. After reprocessing, the remaining material will be in several different waste forms, and the total volume of nuclear waste will have been increased by a factor of twenty or more, including low-level waste and plutonium-contaminated waste. The largest component of the remaining material is uranium, which is also a waste product because it is contaminated and undesirable for reuse in reactors. Even if the uranium is classified as low-level waste, new low-level nuclear waste facilities would have to be built to dispose of it. And to make a significant reduction in the amount of high-level nuclear waste that would require disposal, the used fuel would need to be reprocessed and reused many times with an extremely high degree of efficiency—an extremely difficult endeavor that would likely take centuries to accomplish. Finally, reprocessing would divert focus and resources from a U.S. geologic disposal program and hurt—not help—the U.S. nuclear waste management effort. The licensing requirements for the reprocessing, fuel fabrication, and waste processing plants would dwarf those needed to license a repository, and provide additional targets for public opposition. What is most needed today is a renewed focus on secure interim storage of spent fuel and on gaining the scientific and technical consensus needed to site a geological repository.

### NPT credibility is essential to prevent runaway proliferation.

Dunn 9 [Lewis A. Dunn, Senior vice president of Science Applications International Corp, Former assistant director of the U.S. Arms Control and Disarmament Agency, Ambassador for the nuclear Nonproliferation Treaty in the Reagan Administration, “THE NPT: Assessing the Past, Building the Future,” Nonproliferation Review, Vol. 16 No. 2, July 2009, <http://cns.miis.edu/npr/pdfs/npr_16-2_dunn.pdf>]

Metric: Does NPT adherence provide a leverage point for outside influence and action to prevent proliferation? NPT adherence clearly provides a point of leverage, although the nature of that leverage\* and its likely effectiveness\*could vary depending on the country. In Iran’s case, its adherence to the NPT has been most useful as a rallying point for outside efforts to pressure Iranian leaders to think anew about their goals. UN Security Council Resolutions 1737 (2006), 1747 (2007), 1803 (2008), and 1835 (2008) all reaffirmed the council’s support for the NPT, while Resolutions 1747 and 1803 both emphasized ‘‘the need for all States Parties to that Treaty to comply fully with all their obligations.’’ Moreover, some key European countries’ support for actions to stop Iran’s uranium enrichment activities has been linked to a belief\*accurate or not\*that Iranian acquisition of nuclear weapons would put at risk the overall NPT structure.19 Amid continuing tensions between the George W. Bush administration and other countries, Iran’s NPT obligations provided a ready basis to argue that the issue was not simply one of the United States versus Iran. To use a hypothetical example, let us imagine that due to some combination of the most recent North Korean volte-face on giving up its nuclear weapons, tensions with China, and uncertainty about the U.S. security link, pressures grow in Japan to pursue nuclear weapons. In this case, outside powers could use Japan’s NPT adherence as a leverage point to urge the Japanese leadership to think carefully about whether to take that step. Japan’s NPT adherence\*and the need for it to go through procedures to withdraw from the NPT\*would also help buy time for new initiatives to deal with future Japanese security concerns. Still another example of the leverage provided by NPT membership concerns possible action to be taken after a country has violated its obligations and broken out of the NPT. Iran may yet be a future case in point. Should Iran acquire nuclear weapons, the international community will need to take many actions to contain the regional and global spillovers.20 Those actions could well include measures to make Iran pay a price for violating the NPT, to signal resolve to Iran, to its threatened neighbors, and to the wider NPT community. The fact that Iran would have violated its legal obligations under the NPT would provide a stronger foundation for any such international punitive actions. Metric: Did widespread NPT adherence help reverse the perception that runaway proliferation was unavoidable? In the early 1960s, there was a growing fear that widespread proliferation of nuclear weapons was possibly unavoidable. President John F. Kennedy warned in 1963 that a world with many dozens of nuclear weapon states might emerge. This fear of runaway proliferation gave urgency to the negotiation of a nonproliferation treaty, not least because of the belief that growing worldwide use of nuclear power would place access to nuclear weapons material in the hands of many countries.21 Such warnings of runaway proliferation, however, could well have become a self-fulfilling prophecy. Fearful of a world of nuclear powers, many countries might have sought nuclear weapons lest they be left behind. Responding to such fears, the United States took actions to enhance the nuclear security of its European non-nuclear allies. In parallel, the United States, the Soviet Union, and many other countries joined together to create what became the nonproliferation regime. The NPT was and remains a key part of that regime. Steadily growing membership in the NPT after its opening for signature in 1968\*including critical countries in Europe and Asia\*provided a valuable symbol that demonstrated to many countries that runaway proliferation was not the wave of the future. So did the prospect of an international system of nuclear safeguards\*run by a then-new International Atomic Energy Agency (IAEA)\*to prevent diversion of nuclear weapon materials from peaceful nuclear uses. In effect, partly because of more traditional security mechanisms and partly due to the growing NPT membership, early fears of a world of runaway global proliferation became a self-denying prophecy. Today, fears have again emerged that runaway proliferation could develop. It is often argued that the spread of nuclear weapons is at a ‘‘tipping point,’’ that there is a danger of ‘‘cascading’’ proliferation, and that we could be entering a ‘‘new nuclear age.’’22 In this context, however, widespread adherence to the NPT alone will not suffice to counter fears of nuclear weapon proliferation. Rather, the NPT’s contribution to countering fears of runaway proliferation will depend heavily on whether there is a widespread perception that countries are complying fully with their NPT obligations. Article II Net Assessment. The direct impact of Article II in preventing proliferation is mixed. Negotiation of the NPT with its ‘‘no manufacture, no acquisition’’ obligation forced a number of countries to decide whether or not to pursue nuclear weapons. Faced with that decision, important countries chose to renounce nuclear weapons. In deciding, states were motivated by a mix of considerations, and the NPT helped crystallize their decisions. By contrast, some prominent NPT parties have stayed in the NPT while pursuing nuclear weapons: North Korea, Iraq, and Libya\*and quite possibly Iran. The indirect impact of Article II may be more compelling. The ‘‘no acquisition, no manufacture’’ obligation provides a nonproliferation leverage point for rallying outsiders, for engaging in dialogue with countries rethinking their nonproliferation commitment, and for taking action after NPT breakout.

### Proliferation creates multiple scenarios for nuclear war.

Below 8 — Below, Masters Thesis for School of Advanced Air & Space Studies, ’08 [Tim D.Q., Wing Commander, RAF; MA in Defence Studies, King’s College London; “Options for US nuclear disarmament: exemplary leadership or extraordinary lunacy?,” June 2008, Thesis for School of Advanced Air and Space Studies, Air University Maxwell Air Force Base, Alabama]

Proliferation. Roger Molander, of RAND Corporation, asserts that “in the near future, a large number of countries are each going to develop a small number of nuclear weapons.”50 The Union of Concerned Scientists considers this to be the greatest long term danger confronting both US and international security today.51 Proliferation increases risk in a number of ways. First, the more states that hold nuclear weapons, the more likely it is that one will have an insufficiently mature or robust nuclear doctrine to manage its capability responsibly. Tom Sauer suggests that developing states that do not have democratic political systems present a particularly high risk because in dictatorial regimes, the military are frequently in control, and as Sagan has observed, the military appear to be more inclined to initiate preventative attacks against adversaries than civilians.52 Second, the more widely proliferated nuclear weapons become, the more theoretical opportunities may be presented for theft of nuclear material. Third, proliferation increases the risk of nuclear intervention by an established nuclear power, including the five NWSs. Stephen Younger envisages several scenarios in which currently established nuclear powers might “feel a need” to intervene with nuclear weapons in present regional conflicts, especially if WMD are being employed or threatened. Moreover, since proliferation is frequently associated with reaction to nuclear development either within a bordering nation or regional counterpart, further proliferation is in turn likely to generate a quasi-exponential expansion of similar regional scenarios.53 Ambassador Lehman envisages a scenario in which proliferation may induce a chain reaction of related regional arms races that could result in unintended and unexpected consequences far removed from the objectives of the proliferating nations, and in the United States’ specific case, a risk that the nation could get sucked into a conventional regional conflict which is subsequently escalated into nuclear warfare by its allies or their opponents.54

### Nuclear leadership solves—credibility is key to influence states not to proliferate.

Bengelsdorf 7 — Harold Bengelsdorf, consultant and former director of both key State and Energy Department offices that are concerned with international nuclear and nonproliferation affairs, 07 [“THE U.S. DOMESTIC CIVIL NUCLEAR INFRASTRUCTURE AND U.S. NONPROLIFERATION POLICY”, White Paper prepared for the American Council on Global Nuclear Competitiveness May, http://www.nuclearcompetitiveness.org/images/COUNCIL\_WHITE\_PAPER\_Final.pdf]

It is, therefore, essential that the United States have vibrant nuclear reactor, enrichment services, and spent fuel storage and disposal industries that can not only meet the needs of U.S. utilities but will also enable the United States to promote effective safeguards and other nonproliferation controls through close peaceful nuclear cooperation with other countries. U.S. nuclear exports can be used to influence other states’ nuclear programs through the nonproliferation commitments that the U.S. requires. The U.S. has so-called consent rights over the enrichment, reprocessing and alteration in form or content of the nuclear materials that it has provided to other countries, as well as to the nuclear materials that are produced from the nuclear materials and equipment that the U.S. has supplied. Further, the ability of the U.S. to develop improved and advanced nuclear technologies will depend on its ability to provide consistent and vigorous support for nuclear R&D programs that will enjoy solid bipartisan political support in order that they can be sustained from one administration to another. As the U.S. Government expends taxpayer funds on the Nuclear Power 2010 program, the Global Nuclear Energy Partnership, the Generation IV initiative and other programs, it should consider the benefit to the U.S. industrial base and to U.S. non-proliferation posture as criteria in project design and source selection where possible. Finally, the ability of the United States to resolve its own difficulties in managing its spent fuel and nuclear wastes will be crucial to maintaining the credibility of the U.S. nuclear power program and will be vital to implementing important new nonproliferation initiatives designed to discourage the spread of sensitive nuclear facilities to other countries.

## 1AC—Nuclear Terrorism Adv

### Contention 2: Nuclear Terrorism

### Current U.S. waste storage practices are overloaded—they are extremely dangerous and susceptible to terrorist attacks.

Ananda 11 (Rady, “US stores spent nuclear fuel rods at 4 times pool capacity,” 3/27) MFR

US stores spent nuclear fuel rods at 4 times pool capacity In a recent interview with The Real News Network, Robert Alvarez, a nuclear policy specialist since 1975, reports that spent nuclear fuel in the United States comprises the largest concentration of radioactivity on the planet: 71,000 metric tons. Worse, since the Yucca Mountain waste repository has been scrapped due to its proximity to active faults (see last image), the US Nuclear Regulatory Commission has allowed reactor operators to store four times more waste in the spent fuel pools than they're designed to handle. Each Fukushima spent fuel pool holds about 100 metric tons, he says, while each US pool holds from 500-700 metric tons. A single pool fire would release catastrophic amounts of radioactivity, rendering 17-22,000 square miles of area uninhabitable. That's about the size of New Hampshire and Vermont - from one pool fire. In a March 25th interview, physician and nuclear activist Dr Helen Caldicott explains that "there's far more radiation in each of the cooling pools than there is in each reactor itself.... Now the very short-lived isotopes have decayed away to nothing. But the long-lived ones, the very dangerous ones, Cesium, Strontium, Uranium, Plutonium, Americium, Curium, Neptunium, I mean really dangerous ones, the long-lived ones - that's what the fuel pools hold." Nuclear waste, in the form of tiny pellets, are loaded into metal rods, that are then bundled into a “fuel assembly.” The assemblies are stored inside casements that are then submerged in cooling pools that are located at the top of a nuclear reactor, as the [following images](http://joelcayford.blogspot.com/2011/03/what-f-is-happening-at-fukushima-2.html" \t "_blank) reveal: The image at the top of the article shows an entire pool filled with these assemblies. There are millions of these rods around the planet, reports Reuters. As a Senior Scholar at the Institute for Policy Studies, Alvarez was part of a multidisciplinary international team that looked at possible terror attacks on nuclear facilities, focusing on the spent fuel storage pools. In 2003, they released a report, Reducing the Hazards from Stored Spent Power-Reactor Fuel in the United States, which calls for transferring the spent fuel from the pools into dry-cask storage. (Summary here.) The report recommends that 75% of the spent rods be removed from each of the pools and stored in ultra-thick concrete bunkers capable of withstanding aerial impact. The project would take about ten years and would “reduce the average inventory of 137Cs (radioactive cesium) in U.S. spent-fuel pools by about a factor of four.” The NRC attempted to suppress the IPC report, Alvarez says. “The response by the Nuclear Regulatory Commission and nuclear industry was hostile.” But the National Academy of Sciences agreed that a fire in an overloaded fuel pool would be catastrophic. The NRC attempted to block the Academy’s report, as well. The NRC serves industry, not the public, and by controlling the purse strings, Congress has forced the NRC to “greatly curtail its regulatory programs,” says Alvarez. Engineer Keith Harmon Snow couldn’t agree more. He recently lambasted the NRC and mainstream media for downplaying the ongoing catastrophe in Japan. He notes that, “The atomic bomb that exploded at Hiroshima created about 2000 curies of radioactivity. The spent fuel pools at Vermont Yankee Nuclear Plant (U.S.) are said to hold about 75 million curies.” And that’s just one US nuclear plant, out of 104, not to ignore the undisclosed number of research sites. Then consider that several nuclear plants sit on geologic faults, as this image by Public Integrity reveals: Also see this global map of earthquake activity and nuclear power plant locations. Nuclear waste is a serious, deadly and growing problem that the industry refuses to address, preferring to externalize disposal costs onto the public (even suing the US government to clean up its mess for them, under a 1998 law it no doubt favored). Unless the radioactive waste is laser-launched toward the sun, we’re stuck with waste that will contaminate the biosphere for thousands of years, for the measly prize of 25-30 years of electricity, as nuclear activist and mathematician Gordon Edwards so eloquently explained. The risk far outweighs the benefit; this energy choice exemplifies the insanity of the nuclear industry and its government protectors.

### Independent from reprocessing technology, current nuclear facilities are highly susceptible to terrorist attacks, theft, and nuclear accidents due to overstoring of spent fuel—it could happen *any time*.

Alvarez et al. 3 (\*Robert, a Senior Scholar at IPS, where he is currently focused on nuclear disarmament, environmental, and energy policies, served as a Senior Policy Advisor to the Secretary and Deputy Assistant Secretary for National Security and the Environment. \*Jan Beyea, PhD, earth science and environmental studies \*Klaus Janberg, \*Jungmin Kang, \*Ed Lyman, \*Allison Macfarlane, \*Gordon Thompson, \*Frank N. von Hippel, PhD Princeton University. “Reducing the Hazards from Stored Spent Power-Reactor Fuel in the United States” Science and Global Security, 11:1–51, 2003 www.irss-usa.org/pages/documents/11\_1Alvarez.pdf) MFR

Because of the unavailability of off-site storage for spent power-reactor fuel, the NRC has allowed high-density storage of spent fuel in pools originally designed to hold much smaller inventories. As a result, virtually all U.S. spent-fuel pools have been re-racked to hold spent-fuel assemblies at densities that approach those in reactor cores. In order to prevent the spent fuel from going critical, the fuel assemblies are partitioned off from each other in metal boxes whose walls contain neutron-absorbing boron. It has been known for more than two decades that, in case of a loss of water in the pool, convective air cooling would be relatively ineffective in such a “dense-packed” pool. Spent fuel recently discharged from a reactor could heat up relatively rapidly to temperatures at which the zircaloy fuel cladding could catch ﬁre and the fuel’s volatile ﬁssion products, including 30-year half-life 137 Cs, would be released. The ﬁre could well spread to older spent fuel. The long-term land-contamination consequences of such an event could be signiﬁcantly worse than those from Chernobyl. No such event has occurred thus far. However, the consequences would affect such a large area that alternatives to dense-pack storage must be examined—especially in the context of concerns that terrorists might ﬁnd nuclear facilities attractive targets**.** To reduce both the consequences and probability of a spent-fuel-pool ﬁre, it is proposed that all spent fuel be transferred from wet to dry storage within ﬁve years of discharge. The cost of on-site dry-cask storage for an additional 35,000 tons of older spent fuel is estimated at $3.5–7 billion dollars or 0.03–0.06 cents per kilowatt-hour generated from that fuel. Later cost savings could offset some of this cost when the fuel is shipped off site. The transfer to dry storage could be accomplished within a decade. The removal of the older fuel would reduce the average inventory of 137 Cs in the pools by about a factor of four, bringing it down to about twice that in a reactor core. It would also make possible a return to open-rack storage for the remaining more recently discharged fuel. If accompanied by the installation of large emergency doors or blowers to provide largescale airﬂow through the buildings housing the pools, natural convection air cooling of this spent fuel should be possible if airﬂow has not been blocked by collapse of the building or other cause. Other possible risk-reduction measures are also discussed.

### Nuclear terrorists will make a move by 2013—most qualified evidence.

Zaitchik 8 (Alexander, staffwriter. “Experts Predict a Possible Terrorist Strike with a Nuke in the US by 2013 -- What Can We Do to Stop It?”, 12/16, <http://www.alternet.org/world/113115/experts_predict_a_possible_terrorist_strike_with_a_nuke_by_2013_--_what_can_we_do_to_stop_it/?page=entire>) MFR

"Megaterror Attack Likely By 2013, Say Experts." It's a good bet this headline caused thousands of Americans to stop in the tracks of their morning routines. Even by the tough post-9/11 standards of a.m. bummers, it was a gulper. On Dec. 4, the Commission on the Prevention of Weapons of Mass Destruction Proliferation and Terrorism convened a press conference to declare that our margin of safety against an act of megaterror is shrinking at a disturbing clip. The commission also issued a book-length study, World at Risk, which concluded, "unless the world community acts decisively and with great urgency, it is more likely than not that a weapon of mass destruction will be used in a terrorist attack somewhere in the world by the end of 2013." Depending on whom you ask, this is the good news. The WMD commission's conclusion is actually a little sunnier than some previous warnings of the same ilk. In 2004, one of the commission's ranking members, Harvard's Graham Allison, published a book called Nuclear Terrorism: The Ultimate Preventable Catastrophe, in which he estimated that there was an even chance that a nuclear weapon -- not a "dirty bomb," but an actual Hiroshima-style fission bomb -- would destroy an American city within a decade unless swift action was taken to lock down the world's sprawling stocks of fissile material, concentrated in, but not limited to, Russia.

### And the possibility of nuclear plant terrorism would result in eco-calamity—it’s an existential risk.

Alexei 11 (Turchin, commentator on Nuclear Power and Terrorism. “Worst Case Scenario of Nuclear Accidents - human extinction” <http://www.scribd.com/doc/52440799/Worst-Case-Scenario-of-Nuclear-Accidents-human-extinction>) MFR

The explosion of a small nuclear bomb inside a station Suppose a terrorist is an employee of the station and he brings (or assemblefrom readily available materials such as spent nuclear fuel), a small nuclear device(a few kilotons) inside the station.Assume the worst scenario. The bomb is put beneath working reactor. At the time of explosion of the reactor is in critical condition, that is, it has chain reaction. In the moment of explosion, the compression wave is formed, which is moving through the reactor from the bottom up, clutching uranium. This will cause parts of the reactor which are in a compression wave (in microseconds) to turn in the supercritical condition, and the chain reaction in them dramatically increase. (In the compression zoneoccurs prompt criticality needed for the occurrence of an explosive process, in thesame reactor is used delayed criticality associated with the fact that part of theisotope decays after a few seconds.)The possibility of this depends on the specific reactor design, for example,the orientation of the fuel rods in relation to the compression wave – it must belongitudinal, so that the rods had time to shrink along the longitudinal axis, not expanding to sides. It also depends on the braking system of neutrons in thereactor.Yet we cannot know the consequences of a nuclear explosion at the reactor without carrying out computer simulation. But the terrorist could use suchsimulation, and chose the most vulnerable type of reactor and place for the bomb.That is, he placed the bomb so as to cause maximum enhancement of theexplosion.I think that the location of the bomb at the reactor would lead to longitudinalcompression of the fuel rods and release the entire mass of the reactor up.In addition, the first atomic bomb would create a neutron flux, which isspread inside the reactor and dramatically enhance all the nuclear reactions in it.Compression area with an explosive reaction will serve as a source of neutrons,and additional compression to the upper parts of a reactor. Due to the enormousphysical dimensions of the reactor retention time of uranium in the critical regionwould be larger than the atomic bomb, and it will lead to more completecombustion of uranium.Modern reactor has a thermal capacity of 4 GW, the stock of fuel for a year and spends while only 5 percent of the fuel (or rather, does not spend, since hiswork enough plutonium partly able to participate in a nuclear explosion). 20 \* 35million seconds \* 10.4 \*\* 9dzh = 2.8 \* 10 \*\* 18dzh = roughly 750 megatons. Thisenergy is the upper limit, and any real explosion will be weaker.In addition, there may be an exploding thermonuclear reactions inside thereactor, for example, by deuterium in water in the cooling circuits. This water isenriched in deuterium by neutron capture during the last operation of the reactor or during the explosion (?), Especially if the cooling is used heavy water as in sometypes of reactors. 4 such CANDO reactor located in South Korea.In such a reactor, probably has about 100 tons of heavy water in the core, or 20 tons of deuterium. 1 kg of deuterium and tritium yields an energy of 80kilotonnes per kg, http://www.rhbz.ru/nuclear-weapon/phisical-base-of-nuclear-weapon.html of deuterium is less than, say, 50. In any case, it will be 1 gigatons of fusion energy in a reactor.Fusion energy will be very actively divide uranium 238 (available in largequantities in the fuel) by neutrons, which will (at least) doubling the force of theexplosion, and the manifold increase contamination.If we are talking about the explosion, for example, in Japan at theKashiwazaki station (written before Fukusima), there are six reactors next to eachother and the explosion of one of them (100 megatons) would destroy the others,and may even lead to their compression and explosion. Then the total explosion of 600 megatons, plus the reaction of the spent nuclear fuel. Such an explosion canlead to destruction and its neighboring nuclear power plant. For example,Fukushima-1 spaced at 10 km from the Fukushima-2. Yet the density of the reactor is not large enough on the planet to go to "chain reaction" - an explosion of one of the reactor leads to an explosion of another, and so on.Such an explosion would lead to complete destruction within a radius of about 100 km. But the greatest damage will be from the radiation release. It manifold surpasses Chornobyl for several reasons:A) The reactor will be completely vaporized and the steam gets going far beyond the blast. In Chernobyl the most part of fragments of the reactor was folded back into the sarcophagus, or had settled in the form of dust on the surroundingarea. As a result of contamination of plutonium and cesium 137 would be ten times more.B) The Chernobyl had released mostly relatively long-lived isotopes, sincethe short-lived - in a few days half-life - mostly disbanded before the explosion of the Rector - that is, they constantly are generated during operation of the reactor and it also fell apart. In our case, all the short-lived isotopes occur at the time of the explosion. In other words, all the iodine-131 with a decay period of 8 days, thrown in Chernobyl, had accumulated over the last 2 weeks before the accident,as more previously accumulated iodine have time to decay. That is, the release of radioactive iodine will be 100-1000 times higher than in Chernobyl.B) spent fuel pools will evaporate from the next to nuclear reactor and radioactive reactor construction too. A large number of isotopes will be produced by neutrons during the explosion in the reactor design. Due to this release of radiation will be greater than a nuclear explosion of equal power. This will worsen the situation further by 10-100 times. As a result, the total emission of radiation will be approximately 10,000 times higher than in Chernobyl, particularly short-lived isotopes. As a result of that large populated areas will be subjected to radiation (of theorder throughout the territory of South Korea and Japan), and evacuation would be impossible. In Chernobyl survived inhabitants of Pripyat, the liquidators, the staff of the plant, but due to their rapid evacuation. A man who spent a day sunbathing on theroof of a house in Pripyat in a few days after the accident, has died. One can argue that from a short-lived radiation would kill humans within a few kilometers from Chernobyl, say an area of 10 square meters. km., if there were no evacuations. In our case, it would be an area of hundreds of thousands of square kilometers. Although the majority of the population managed to evacuate or to hide, about half have died - from a short-lived (up to 10 days) radiation. The worst scenario would be if at the same time in such a way would have been blown hundreds of reactors. This is possible if it is proved that nuclear missile attack could lead to anuclear reactor nuclear explosion (not just evaporating as we discussed in the 1chapter) at the exact contact with the reactor building. This is only possible when using cruise missiles with high accuracy. In the world there are three areas with a high concentration of nuclear reactors - Japan + South Korea, west Europe and the U.S. East coast. In each region there are about a hundred reactors. In the case of rebellion on nuclear submarines with cruise missiles, is one such boat could have hit a hundred reactors. The probability of such a rebellion could not be considered zero, and some types of boats stored codes of launch on the board. The threat of strike on the reactor can be an instrument of global blackmail. But in order to kick brought an explosion of reactors, it is necessary thatthey were not plugged, it is needed the element of surprise. In this case, a one-time release of radiation would be about 1 million of Chernobyl, or 50 trillion curies. Which is approximately equivalent to 10 thousandx-rays per person per year. This is guaranteed lethal dose for most of humanity,even though much of it will have on the short-lived isotopes, namely, iodine, and certain groups of people can sit out of its sealed shelters. But the biosphere will be destroyed, agriculture destroyed, and it is probable that these survivors are a group of people will be doomed to further extinction

### The plan solves the nuclear disposal problem—it’s cheap, efficient, safe, feasible, and prototype technologies have been used in the past.

Coopersmith 5 (Jonathan, associate professor of history at Texas A&M University, specializes in the history of technology and the history of Russia. “Nuclear waste in space?” 8/22, <http://www.thespacereview.com/article/437/1>) MFR

Neither the space shuttle nor conventional rockets are up to this task. Not only are they expensive, but they lack the desired reliability and safety as insurance rates demonstrate. Instead, we need to develop a new generation of launch systems where the launcher remains on the ground so the spacecraft is almost all payload, not propellant. As well as being more efficient, ground-launched systems are inherently safer than rockets because the capsules will not carry liquid fuels, eliminating the in-flight danger of an explosion. Nor will the capsules have the pumps and other mechanical equipment of rockets, further reducing the chances of something going wrong. We need to develop a new generation of launch systems where the launcher remains on the ground so the spacecraft is almost all payload, not propellant. How would disposal of nuclear wastes in space actually work? In the simplest approach, a ground-based laser system will launch capsules directly out of the solar system. In a more complicated scheme, the laser system will place the capsules into a nuclear-safe orbit, at least 1,100 kilometers above the earth, so that they could not reenter for several hundred years at a minimum. Next, a space tug will attach the capsules to a solar sail for movement to their final destination orbiting around the sun, far, far from earth. The underlying concept is simple: the launcher accelerates the capsule to escape velocity. Like a gun, only the bullet heads toward the target, not the entire gun. Unlike a shuttle or rocket, ground systems are designed for quick reuse. To continue the analogy, the gun is reloaded and fired again. These systems would send tens or hundreds of kilograms instead of tons into orbit per launch. Of the three possible technologies—laser, microwave, and electromagnetic railguns—laser propulsion is the most promising for the next decade. In laser propulsion, a laser beam from the ground hits the bottom of the capsule. The resultant heat compresses and explodes the air or solid fuel there, providing lift and guidance. Although sounding like science fiction, the concept is more than just an elegant idea. In October 2000, a 10-kilowatt laser at White Sands Missile Range in New Mexico boosted a two-ounce (50 gram) lightcraft over 60 meters vertically. These numbers seem small, but prove the underlying feasibility of the concept. American research, currently at Rensselaer Polytechnic Institute in New York with previous work at the Department of Energy’s Lawrence Livermore National Laboratory in California, has been funded at low levels by the United States Air Force, NASA, and FINDS, a space development group. The United States does not have a monopoly in the field. The four International Symposiums on Beamed Energy Propulsion have attracted researchers from Germany, France, Japan, Russia, South Korea, and other countries. The long-term benefit of a ground-based system will be much greater if it can ultimately handle people as well as plutonium. Dartmouth physics professor Arthur R. Kantrowitz, who first proposed laser propulsion in 1972, considers the concept even more promising today due to more efficient lasers and adaptive optics, the technology used by astronomers to improve their viewing and the Air Force for its airborne anti-ballistic missile laser. Where should the nuclear waste ultimately go? Sending the capsules out of the solar system is the simplest option because the laser can directly launch the capsule on its way. Both Ivan Bekey, the former director of NASA’s of Advanced Programs in the Office of Spaceflight, and Dr. Jordin T. Kare, the former technical director of the Strategic Defense Initiative Organization’s Laser Propulsion Program, which ran from 1987-90, emphasized solar escape is the most reliable choice because less could go wrong. A second option, a solar orbit inside Venus, would retain the option of retrieving the capsules. Future generations might actually find our radioactive wastes valuable, just as old mine tailings are a useful source of precious metals today. After all, the spent fuel still contains over three-quarters of the original fuel and could be reprocessed. Terrorists or rogue states might be able to reach these capsules, but if they have that technical capability, stealing nuclear wastes will be among the least of our concerns**.** This approach is more complex, demanding a temporary earth orbit and a solar sail to move it into a solar orbit, thus increasing the possibility of something going wrong.

## 1AC—Exploration Adv

### Contention 3: Exploration

### Safe nuclear waste disposal is a prerequisite to exploration and research and development incentives for better and cheaper space technology.

Coopersmith 5 (Jonathan, associate professor of history at Texas A&M University, specializes in the history of technology and the history of Russia. “Nuclear waste in space?” 8/22, <http://www.thespacereview.com/article/437/1>) MFR

When I fly from Texas to Europe, I pay $3–6 a pound, depending on how well I do buying a ticket. When a satellite or shuttle is launched into space, the customer (or taxpayer) pays over $10,000 a pound. That is the major challenge of space flight: until the cost of going into space drastically decreases, the large-scale exploration and exploitation of space will not occur. The world currently sends approximately 200 tons of payloads, the equivalent of two 747 freighter flights, into space annually. At $50–500 million a launch, very few cargoes can justify their cost. We have here the classic chicken-and-egg situation. As long as space flight remains very expensive, payloads will be small. As long as payloads remain small, rockets will be expensive. If annual demand were 5,000 tons instead of 200, the equation would shift. Engineers would have the incentive to design more efficient launch systems. Large, guaranteed payloads could significantly reduce the cost of reaching orbit, ushering in a new, affordable era in space for governments, businesses, universities, and, hopefully, individuals. Where would this much new cargo come from? Fortunately, there is an answer. Unfortunately, it’s not intuitively attractive, at least at first glance: it’s high-level nuclear waste, the 45,000 tons and 380,000 cubic meters of high-level radioactive spent fuel and process waste and detritus (as opposed to the more abundant but far less dangerous and shorter-lived low-level waste) from six decades of nuclear weapons programs and civilian power plants. There are three good reasons to send nuclear waste into space. First, it is safe. Second, space disposal is better than the alternative, underground burial. Third, it may finally open the door to widespread utilization of space. Because of the obvious and real concern about moving such dangerous material anywhere, let alone into space, this proposal justly raises the question of safety. Can nuclear waste be safely launched into earth orbit? The answer is yes. By keeping the launch system on the ground instead of putting it on the vehicle, designing and building unbreakable containers, and arranging multiple layers of safety precautions, we can operate in a judicious and safe manner.

### The plan expands the space industry and makes it economically viable to explore space.

Coopersmith 99 (Jonathan, associate professor of history at Texas A&M University, specializes in the history of technology and the history of Russia. “DISPOSAL OF HIGH-LEVEL NUCLEAR WASTE IN SPACE” 1999 AIAA Annual Technical Symposium)

In the spirit of Jonathan Swift, let me offer a modest proposal: Let's put high-level radioactive waste where it belongs -- out in space where it cannot endanger anyone on earth. The idea is not new -- NASA's Lewis Research Center concluded it was technically feasible in 1974 and the Space Systems Technical Committee of the American Institute of Aeronautics and Astronautics endorsed it in 1981, to name only two of many studies, but space disposal has never received strong institutional support from government or the private sector.vi Instead, nuclear waste disposal has remained the province of the geologists, who are professionally inclined to look down, not up. Space disposal has two major benefits. First, it will permanently remove the burden and responsibility of high-level radioactive waste from future generations. Second, the infrastructure needed to dispose of radioactive waste safely will greatly reduce the cost of exploiting space. The tonnage currently launched into space is not that great. In 1998, rockets launched less than 200 tons of payloads into earth orbit and beyond (excluding the weight of the space shuttle).vii The attraction for the aerospace community of waste disposal is the guarantee of large payloads for decades to come. What could engineers develop if asked to launch 10,000 tons annually? Space disposal will create the first market for launch systems that could truly provide the inexpensive access to space promised for decades. Disposal in space consists of three steps: - preparing and transporting the waste to the launch site - launching into low earth orbit - launching to a final destination All three steps have been studied extensively over the last quarter century. I will focus on the last two steps, each of which offers a wide range of technological options. The important criteria are safety, and technological and economic feasibility. Launch into earth orbit The most visible technological choice is the launch system -- or systems - to provide a quantum increase in access to space. The two basic choices are conventional rockets carrying large cargoes or ground-based systems launching smaller vehicles. Most studies in the 1970s-80s assumed the use of the space shuttle, possible derivatives, other rockets like Ariane, and even surplus ICBMs.viii The next generation of rockets, such as the EELV and even the proposed reusable launch vehicles (like the Kistler K-1) will reduce the cost of access by an order of magnitude at most and probably less. While these are major improvements on existing rockets, only more radical approaches may reduce costs by the one or two more orders of magnitude necessary to truly change the economic perceptions of space. Advocates have proposed ground-based launch systems for decades: Arthur C. Clarke proposed the electromagnetic launcher in 1960 and Arthur R. Kantrowitz first proposed laser propulsion in 1972.ix Among the possible systems are electromagnetic launchers, mass drivers, gas guns, laser propulsion, and the Scramaccelerator.x Laser propulsion is probably the most appealing option because of its ability to launch people as well as plutonium, if the Lightcraft Technology Demonstrator performs as promised. The major stumbling blocks of ground-based systems have been the low efficiencies of the technologies, which were in an early stage of development, the high development and construction costs (usually estimated at billions of dollars), and the absence of sufficient payloads to justify these high costs. A more subjective factor was their unconventional approach, compared with the existing rocket launchers. The theoretical advantage of ground-based systems is that most of the weight of such a system remains on the ground so most of the spacecraft is payload. Although each launch would dispatch kilograms instead of tons, such systems might prove ideal because of their low operational costs. The large tonnages will offer, finally, the great demand and economic rationale needed to justify building a groundbased launching system.

### And leadership in space exploration is the lynchpin of U.S. global leadership.

Stone 11 [Christopher Stone is a space policy analyst and strategist who lives near Washington DC., “ American leadership in space: leadership through capability,” Space Review, March 14, 2011 ]

When it comes to space exploration and development, including national security space and commercial, I would disagree somewhat with Mr. Friedman’s assertion that space is “often” overlooked in “foreign relations and geopolitical strategies”. My contention is that while space is indeed overlooked in national grand geopolitical strategies by many in national leadership, space is used as a tool for foreign policy and relations more often than not. In fact, I will say that the US space program has become less of an effort for the advancement of US space power and exploration, and is used more as a foreign policy tool to “shape” the strategic environment to what President Obama referred to in his National Security Strategy as “The World We Seek”. Using space to shape the strategic environment is not a bad thing in and of itself. What concerns me with this form of “shaping” is that we appear to have changed the definition of American leadership as a nation away from the traditional sense of the word. Some seem to want to base our future national foundations in space using the important international collaboration piece as the starting point. Traditional national leadership would start by advancing United States’ space power capabilities and strategies first, then proceed toward shaping the international environment through allied cooperation efforts. The United States’ goal should be leadership through spacefaring capabilities, in all sectors. Achieving and maintaining such leadership through capability will allow for increased space security and opportunities for all and for America to lead the international space community by both technological and political example. The world has recognized America as the leaders in space because it demonstrated technological advancement by the Apollo lunar landings, our deep space exploration probes to the outer planets, and deploying national security space missions. We did not become the recognized leaders in astronautics and space technology because we decided to fund billions into research programs with no firm budgetary commitment or attainable goals. We did it because we made a national level decision to do each of them, stuck with it, and achieved exceptional things in manned and unmanned spaceflight. We have allowed ourselves to drift from this traditional strategic definition of leadership in space exploration, rapidly becoming participants in spaceflight rather than the leader of the global space community. One example is shutting down the space shuttle program without a viable domestic spacecraft chosen and funded to commence operations upon retirement of the fleet. We are paying millions to rely on Russia to ferry our astronauts to an International Space Station that US taxpayers paid the lion’s share of the cost of construction. Why would we, as United States citizens and space advocates, settle for this? The current debate on commercial crew and cargo as the stopgap between shuttle and whatever comes next could and hopefully will provide some new and exciting solutions to this particular issue. However, we need to made a decision sooner rather than later. Finally, one other issue that concerns me is the view of the world “hegemony” or “superiority” as dirty words. Some seem to view these words used in policy statements or speeches as a direct threat. In my view, each nation (should they desire) should have freedom of access to space for the purpose of advancing their “security, prestige and wealth” through exploration like we do. However, to maintain leadership in the space environment, space superiority is a worthy and necessary byproduct of the traditional leadership model. If your nation is the leader in space, it would pursue and maintain superiority in their mission sets and capabilities. In my opinion, space superiority does not imply a wall of orbital weapons preventing other nations from access to space, nor does it preclude international cooperation among friendly nations. Rather, it indicates a desire as a country to achieve its goals for national security, prestige, and economic prosperity for its people, and to be known as the best in the world with regards to space technology and astronautics. I can assure you that many other nations with aggressive space programs, like ours traditionally has been, desire the same prestige of being the best at some, if not all, parts of the space pie. Space has been characterized recently as “congested, contested, and competitive”; the quest for excellence is just one part of international space competition that, in my view, is a good and healthy thing. As other nations pursue excellence in space, we should take our responsibilities seriously, both from a national capability standpoint, and as a country who desires expanded international engagement in space. If America wants to retain its true leadership in space, it must approach its space programs as the advancement of its national “security, prestige and wealth” by maintaining its edge in spaceflight capabilities and use those demonstrated talents to advance international prestige and influence in the space community. These energies and influence can be channeled to create the international space coalitions of the future that many desire and benefit mankind as well as America. Leadership will require sound, long-range exploration strategies with national and international political will behind it. American leadership in space is not a choice. It is a requirement if we are to truly lead the world into space with programs and objectives “worthy of a great nation”.

### Hegemony prevents extinction

Khalizad 11 (Zalmay, United States ambassador to Afghanistan, Iraq, and the United Nations, The National Review, “The Economy and National Security” 2-8, http://www.nationalreview.com/articles/259024/economy-and-national-security-zalmay-khalilzad?page=1

If U.S. policymakers fail to act and other powers continue to grow, it is not a question of whether but when a new international order will emerge. The closing of the gap between the United States and its rivals could intensify geopolitical competition among major powers, increase incentives for local powers to play major powers against one another, and undercut our will to preclude or respond to international crises because of the higher risk of escalation. The stakes are high. In modern history, the longest period of peace among the great powers has been the era of U.S. leadership. By contrast, multi-polar systems have been unstable, with their competitive dynamics resulting in frequent crises and major wars among the great powers. Failures of multi-polar international systems produced both world wars. American retrenchment could have devastating consequences. Without an American security blanket, regional powers could rearm in an attempt to balance against emerging threats. Under this scenario, there would be a heightened possibility of arms races, miscalculation, or other crises spiraling into all-out conflict. Alternatively, in seeking to accommodate the stronger powers, weaker powers may shift their geopolitical posture away from the United States. Either way, hostile states would be emboldened to make aggressive moves in their regions.

### And delays ensure the collapse of U.S. space leadership.

Gerstenmaier 7 [William, ASSOCIATE ADMINISTRATOR, SPACE OPERATIONS, NATIONAL AERONAUTICS AND SPACE ADMINISTRATION, HEARING BEFORE THE SUBCOMMITTEE ON SPACE, AERONAUTICS, AND RELATED SCIENCES OF THE COMMITTEE ON COMMERCE, SCIENCE, AND TRANSPORTATION UNITED STATES SENATE, <http://www.gpo.gov/fdsys/pkg/CHRG-110shrg39519/pdf/CHRG-110shrg39519.pdf>]

The goal of transition is to keep the U.S. space workforce fully engaged and moving toward design and development of the new vehicles. Our focus is on life-cycle cost and risk management of our workforce, infrastructure, and facilities, including the necessary budget and plans to execute the ambitious agenda at hand. Full funding of NASA’s FY 2008 budget request is critical to ensuring the gap between retirement of the Space Shuttle and America’s new human spaceflight capability does not grow longer. If the gap in our human spaceflight capability extends even further than already planned, I believe our Nation may be ceding leadership in human spaceflight at a time when other nations are outlining ambitious programs of their own

### Laser Propulsion is the only viable way to colonize—sending materials must be cheap.

Kare 90 (Jordin T., PhD Astrophysics “GROUND-TO-ORBITLASER PROPULSION ADVANCEDAPPLICATIONS” [www.osti.gov/bridge/servlets/purl/6203669-Uxrfwv/6203669.pdf)](http://www.osti.gov/bridge/servlets/purl/6203669-Uxrfwv/6203669.pdf)) MFR

Laser propulsion uses a large fixed laser to supply energy to heat an inert propellant in a Livermore, CA rocket thruster. Such a system has two potential advantages: extreme simplicity, of DE91 004787 the thruster, and potentially high performance -- particularly high exhaust velocity. By taking advantage of the sireplicity of the thruster, it should be possible to launch small (10 - 1000 kg) payloads to orbit using roughly 1 MW of average laser power per kg of payload. The incremental cost of such launches would be of order $200/kg for the smallest systems, decreasing to essentially the cost of electricity to run the laser (a few times $10/kg) for large systems. Although the individual payload size would be small, a laser launch system would be inherently high-volume, with the capacity to launch tens of thousands of payloads per year. Also, with high exhaust velocity, a laser launch system could launch payloads to high velocities -- geosynchronous transfer, Earth escape, or beyond -at a relatively small premium over launches to L.EO. In this paper, we briefly review the status of pulsed laser propulsion, including proposals for advanced vehicles. We then discuss qualitatively several unique applications appropriate to the early part of the next century, and perhaps valuable well into the next millenium: space habitat supply, deep space mission supply, nuclear waste disposal, aral manned vehicle launching. Space habitat supply depends primarily on the ability of the laser propulsion system to launch large total volumes at low, cost, and with sufficient precision to avoid expensive rendezvous maneuvering. However, a key advantage is the laser system's ability to launch on short notice -the ability to receive spare parts, emergency supplies, etc. on less 'than 24 hou\_ notice could greatly simplify the logistics of space facilities. A crucial factor is the laser's cross-range capability, which allows a launch window of several hours per day to an inclined orbit. Deep space mission supply requires the same properties as habitat supply, but also requires high specific impulse to reach Earth escape. Rendezvous with a deep-space mission could be aided by an on-board laser. Nuclear waste disposal takes specific advantage of what is normally a disadvantage of laser propulsion -- small payload size. A laser launch system can demonstrate an almost arbitrarily low risk by launching a large number (1130,000) of test payloads and allowing them to "crash" in various ways to verify emergency recovery--systems. However, given that even a well-tested and reliable system can fail, the small payloads used would minimize the potential environmental damage from a failure. Very modest system performance would suffice for disposing of material on the Moon; a high-performance system could dispose of waste into deep space or into the sun. Finally, launching manned vehicles requires relatively large payload capacity and places a premium on low acceleration. A gigawatt-scale laser propulsion system could provide the needed capacity, however, and could easily be designed and tested to provide the extremely high level of safety needed for routine manned flight.

### Extinction is inevitable if we don’t get off the rock—multiple scenarios.

Austen 11 [Ben Austen, contributing editor of Harper’s Magazine, “After Earth: Why, Where, How, and When We Might Leave Our Home Planet,” popular science, <http://www.popsci.com/science/article/2011-02/after-earth-why-where-how-and-when-we-might-leave-our-home-planet?page=3>] WZ

Earth won’t always be fit for occupation. We know that in two billion years or so, an expanding sun will boil away our oceans, leaving our home in the universe uninhabitable—unless, that is, we haven’t already been wiped out by the Andromeda galaxy, which is on a multibillion-year collision course with our Milky Way. Moreover, at least a third of the thousand mile-wide asteroids that hurtle across our orbital path will eventually crash into us, at a rate of about one every 300,000 years.

Why?

Indeed, in 1989 a far smaller asteroid, the impact of which would still have been equivalent in force to 1,000 nuclear bombs, crossed our orbit just six hours after Earth had passed. A recent report by the Lifeboat Foundation, whose hundreds of researchers track a dozen different existential risks to humanity, likens that one-in-300,000 chance of a catastrophic strike to a game of Russian roulette: “If we keep pulling the trigger long enough we’ll blow our head off, and there’s no guarantee it won’t be the next pull.” Many of the threats that might lead us to consider off-Earth living arrangements are actually man-made, and not necessarily in the distant future. The amount we consume each year already far outstrips what our planet can sustain, and the World Wildlife Fund estimates that by 2030 we will be consuming two planets’ worth of natural resources annually. The Center for Research on the Epidemiology of Disasters, an international humanitarian organization, reports that the onslaught of droughts, earthquakes, epic rains and floods over the past decade is triple the number from the 1980s and nearly 54 times that of 1901, when this data was first collected. Some scenarios have climate change leading to severe water shortages, the submersion of coastal areas, and widespread famine. Additionally, the world could end by way of deadly pathogen, nuclear war or, as the Lifeboat Foundation warns, the “misuse of increasingly powerful technologies.” Given the risks humans pose to the planet, we might also someday leave Earth simply to conserve it, with our planet becoming a kind of nature sanctuary that we visit now and again, as we might Yosemite.

None of the threats we face are especially far-fetched. Climate change is already a major factor in human affairs, for instance, and our planet has undergone at least one previous mass extinction as a result of asteroid impact. “The dinosaurs died out because they were too stupid to build an adequate spacefaring civilization,” says Tihamer Toth-Fejel, a research engineer at the Advanced Information Systems division of defense contractor General Dynamics and one of 85 members of the Lifeboat Foundation’s space-settlement board. “So far, the difference between us and them is barely measurable.” The Alliance to Rescue Civilization, a project started by New York University chemist Robert Shapiro, contends that the inevitability of any of several cataclysmic events means that we must prepare a copy of our civilization and move it into outer space and out of harm’s way—a backup of our cultural achievements and traditions. In 2005, then–NASA administrator Michael Griffin described the aims of the national space program in similar terms. “If we humans want to survive for hundreds of thousands or millions of years, we must ultimately populate other planets,” he said. “One day, I don’t know when that day is, but there will be more human beings who live off the Earth than on it.”

### Err affirmative—reducing existential risk by even a tiny amount outweighs every other impact — the math is conclusively on our side.

Bostrom 11 — Nick Bostrom, Professor in the Faculty of Philosophy & Oxford Martin School, Director of the Future of Humanity Institute, and Director of the Programme on the Impacts of Future Technology at the University of Oxford, recipient of the 2009 Eugene R. Gannon Award for the Continued Pursuit of Human Advancement, holds a Ph.D. in Philosophy from the London School of Economics, 2011 (“The Concept of Existential Risk,” Draft of a Paper published on ExistentialRisk.com, Available Online at <http://www.existentialrisk.com/concept.html>, Accessed 07-04-2011)

Holding probability constant, risks become more serious as we move toward the upper-right region of figure 2. For any fixed probability, existential risks are thus more serious than other risk categories. But just how much more serious might not be intuitively obvious. One might think we could get a grip on how bad an existential catastrophe would be by considering some of the worst historical disasters we can think of—such as the two world wars, the Spanish flu pandemic, or the Holocaust—and then imagining something just a bit worse. Yet if we look at global population statistics over time, we find that these horrible events of the past century fail to register (figure 3).

[Graphic Omitted]

Figure 3: World population over the last century. Calamities such as the Spanish flu pandemic, the two world wars, and the Holocaust scarcely register. (If one stares hard at the graph, one can perhaps just barely make out a slight temporary reduction in the rate of growth of the world population during these events.)

But even this reflection fails to bring out the seriousness of existential risk. What makes existential catastrophes especially bad is not that they would show up robustly on a plot like the one in figure 3, causing a precipitous drop in world population or average quality of life. Instead, their significance lies primarily in the fact that they would destroy the future. The philosopher Derek Parfit made a similar point with the following thought experiment:

I believe that if we destroy mankind, as we now can, this outcome will be much worse than most people think. Compare three outcomes: (1) Peace. (2) A nuclear war that kills 99% of the world’s existing population. (3) A nuclear war that kills 100%. (2) would be worse than (1), and (3) would be worse than (2). Which is the greater of these two differences? Most people believe that the greater difference is between (1) and (2). I believe that the difference between (2) and (3) is very much greater. … The Earth will remain habitable for at least another billion years. Civilization began only a few thousand years ago. If we do not destroy mankind, these few thousand years may be only a tiny fraction of the whole of civilized human history. The difference between (2) and (3) may thus be the difference between this tiny fraction and all of the rest of this history. If we compare this possible history to a day, what has occurred so far is only a fraction of a second. (10: 453-454)

To calculate the loss associated with an existential catastrophe, we must consider how much value would come to exist in its absence. It turns out that the ultimate potential for Earth-originating intelligent life is literally astronomical.

One gets a large number even if one confines one’s consideration to the potential for biological human beings living on Earth. If we suppose with Parfit that our planet will remain habitable for at least another billion years, and we assume that at least one billion people could live on it sustainably, then the potential exist for at least 1018 human lives. These lives could also be considerably better than the average contemporary human life, which is so often marred by disease, poverty, injustice, and various biological limitations that could be partly overcome through continuing technological and moral progress.

However, the relevant figure is not how many people could live on Earth but how many descendants we could have in total. One lower bound of the number of biological human life-years in the future accessible universe (based on current cosmological estimates) is 1034 years.[10] Another estimate, which assumes that future minds will be mainly implemented in computational hardware instead of biological neuronal wetware, produces a lower bound of 1054 human-brain-emulation subjective life-years (or 1071 basic computational operations).(4)[11] If we make the less conservative assumption that future civilizations could eventually press close to the absolute bounds of known physics (using some as yet unimagined technology), we get radically higher estimates of the amount of computation and memory storage that is achievable and thus of the number of years of subjective experience that could be realized.[12]

Even if we use the most conservative of these estimates, which entirely ignores the possibility of space colonization and software minds, we find that the expected loss of an existential catastrophe is greater than the value of 1018 human lives. This implies that the expected value of reducing existential risk by a mere one millionth of one percentage point is at least ten times the value of a billion human lives. The more technologically comprehensive estimate of 1054 human-brain-emulation subjective life-years (or 1052 lives of ordinary length) makes the same point even more starkly. Even if we give this allegedly lower bound on the cumulative output potential of a technologically mature civilization a mere 1% chance of being correct, we find that the expected value of reducing existential risk by a mere one billionth of one billionth of one percentage point is worth a hundred billion times as much as a billion human lives.

One might consequently argue that even the tiniest reduction of existential risk has an expected value greater than that of the definite provision of any “ordinary” good, such as the direct benefit of saving 1 billion lives. And, further, that the absolute value of the indirect effect of saving 1 billion lives on the total cumulative amount of existential risk—positive or negative—is almost certainly larger than the positive value of the direct benefit of such an action.[13]

## 1AC—Solvency

### Contention 4: Solvency

### Nuclear waste is rapidly piling up—no other solution is viable.

Merchant 10 (Brian, “Nuclear Waste Piling Up Across US: 138 Million Pounds and Counting” 11/17 <http://www.treehugger.com/files/2010/11/nuclear-waste-piles-up-across-us-138-million-pounds.php>) MFR

... And nowhere to put it. What happens to all that radioactive waste created by nuclear power plants? Not much. In 1982, Congress mandated the construction of a national nuclear waste repository. It's been nearly 30 years since then, of course, and there's no such repository. Planned for Yucca Mountain, Nevada, it was scuttled by the Obama administration due to NIMBY issues -- and there's no rush to find an alternative to Yucca. As a result, nuke plants are still required to keep their waste on site. So, they do. In Virginia, for instance, nuclear waste continues to pile up -- at one site, the radioactive waste containers cover a plot of land the size of a football field. Between Virginia's two nuclear power plants -- the Surry and North Anna Power Stations -- there's 5.2 million pounds of waste in storage. And, of course, more is always on the way. The Daily Press sets the scene at Surry: The bus stops before a barbed wire gate at Surry Power Station, less than a mile from the James River ... Inside the fence, on a concrete pad the size of a football field, is nearly 1.9 million pounds of radioactive nuclear waste. Encased in concrete casks and no immediate public health threat, the waste is a by-product of nearly four decades of atomic energy-making at Virginia's oldest nuclear power plant ... Most of the fuel is stored in 16-foot tall concrete casks that stand upright and weigh more than 262,000 pounds when full. Scenes like this are common across the country -- with no permanent place to store the waste, it simply piles up. There are plenty of reasons that this is unacceptable: potential ecological, human health, and security-related woes abound. Many of these containment sites weren't designed for long-term storage, which has environmental advocates and scientists concerned. Edwin Lyman, a physicist and nuclear proliferation expert with the Union of Concerned Scientists in Washington, D.C, told the Daily Press, "There are a handful of scenarios, such as an earthquake or terrorist attack, that could cause the casks or pools to leak, he said. Also, spent nuclear fuel remains radioactive for thousands of years -- it could cause the concrete and other materials to erode." There are also fears that nuclear waste is leeching into groundwater after years of storage -- tritium, the radioactive isotope of hydrogen, was discovered in groundwater near North Anna. It doesn't pose any immediate health risks, officials say, but the occurrence does point to worrying possibilities. National security hawks worry that the policy of leaving so much nuclear waste onsite could be exploited. And environmentalists have long been concerned about the effects of radioactive waste on nearby wildlife and ecosystems. There's some 138 million pounds of nuclear waste piling up at power plants around the nation. It's probably time we found someplace to lock it up.

### The U.S. is critical to getting other countries off the reprocessing boat.

UCS 11 (Union of Concerned Scientists, “Reprocessing and Nuclear Terrorism” 3/21 <http://www.ucsusa.org/nuclear_power/nuclear_power_risk/nuclear_proliferation_and_terrorism/reprocessing-and-nuclear.html>) MFR

Reprocessing would increase the risk of nuclear proliferation U.S. reprocessing would encourage other countries to do likewise and undermine the U.S. goal of halting the spread of proliferation-prone fuel cycle technologies, which is why U.S. policy has been to not engage in reprocessing. Some reprocessing advocates claim that a new generation of so-called "proliferation-resistant" reprocessing technologies now under development would resolve the proliferation concerns of conventional reprocessing. However, these technologies would actually be more difficult for international inspectors to safeguard because it would be harder to make precise measurements of the weapon-usable materials during and after processing. Moreover, all reprocessing technologies are far more proliferation-prone than direct disposal, and require much greater resources to be safeguarded against diversion and theft of plutonium.

### Laser propulsion is the best method for staffed space exploration.

\*\*we disagree with the gendered language in this evidence

Kare 90 (Jordin T., PhD Astrophysics “GROUND-TO-ORBITLASER PROPULSION ADVANCEDAPPLICATIONS” [www.osti.gov/bridge/servlets/purl/6203669-Uxrfwv/6203669.pdf)](http://www.osti.gov/bridge/servlets/purl/6203669-Uxrfwv/6203669.pdf)) MFR

In the long run, the most valuable payload is always Man. Laser propulsion, because of its inherent safety, is a nearly ideal launcher for people, provided the basic requirements of a man-rated launcher can be met. Requirements: Excellent safety -- but actually less than for nuclear disposal Accident consequences are smaller, hysteria is less Sufficient payload capacity Low peak acceleration Apollo was "5 G's; Shuttle is -3 G's Good shock absorber required (<1 G vibration?) Ea,,, to do in a large vehicle with a high pulse rate Payload capacity needed is clearly less than 1 ton (a Mercury, capsule): Better structures, electronics available Minimal life-support needed Normal dock-or-reenter in "2 hrs (1 orbit) Assumes synchronized launch; 2-4 "windows" Worst-case dock-or-reenter in "24 hours Minimal guidance system (Must have some, to prevent tumble) Baggage goes up first! (Limit 1 carryon, must fit under your seat) Potentially "300 kg, but must include: Person (up to '\_00 kg) Couch Air/water/power Pressure shell Emergency reentry system (pared to minimum mass via extensive tests) per day G-limit: Drives system to long range, high 1(\_0 km range giv,\_s5-6 G's for last few seconds @ 800 s Lp -12 G's at 400 s Thrust is constant, so acceleration peaks sharply at end of launch Trivial to throttle system --just reduce laser pulse rate But good shock absorbers will be a necessity

### The plan solves—laser propulsion technology is effective, safe, and cheaper than geological disposal.

Kare 90 (Jordin T., PhD Astrophysics “GROUND-TO-ORBITLASER PROPULSION ADVANCEDAPPLICATIONS” [www.osti.gov/bridge/servlets/purl/6203669-Uxrfwv/6203669.pdf)](http://www.osti.gov/bridge/servlets/purl/6203669-Uxrfwv/6203669.pdf)) MFR

Unlike weight- and volume-limited conventional systems, a laser launcher could potentially handle unprocessed or minimally-processed waste. This minimizes boda radiation and toxic chemical hazards on the ground, and is therefore crucial to an economical system. A laser system could even be cheaper than geological disposal, because there would be less handling (separation, glassification) of waste. Lasers can launch waste directly to any desirable disposal site -- the Lunar surface, interplanetary space, or deep space (solar escape). The required delta-V's are roughly 11 to 15 km/s, beyond the capability of any single-stage chemical rocket or proposed cannon launcher. Laser propulsion could even launch payloads directly into the Sun, at 30 km/s delta-V. The precision guidance and flexible launch direction of a laser system could allow dumping payloads into, e.g., a selected lunar crater, for future recovery if desired. Very small laser propulsion payloads could present problems of shielding (to protect both launch-site workers and possible crash site bystanders) and safe any-angle reentry [11]. However, some problems of laser propulsion, such as launch delays due to weatller, are not important as long as the total mass launched is constant and the reliability is high.

# Nuclear Leadership Advantage

## Uniqueness—Leadership Declining

### U.S. nuclear leadership is declining—other countries’ programs are growing—only the plan can make the U.S. a key player in global nuclear affairs.

Bengelsdorf 7 — Harold Bengelsdorf, consultant and former director of both key State and Energy Department offices that are concerned with international nuclear and nonproliferation affairs, 07 [“THE U.S. DOMESTIC CIVIL NUCLEAR INFRASTRUCTURE AND U.S. NONPROLIFERATION POLICY”, White Paper prepared for the American Council on Global Nuclear Competitiveness May, http://www.nuclearcompetitiveness.org/images/COUNCIL\_WHITE\_PAPER\_Final.pdf]

Today due to its political, military and economic position in the world, the United States continues to exercise great weight in nonproliferation matters. However, the ability of the United States to promote its nonproliferation objectives through peaceful nuclear cooperation with other countries has declined. The fact that no new nuclear power plant orders have been placed in over three decades has led to erosion in the capabilities of the U.S. civil nuclear infrastructure. Moreover, during the same period, the U.S. share of the global nuclear market has declined significantly, and several other countries have launched their own nuclear power programs and have become major international suppliers in their own right. It is highly significant that all but one of the U.S. nuclear power plant vendors and nuclear fuel designers and manufactures for light water reactors have now been acquired by their non-U.S. based competitors. Thus, while the U.S. remains a participant in the international market for commercial nuclear power, it no longer enjoys a dominant role as it did four decades ago. To the extent that U.S. nuclear plant vendors and nuclear fuel designers and manufacturers are able to reassert themselves on a technical and commercial basis, opportunities for U.S. influence with respect to nuclear nonproliferation can be expected to increase. However, the fact that there are other suppliers that can now provide plants and nuclear fuel technology and services on a competitive commercial basis suggests that the U.S. will have to work especially hard to maintain and, in some cases, rebuild its nuclear infrastructure, if it wishes to exercise its influence in international nuclear affairs. The influence of the United States internationally could be enhanced significantly if the U.S. is able to achieve success in its Nuclear Power 2010 program and place several new orders in the next decade and beyond. There is a clear upsurge of interest in nuclear power in various parts of the world. As a consequence, if the U.S. aspires to participate in these programs and to shape them in ways that are most conducive to nonproliferation, it will need to promote the health and viability of the American nuclear infrastructure. Perhaps more importantly, if it wishes to exert a positive influence in shaping the nonproliferation policies of other countries, it can do so more effectively by being an active supplier to and partner in the evolution of those programs. Concurrent with the prospective growth in the use of nuclear power, the global nonproliferation regime is facing some direct assaults that are unprecedented in nature. International confidence in the effectiveness of nuclear export controls was shaken by the disclosures of the nuclear operations of A.Q. Khan. These developments underscore the importance of maintaining the greatest integrity and effectiveness of the nuclear export conditions applied by the major suppliers. They also underscore the importance of the U.S. maintaining effective policies to achieve these objectives. Constructive U.S. influence will be best achieved to the extent that the U.S. is perceived as a major technological leader, supplier and partner in the field of nuclear technology.

## Uniqueness—NPT Ineffective Now

### NPT uncertainty now—loopholes means reprocessing gets exploited.

Bengelsdorf 7 — Harold Bengelsdorf, consultant and former director of both key State and Energy Department offices that are concerned with international nuclear and nonproliferation affairs, 07 [“THE U.S. DOMESTIC CIVIL NUCLEAR INFRASTRUCTURE AND U.S. NONPROLIFERATION POLICY”, White Paper prepared for the American Council on Global Nuclear Competitiveness May, http://www.nuclearcompetitiveness.org/images/COUNCIL\_WHITE\_PAPER\_Final.pdf]

Although the nonproliferation regime has been largely effective in limiting the spread of nuclear weapons, many experts and observers believe that the end of the Cold War has accelerated the risks of proliferation and that the current nonproliferation system needs to be strengthened. They have expressed concern that certain countries that possess nuclear weapons, fissile materials or sensitive nuclear technologies that can produce weapons-usable materials might transfer them to other states or to terrorist organizations. The Government of Pakistan has admitted that A.Q. Khan, the former head of the Khan Research Laboratory, has transferred enrichment technology to North Korea, Iran and Libya, as well as nuclear weapons technology to Libya. Some experts also believe that, although the NPT has generally worked well since it went into effect in the 1970s, several “legal loopholes” have become apparent, which have allowed some states to abuse the Treaty by using it as a cover to obtain nuclear material that could subsequently be used to develop nuclear weapons. They believe that Iran and Iraq both joined the NPT in order to reap the rewards promised by Article IV of the Treaty, while seeking to develop covertly a nuclear weapons capability. Under the NPT, a non-nuclear weapons state is free to acquire enrichment and reprocessing plants so long as such states conform to the provisions of Article II not to manufacture or acquire nuclear weapons or nuclear explosive devices and Article III to place all of their peaceful nuclear activities under IAEA safeguards. Many experts fear that, under the NPT, states such as Iran have acquired the technology needed to produce separated plutonium or highly enriched uranium and that, once having acquired these weapons-usable materials, they could withdraw from the Treaty on 90-days notice and develop nuclear weapons without violating the NPT.

## EXT—SQ Causes Prolif

### Prolif inevitable without US influence—key to multilateralism.

Bengelsdorf 7 — Harold Bengelsdorf, consultant and former director of both key State and Energy Department offices that are concerned with international nuclear and nonproliferation affairs, 07 [“THE U.S. DOMESTIC CIVIL NUCLEAR INFRASTRUCTURE AND U.S. NONPROLIFERATION POLICY”, White Paper prepared for the American Council on Global Nuclear Competitiveness May, http://www.nuclearcompetitiveness.org/images/COUNCIL\_WHITE\_PAPER\_Final.pdf]

The years since the initiation of the Atoms for Peace Program have shown the vital connection between the conduct of peaceful international nuclear trade and the fostering of nonproliferation norms and legal commitments. Nuclear trade has enabled some governments -- especially the United States -- to lay the basis for an effective nonproliferation regime. During the 1950s and 1960s, the United States used the influence stemming from its position as a dominant supplier of nuclear technology to forge various elements of today's nonproliferation regime. Indeed there have been two important principles underlying the current approach to nonproliferation. First, there has been a widespread recognition that international nuclear cooperation is unlikely to occur unless it is based on a solid foundation of safeguards, assurances of peaceful use, effective physical protection, and other controls designed to prevent the diversion of civil nuclear programs to explosive purposes. Secondly, an effective nonproliferation regime cannot be based solely on a system of denials, constraints and controls. It must also involve constructive engagement with, and promotion of peaceful nuclear programs in cooperating partner states.

### Reprocessing leads to prolif – lack of nuclear assurance.

Bengelsdorf 7 — Harold Bengelsdorf, consultant and former director of both key State and Energy Department offices that are concerned with international nuclear and nonproliferation affairs, 07 [“THE U.S. DOMESTIC CIVIL NUCLEAR INFRASTRUCTURE AND U.S. NONPROLIFERATION POLICY”, White Paper prepared for the American Council on Global Nuclear Competitiveness May, http://www.nuclearcompetitiveness.org/images/COUNCIL\_WHITE\_PAPER\_Final.pdf]

Thus in recent years attention has largely focused on the risks of proliferation associated with the spread of enrichment and reprocessing facilities and the weapons-usable materials that they produce. This problem has led to a number of proposals to discourage the spread of enrichment and reprocessing capabilities. These have included calls by the Director General of the IAEA, Mohammed El Baradei, urging states to place enrichment and reprocessing facilities under some form of multinational control and proposals to improve international nuclear fuel assurances as an inducement to states to refrain from acquiring and operating enrichment plants. Further, in a speech on February 11, 2004 at the National Defense University, President Bush proposed two new initiatives designed to address this specific problem. Specifically he proposed that (a) the members of the Nuclear Suppliers Group should refuse to sell enrichment and reprocessing equipment and technologies to any state that does not already possess full- scale, functioning enrichment and reprocessing plants and (b) the world's leading nuclear exporters should ensure that states have reliable access at reasonable cost to fuel for civilian reactors in order to discourage the spread of enrichment and reprocessing facilities. Since then, the U.S. had been engaged with other suppliers and the IAEA in discussing the challenges of assuring fuel services to those states that foreswear enrichment and reprocessing. For example, at the 2005 IAEA General Conference the U.S. Secretary of Energy announced that the U.S. intended to establish a strategic reserve based on 17.4 tons of highly enriched uranium (HEU) that would be blended down to help qualified states deal with any disruptions in supply from their nuclear fuel suppliers, provided that these qualified states are fulfilling their nonproliferation obligations. Subsequently, six states, France, Germany, the Netherlands, Russia, the UK and the U.S. made a proposal at the June 2006 IAEA Board of Governors’ Meeting that offers improved fuel assurances in order to discourage countries from building enrichment and reprocessing facilities.

### US must be a leader in nuclear technology – dependence on other countries means reprocessing and proliferation spreads.

Bengelsdorf 7 — Harold Bengelsdorf, consultant and former director of both key State and Energy Department offices that are concerned with international nuclear and nonproliferation affairs, 07 [“THE U.S. DOMESTIC CIVIL NUCLEAR INFRASTRUCTURE AND U.S. NONPROLIFERATION POLICY”, White Paper prepared for the American Council on Global Nuclear Competitiveness May, http://www.nuclearcompetitiveness.org/images/COUNCIL\_WHITE\_PAPER\_Final.pdf]

Maintaining the U.S. as a Significant Global Supplier

The health of the U.S. civil nuclear infrastructure will also be crucial to the success of U.S. efforts to play a significant role as a nuclear supplier and to advance its nonproliferation objectives.

There is a clear and compelling upsurge of interest in nuclear power in various parts of the world that is independent of U.S. policy and prerogatives. As a consequence, if the U.S. aspires to participate in these programs and to shape them in ways that are most conducive to nonproliferation, it will need to promote the health and viability of the American nuclear infrastructure. Perhaps more importantly, if it wishes to exert a positive influence in shaping the nonproliferation policies of other countries, it can do so more effectively by being an active supplier to and partner in the evolution of those programs.

Concurrent with the prospective growth in the use of nuclear power, the global nonproliferation regime is facing some direct assaults that are unprecedented in nature. International confidence in the effectiveness of nuclear export controls was shaken by the disclosures of the nuclear operations of A.Q. Khan. These developments underscore the importance of maintaining the greatest integrity and effectiveness of the nuclear export conditions applied by the major suppliers. They also underscore the importance of the U.S. maintaining effective policies to achieve these objectives. Constructive U.S. influence will be best achieved to the extent that the U.S. is perceived as a major technological leader, supplier and partner in the field of nuclear technology. As the sole superpower, the U.S. will have considerable, on-going influence on the international nonproliferation regime, regardless of how active and successful it is in the nuclear export market. However, if the U.S. nuclear infrastructure continues to erode, it will weaken the ability of the U.S. to participate actively in the international nuclear market. If the U.S. becomes more dependent on foreign nuclear suppliers or if it leaves the international nuclear market to other suppliers, the ability of the U.S. to influence nonproliferation policy will diminish. It is, therefore, essential that the United States have vibrant nuclear reactor, uranium enrichment, and spent fuel storage and disposal industries that can not only meet the needs of U.S. utilities but will also enable the United States to promote effective safeguards and other nonproliferation controls through close peaceful nuclear cooperation other countries. The U.S. should establish a high priority goal to rebuild an indigenous nuclear industry and support its growth in domestic and international markets. U.S. nuclear exports can be used to influence other states’ nuclear programs through the nonproliferation commitments that the U.S. requires. The U.S. has so-called consent rights over the enrichment, reprocessing and alteration in form or content of the nuclear materials that it has provided to other countries, as well as to the nuclear materials that are produced from the nuclear materials and equipment that the U.S. has supplied. The percentage of nuclear materials, including separated plutonium, that are subject to U.S. consent rights will diminish over time as new suppliers of nuclear materials and facilities take a larger share of the international nuclear market. Unless the U.S. is able to compete effectively in the international market as a supplier of nuclear fuels, equipment and technology, the quantity of the nuclear materials around the globe that the U.S. has control over will diminish significantly in the future. This may not immediately weaken the effectiveness of the nonproliferation regime since all the major suppliers have adopted the export guidelines of the Nuclear Supplier Group. However, only the U.S., Australia and Canada have consent rights over enrichment and reprocessing of the nuclear materials subject to their agreements. Consequently, if there is a major decline in the U.S. share of the international nuclear market, the U.S. may not be as effective as it has been in helping to ensure a rigorous system of export controls.

## EXT—Leadership Solves Prolif

### Nuclear leadership solves prolif – export market.

Bengelsdorf 7 — Harold Bengelsdorf, consultant and former director of both key State and Energy Department offices that are concerned with international nuclear and nonproliferation affairs, 07 [“THE U.S. DOMESTIC CIVIL NUCLEAR INFRASTRUCTURE AND U.S. NONPROLIFERATION POLICY”, White Paper prepared for the American Council on Global Nuclear Competitiveness May, http://www.nuclearcompetitiveness.org/images/COUNCIL\_WHITE\_PAPER\_Final.pdf]

As the sole superpower, the U.S. will have considerable, on-going influence on the international nonproliferation regime, regardless of how active and successful it is in the nuclear export market. However, the erosion of the U.S. nuclear infrastructure has begun to weaken the ability of the U.S. to participate actively in the international nuclear market. If the U.S. becomes more dependent on foreign nuclear suppliers or if it leaves the international nuclear market to other suppliers, the ability of the U.S. to influence nonproliferation policy will diminish.

### Fuel assurances solve prolif

Bengelsdorf 7 — Harold Bengelsdorf, consultant and former director of both key State and Energy Department offices that are concerned with international nuclear and nonproliferation affairs, 07 [“THE U.S. DOMESTIC CIVIL NUCLEAR INFRASTRUCTURE AND U.S. NONPROLIFERATION POLICY”, White Paper prepared for the American Council on Global Nuclear Competitiveness May, http://www.nuclearcompetitiveness.org/images/COUNCIL\_WHITE\_PAPER\_Final.pdf]

Historically, the ability of the U.S. to help prevent the spread of nuclear weapons has stemmed from many factors, not least of which has been the political, military and economic power that the US has exercised in international affairs. The U.S. has used many tools to promote its nonproliferation objectives. One important instrument that the U.S. has employed for decades in building the international nonproliferation system has been its ability to provide nuclear fuel, nuclear power plants and fuel cycle services to countries on a reliable and stable basis, under strict nonproliferation controls and conditions.

## EXT—Tech is Shared

### US would share technology – past agreements.

Bengelsdorf 7 — Harold Bengelsdorf, consultant and former director of both key State and Energy Department offices that are concerned with international nuclear and nonproliferation affairs, 07 [“THE U.S. DOMESTIC CIVIL NUCLEAR INFRASTRUCTURE AND U.S. NONPROLIFERATION POLICY”, White Paper prepared for the American Council on Global Nuclear Competitiveness May, http://www.nuclearcompetitiveness.org/images/COUNCIL\_WHITE\_PAPER\_Final.pdf]

The global nonproliferation regime had its origins in the 1950s when the United States and several other countries with nuclear capabilities made important decisions to declassify certain aspects of nuclear technology so that they could be shared with other nations solely for peaceful purposes. The U.S. and these other states had a strong awareness that their decisions could produce important benefits in the field of energy, medicine and agriculture. However, they also shared a profound recognition that nuclear materials, equipment and technologies could be misused. Consequently, the United States as well as other states concluded that suppliers should share civil nuclear technology with other countries only if they were able and willing to put into place a rigorous system to ensure that civil uses of nuclear materials, equipment and technologies would not be diverted to the manufacture of nuclear weapons, nuclear explosive devices or other military purposes.

### US leadership fosters cradle-to-grave programs – US can take other countries’ spent fuel.

Bengelsdorf 7 — Harold Bengelsdorf, consultant and former director of both key State and Energy Department offices that are concerned with international nuclear and nonproliferation affairs, 07 [“THE U.S. DOMESTIC CIVIL NUCLEAR INFRASTRUCTURE AND U.S. NONPROLIFERATION POLICY”, White Paper prepared for the American Council on Global Nuclear Competitiveness May, http://www.nuclearcompetitiveness.org/images/COUNCIL\_WHITE\_PAPER\_Final.pdf]

During the last several decades, the U.S. has been struggling to implement a national policy for management of commercial spent nuclear fuel, independently of whether it will result in direct disposal of the spent fuel or reprocessing and recycle. In fact, the U.S. Government is presently in protracted litigation with most U.S. utilities for monetary damages associated with DOE's inability to accept their spent fuel and dispose of it as called for in contracts that it has with each of these customers. One adverse implication that this may have on U.S. nuclear nonproliferation policy is that it seriously undermines the ability of the U.S. to offer fuel leasing or cradle- to-grave fuel cycle services to foreign countries. The ability to make such offers could be a valuable tool for discouraging the spread of sensitive nuclear technologies.

## AT: Nuclear Leadership Terminally Non-Unique

### Nuclear Leadership on the brink.

Bengelsdorf 7 — Harold Bengelsdorf, consultant and former director of both key State and Energy Department offices that are concerned with international nuclear and nonproliferation affairs, 07 [“THE U.S. DOMESTIC CIVIL NUCLEAR INFRASTRUCTURE AND U.S. NONPROLIFERATION POLICY”, White Paper prepared for the American Council on Global Nuclear Competitiveness May, http://www.nuclearcompetitiveness.org/images/COUNCIL\_WHITE\_PAPER\_Final.pdf]

Presently, the U.S. continues to be at the forefront in meeting the challenges facing the nonproliferation regime. It has, among other things, worked with the UK and the IAEA to persuade Libya to dismantle its programs of weapons of mass destruction. The U.S. has also collaborated with its European allies as well as Russia and the PRC in crafting UN Security Council resolutions that imposed sanctions on Iran and called upon that government’s leaders to suspend its sensitive nuclear activities. At the same time the U.S. has supported the diplomatic efforts of the European Union and others to offer Iran economic and energy incentives if Tehran agrees to forego its enrichment and reprocessing activities and the construction of its heavy water production reactor. The United States worked with the PRC, Japan, and the Republic of Korea (i.e., South Korea) to persuade the Democratic People’s Republic of Korea (i.e., North Korea) to freeze its nuclear activities and to allow IAEA inspectors into North Korea in return for energy and economic assistance. The U.S. also led initiatives to provide the states of the former Soviet Union with financial and technical assistance in strengthening the material accountancy, control and protection measures of nuclear weapons and materials at risk. If the United States hopes to continue to exercise strong and specific influence internationally in nonproliferation matters in the future, it can best achieve this objective by remaining an active player in international nuclear affairs by providing advanced nuclear power systems, uranium enrichment services and nuclear fuel to other countries; and by maintaining its ability to develop and apply advanced nuclear technologies. A revival of nuclear power in the United States with new nuclear power plant orders should greatly help enhance U.S. power and influence in international nuclear affairs, but we must also seek to once again be a major supplier of nuclear power technology and equipment world-wide. Conversely, if the U.S. nuclear power program starts to diminish significantly through the retirement of old nuclear power plants without new replacements, then its voice in civil nuclear matters and nonproliferation will decline internationally, even though the U.S. may remain a superpower on the political level.

## AT: US Won’t Pursue Non-Proliferation Efforts

### Obama committed to non proliferation.

Spring 10 — Baker Spring, Fellow at the Heritage Foundation, 10 [“The Nuclear Posture Review's Missing Objective: Defending the U.S. and Its Allies Against Strategic Attack”, Heritage foundation, April, 14, http://www.heritage.org/research/reports/2010/04/nuclear-posture-review-missing-objective-defending-us-and-allies-against-strategic-attack]

The chief flaw of the Obama Administration's Nuclear Posture Review is that it fails to make a clear commitment to defend the U.S. and its allies. However, if Congress is willing to press the Administration, it can correct many of these weaknesses, resulting in a stronger U.S. nuclear posture and serving important nonproliferation and arms control objectives. Specifically, Congress should push the Administration to emphasize nonproliferation over arms control, maintain a strong and modernized U.S. nuclear arsenal, reserve the option to use nuclear weapons to defend the U.S. and its allies, maintain operational flexibility across the nuclear force, and pursue nonproliferation goals before pursuing disarmament goals. The Obama Administration released its overdue Nuclear Posture Review (NPR) on April 6, 2010.[1] The review establishes five specific objectives for the future nuclear force of the United States. Missing from these five objectives is what should be the most important objective of all: defending the U.S. and its allies against strategic attack. Accordingly, Congress, the American people, and America's allies need to ask the Obama Administration a simple and straightforward question: Why won't you defend us? The NPR lists the following objectives: 1. Preventing nuclear proliferation and nuclear terrorism; 2. Reducing the role of nuclear weapons in the U.S. National Security Strategy; 3. Maintaining strategic deterrence and stability at reduced nuclear force levels; 4. Strengthening regional deterrence and reassuring allies and partners; and 5. Sustaining a safe, secure, and effective arsenal. Each of these objectives may be worthy, but they are not connected to the basic obligation to protect and defend the people, territory, institutions, and infrastructure of the U.S. and its allies against strategic attack. As a result, the NPR's more specific recommendations fall short in explaining how to organize, manage, sustain, and modernize the U.S. nuclear force in a cohesive and coherent way. This is not to say that the Administration and Congress cannot find ways to fashion the NPR's recommendations into a broader strategic posture that acknowledges that both nuclear weapons and the tools of arms control and nonproliferation continue to play essential roles in protecting the U.S. and its allies.

## AT: No International Spillover

### Try or Die – other countries will do reprocessing if the US does.

UCS 11 (Union of Concerned Scientists, “Reprocessing and Nuclear Terrorism” 3/21 <http://www.ucsusa.org/nuclear_power/nuclear_power_risk/nuclear_proliferation_and_terrorism/reprocessing-and-nuclear.html>) MFR

Reprocessing would increase the risk of nuclear proliferation U.S. reprocessing would encourage other countries to do likewise and undermine the U.S. goal of halting the spread of proliferation-prone fuel cycle technologies, which is why U.S. policy has been to not engage in reprocessing. Some reprocessing advocates claim that a new generation of so-called "proliferation-resistant" reprocessing technologies now under development would resolve the proliferation concerns of conventional reprocessing. However, these technologies would actually be more difficult for international inspectors to safeguard because it would be harder to make precise measurements of the weapon-usable materials during and after processing. Moreover, all reprocessing technologies are far more proliferation-prone than direct disposal, and require much greater resources to be safeguarded against diversion and theft of plutonium.

## A2: Deterrence Takes Out Prolif Impacts

### MAD and Deterrence theory fail in a world of horizontal proliferation – stress and miscalc means we will bury nations.

Utgoff 2 — Victor A. Utgoff, Deputy Director of the Strategy, Forces, and Resources Division of the Institute for Defense Analysis, Survival Vol 44 No 2 Proliferation, Missile Defence and American Ambitions, p. 87-90 02

History and human nature, however, suggest that they are almost surely wrong. History includes instances in which states known to possess nuclear weapons did engage in direct conventional conflict. China and Russia fought battles along their common border even after both had nuclear weapons. Moreover, logic suggests that if states with nuclear weapons always avoided conflict with one another, surely states without nuclear weapons would avoid conflict with states that had them. Again, history provides counter-examples. Egypt attacked Israel in 1973 even though it saw Israel as a nuclear power at the time. Argentina invaded the Falkland Islands and fought Britain's efforts to take them back, even though Britain had nuclear weapons. Those who claim that two states with reliable nuclear capabilities to devastate each other will not engage in conventional conflict risking nuclear war also assume that any leader from any culture would not choose suicide for his nation. But history provides unhappy examples of states whose leaders were ready to choose suicide for themselves and their fellow citizens. Hitler tried to impose a 'victory or destruction' policy on his people as Nazi Germany was going down to defeat.} And Japan's war minister, during debates on how to respond to the American atomic bombing, suggested 'Would it not be wondrous for the whole nation to be destroyed like a beautiful flower''- If leaders are willing to engage in conflict with nuclear-armed nations, use of nuclear weapons in any particular instance may not be likely, but its probability would still be dangerously significant. In particular, human nature suggests that the threat of retaliation with nuclear weapons is not a reliable guarantee against a disastrous first use of these weapons. While national leaders and their advisors everywhere are usually talented and experienced people, even their most important decisions cannot be counted on to be the product of well-informed and thorough assessments of all options from all relevant points of view. This is especially so when the stakes are so large as to defy assessment and there are substantial pressures to act quickly, as could be expected in intense and fast-moving crises between nuclear-armed states.' Instead, like other human beings, national leaders can be seduced by wishful thinking. They can misinterpret the words or actions of opposing leaders. Their advisors may produce answers that they think the leader wants to hear, or coalesce around what they know is an inferior decision because the group urgently needs the confidence or the sharing of responsibility that results from settling on something. Moreover, leaders may not recognise clearly where their personal or party interests diverge from those of their citizens. Under great stress, human beings can lose their ability to think carefully. They can refuse to believe that the worst could really happen, oversimplify the problem at hand, think in terms of simplistic analogies and play hunches. The intuitive rules for how individuals should respond to insults or signs of weakness in an opponent may too readily suggest a rash course of action. Anger, fear, greed, ambition and pride can all lead to bad decisions. The desire for a decisive solution to the problem at hand may lead to an unnecessarily extreme course of action. We can almost hear the kinds of words that could flow from discussions in nuclear crises or war. 'These people are not willing to die for this interest'. 'No sane person would actually use such weapons'. 'Perhaps the opponent will back down if we show him we mean business by demonstrating a willingness to use nuclear weapons'. 'If I don't hit them back really hard, I am going to be driven from office, if not killed'. Whether right or wrong, in the stressful atmosphere of a nuclear crisis or war, such words from others, or silently from within, might resonate too readily with a harried leader. Thus, both history and human nature suggest that nuclear deterrence can be expected to fail from time to time, and we are fortunate it has not happened yet. But the threat of nuclear war is not just a matter of a few weapons being used. It could get much worse. Once a conflict reaches the point where nuclear weapons are employed, the stresses felt by the leaderships would rise enormously. These stresses can be expected to further degrade their decision-making. The pressures to force the enemy to stop fighting or to surrender could argue for more forceful and decisive military action, which might be the right thing to do in the circumstances, but maybe not. And the horrors of the carnage already suffered may be seen as justification for visiting the most devastating punishment possible on the enemy.' Again, history demonstrates how intense conflict can lead the combatants to escalate violence to the maximum possible levels. In the Second World War, early promises not to bomb cities soon gave way to essentially indiscriminate bombing of civilians. The war between Iran and Iraq during the 1980's led to the use of chemical weapons on both sides and exchanges of missiles against each other's cities. And more recently, violence in the Middle East escalated in a few months from rocks and small arms to heavy weapons on one side, and from police actions to air strikes and armoured attacks on the other. Escalation of violence is also basic human nature. Once the violence starts, retaliatory exchanges of violent acts can escalate to levels unimagined by the participants beforehand.' Intense and blinding anger is a common response to fear or humiliation or abuse. And such anger can lead us to impose on our opponents whatever levels of violence are readily accessible. In sum, widespread proliferation is likely to lead to an occasional shoot-out with nuclear weapons, and that such shoot-outs will have a substantial probability of escalating to the maximum destruction possible with the weapons at hand. Unless nuclear proliferation is stopped, we are headed toward a world that will mirror the American Wild West of the late 1800s. With most, if not all, nations wearing nuclear 'six-shooters' on their hips, the world may even be a more polite place than it is today, but every once in a while we will all gather on a hill to bury the bodies of dead cities or even whole nations.

### We control their internal links - deterrence fails in a proliferated world.

Krieger 9 — Krieger, President Nuclear Age Peace Foundation, ’09 [David, Pres. Nuclear Age Peace Foundation and Councilor—World Future Council, “Still Loving the Bomb After All These Years”, 9-4, https://www.wagingpeace.org/articles/2009/09/04\_krieger\_newsweek\_response.php?krieger]

Jonathan Tepperman’s article in the September 7, 2009 issue of Newsweek, “Why Obama Should Learn to Love the Bomb,” provides a novel but frivolous argument that nuclear weapons “may not, in fact, make the world more dangerous….” Rather, in Tepperman’s world, “The bomb may actually make us safer.” Tepperman shares this world with Kenneth Waltz, a University of California professor emeritus of political science, who Tepperman describes as “the leading ‘nuclear optimist.’” Waltz expresses his optimism in this way: “We’ve now had 64 years of experience since Hiroshima. It’s striking and against all historical precedent that for that substantial period, there has not been any war among nuclear states.” Actually, there were a number of proxy wars between nuclear weapons states, such as those in Korea, Vietnam and Afghanistan, and some near disasters, the most notable being the 1962 Cuban Missile Crisis. Waltz’s logic is akin to observing a man falling from a high rise building, and noting that he had already fallen for 64 floors without anything bad happening to him, and concluding that so far it looked so good that others should try it. Dangerous logic! Tepperman builds upon Waltz’s logic, and concludes “that all states are rational,” even though their leaders may have a lot of bad qualities, including being “stupid, petty, venal, even evil….” He asks us to trust that rationality will always prevail when there is a risk of nuclear retaliation, because these weapons make “the costs of war obvious, inevitable, and unacceptable.” Actually, he is asking us to do more than trust in the rationality of leaders; he is asking us to gamble the future on this proposition. “The iron logic of deterrence and mutually assured destruction is so compelling,” Tepperman argues, “it’s led to what’s known as the nuclear peace….” But if this is a peace worthy of the name, which it isn’t, it certainly is not one on which to risk the future of civilization. One irrational leader with control over a nuclear arsenal could start a nuclear conflagration, resulting in a global Hiroshima. Tepperman celebrates “the iron logic of deterrence,” but deterrence is a theory that is far from rooted in “iron logic.” It is a theory based upon threats that must be effectively communicated and believed. Leaders of Country A with nuclear weapons must communicate to other countries (B, C, etc.) the conditions under which A will retaliate with nuclear weapons. The leaders of the other countries must understand and believe the threat from Country A will, in fact, be carried out. The longer that nuclear weapons are not used, the more other countries may come to believe that they can challenge Country A with impunity from nuclear retaliation. The more that Country A bullies other countries, the greater the incentive for these countries to develop their own nuclear arsenals. Deterrence is unstable and therefore precarious. Most of the countries in the world reject the argument, made most prominently by Kenneth Waltz, that the spread of nuclear weapons makes the world safer. These countries joined together in the Nuclear Non-Proliferation Treaty (NPT) to prevent the spread of nuclear weapons, but they never agreed to maintain indefinitely a system of nuclear apartheid in which some states possess nuclear weapons and others are prohibited from doing so. The principal bargain of the NPT requires the five NPT nuclear weapons states (US, Russia, UK, France and China) to engage in good faith negotiations for nuclear disarmament, and the International Court of Justice interpreted this to mean complete nuclear disarmament in all its aspects. Tepperman seems to be arguing that seeking to prevent the proliferation of nuclear weapons is bad policy, and that nuclear weapons, because of their threat, make efforts at non-proliferation unnecessary and even unwise. If some additional states, including Iran, developed nuclear arsenals, he concludes that wouldn’t be so bad “given the way that bombs tend to mellow behavior.” Those who oppose Tepperman’s favorable disposition toward the bomb, he refers to as “nuclear pessimists.” These would be the people, and I would certainly be one of them, who see nuclear weapons as presenting an urgent danger to our security, our species and our future. Tepperman finds that when viewed from his “nuclear optimist” perspective, “nuclear weapons start to seem a lot less frightening.” “Nuclear peace,” he tells us, “rests on a scary bargain: you accept a small chance that something extremely bad will happen in exchange for a much bigger chance that something very bad—conventional war—won’t happen.” But the “extremely bad” thing he asks us to accept is the end of the human species. Yes, that would be serious. He also doesn’t make the case that in a world without nuclear weapons, the prospects of conventional war would increase dramatically. After all, it is only an unproven supposition that nuclear weapons have prevented wars, or would do so in the future. We have certainly come far too close to the precipice of catastrophic nuclear war. As an ultimate celebration of the faulty logic of deterrence, Tepperman calls for providing any nuclear weapons state with a “survivable second strike option.” Thus, he not only favors nuclear weapons, but finds the security of these weapons to trump human security. Presumably he would have President Obama providing new and secure nuclear weapons to North Korea, Pakistan and any other nuclear weapons states that come along so that they will feel secure enough not to use their weapons in a first-strike attack. Do we really want to bet the human future that Kim Jong-Il and his successors are more rational than Mr. Tepperman?

# Nuclear Terrorism Advantage

## AT: Won’t Be Stolen – Motivation

### Reprocessing significantly increases the risk of nuclear terrorism

UCS 11 (Union of Concerned Scientists, “Reprocessing and Nuclear Terrorism” 3/21 <http://www.ucsusa.org/nuclear_power/nuclear_power_risk/nuclear_proliferation_and_terrorism/reprocessing-and-nuclear.html>) MFR

Reprocessing would increase the risk of nuclear terrorism From the perspective of terrorists seeking a nuclear weapon, reprocessing changes plutonium from a form in which it is highly radioactive and nearly impossible to steal to one in which it is not radioactive and could be stolen surreptitiously by an insider, or taken by force during its routine transportation. This situation is made worse by the fact that the theft of enough plutonium to build several nuclear weapons could remain undetected for many years at a reprocessing facility. In particular, at commercial scale "bulk-handling" reprocessing facilities and fuel fabrication plants, which annually handle from several tons to many tens of tons of separated plutonium in solution or powder form, it is essentially impossible to account for the plutonium throughput to within tens or even hundreds of kilograms in a timely manner, making it feasible that the theft of this quantity of plutonium could go undetected for many years. Since a relatively simple implosion nuclear weapon can be made with roughly six kilograms of plutonium, the uncertainty in the annual amount of plutonium processed is quite significant, and could lead to undetected acquisition of weapon-usable materials by states or terrorists. This is not just a theoretical problem: two striking examples have occurred in Japan. In 1994, it was revealed that over five years of operation, the total amount of plutonium unaccounted for at the Plutonium Fuel Production Facility in Tokai-mura had grown to seventy kilograms—enough for some 11 nuclear weapons. Ultimately, in 1996 it was determined that most of the missing material was in dust that accumulated on the equipment inside the facility. Had the material instead been stolen, the theft would have remained undetected for years—more than enough time for terrorists to convert the material into crude nuclear weapons. Similar problems occurred at the reprocessing plant in Tokai-mura, which started operation in 1977. Japanese officials acknowledged in January 2003 that it took a 15-year investigation to account for a more than 200-kilogram shortfall in plutonium at the reprocessing plant. This amount constitutes about three percent of the total amount of plutonium separated by the plant during 25 years of operation, and is enough for some thirty nuclear weapons. In contrast, in a "once-through" nuclear fuel cycle, the spent fuel is left intact and simply stored once it is removed from the reactor, for ultimate disposal in a repository. In this case the plutonium remains imbedded in the highly radioactive spent fuel, which is thus "self-protected" from theft. Since anyone within a meter of spent fuel that was less than 50 years old would receive a deadly dose in less than 30 minutes, even terrorists willing to die for their cause would not have enough time to do anything useful. Of course, the size and weight of the spent fuel assemblies (typically 10 feet long, and fifteen hundred pounds) also makes them difficult to steal. Moreover, it is straightforward to account for the number of fuel assemblies. In sum, a closed nuclear fuel cycle entails the handling and transportation of large amounts of nuclear bomb-making material. As discussed above, during much of this process, the material cannot be accounted for precisely enough to ensure that an amount adequate for one or more nuclear weapons has not been stolen. This situation presents numerous opportunities for terrorists to acquire the material they need to build a nuclear weapon. We will be much safer if plutonium remains within the highly radioactive spent fuel that is eventually sealed in a secure geologic repository than if plutonium is extracted from spent fuel,. fabricated into fresh fuel, and shipped to nuclear reactors around the country, where it would be vulnerable to diversion or theft at every stage

## AT: No Impact Terror – general

### An attack would escalate – global WMDs

Morgan 9 — Dennis Ray Morgan, Hankuk University of Foreign Studies, Yongin Campus - South Korea [Futures](http://www.sciencedirect.com.ezp-prod1.hul.harvard.edu/science/journal/00163287" \t "_blank), [Volume 41, Issue 10](http://www.sciencedirect.com.ezp-prod1.hul.harvard.edu/science?_ob=PublicationURL&_tockey=%23TOC%235805%232009%23999589989%231515128%23FLA%23&_cdi=5805&_pubType=J&view=c&_auth=y&_acct=C000014438&_version=1&_urlVersion=0&_userid=209690&md5=7eaadd08919055b45011bba80bf06023" \t "_blank), December 2009, Pages 683-693, World on fire: two scenarios of the destruction of human civilization and possible extinction of the human race

In a remarkable website on nuclear war, Carol Moore asks the question “Is Nuclear War Inevitable??” In Section , Moore points out what most terrorists obviously already know about the nuclear tensions between powerful countries. No doubt, they’ve figured out that the best way to escalate these tensions into nuclear war is to set off a nuclear exchange. As Moore points out, all that militant terrorists would have to do is get their hands on one small nuclear bomb and explode it on either Moscow or Israel. Because of the Russian “dead hand” system, “where regional nuclear commanders would be given full powers should Moscow be destroyed,” it is likely that any attack would be blamed on the United States”  Israeli leaders and Zionist supporters have, likewise, stated for years that if Israel were to suffer a nuclear attack, whether from terrorists or a nation state, it would retaliate with the suicidal “Samson option” against all major Muslim cities in the Middle East. Furthermore, the Israeli Samson option would also include attacks on Russia and even “anti-Semitic” European cities   In that case, of course, Russia would retaliate, and the U.S. would then retaliate against Russia. China would probably be involved as well, as thousands, if not tens of thousands, of nuclear warheads, many of them much more powerful than those used at Hiroshima and Nagasaki, would rain upon most of the major cities in the Northern Hemisphere. Afterwards, for years to come, massive radioactive clouds would drift throughout the Earth in the nuclear fallout, bringing death or else radiation disease that would be genetically transmitted to future generations in a nuclear winter that could last as long as a 100 years, taking a savage toll upon the environment and fragile ecosphere as well. And what many people fail to realize is what a precarious, hair-trigger basis the nuclear web rests on. Any accident, mistaken communication, false signal or “lone wolf’ act of sabotage or treason could, in a matter of a few minutes, unleash the use of nuclear weapons, and once a weapon is used, then the likelihood of a rapid escalation of nuclear attacks is quite high while the likelihood of a limited nuclear war is actually less probable since each country would act under the “use them or lose them” strategy and psychology; restraint by one power would be interpreted as a weakness by the other, which could be exploited as a window of opportunity to “win” the war. In other words, once Pandora's Box is opened, it will spread quickly, as it will be the signal for permission for anyone to use them. Moore compares swift nuclear escalation to a room full of people embarrassed to cough. Once one does, however, “everyone else feels free to do so. The bottom line is that as long as large nation states use internal and external war to keep their disparate factions glued together and to satisfy elites’ needs for power and plunder, these nations will attempt to obtain, keep, and inevitably use nuclear weapons. And as long as large nations oppress groups who seek self-determination, some of those groups will look for any means to fight their oppressors”  In other words, as long as war and aggression are backed up by the implicit threat of nuclear arms, it is only a matter of time before the escalation of violent conflict leads to the actual use of nuclear weapons, and once even just one is used, it is very likely that many, if not all, will be used, leading to horrific scenarios of global death and the destruction of much of human civilization while condemning a mutant human remnant, if there is such a remnant, to a life of unimaginable misery and suffering in a nuclear winter.    In “Scenarios,” Moore summarizes the various ways a nuclear war could begin: Such a war could start through a reaction to terrorist attacks, or through the need to protect against overwhelming military opposition, or through the use of small battle field tactical nuclear weapons meant to destroy hardened targets. It might quickly move on to the use of strategic nuclear weapons delivered by short-range or inter-continental missiles or long-range bombers. These could deliver high altitude bursts whose electromagnetic pulse knocks out electrical circuits for hundreds of square miles. Or they could deliver nuclear bombs to destroy nuclear and/or non-nuclear military facilities, nuclear power plants, important industrial sites and cities. Or it could skip all those steps and start through the accidental or reckless use of strategic weapons.

# Exploration Advantage

## AT: No Political Motivation

### Plan creates institutional inertia

Coopersmith 99 (Jonathan, associate professor of history at Texas A&M University, specializes in the history of technology and the history of Russia. “DISPOSAL OF HIGH-LEVEL NUCLEAR WASTE IN SPACE” 1999 AIAA Annual Technical Symposium)

In the spirit of Jonathan Swift, let me offer a modest proposal: Let's put high-level radioactive waste where it belongs -- out in space where it cannot endanger anyone on earth. The idea is not new -- NASA's Lewis Research Center concluded it was technically feasible in 1974 and the Space Systems Technical Committee of the American Institute of Aeronautics and Astronautics endorsed it in 1981, to name only two of many studies, but space disposal has never received strong institutional support from government or the private sector.vi Instead, nuclear waste disposal has remained the province of the geologists, who are professionally inclined to look down, not up. Space disposal has two major benefits. First, it will permanently remove the burden and responsibility of high-level radioactive waste from future generations. Second, the infrastructure needed to dispose of radioactive waste safely will greatly reduce the cost of exploiting space. The tonnage currently launched into space is not that great. In 1998, rockets launched less than 200 tons of payloads into earth orbit and beyond (excluding the weight of the space shuttle).vii The attraction for the aerospace community of waste disposal is the guarantee of large payloads for decades to come. What could engineers develop if asked to launch 10,000 tons annually? Space disposal will create the first market for launch systems that could truly provide the inexpensive access to space promised for decades. Disposal in space consists of three steps: - preparing and transporting the waste to the launch site - launching into low earth orbit - launching to a final destination All three steps have been studied extensively over the last quarter century. I will focus on the last two steps, each of which offers a wide range of technological options. The important criteria are safety, and technological and economic feasibility. Launch into earth orbit The most visible technological choice is the launch system -- or systems - to provide a quantum increase in access to space. The two basic choices are conventional rockets carrying large cargoes or ground-based systems launching smaller vehicles. Most studies in the 1970s-80s assumed the use of the space shuttle, possible derivatives, other rockets like Ariane, and even surplus ICBMs.viii The next generation of rockets, such as the EELV and even the proposed reusable launch vehicles (like the Kistler K-1) will reduce the cost of access by an order of magnitude at most and probably less. While these are major improvements on existing rockets, only more radical approaches may reduce costs by the one or two more orders of magnitude necessary to truly change the economic perceptions of space. Advocates have proposed ground-based launch systems for decades: Arthur C. Clarke proposed the electromagnetic launcher in 1960 and Arthur R. Kantrowitz first proposed laser propulsion in 1972.ix Among the possible systems are electromagnetic launchers, mass drivers, gas guns, laser propulsion, and the Scramaccelerator.x Laser propulsion is probably the most appealing option because of its ability to launch people as well as plutonium, if the Lightcraft Technology Demonstrator performs as promised. The major stumbling blocks of ground-based systems have been the low efficiencies of the technologies, which were in an early stage of development, the high development and construction costs (usually estimated at billions of dollars), and the absence of sufficient payloads to justify these high costs. A more subjective factor was their unconventional approach, compared with the existing rocket launchers. The theoretical advantage of ground-based systems is that most of the weight of such a system remains on the ground so most of the spacecraft is payload. Although each launch would dispatch kilograms instead of tons, such systems might prove ideal because of their low operational costs. The large tonnages will offer, finally, the great demand and economic rationale needed to justify building a groundbased launching system.

## AT: No Challengers

### China will inevitably challenge the U.S. in space – national imperative

Gupta 10 [Rukmani, Associate Fellow at the Institute for Defence Studies and Analysis (IDSA), “Book Reviews: Erik Seedhouse, The New Space Race: China vs. the United States, 2010, Chichester: Praxis Publishing Ltd.,” New Delhi, Vol 4. No 4. October 2010]

In wake of the increasing attention received by China’s space programme, it has been posited by some that a new space race, akin to the space race between the United States (US) and the Soviet Union during the Cold War, has already begun between China and the US. Erik Seedhouse in his book explores the various elements of the space programmes of both countries with a view to assess the possibility of a space race between them. Divided into four sections, the book begins with a historical review of China’s space programme. The ideological impetus behind China’s investment in a space programme right from the time of Mao Zedong to the current leadership is examined and the important figures that shaped China’s endeavours in space are identified. Seedhouse believes that despite the enormous financial costs and the dangers, by pursuing a manned spaceflight programme China hopes to “boost domestic pride, gain international prestige, increase economic development and reap all the benefits that the US acquired through the Apollo and Space Shuttle programmes” (p. 5). Nationalism and threat perceptions vis-à-vis the US are seen as having played an important role in the formulation of China’s space programme. It is asserted that China’s space programme has continued to be strongly military-oriented, right from the time of its inception (p. 13). Assessments of Chinese technological progress that has been instrumental in facilitating its space programme are made. The author documents the setbacks faced by China’s commercial space programme with a series of failed launches and the subsequent investigations into these which included US satellite manufacturers, and ultimately enabled China’s access to information with dual-use capabilities. An in-depth analysis of the space policies of both, China and the US, is made in Chapter two. The US space policy document of 2006 is compared with that of 1996 and its emphasis on national security along with the de-emphasis of international cooperation and arms control is seen as indicative of American concerns of space security. China’s Five-Year Plans and the White Paper on China’s Space Activities in 2006 are the sources utilised to glean information about China’s space policy. Despite the rhetoric by China’s officials on the peaceful exploration of space and China’s participation in activities organised by the United Nations Committee on the Peaceful Uses of Outer Space, its ASAT test of 2007 and the control that the People’s Liberation Army (PLA) exercises over the entire programme has strengthened the belief that China’s space programme is essentially military in nature (p. 46). Section two of the book reflects on the threats posed by China to US space superiority. The space capabilities and military assets of both countries are listed and assessed. China is believed to view space as any other battle field and considers superiority in space as essential for winning battles on land. China is expected to enhance its targeting capabilities and communications systems, China’s pursuit of counter-space capabilities since the 1991 Gulf War is also emphasised (p. 86). The author contends that the US believes the deployment of space weapons works as a deterrent by reducing the confidence in the success of any attack (p. 104). In the near future the US is expected to continue deploying assets to improve real-time information on space assets and stealth capabilities. Advancement in interceptor technology could enable the US to overcome the use of high-altitude electromagnetic pulse (HEMP) by China to disrupt electronic systems. Although reduced interest in science and engineering among students in the US, along with increasing numbers of Chinese graduates in these fields, can be expected to impact the sustained superiority of the US in the realm of space technology, the author believes that the US’ counter space capabilities are currently no match for China (p. 113). The most important consequence of a conflict between China and the US over superiority in space would be the death of any agreement banning the deployment of space weapons. The third section of the book titled the “Second Space Race” examines the Vision for Space Exploration (VSE) launched by the Bush Administration in 2004. This identifies the long term tasks set by NASA, including manned missions to Mars, and the hardware necessary to achieve these goals. The drivers identified for a mission by NASA to return to the moon are science, technology, exploration and exploitation (p. 139). These are drivers that can be common to many other missions planned by NASA. A review of China’s manned space flight programme, from the completion of the Long March launch vehicle to the planned lunar base in 2020 is undertaken. Although China is developing the Long-March 5 launch vehicle (expected to be completed by 2014) and its Shenzhou-7 mission of 2008 showcased its Extravehicular Activity (EVA) capabilities, since China’s Manned Lunar Programme and lunar base programme are not part of any existing state plan it is unclear how they will be realized (p. 146) The final section of the book reasons why cooperation between the US and China in space exploration and exploitation is unlikely and why the space race between the two is all but inevitable. The moral differences between the US and China and the lack of transparency in the Chinese system are identified as the two main barriers to cooperation between the US and China (p 212-13). China is not part of the consortium of states participating in the International Space Station venture. This is not only because until recently China was not believed to have the monetary or technological wherewithal to contribute to the venture, but also because of China’s questionable human rights record. China’s ASAT test, the lack of political trust, the role of the PLA in China’s space programme and also lack of avenues that necessitate collaboration, are all impediments to greater cooperation between the US and China. China’s pursuit of soft power and the perception that manned spaceflight is an expression of leadership, pursuit of hightech war capabilities and determinacy to acquire superiority in space in the face of US unwillingness to abrogate its leadership position, are all seen as reasons for the inevitability of a space race between the US and China.

## AT: Space Not Key To Heg

### Space technology is key to U.S. leadership

Martino 7 — Rocco Martino, 2007, Ph.D. in astrophysics from the Institute of Aerospace Studies, Senior Fellow at the Foreign Policy Research Institute, former Professor of Mathematics at NYU, former Professor of Systems Engineering at the University of Waterloo, Spring, “A Strategy for Success: Innovation Will Renew American Leadership”, Orbis, Vol. 51, No. 2, KK

Much of the foreign policy discussion in the United States today is focused upon the dilemma posed by the Iraq War and the threat posed by Islamist terrorism. These problems are, of course, both immediate and important. However, America also faces other challenges to its physical security and economic prosperity, and these are more long-term and probably more profound. There is, ﬁrst, the threat posed by our declining competitiveness in the global economy, a threat most obviously represented by such rising economic powers as China and India. There is, second, the threat posed by our increasing dependence on oil imports from the Middle East. Moreover, these two threats are increasingly connected, as China and India themselves are greatly increasing their demand for Middle East oil. The United States of course faced great challenges to its security and economy in the past, most obviously from Germany and Japan in the ﬁrst half of the twentieth century and from the Soviet Union in the second half. Crucial to America’s ability to prevail over these past challenges was our technological and industrial leadership, and especially our ability to continuously recreate it. Indeed, the United States has been unique among great powers in its ability to keep on creating and recreating new technologies and new industries, generation after generation. Perpetual innovation and technological leadership might even be said to be the American way of maintaining primacy in world affairs. They are almost certainly what America will have to pursue in order to prevail over the contemporary challenges involving economic competitiveness and energy dependence

### It’s the vital internal link.

Johnson-Freese 11 (Dr. Joan Johnson-Freese, Professor of National Security Affairs at the Naval War College. Previously, she was on the faculty at the Asia Pacific Center for Security Studies; the Air War College in Montgomery, AL; and Director of the Center for Space Policy & Law at the University of Central Florida. “China in Space: Not Time for Bright, Shiny Objects”, 7/1/11, defense.aol.com/2011/07/01/chinas-in-space-not-time-for-bright-shiny-objects/) AK

Railing against that reality while planning to deploy a global fleet of new SM-3, Block II missiles is feckless and will fall on deaf geostrategic ears. Finally, cutting edge space technology has been the hinge of American military power for the past two decades but is its greatest uncertainty moving forward. The successful raid on Osama Bin Laden's compound in Abbotabad, Pakistan was in some ways analogous to General Norman Schwartzkopf's "Hail Mary" maneuver, marching his troops across the Iraqi desert in 1990 - a risky move possible because of our high tech advantage over a low tech enemy that carried a big payoff. Just as Schwartzkopf's troops could "see" their way across the desert with GPS and communicate with each other via satellites, the intelligence community and Seal Team Six used communication satellites, GPS, signals intelligence and satellite imagery to find and take out America's Most Wanted Fugitive. Space assets have been critical in providing the United States with an edge when it needed it, and that edge must be protected. In the forthcoming article "Space, China's Strategic Frontier," in the Journal of Strategic Studies, Eric Hagt and Matt Durnin present a convincing case that China is crossing a threshold, moving from being able to use space for limited strategic purposes to having the capabilities to use space in tactical operations as they happen. That threat to America's edge must be a priority. Too much time and resources have been spent worrying about whether China was clandestinely developing a Death Star powered by dilithium crystals as a shashoujian, or "assassin's mace," that had to be countered by orbiting Rods from God as part of US space control. And now there is a move afoot to resurrect Reagan-era space-based missile defense interceptors as part of a technical calculation where X + Y = deterrence, though deterrence is as much or more a psychological calculation as it is a technical one. Further, the Chinese (and others) are not as worried about the US technical capabilities associated with space control and missile defense as they are about a political climate in the United States that is obsessed with missile defense and our own bright shiny objects. Meanwhile, that obsession has given China the time it needed for the careful development of space systems to give it operational military space capabilities akin to our own. Satellites are a globalized industry, within which China plays a growing and maturing role, and space - like it or not - is not exclusive US territory, so we cannot prevent China from developing or launching the same kinds of spacecraft that have proved so valuable to the US military. China has also learned from the US experience that too much dependency on these valuable high-tech assets creates a risk in itself and, determined not to get into that situation, have factored redundancy and back-up capabilities into future plans. So what can the United States do? It can stay ahead, as it has done in the past. This is not a case of US decline - a drum beat loudly and consistently of late - but of other countries developing. Certainly, given the undesirable effects shown in countries that have not developed, a developing China is a better alternative than an imploding China. But it requires the United States to focus more on its space assets in terms of both upgrading the technology where needed, providing redundancy for the capabilities they provide, and robust research and development far more and better than our track record to date. The New York Times called the 2005 cancellation of the projected $5 billion-plus Future Imagery Architecture (FIA) program, intended to provide the next generation of optical and radar spy satellites - described as technologically "audacious" in complexity -- "perhaps the most spectacular and expensive failure in the 50-year history of spy satellite projects." Since then, political and bureaucratic debates over whether to again stretch for new technology, use satellites of a proven design, or rely more on commercial satellites have largely prevailed over purposeful action. Mismanagement and underinvestment in replacement satellites for the Global Positioning System (GPS) have threatened that system as well. This is simply unacceptable. A May 2011 GAO study on Space Acquisition states that while efforts to address two decades of problems in nearly every military space acquisition program have been "good" there is still a substantial amount to do. And given the increasing capabilities of the Chinese, it is imperative that we not just be "good," but "the best." Space systems supporting force enhancement must be kept cutting edge, well-coordinated and able to get information to the warfighters better and faster than anyone else. The administration, Congress and the Pentagon must focus their efforts in a bi-partisan, non-sensationalist manner toward maintaining the military space edge that has repeatedly proven invaluable in operations. The time to be distracted by bright, shiny objects has passed.

# Solvency

## AT: Safety

### Utilization of nuclear waste disposal technology in conjunction with laser propulsion is safe and allows for continued public and political support.

Coopersmith 5 (Jonathan, associate professor of history at Texas A&M University, specializes in the history of technology and the history of Russia. “Nuclear waste in space?” 8/22 <http://www.thespacereview.com/article/437/1>) MFR

The issue of safety has two components. One is the actual engineering of safe operations. This is demonstrable and testable. The other, equally important, part is the public perception of safety. As University of Missouri nuclear engineering professor William H. Miller, a specialist on nuclear fuel cycle and fuel management, noted, “The obvious problem is public perception. No matter how far you go to show that it is safe, there will always be someone to say ‘what if’.” John W. Poston, a Texas A&M nuclear engineering professor with a forty-six year career in nuclear health physics, agrees, considering convincing people of the safety of space-based disposal as challenging, if not more so, than the actual technical questions. Safety should appropriately dominate public discussion of this proposal. To succeed, space disposal must demonstrate lower risk and uncertainty than underground disposal. This project must be completely safe technically, but nonetheless will not succeed unless potential supporters and opponents are thoroughly convinced about its safety and efficiency. Safety should appropriately dominate public discussion of this proposal. To succeed, space disposal must demonstrate lower risk and uncertainty than underground disposal. Assuring safety is possible. The two major concerns are launching the capsule and ensuring the integrity of the capsule. Laser launching is safer and more reliable than rockets. The absence of rocket propellants and its accompanying propulsion systems eliminates the possibility of an explosion. The major problem would be if the laser failed before the capsule reached escape velocity. Because the capsule will be bullet-shaped, its ballistic characteristics are well known. Thus, if a launch failure occurred, the capsule would land only in known recovery zones. Launch trajectories would be designed to avoid populated areas. One advantage of a laser launch system is that the safe return from these aborted missions can be demonstrated by testing with inert capsules. Scores of launches could test every conceivable scenario, the equivalent of firing a new rifle to understand all its characteristics. This could not be done with a rocket. If another layer of safety is desired, placing the launch system on an island in the Pacific Ocean will further decrease the chance of an aborted flight landing in a populated area. Such isolation would also improve security. The capsule itself must protect its radioactive cargo not only from the demands of a normal launch with its severe atmospheric heating and aerodynamic loading, but also from potential accidents ranging from reentry into the atmosphere to a seriously flawed launch that would send the capsule into the high pressures of the ocean’s depths or into land. Summing up the engineering challenges, Bob Carpenter, the program manager for Orbital Sciences’ space nuclear power program, cautioned, “I’m not saying they are insurmountable, but they are major technical issues to be solved.” Jordin Kare, now an independent aerospace consultant, was more optimistic. The laser can accelerate the capsule slowly in the lower atmosphere, reducing heating. Furthermore, noted NASA nuclear engineer Dr. Robert C. Singleterry, the same aerobraking analyses and technologies that use a planet’s atmosphere to slow down a visiting spacecraft as the Mars Global Surveyor demonstrated in 1997 can ensure the control of a capsule leaving the earth’s atmosphere. The integrity of a capsule can be demonstrated too. The aerospace industry has accumulated decades of research and experience on how to contain radioactive material in containers that can maintain their integrity despite atmospheric re-entry, accidents, explosions, and other potential catastrophes. They are called nuclear warheads. Designing containers for space disposal is well within the state of the art. Dr. Rowland E. Burns, the engineer who led a NASA study in the mid-1970s on this issue, stated it is feasible to design and construct containers that can safely withstand the demands of even a catastrophic explosion, claiming, “I won’t say you would have to nuke the container to break it, but it would take something like that.” Materials technology has improved since the 1970s, making even tougher capsules possible. Because launch costs will be relatively inexpensive, engineers can overdesign for safety instead of trying to create the lightest possible container. Fail-proof capsules can be built, though the ratio of waste to shielding will be low. Ensuring safety must have an inclusionary component. A broadly based panel of stakeholders, including skeptics and opponents, should determine the criteria for tests and scenarios that proponents must pass. Computer simulations and controlled tests, however, will not be enough. Convincing demonstrations such as aborting launches with a mock payload and sending test capsules to reenter the atmosphere will be necessary to calm fears and prove the veracity of safety calculations. Minimum danger must be demonstrated, not assumed. Those opponents who unilaterally reject space-based disposal should be asked to propose an alternative. Nuclear waste will not go away on its own volition.

## AT: Expensive

### The plan is relatively inexpensive and pays for itself.

Coopersmith 5 (Jonathan, associate professor of history at Texas A&M University, specializes in the history of technology and the history of Russia. “Nuclear waste in space?” 8/22 <http://www.thespacereview.com/article/437/1>) MFR

What about the economics? Let’s be honest and upfront in our accounting: Space disposal will ultimately cost tens of billions of dollars, but the federal government has already spent $8 billion researching underground disposal and expects the total cost will be $60 billion. The difference is that future generations will not have to worry about the waste and they will have an infrastructure for reaching space. While technologically impressive, developments in tunnel boring have far less potential. Disposal in any form will be expensive. Space disposal at least offers a major spinoff, inexpensive access to space. Putting a small surcharge—a fraction of a cent per kilowatt-hour of electricity—on power generated by nuclear reactors would handle the operational costs. How can a system be both expensive and inexpensive? Judging by the costs of other high technology projects such as the Airbus 380 and Boston’s Big Dig, developing a laser launch system will require at least $5–10 billion. This is a lot of money, but historically space technologies are expensive: The Apollo program cost over $150 billion in contemporary dollars. Constructing the actual launch system will require a few billion dollars and operations will consume billions more. And even if the price of a pound to escape velocity is only $100, 5000 tons is $1 billion. We owe the future as well as ourselves the opportunity to determine whether space-based disposal is the best way to handle nuclear waste. Accordingly, over the next few years, NASA and the Department of Energy should establish three research programs. The first will determine the criteria and acceptance for a demonstration program. The second program will design safe capsules and the third program will test the ground-launched system. For the price of a new hotel in Las Vegas or a day or two of the defense budget, we will have enough information to decide whether to commit large resources to space-based disposal. Space disposal may not appear the obvious solution to the high-level nuclear waste problem. Nor is disposing of nuclear waste the obvious answer to the question of how to reduce the cost of reaching space. But the immense magnitude of nuclear wastes provides the incentive to develop launch systems that will drastically cut the cost of space exploitation. The result will be lower operating costs, more infrastructure, and more skilled personnel able to develop other areas of space. The development of the computer may offer a good analogy. Government funding, mostly from the military, intelligence community, and NASA, greatly accelerated research, development, and diffusion of computers since the 1940s. The federal government did this to conduct projects of national significance such as the census, Social Security, weapons research (especially nuclear explosions), cryptoanalysis, and space exploration. Not until the 1970s did the civilian market grow large enough to seize the technological initiative. Space disposal may prove a similar opportunity. Once a ground launcher is developed and built, constructing additional launchers will be far less costly and risky. The dream of affordable access to space may then come true, opening up the final frontier in ways that we have not dreamed of since the 1960s. As important, we will be acting ethically, providing our children a safer earth and inexpensive access to space for people as well as plutonium.

### Normal means for plan is a tax that is .05 cents of a kilowatt of energy used by nuclear power – functionally costs nothing even if it requires billions.

Coopersmith 5 (Jonathan, associate professor of history at Texas A&M University, specializes in the history of technology and the history of Russia. “Nuclear waste in space?” <http://www.thespacereview.com/article/437/1>) MFR

What about the economics? Let’s be honest and upfront in our accounting: Space disposal will ultimately cost tens of billions of dollars, but the federal government has already spent $8 billion researching underground disposal and expects the total cost will be $60 billion. The difference is that future generations will not have to worry about the waste and they will have an infrastructure for reaching space. While technologically impressive, developments in tunnel boring have far less potential. Disposal in any form will be expensive. Space disposal at least offers a major spinoff, inexpensive access tospace**.** Putting a small surcharge—a fraction of a cent per kilowatt-hour of electricity—on power generated by nuclear reactors would handle the operational costs.

## AT: Coolant Failure Unlikely

### Probability doesn’t matter in the context of our impact—the severity of the impact means it’s try or die for the negative.

Alvarez et al. 3 (\*Robert, a Senior Scholar at IPS, where he is currently focused on nuclear disarmament, environmental, and energy policies, served as a Senior Policy Advisor to the Secretary and Deputy Assistant Secretary for National Security and the Environment. \*Jan Beyea, PhD, earth science and environmental studies \*Klaus Janberg, \*Jungmin Kang, \*Ed Lyman, \*Allison Macfarlane, \*Gordon Thompson, \*Frank N. von Hippel, PhD Princeton University. “Reducing the Hazards from Stored Spent Power-Reactor Fuel in the United States” Science and Global Security, 11:1–51, 2003 www.irss-usa.org/pages/documents/11\_1Alvarez.pdf) MFR

The U.S. Nuclear Regulatory Commission (NRC) has estimated the probability of a loss of coolant from a spent-fuel storage pool to be so small (about 10−6 per pool-year) that design requirements to mitigate the consequences have not been required.1 As a result, the NRC continues to permit pools to move from open-rack conﬁgurations, for which natural-convection air cooling would have been effective, to “dense-pack” conﬁgurations that eventually ﬁll pools almost wall to wall. A 1979 study done for the NRC by the Sandia National Laboratory showed that, in case of a sudden loss of all the water in a pool, dense-packed spent fuel, even a year after discharge, would likely heat up to the point where its zircaloy cladding would burst and then catch ﬁre.2 This would result in the airborne release of massive quantities of ﬁssion products. No such event has occurred thus far. However, the consequences would be so severe that alternatives to dense-pack storage must be examined—especially in the context of heightened concerns that terrorists could ﬁnd nuclear facilities attractive targets. The NRC’s standard approach to estimating the probabilities of nuclear accidents has been to rely on fault-tree analysis. This involves quantitative estimates of the probability of release scenarios due to sequences of equipment failure, human error, and acts of nature. However, as the NRC staff stated in a June 2001 brieﬁng on risks from stored spent nuclear fuel:3 “No established method exists for quantitatively estimating the likelihood of a sabotage event at a nuclear facility.” Recently, the NRC has denied petitions by citizen groups seeking enhanced protections from terrorist acts against reactor spent-fuel pools.4 In its decision, the NRC has asserted that “the possibility of a terrorist attack . . . is speculative and simply too far removed from the natural or expected consequences of agency action . . . ”5 In support of its decision, the NRC stated: “Congress has recognized the need for and encouraged high-density spent fuel storage at reactor sites,”6 referencing the 1982 Nuclear Waste Policy Act (NWPA). In fact, although the NWPA cites the need for “the effective use of existing storage facilities, and necessary additional storage, at the site of each civilian nuclear power reactor consistent with public health and safety,” it does not explicitly endorse densepack storage.7 If probabilistic analysis is of little help for evaluating the risks of terrorism, the NRC and the U.S. Congress will have to make a judgment of the probability estimates that will be used in cost-beneﬁt analyses. Here, we propose physical changes to spent-fuel storage arrangements that would correct the most obvious vulnerabilities of pools to loss of coolant and ﬁre. The most costly of these proposals, shifting fuel to dry cask storage about 5 years after discharge from a reactor, would cost $3.5–7 billion for dry storage of the approximately 35,000 tons of older spent fuel that would otherwise be stored in U.S. pools in 2010. This corresponds to about 0.03–0.06 cents per kilowatt-hour of electricity generated from the fuel. Some of this cost could be recovered later if it reduced costs for the shipment of the spent fuel off-site to a long-term or permanent storage site. For comparison, the property losses from the deposition downwind of the cesium-137 released by a spent-fuel-pool ﬁre would likely be hundreds of billions of dollars. The removal of the older spent fuel to dry storage would therefore be justiﬁed by a traditional cost-beneﬁt analysis if the likelihood of a spent-fuelpool ﬁre in the U.S. during the next 30 years were judged to be greater than about a percent. Other actions recommended below could be justiﬁed by much lower probabilities.

### The fact that we can’t quantify malevolence means our impact is 100%.

Alvarez et al. 3 (\*Robert, a Senior Scholar at IPS, where he is currently focused on nuclear disarmament, environmental, and energy policies, served as a Senior Policy Advisor to the Secretary and Deputy Assistant Secretary for National Security and the Environment. \*Jan Beyea, PhD, earth science and environmental studies \*Klaus Janberg, \*Jungmin Kang, \*Ed Lyman, \*Allison Macfarlane, \*Gordon Thompson, \*Frank N. von Hippel, PhD Princeton University. “Reducing the Hazards from Stored Spent Power-Reactor Fuel in the United States” Science and Global Security, 11:1–51, 2003 www.irss-usa.org/pages/documents/11\_1Alvarez.pdf) MFR

A variety of possibilities can be identiﬁed for reducing the risk posed by spentfuel pools. Some were considered in reports prepared for the NRC prior to the Sept. 11, 2001 destruction of the World Trade Center and rejected because the estimated probability of an accidental loss of coolant was so low (about 2 chances in a million per reactor year) that protecting against it was not seen to be cost effective.69 Now it is necessary to take into account the potentially higher probability that a terrorist attack could cause a loss of coolant. Since the probabilities of speciﬁc acts of malevolence cannot be estimated in advance, the NRC and Congress will have to make a judgment of the probability that should be used in cost-beneﬁt analyses. The most costly measures we propose would be justiﬁed using the NRC’s cost-beneﬁt approach if the probability of an accident or attack on a U.S. spent-fuel pool resulting in a complete release of its 137 Cs inventory to the atmosphere were judged to be 0.7 percent in a 30-year period. This is at the upper end of the range of probabilities estimated by the NRC staff for spent-fuel ﬁres caused by accidents alone. For a release of one tenth of the 137 Cs inventory, the break-even probability would rise to about 5 percent in 30 years.70 Below, we discuss more speciﬁcally initiatives to: -Reduce the probability of an accidental loss of coolant from a spent-fuel pool, -Make the pools more resistant to attack, -Provide emergency cooling, -Reduce the likelihood of ﬁre should a loss of coolant occur, and -Reduce the inventory of spent fuel in the pools. Included are three recommendations made in the 1979 Sandia study on the consequences of possible loss-of-coolant accidents at spent-fuel storage pools.71 Unfortunately, all of these approaches offer only partial solutions to the problem of spent-fuel-pool safety. That problem will remain as long as nuclear power plants operate. However, the probability of a spent-fuel ﬁre can be signiﬁcantly reduced, as can its worst-case consequences. Some options will involve risk tradeoffs, and will therefore require further analysis before decisions are made on their implementation. We discuss the speciﬁc changes below under three headings: regulatory, operational, and design.

## AT: Yucca Solves

### Even the government indicates that Yucca fails.

Coopersmith 5 (Jonathan, associate professor of history at Texas A&M University, specializes in the history of technology and the history of Russia. “Nuclear waste in space?” 8/22 <http://www.thespacereview.com/article/437/1>) MFR

The problem of nuclear waste disposal is real, especially for future generations. Leaving radioactive wastes on earth creates permanent and tempting targets for terrorism as well as threatening the environment. We have a moral imperative to solve this problem now so we do not burden our children and their children. For twenty years, the federal government’s preferred solution to the nuclear waste problem is underground disposal, specifically, over 11,000 30–80 ton canisters buried in 160 kilometers of tunnels hundreds of meters underneath Yucca Mountain in northern Nevada. Forty-nine states favor this plan. It’s not hard to guess which state does not. To be fair to Nevada, any site would draw the same objections from anybody who lost this lottery, yet policymakers remain stuck on the idea of burial. Nevada’s fears are justified: researchers cannot guarantee complete environmental isolation for the thousands of years needed for these wastes to decay harmlessly. A recent report by the Government Accountability Office raised nearly 200 technical and managerial concerns about the site. Even the promise of construction and maintenance jobs has failed to sway a skeptical public. Historically, garbage has been something to bury or recycle. Consequently, nuclear waste disposal has remained the province of the geologists, who are professionally inclined to look down, not up. That’s shortsighted. The permanent elimination of high-level radioactive waste demands a reconceptualization of the problem. We need to look up, not down. Let’s put high-level radioactive waste where it belongs, far out in space where it will not endanger anyone on earth.

## AT: Inherency

### No viable waste disposal now.

UCS 11 (Union of Concerned Scientists, “Reprocessing and Nuclear Terrorism” 3/22 <http://www.ucsusa.org/nuclear_power/nuclear_power_risk/nuclear_proliferation_and_terrorism/reprocessing-and-nuclear.html>) MFR

Background U.S. civilian nuclear power plants use only low-enriched uranium (LEU) as fuel. LEU cannot be used directly to make nuclear weapons. As the fuel is burned up in the reactor, plutonium and radioactive fission products are produced. The plutonium and remaining uranium can be separated from the other materials in spent nuclear fuel by a series of chemical operations known as "reprocessing." The purified plutonium that is obtained from reprocessing can be reused as fuel, but states or terrorist groups can also use it to make nuclear weapons. Over three decades ago, the United States decided on nuclear non-proliferation grounds not to reprocess the spent fuel generated by civilian nuclear power plants, but instead to directly dispose of it in a geologic repository. However, the United States does not yet have a geologic repository and policymakers periodically propose that the United States begin to reprocess its spent fuel. Reprocessing existing U.S. spent fuel would produce hundreds of tons of separated plutonium that would be vulnerable to diversion or theft by terrorists.

# 2AC Add-Ons

## 2AC—South Korean Alliance Add-On

### South Korea will pursue reprocessing—no disposal method without the plan—that kills the alliance.

Seong-won et al. 10 — Park Seong-won, Miles A. Pomper, and Lawrence Scheinman, The authors are at the James Martin Center for Nonprolif- eration Studies. Dr. Park is a Visiting Fellow; he was for- merly vice president of the Korea Atomic Energy Research Institute. Mr. Pomper is a Senior Research Associate. Dr. Scheinman is a Distinguished Professor, 10 [“The Domestic and International Politics of Spent Nuclear Fuel in South Korea: Are We Approaching Meltdown?”, Korea Economic, March 2010 • Volume 5 • Number 3, pdf]

When South Korea and the United States negotiated their last nuclear cooperation agreement in the early 1970s, the talks attracted little political attention or concern. Now, Seoul and Washington are gearing up to negotiate a new nuclear agreement within a radically changed economic, political and diplomatic context. Among other changes, South Korea now boasts one of the world’s largest and fastest growing nuclear power reactor fleets and has be- come a significant nuclear exporter. To win U.S. support for a nuclear cooperation agreement, South Korea may have to be willing to take on new global nonproliferation commitments commensurate with its new role as a major global nuclear technology supplier, or in some cases be more public about doing so. In this context, Seoul can be expected to face particularly strong pressure from Congress not to proceed with the construc- tion of a pyroprocessing test facility.12 More than three decades ago, the United States ended its own large-scale reprocessing efforts (based on an older technology) because it found the technology uneconomi- cal and feared that it was providing a poor example to other countries. In dealing with domestic spent fuel, the Obama administration has indicated that it is inclined to rely on interim storage of U.S. spent fuel at reactor sites for the foreseeable future while looking at the possibil- ity of centralized interim storage sites and conducting re- search on long-term alternatives advanced reprocessing options such as pyroprocessing. Seoul is likely to face pressures from Washington to adopt the same approach. 13 Indeed, South Korean nuclear experts acknowledge that, with or without pyroprocessing, they will need to rely on interim storage for decades as they do not plan to build commercial-scale facilities for pyroprocessing until close to the middle of the 21st century. But they say that to win public acceptance they need to show that pyroprocessing or other long-term storage options are viable. Otherwise, local communities will not be convinced that any interim storage facilities will in fact be temporary. The Obama administration is likely to insist that the new nuclear cooperation agreement conform to the terms of the 1978 NNPA and will not readily grant South Korea programmatic prior consent for reprocessing or pyropro- cessing. Any other agreement would lead to substantial procedural and substantive problems in winning con- gressional approval for the pact. It is clear that South Korea faces a significant problem in dealing with its spent nuclear fuel problem. Locating politically acceptable spent-fuel storage sites on Korean territory is a major challenge. Seeking to address the problem through supplier take-back of spent fuel, offi- cials have found that regional or international alternatives have not to this point proven to be a viable and reliable solution. Still, reprocessing, including pyroprocessing, poses its own economic, technical, diplomatic, and non- proliferation challenges. Even the intuitively appealing notion of placing the facilities under some kind of mul- tilateral structural or institutional arrangement—an ap- proach some in Seoul are suggesting—will not serve to completely banish skepticism or challenges. Nevertheless, given the close relationship between the United States and South Korea and both countries’ posi- tions as leading nuclear energy producers and now ex- porters, the negotiations over a new nuclear cooperation agreement provide an opportunity to influence the course that others will follow in making effective use of nuclear energy without incurring increased risks of nuclear proliferation. Creative solutions are needed to address Seoul’s challenges regarding spent fuel without triggering Washington’s anxieties about proliferation.

Multiple scenarios for war.

Prichard et al. 9 [Jack, President, Korea Economic Institute, John Tilelli, Chairman and CEO, Cypress Int’l, and Scott Snyder, Adjunct Senior Fellow for Korea Studies, “A New Chapter for U.S.-South Korea alliance” Council on Foreign Relations -- June 16 http://www.cfr.org/publication/19635/new\_chapter\_for\_ussouth\_korea\_alliance.html]

While all eyes have been trained on North Korea's belligerent and aggressive actions in recent weeks, it is important to note that the U.S.-South Korea alliance has emerged as a linchpin in the Obama administration's efforts to successfully manage an overcrowded global agenda, and a pivotal tool for safeguarding U.S. long-term interests in Asia. When South Korea's President Lee Myung-bak meets with President Barack Obama at the White House Tuesday, the two leaders must effectively address three main areas: policy coordination to address North Korea's nuclear threat, the development of a global security agenda that extends beyond the peninsula, and collaboration to address the global financial crisis as South Korea takes a lead on the G-20 process. By conducting a second nuclear test in May, followed by a number of missile launches, North Korea has forced its way onto the Obama administration's agenda. First and foremost, effective U.S.-South Korea alliance coordination is critical to managing both the global effects of North Korea's nuclear threat on the nonproliferation regime and the regional security challenges posed by potential regime actions that lead to further crisis in the region. North Korea's internal focus on its leadership succession, and the apparent naming of North Korean leader Kim Jong-il's little-known and inexperienced youngest son as his successor, make the task of responding to North Korea's aggressive and destabilizing actions all the more challenging. Both deterrence and negotiation must be pursued on the basis of close consultations. Presidents Obama and Lee must also develop coordinated contingency plans in the event of internal instability in North Korea. Through effective U.S.-South Korea alliance coordination, it should be possible to forge a combined strategy capable of managing the nuclear, proliferation, and regional security dimensions of North Korea's threat. A coordinated position would also strengthen the administration's hand in its efforts to persuade China to put pressure on North Korea. Both countries also face hostage crises involving citizens detained in North Korea. The recent conviction of two U.S. journalists heightens the stakes for the United States, although the administration has tried to decouple their plight from Pyongyang's missile tests. Second, Presidents Obama and Lee should set the stage for a reinvigorated vision of a broader role for the U.S.-South Korea alliance as an important component of a broader U.S. strategy toward East Asia. A critical aspect of this vision is a mutual commitment to jointly address sources of global and functional instability beyond the peninsula. Lee Myung-bak has offered a vision of a global Korea that features an expanded commitment to peacekeeping and development assistance that is in greater proportion to South Korea's economic clout as the world's 13th largest economy. As the third-largest contributor of troops to Iraq, South Korea has also demonstrated its capacity to make valuable contributions to post-conflict stabilization. The U.S.-South Korea alliance can serve as a platform by which South Korea can make such contributions in many other areas, including Afghanistan. South Korea has already made commitments to send engineers and medical personnel to Afghanistan. It is poised now to expand its contributions, in line with its broadening scope of interest in contributing to global stability and its economic prowess. Third, South Korea is an essential partner in addressing the global financial crisis. Its emphasis on fighting protectionism and promotion of stimuli at the April G-20 leaders meeting in London illustrate how closely its priorities are aligned with those of the United States. A U.S. Federal Reserve Bank line of credit to South Korea last fall played a critical role in stabilizing the South Korean's currency and forestalled a possible repeat of South Korea's difficulties in the Asian financial crisis of a decade ago. The Obama and Lee administrations have the opportunity to send a powerful signal opposing protectionism by winning legislative support in both countries for the Korea-U.S. Free Trade Agreement negotiated by their predecessors. With the necessary revisions to meet new political conditions, Mr. Lee and Mr. Obama should urge their respective legislatures to consider early ratification of the trade pact. This would both support more effective coordination on the global financial crisis and underscore its value as a precedent that sets high standards for trade agreements in Asia, in contrast to the proliferation of Asian trade agreements that do little to promote a more open Asian trade and investment environment. U.S.-South Korean coordination to manage North Korea's challenge to nonproliferation norms, the global financial crisis, and the transition in Afghanistan will underscore the practical value of alliance contributions to meet mutual interests in global security and prosperity. For this reason, Presidents Obama and Lee have a compelling interest in establishing a firm foundation for unlocking the potential of alliance cooperation in the service of our shared interests.

## Uniqueness—SK will reprocess now

### SK will reprocess now – Needs to get rid of it’s massive amounts of spent fuel

Seong-won et al. 10 — Park Seong-won, Miles A. Pomper, and Lawrence Scheinman, The authors are at the James Martin Center for Nonprolif- eration Studies. Dr. Park is a Visiting Fellow; he was for- merly vice president of the Korea Atomic Energy Research Institute. Mr. Pomper is a Senior Research Associate. Dr. Scheinman is a Distinguished Professor, 10 [“The Domestic and International Politics of Spent Nuclear Fuel in South Korea: Are We Approaching Meltdown?”, Korea Economic, March 2010 • Volume 5 • Number 3, pdf]

Instead, South Korea in the new negotiations is seeking advance, long-term U.S. consent to pyroprocess or even reprocess U.S. fuel and use the fuel in fast reactors, a right the United States has so far granted only to Japan and Euratom several decades ago and to Switzerland and India recently. Such a deal would likely be seen as falling short of the NNPA’s requirements and would thus face far tougher requirements for congressional approval. Under this circumstance, the administration would have to convince majorities in both the House and Senate to approve the change. South Korean officials have sought to dodge this issue in part by arguing that, given the differences between pyroprocessing and traditional reprocessing, South Korean technology should not be subject to the same limitations; but it is unlikely this argument will sway lawmakers or nonproliferation advocates. Throughout the life of the current agreement, South Korea has shown a consistent interest in reprocessing al- though its motivations and the type of technology it has pursued have changed over time. South Korea’s interest in reprocessing was first stimulated by views then popular in the global community that the world would soon see the emergence of a nuclear energy economy anchored on plutonium breeder reactors, which, of course, would require reprocessing capability. In the early 1970s, South Korea sought to purchase this technology, eventually reaching agreement to buy a small-scale reprocessing plant from France. This initial effort was halted, however, after the 1974 Indian “peaceful” nuclear test prompted the United States to turn against the spread of reprocessing technologies and after revelations that the then military government of Korea was planning to develop nuclear weapons or, at least, acquire the technology and capability to do so on short notice. Park Chung-hee, then Korea’s president, backed away from the effort after the United States threatened to withdraw its security guarantee to South Korea if Seoul did not halt its weapons development plans.8

### Tensions now – South Korea not agreeing to nuclear deal

Seong-won et al. 10 — Park Seong-won, Miles A. Pomper, and Lawrence Scheinman, The authors are at the James Martin Center for Nonprolif- eration Studies. Dr. Park is a Visiting Fellow; he was for- merly vice president of the Korea Atomic Energy Research Institute. Mr. Pomper is a Senior Research Associate. Dr. Scheinman is a Distinguished Professor, 10 [“The Domestic and International Politics of Spent Nuclear Fuel in South Korea: Are We Approaching Meltdown?”, Korea Economic, March 2010 • Volume 5 • Number 3, pdf]

U.S.-ROK cooperation in the civil nuclear field is gov- erned by the 1974 Agreement Concerning Civil Uses of Nuclear Energy, which expires in 2014.7 Insofar as spent nuclear fuel is concerned, the provision that is most rele- vant in that agreement is Article VIII (F), which provides that, with respect to reprocessing or “alteration in form or content” of U.S.-obligated spent fuel, “such reprocessing or alteration” shall be performed in facilities acceptable to both parties upon a joint determination of the parties that the provisions in Article XI (dealing with the appli- cation of International Atomic Energy Agency [IAEA] safeguards) may be effectively applied. Thus, its legal emphasis is on the ability of IAEA inspectors to detect whether material from the civil nuclear program could be diverted to weapons, rather than trying to forestall this possibility altogether. By contrast, the new agreement will be negotiated against the background of the 1978 U.S. Nuclear Non-Prolifer- ation Act (NNPA), which amended the Atomic Energy Act of 1946 pursuant to which the 1974 agreement had been concluded. The NNPA established new criteria for nuclear exports, including a provision on “subsequent ar- rangements” covering a range of activities. The NNPA requires that any new nuclear cooperation agreements condition the supply of U.S. nuclear material on the will- ingness of the recipient country to agree that it will have to obtain prior consent from the United States for any “alteration in form or content.” It also broadens U.S. con- sent rights to cover not only nuclear material supplied by the United States, but also nuclear material that has been irradiated in a U.S.-supplied reactor. Agreements with non-nuclear-weapons states that adhere to the NNPA are subject to a congressional process that is biased toward approval: after Congress receives such an agreement, lawmakers must pass legislation opposing it within 90 legislative days for it to be blocked. Although the United States has sought to have South Korea sign a new co- operation agreement adhering to the NNPA terms, Seoul has refused to do so, preferring to wait until the current one expires.

## EXT—Solves Alliance

### Nuclear cooperation key to the alliance and stopping North Korean Prolif

Seong-won et al. 10 — Park Seong-won, Miles A. Pomper, and Lawrence Scheinman, The authors are at the James Martin Center for Nonprolif- eration Studies. Dr. Park is a Visiting Fellow; he was for- merly vice president of the Korea Atomic Energy Research Institute. Mr. Pomper is a Senior Research Associate. Dr. Scheinman is a Distinguished Professor, 10 [“The Domestic and International Politics of Spent Nuclear Fuel in South Korea: Are We Approaching Meltdown?”, Korea Economic, March 2010 • Volume 5 • Number 3, pdf]

All the while, the United States, a major partner of South Korea in many respects, including peaceful nuclear de- velopment, has generally not supported—in fact, has sought to impede—South Korea’s engagement in pro- liferation-prone nuclear fuel cycle activity, primarily, at this stage, reprocessing.

Washington’s approach reflects the fact that, since In- dia’s 1974 “peaceful” nuclear test, the United States has grown increasingly concerned about nuclear prolifera- tion and has attempted to prevent the spread of enrich- ment and reprocessing technologies to new countries, not just South Korea. But it also reflects particular concerns about the Korean peninsula, which led Washington to block the sale of reprocessing technology to South Ko- rea in the late 1970s and, more recently, to engage with Seoul and Pyongyang in six-party talks aimed at ending North Korea’s nuclear weapons program. In 1992, under pressure from Washington, South Korea signed the Joint Declaration on the Denuclearization of the Korean Peninsula with North Korea. South and North Korea agreed “not to test, manufacture, produce, receive, possess, store, deploy, or use nuclear weapons; to use nuclear energy solely for peaceful purposes; and not to possess facilities for nuclear reprocessing and ura- nium enrichment.” North Korea has clearly violated the agreement by operating nuclear reprocessing facilities and producing and testing nuclear weapons; yet, to date, South Korea has been reluctant to renounce the agree- ment altogether, hoping that North Korea can be lured back into eliminating its nuclear weapons and nuclear weapons program. The United States has strongly sup- ported this position, with U.S. officials believing that, if South Korea were to openly break with the agreement by constructing its own nuclear reprocessing facilities, it might provide a pretext for Pyongyang to claim that its behavior was no more illegitimate than that of its south- ern neighbor.

## 2AC—Accidents Add-On

### Reprocessing has created fuel pools holding 500 metric tons more than they can hold—nuclear fires are likely because air cooling systems are densely packed. Volatile fission waste risks reactor explosion—that’s Ananda and UCS from the 1AC.

### Any accident would bring about an economic shockwave

Alvarez et al. 3 (\*Robert, a Senior Scholar at IPS, where he is currently focused on nuclear disarmament, environmental, and energy policies, served as a Senior Policy Advisor to the Secretary and Deputy Assistant Secretary for National Security and the Environment. \*Jan Beyea, PhD, earth science and environmental studies \*Klaus Janberg, \*Jungmin Kang, \*Ed Lyman, \*Allison Macfarlane, \*Gordon Thompson, \*Frank N. von Hippel, PhD Princeton University. “Reducing the Hazards from Stored Spent Power-Reactor Fuel in the United States” Science and Global Security, 11:1–51, 2003 www.irss-usa.org/pages/documents/11\_1Alvarez.pdf) MFR

A 1997 study done for the NRC estimated the median consequences of a spent-fuel ﬁre at a pressurized water reactor (PWR) that released 8–80 MCi of 137 Cs. The consequences included: 54,000–143,000 extra cancer deaths, 2000– 7000 km of agricultural land condemned, and economic costs due to evacuation of $117–566 billion.29 This is consistent with our own calculations using the MACCS2 code. It is obvious that all practical measures must be taken to prevent the occurrence of such an event.

Economic shocks go nuclear

Ferguson 9 (Niall, Laurence A. Tisch Professor of History at Harvard University, “The Axis of Upheaval,” Foreign Policy, February 16th, http://www.foreignpolicy.com/articles/2009/02/16/the\_axis\_of\_upheaval)

The Bush years have of course revealed the perils of drawing facile parallels between the challenges of the present day and the great catastrophes of the 20th century. Nevertheless, there is reason to fear that the biggest financial crisis since the Great Depression could have comparable consequences for the international system. For more than a decade, I pondered the question of why the 20th century was characterized by so much brutal upheaval. I pored over primary and secondary literature. I wrote more than 800 pages on the subject. And ultimately I concluded, in The War of the World, that three factors made the location and timing of lethal organized violence more or less predictable in the last century. The first factor was ethnic disintegration: Violence was worst in areas of mounting ethnic tension. The second factor was economic volatility: The greater the magnitude of economic shocks, the more likely conflict was. And the third factor was empires in decline: When structures of imperial rule crumbled, battles for political power were most bloody. In at least one of the world’s regions—the greater Middle East—two of these three factors have been present for some time: Ethnic conflict has been rife there for decades, and following the difficulties and disappointments in Iraq and Afghanistan, the United States already seems likely to begin winding down its quasi-imperial presence in the region. It likely still will. Now the third variable, economic volatility, has returned with a vengeance. U.S. Federal Reserve Chairman Ben Bernanke’s “Great Moderation”—the supposed decline of economic volatility that he hailed in a 2004 lecture—has been obliterated by a financial chain reaction, beginning in the U.S. subprime mortgage market, spreading through the banking system, reaching into the “shadow” system of credit based on securitization, and now triggering collapses in asset prices and economic activity around the world. After nearly a decade of unprecedented growth, the global economy will almost certainly sputter along in 2009, though probably not as much as it did in the early 1930s, because governments worldwide are frantically trying to repress this new depression. But no matter how low interest rates go or how high deficits rise, there will be a substantial increase in unemployment in most economies this year and a painful decline in incomes. Such economic pain nearly always has geopolitical consequences. Indeed, we can already see the first symptoms of the coming upheaval. In the essays that follow, Jeffrey Gettleman describes Somalia’s endless anarchy, Arkady Ostrovsky analyzes Russia’s new brand of aggression, and Sam Quinones explores Mexico’s drug-war-fueled misery. These, however, are just three case studies out of a possible nine or more. In Gaza, Israel has engaged in a bloody effort to weaken Hamas. But whatever was achieved militarily must be set against the damage Israel did to its international image by killing innocent civilians that Hamas fighters use as human shields. Perhaps more importantly, social and economic conditions in Gaza, which were already bad enough, are now abysmal. This situation is hardly likely to strengthen the forces of moderation among Palestinians. Worst of all, events in Gaza have fanned the flames of Islamist radicalism throughout the region—not least in Egypt. From Cairo to Riyadh, governments will now think twice before committing themselves to any new Middle East peace initiative. Iran, meanwhile, continues to support both Hamas and its Shiite counterpart in Lebanon, Hezbollah, and to pursue an alleged nuclear weapons program that Israelis legitimately see as a threat to their very existence. No one can say for sure what will happen next within Tehran’s complex political system, but it is likely that the radical faction around President Mahmoud Ahmadinejad will be strengthened by the Israeli onslaught in Gaza. Economically, however, Iran is in a hole that will only deepen as oil prices fall further. Strategically, the country risks disaster by proceeding with its nuclear program, because even a purely Israeli air offensive would be hugely disruptive. All this risk ought to point in the direction of conciliation, even accommodation, with the United States. But with presidential elections in June, Ahmadinejad has little incentive to be moderate. On Iran’s eastern border, in Afghanistan, upheaval remains the disorder of the day. Fresh from the success of the “surge” in Iraq, Gen. David Petraeus, the new head of U.S. Central Command, is now grappling with the much more difficult problem of pacifying Afghanistan. The task is made especially difficult by the anarchy that prevails in neighboring Pakistan. India, meanwhile, accuses some in Pakistan of having had a hand in the Mumbai terrorist attacks of last November, spurring yet another South Asian war scare. Remember: The sabers they are rattling have nuclear tips. The democratic governments in Kabul and Islamabad are two of the weakest anywhere. Among the biggest risks the world faces this year is that one or both will break down amid escalating violence. Once again, the economic crisis is playing a crucial role. Pakistan’s small but politically powerful middle class has been slammed by the collapse of the country’s stock market. Meanwhile, a rising proportion of the country’s huge population of young men are staring unemployment in the face. It is not a recipe for political stability. This club is anything but exclusive. Candidate members include Indonesia, Thailand, and Turkey, where there are already signs that the economic crisis is exacerbating domestic political conflicts. And let us not forget the plague of piracy in Somalia, the renewed civil war in the Democratic Republic of the Congo, the continuing violence in Sudan’s Darfur region, and the heart of darkness that is Zimbabwe under President Robert Mugabe. The axis of upheaval has many members. And it’s a fairly safe bet that the roster will grow even longer this year. The problem is that, as in the 1930s, most countries are looking inward, grappling with the domestic consequences of the economic crisis and paying little attention to the wider world crisis. This is true even of the United States, which is now so preoccupied with its own economic problems that countering global upheaval looks like an expensive luxury. With the U.S. rate of GDP growth set to contract between 2 and 3 percentage points this year, and with the official unemployment rate likely to approach 10 percent, all attention in Washington will remain focused on a nearly $1 trillion stimulus package. Caution has been thrown to the wind by both the Federal Reserve and the Treasury. The projected deficit for 2009 is already soaring above the trillion-dollar mark, more than 8 percent of GDP. Few commentators are asking what all this means for U.S. foreign policy. The answer is obvious: The resources available for policing the world are certain to be reduced for the foreseeable future. That will be especially true if foreign investors start demanding higher yields on the bonds they buy from the United States or simply begin dumping dollars in exchange for other currencies. Economic volatility, plus ethnic disintegration, plus an empire in decline: That combination is about the most lethal in geopolitics. We now have all three. The age of upheaval starts now.

## 2AC—Nuclear Infrastructure Add-On

### Calming public fears about waste disposal is key to future development of Nuclear Infrastructure.

Ballard 3 — James David Ballard, professor of sociology at California State University, 03 [“Perceptions and the social-political aspects of nuclear power and nuclear waste disposal.”, Research Paper, September 1, 2003 is the last date cited, pdf]

While many nuclear industry insiders believe that probabilities and their associate risk calculations have real meaning to the public, the fact remains that these calculations are not what drives the public’s view of nuclear power and highly radioactive wastes. One suggestion to overcome the problem that can arise when the general public reacts badly to nuclear power and radioactive wastes is to: 1) conduct an analysis of the perceptions the public has on nuclear related issues and 2) to address their concerns in a non-confrontational and respectful manner.4 Prior to this being accomplished, it is necessary to understand how the differentials in industry and public perceptions come about and what effects they have on social and political debates surrounding the energy industry. As such this argument will attempt to highlight these issues in a manner that will allow for such understanding. The social and political consequences of a perceptual differential between the industry and the public can be profound. Just think about the typically response of the nuclear industry to criticisms from outside, what can be termed social or political criticism. For a moment consider the hypothetical situation where the industry, or one of its representatives, contends that the risks of a nuclear power plant have already been studied and for the most part found to be meaningless, in terms of the probability or consequences. This industry reality is in direct opposition to the reality felt by the general public who quickly come to distrust these industry proclamations and find value in the perceptions of alternative experts who use their training in engineering, or risk modeling, to contend that the energy industry is using self serving calculations as the basis of their claims. The tension between these two positions is evident and while it may be easy for the energy industry to dismiss the very real public fears that result, they should not be discarded so easily.5 A more tangible example of the perceptual divide represented herein can be found in the debates on the Yucca Mountain project in America. Recently one industry official testified in the American Congress regarding the chorus of social and political voices opposing the pending program to transport radioactive materials to the proposed Yucca geologic repository.6 Paraphrasing this testimony, this industry representative referred to the critical voices as a “cottage industry” intent on playing off of the irrational fears of the public and opposing progress by the industry.7 The oppositional dialogue represented by such a comment, a distinct “we” verses “them” mentality, easily develops when perceptual differences are so profoundly disjointed. This real world example is not an atypical response when nuclear energy infrastructure proponents face intense questioning of their actions by the public, politicians, non-technical opposition forces, and/or even those within the industry who question choices made by the infrastructure managers regarding safety, security, and transportation.

### Infrastructure key to nuclear leadership

Bengelsdorf 7 — Harold Bengelsdorf, consultant and former director of both key State and Energy Department offices that are concerned with international nuclear and nonproliferation affairs, 07 [“THE U.S. DOMESTIC CIVIL NUCLEAR INFRASTRUCTURE AND U.S. NONPROLIFERATION POLICY”, White Paper prepared for the American Council on Global Nuclear Competitiveness May, http://www.nuclearcompetitiveness.org/images/COUNCIL\_WHITE\_PAPER\_Final.pdf]

The health of the U.S. civil nuclear infrastructure can have an important bearing in a variety of ways on the ability of the United States to advance its nonproliferation objectives. During the Atoms for Peace Program and until the 1970s, the U.S. was the dominant supplier in the international commercial nuclear power market, and it exercised a strong leadership role in shaping the global nonproliferation regime. Today due to its political, military and economic position in the world, the United States continues to exercise great weight in nonproliferation matters. However, the ability of the United States to promote its nonproliferation objectives through peaceful nuclear cooperation with other countries has declined. The fact that no new nuclear power plant orders have been placed in over three decades in the U.S. has led to erosion in the capabilities of the U.S. civil nuclear infrastructure. Moreover, during the same period, while the U.S. share of the global nuclear market declined significantly, several other countries launched major nuclear power programs and became major international suppliers in their own right.

## EXT—Solves Public Fear

### Plan perceives public fear of terrorism.

Ballard 3 — James David Ballard, professor of sociology at California State University, 03 [“Perceptions and the social-political aspects of nuclear power and nuclear waste disposal.”, Research Paper, September 1, 2003 is the last date cited, pdf]

For many in the body politic, radioactivity is a part of the life world where they do not wish to delve. The have been socialized to believe that nuclear power is equated to nuclear war and the outcomes of a nuclear power plant (NPP) accident, or terrorist attack on a spent fuel pool or radioactive waste shipment, would be equated to the attacks on Hiroshima or Nagasaki.9 The bottom line is that due to such characterizations from popular culture and the internalization of such a normative structure, they seek out and value an alternative scientific literature. Due to these factors the public has horrific images attached to nuclear power. These images are difficult to mitigate by typical industry logic alone, or even worse by an industry insistence on using such seemingly normalized engineering presentations of risk calculations replete with references to 10-8 probabilities.10 This social reality is in direct opposition to those within the nuclear infrastructure and their everyday world of handling radioactive materials. To these industry insiders, the normalized rituals of their everyday experience and their intimate working knowledge of the materials and safety procedures therein, make any outside criticism seem less than creditable, especially if the critics use the public dialog of imminent annihilation that could become attached to nuclear power during an accident or hazardous incident.

## EXT—Public Key To Infrastructure

### Waste Disposal key to increased infrastructure development.

Ballard 3 — James David Ballard, professor of sociology at California State University, 03 [“Perceptions and the social-political aspects of nuclear power and nuclear waste disposal.”, Research Paper, September 1, 2003 is the last date cited, pdf]

The problems that many nuclear engineers, energy policy makers, industry officials, and risk regulators face when discussing the social and political aspects of their field can be summarized by one word: perception. The public perception of the dangers inherit in the portions of the fuel cycle associated with nuclear power generation and radioactive waste transportation and disposal is vastly different from the perceptions held by those within the nuclear infrastructure (i.e., policy makers, planners, designers, etc.).1 These perceptual differentials hold the key to any discussion on the social and political aspects of nuclear related activities since they represent the very real, in their consequences, fears that the public has with respect to the industry and especially its related production inputs like nuclear materials and outputs like spent nuclear fuel (SNF).2

### Lack of public support kills infrastructure development

Ballard 3 — James David Ballard, professor of sociology at California State University, 03 [“Perceptions and the social-political aspects of nuclear power and nuclear waste disposal.”, Research Paper, September 1, 2003 is the last date cited, pdf]

The second dimension is that surrounding politics. In general, political structures are supportive of energy production; it is after all the fuel that drives financial expansion and provides for economic viability. The loss of faith by the body politic in nuclear energy can significantly affect the structures of power that are normally very supportive of the nuclear industry. The result may be a temporary or even permanent loss of such structural support. The growth of a perceptual divide between industry and governments would be potentially devastating to one (energy industry) of these institutions and failure to address such perceptual disjunctions could damage the other.

## EXT—Civil Infrastructure Key To Leadership

### Civil infrastructure means US can be an international leader

Bengelsdorf 7 — Harold Bengelsdorf, consultant and former director of both key State and Energy Department offices that are concerned with international nuclear and nonproliferation affairs, 07 [“THE U.S. DOMESTIC CIVIL NUCLEAR INFRASTRUCTURE AND U.S. NONPROLIFERATION POLICY”, White Paper prepared for the American Council on Global Nuclear Competitiveness May, http://www.nuclearcompetitiveness.org/images/COUNCIL\_WHITE\_PAPER\_Final.pdf]

Thus, while the U.S. remains a participant in the international market for commercial nuclear power, it no longer enjoys a dominant role as it did four decades ago. To the extent that U.S. NSSS and nuclear fuel designers and manufacturers are able to reassert themselves on a technical and commercial basis, opportunities for U.S. influence with respect to nuclear nonproliferation might be expected to increase. However, the fact that there are other suppliers that can now provide NSSS and nuclear fuel technology and services on a competitive commercial basis suggests that the U.S. will have to work especially hard to maintain and, in some cases, rebuild its nuclear infrastructure, if it wishes to exercise its influence in international nuclear affairs.

# AT: Disads

## AT: I-Law

### No link—only if there is a potential catastrophe that occurs, which is the only internal link to your liability claims, it’s permissible

Dusek 97 (Robin, B.A. in Government from the University of Notre Dame in 1995, and expects to receive her J.D. from the College of William and Mary School of Law in May of 1998.“Lost in Space?: The Legal Feasability of Nuclear, Waste Disposal in Outer Space” William & Mary Environmental Law and Policy Review Volume 22 | Issue 1) MFR

The international treaties, cases, and principles do not seem to indicate a clear answer to the question of whether disposal of nuclear waste in outer space is permissible. They do indicate, however, that the country that disposes the waste would be liable for any harm that is caused by such disposal. This principle is seen in treaty and customary law. If waste could be disposed of without harming another country, the law is less clear. Certainly no treaty expressly forbids the disposal, and because no country has used space as a disposal site, international custom has not been set. Customary law seems to ban disposal of harmful substances in common areas on earth, but whether this applies to space is, again, unclear. Hence, customary law probably does not prohibit the disposal. If the U.S. did dispose of waste in this manner, it might set custom to allow such disposal. The U.S. is one of a handful of countries that have the technology for such disposal, and therefore, the practice of the U.S. will have a substantial impact on customary law in this area.

## Obama Bad

### Anything that isn’t Yucca is incredibly unpopular in Congress— Future solutions have the perception of being costly and dangerous

Huffington Post 2011 [“Where Do We Store Nuclear Waste? Solution Could Cost Billions, Take 20 Years, 5/13/11, http://www.huffingtonpost.com/2011/05/13/watchdog\_n\_861547.html]

The controversy over President Obama's decision to pull the plug on the decades-long, multi-billion-dollar Yucca Mountain nuclear waste repository project keeps brewing. The latest Government Accountability Office report, "Commercial Nuclear Waste: Effects of a Termination of the Yucca Mountain Repository Program," should only fuel the fire. Though terminating the program has some benefits, the report finds it will cost the government billions and perhaps 20 years to restart the whole process of finding a safe place to store such waste. Located deep underground, the Yucca Mountain site in Nevada was intended for permanent storage of spent nuclear fuel from power plants and high-level radioactive waste from Pentagon facilities, and attracted intense opposition from some environmentalists and safety watchdogs. The administration's move frees up the Energy Department to explore more-popular alternatives to radioactive waste management. But since an affordable and effective option doesn't yet exist, the prognosis is grim. The decision will also prolong the need for interim storage of spent fuel on-site at nuclear plants -- a practice which helped intensify the recent nuclear crisis in Japan. By failing to take custody of the waste by 1998, as required by law, such on-site storage has cost the government more than $15.4 billion. Currently, about 65,000 metric tons of commercial spent nuclear fuel are stored at 75 sites in 33 states, and the amount is increasing by about 2,000 metric tons a year, GAO said. Here is the Nuclear Energy Institute's map of nuclear waste storage sites in 2009. Meanwhile, Rep. Darryl Issa (R-Calif.), frustrated with the lack of response to his request for documents about the project, is threatening the Nuclear Regulatory Commission with a subpoena. In the May 6 letter, Issa calls the delay "unacceptable." The agency has refused to make public whether it will allow the Energy Department to withdraw its license application for the repository, reports the Bureau of National Affairs.

### The link turns the affirmative— environmental lobbies hate the plan— The have the ability to influence policies like the plan

American Society of Mechanical Engineers 2011 [“Congress Needs to Wake Up to Nuclear Waste Disposal, Part 1”, 5/2/11, http://www.american-society-of-mechanical-engineers.bestsellers3dledtv.com/congress-needs-to-wake-up-to-nuclear-waste-disposal-part-1/]

The endless merry-go-round of choosing upon a final resting place for nuclear waste has been studied for more than two decades, has cost taxpayers more than billion and has assuredly been solved. Unless of course, you are talking about an ideal explication which is required to be as satisfactory for up to one million years from now as it might be some 10,000 years into the future. That appears to be the most modern verdict – let’s keep nuclear waste in temporary storehouse scattered over geologically challenged locations, some near major cities, for decades to come, because a minority of environmentalists are “uncomfortable” with a well-studied, scientifically satisfactory centralized disposal site in a remote location. Instead of spirited forward with a site, which will reportedly store the waste safely for 10,000 years (and probably up to 80,000 years), the environmental lobby would prefer a toxic risk for tens of millions of Americans from ‘overcrowded’ temporary storehouse sites. They would like to stall matters until scientists can prove a centralized storehouse site can survive all potential abuse for up to one million years.

## Obama Good

### Politicians like the plan – prevents nuclear waste in their jurisdiction, committee proves

Hartford Business 6/1/11 (“Nuclear waste disposal heads to Congress” [http://www.hartfordbusiness.com/article.php?RF\_ITEM[]=Article$0@18765;Article](http://www.hartfordbusiness.com/article.php?RF_ITEM%5b%5d=Article$0@18765;Article)) MFR

The issue that has left states such as Connecticut with large quantities of nuclear waste is heading to Congress on Wednesday, The Associated Press reports. A Michigan public service regulator is scheduled to testify before Congress during a hearing on the federal government's decision not to build a high-level nuclear waste repository at Nevada's Yucca Mountain. Michigan Public Service Commissioner Greg White is to speak Wednesday on behalf of the National Association of Regulatory Utility Commissioners and the Michigan agency. He'll be discussing the U.S. Department of Energy's role in managing civilian radioactive waste. The hearing will take place before a House subcommittee on the environment and economy. Because of the decision to close Yucca Mountain, nuclear plants must store their spent fuel at temporary sites on their property. Connecticut has two such sites: in Haddam, former location of Connecticut Yankee, and in Waterford, where Millstone Power Station operates. A presidential commission was created last year after the longstanding plan to bury nuclear waste at Yucca Mountain was canceled. The commission is looking for safe ways to dispose of the nation's nuclear waste**.**

### Plan popular – quells not in my backyard backlash over nuclear waste

Kare 90 (Jordin T., PhD Astrophysics “GROUND-TO-ORBITLASER PROPULSION ADVANCEDAPPLICATIONS” www.osti.gov/bridge/servlets/purl/6203669-Uxrfwv/6203669.pdf) MFR

Kantrowitz [9] has suggested using a laser propulsion system to dispose of high-level radioactive waste in space. The problem of finding an environmentally acceptable waste disposal site has consumed billions of dollars and met with enormous political complications of the 'NIMBY' (Not In MY Back Yard) variety. Disposal of waste in space has been studied fairly extensively [10], but conventional launchers (in addition to being very expensive) always present the spectre of a catastrophic accident releasing the radioactive payload inf\_othe environment. No amount of engineering design can eliminate that risk, and no reasonable test program using conventional lau,ichers can demonstrate safety. The problem is compounded by the need to launch, at the very least, to the Moon.

### The budget is irrelevant – Fukishima means both sides of the political spectrum wouldn’t mind spending billions for a waste depository, the plan is popular.

Berkley 4/12/11 (D-Nev. (Shelly, U.S representative of Nevada, “Solving the problem of nuclear waste” http://thehill.com/blogs/congress-blog/energy-a-environment/155437-solving-the-problem-of-nuclear-waste) MFR

At a time when our nation is making tough choices about spending, I am amazed that Congressman John Shimkus (R-Ill.) and other House Republicans are demanding we dump $100 billion into Yucca Mountain. This shuttered boondoggle, located 90 minutes from Las Vegas, is nothing more than an empty hole in the Nevada desert. While some are seeking to use the tragic events in Japan to once again push for moving nuclear waste to Nevada, they fail to mention that Yucca Mountain is located smack in the middle of an earthquake zone. This threat should disqualify the site, especially when combined with the fact that Southwestern water resources will be polluted with radiation as waste canisters at Yucca Mountain disintegrate over time. Americans all across the country would also be threatened by the dangers of transporting nuclear waste to the Yucca dump. This action would leave us one accident away from a disaster that could cause catastrophic damage and leave major population centers uninhabitable. And we would run this risk as part of an effort that does nothing to eliminate spent fuel rods from cooling ponds at America’s operating nuclear plants. The Department of Energy says it would take at least four decades to move spent fuel located at more than 100 sites nationwide to Yucca Mountain. And during that time, those nuclear reactors would not stop churning out nuclear waste. At the end of 40 years, there would be more waste in cooling ponds than there is today. While the Yucca dump is unworkable and unsafe, there remains an affordable, practical solution for securing waste stockpiles now. The Nuclear Regulatory Commission (NRC) has certified that spent nuclear fuel can be isolated safely in dry-cask storage for the next 100 years. This proven technology represents the fastest and safest means of solving the problem of nuclear waste in cooling ponds. The cost of such a move would be a fraction of Yucca Mountain’s price and would help avoid shipping waste through thousands of American towns, only to be stored in an earthquake zone. I invite Members of Congress interested in the safety of nuclear waste to join me in pushing for the immediate use of dry-cask storage. Such a move will help address the need to secure waste now and will provide our nation with an opportunity to find a true alternative to burying nuclear garbage 90 minutes from Las Vegas where it will remain dangerous for the next one million years.

### Congress hates waste – safe disposal measures key, plan is popular

Las Vegas Sun 7/17/11 (“Congress pursues a dangerous path in trying to revive Yucca Mountain” <http://www.lasvegassun.com/news/2011/jul/17/congress-pursues-dangerous-path-trying-revive-yucc/>) MFR

Republican leaders in the House of Representatives pushed through a bill Friday that would provide $45 million to move ahead with the plan to turn Nevada into a dump for the nation’s high-level nuclear waste. The issue has become an obsession for the nuclear industry’s supporters in Congress, who have been angered by President Barack Obama’s correct assessment that the plan is unworkable. Obama stopped work on the project, and a blue-ribbon commission is exploring other options for the nation’s nuclear waste. But that hasn’t stopped the industry’s supporters in Congress. The energy and water appropriations bill that passed Friday would mandate that the Nuclear Regulatory Commission restart its review of the George W. Bush administration’s application to build the dump at Yucca Mountain, 90 miles northwest of Las Vegas. Thankfully, the bill has little chance of moving beyond the House. Nevada’s members of Congress, led by Senate Majority Leader Harry Reid, have diligently worked together for years to try to end a project that has been marked by flawed science and poor plans, and they have successfully cut millions of dollars proposed for Yucca Mountain. For that matter, the effort has been so successful that the project is on the verge of its demise. An outspoken opponent of Yucca Mountain, Rep. Shelley Berkley, D-Nev., voted against the bill Friday, and she was joined by freshman Rep. Joe Heck, R-Nev. It was good to see Heck vote against the bill because his views on nuclear waste haven’t always been clear or consistent. For example, he says geological disposal of nuclear waste, as is proposed at Yucca Mountain, is an old 20th-century technology, but he doesn’t seem to be unalterably opposed to bringing nuclear waste here, as evidenced by his statements last year during the campaign that the NRC’s review should “go to completion.” Furthermore, Heck has proposed making Yucca Mountain a center for research and development of recycling nuclear waste. On Wednesday, Heck introduced an amendment to the bill that would have diverted, but not cut, much of the money for Yucca Mountain and put it into research and development of nuclear waste. His amendment failed. As Karoun Demirjian reported Friday on the Las Vegas Sun’s website, Heck objected to the spending bill because it would cut funding for renewable energy projects that could be built in Nevada and because it “continues funding a project that is unpopular and has long been considered dead, Yucca Mountain, despite other feasible options.” That’s good to hear given his previous statements and actions. As we have pointed out, the plan for Yucca Mountain is dangerous and incredibly expensive, with an estimated cost of $100 billion. It would require years of transporting high-level waste across the country, past most of the nation’s population. Federal officials would then shove it in Yucca Mountain — a porous, volcanic ridge that lies in an area prone to earthquakes. The clear answer is that the waste should be kept where it is now — at nuclear reactor sites. It can be kept safely, and more cheaply, for decades in concrete-and-steel containers called dry casks. In the meantime, scientists can find safe ways to dispose of it. Nevadans have said time and again they don’t want nuclear waste and they don’t want the federal government tying to shove it down their throats. Congress should be done with this project once and for all.

### NIMBY outweighs all other concerns—Congress just wants the waste gone.

New York Times 9 [John J. Fialka is a staff writer for the NYT, “The Screw Nevada Bill and How it Stymied U.S. Nuclear Policy”, 5/11/9, http://large.stanford.edu/publications/coal/references/fialka/]

In the House-Senate conference committee meeting that picked Yucca, Johnston, a conservative Democrat, said he wanted DOE to select the finalist. But the matter was settled by two of the most powerful Democrats then in Congress: Jim Wright Jr. (D-Texas), the speaker of the House, and Tom Foley (D-Wash.), the House majority leader. They vehemently wanted it out of their states. "The politics of the situation was that they had the power," recalled Johnston, who is currently a Washington lobbyist. "Unfortunately, some people still give me credit for the 'screw Nevada bill.'" In the face of the dogged opposition of Sen. Reid and the Obama administration's interest in looking for alternatives to Yucca, this process could begin again. In December, DOE issued a report predicting that there will be 34 new nuclear reactors seeking licensing approval by 2010. It suggests that Congress either increase the legal capacity for waste storage in Yucca Mountain or renew the hunt for a second site. The report notes that new research shows that "all states in the contiguous United States have a potential area that could be considered for the second repository."

### NIMBY even comes before party lines—Obama proves

New York Times 9 [John J. Fialka is a staff writer for the NYT, “The Screw Nevada Bill and How it Stymied U.S. Nuclear Policy”, 5/11/9, http://large.stanford.edu/publications/coal/references/fialka/]

It may seem odd that a president who says the nation needs nuclear power pulls back from this project and that a Democrat-led Congress whose leaders want to mobilize against global warming bleeds Yucca Mountain's budget to the point of immobility. But Stewart thinks that much of this can be explained by the peculiar politics here. It doesn't follow party lines or liberal-conservative lines. The politics that governs the nation's nuclear waste repository is determined by state lines. As Stewart recently explained at a Washington symposium, the politics begins with what he calls "a deep and abiding sense of grievance on the part of Nevada" over the 1987 law. Technically, it was an amendment to the Nuclear Waste Policy Act that made Yucca Mountain the nation's only repository for nuclear waste. Some in Congress and many people in Nevada call it the "screw Nevada bill."

## Reid Link Turn

### Reid likes plan – means he doesn’t have to deal with Yucca possibility

Politico 10 “Murray move at odds with Reid over nuclear waste disposal” 6/21 http://www.politico.com/blogs/glennthrush/0710/Murray\_move\_at\_odds\_with\_Reid\_over\_nuclear\_waste\_disposal.html) MFR

Sen. Patty Murray's move to protect her home state is placing her at odds with Senate Majority Leader Harry Reid over the toxic issue of nuclear waste disposal. Murray says she will introduce a bill to continue the licensing process for a nuclear waste site at Yucca Mountain, Nev. — the same site Reid has vowed to keep closed in his home state. Both Murray and Reid have significant electoral stakes in the issue, as the Yucca Mountain site was slated to handle nuclear waste from the Hanford reservation in Eastern Washington, and a win for either senator on this issue would play well at home. The majority leader has made closing the Yucca project a flash point in his reelection campaign and even dedicates an entire page to the issue on his official Senate website. "With the election of President Barack Obama, the fate of the Yucca Mountain project has never been clearer. The president and his administration are following through on his promise to end Yucca Mountain," Reid writes. "Keeping his promise to Sen. Reid and all Nevadans, President Obama completely eliminated funding for the proposed Yucca Mountain project in the White House’s Fiscal Year 2011 budget request."

# AT: Counterplans

## AT: Borehole CP

### No Solvency: technical problems.

Von Hippel and Hayes 10 — David von Hippel, Nautilus Institute Senior Associate based in Eugene, Oregon, and Peter Hayes, Executive Director of the Nautilus Institute for Security and Sustainable Development, 10 [“Deep Borehole Disposal of Nuclear Spent Fuel and High Level Waste as a Focus of Regional East Asia Nuclear Nautilus Institute Fuel Cycle Cooperation”, Nautilus Institute, December 8th, pdf]

Despite the significant amount of research the deep borehole nuclear materials disposal concept has received to date (though probably several orders of magnitude less, in monetary terms, than has been spent on mined repository research and development) key uncertainties and barriers to DBD implementation remain in a number of areas. Technological uncertainties, legal uncertainties, and perhaps most significantly, political and institutional barriers must be overcome before deep borehole disposal of nuclear materials can come to fruition, particularly at a regional scale. These uncertainties and barriers are discussed briefly below. In most cases, however, we are focusing on identifying these issues as topics for further collaborative study with colleagues within and outside of East Asia. Technological uncertainties associated with DBD include (but are hardly limited to) issues such as:  The extent to which existing drilling technologies are applicable to DBD. Most experience with drilling deep boreholes is in the oil and gas and mining industries, and most of that experience does not involve boreholes of sufficient diameter to be broadly useful for DBD of nuclear materials.  Better understanding is needed of technical issues such as borehole stability under increased heat and radiation loadings, and under the extreme pressures encountered in deep boreholes. For example, will the walls of boreholes at great depth remain as drilled? Ferguson48 notes that the ―[d]iameter of hole and depth are key parameters. Stress/strain impacts on [the] surrounding geosphere will be more critical than in previous drilling. Some evidence suggests that changes in the dimensions of boreholes over time at depths of 4-5 km may be significant enough to affect the emplacement of canisters. How to monitor boreholes. What types of monitoring systems will be needed (if any?) in order to ensure that borehole disposal performs as expected? What types of technologies can be deployed to assure that monitoring can be carried out over the long term?  Research is needed to better understand the movement of groundwater at very great depths, and the impacts that boreholes themselves can have on groundwater movement at the disposal depths What happens if packages are stuck on the way down  The degree to which progress in drilling technologies can meet the needs of DBD implementation in a timely manner is a key uncertainty. Progress in drilling technologies for continues, but the impact of that progress on the types of boreholes needed for DBD of nuclear materials is hard to estimate. What impact will progress in drilling technologies have on the costs of deep borehole disposal?  The need to line boreholes with metal or other casings. It is unclear what fraction of a borehole accommodating nuclear materials must be lined or should be lined. For boreholes not lined, systems will be needed for recovering casings, as well as for obliterating the upper portions of boreholes when holes are completed. How will sealing systems work (and what sealing systems should be used) over the great distances involved in DBD of nuclear materials? Research on the hydrology at depth and the dimensional stability or large- diameter, deep boreholes, along with convergence on the types of nuclear wastes to be emplaced, will help to identify the needs to line disposal boreholes.  Technologies for shaft disposal (lowering canisters into place), handling of packages at depth, recovering from borehole jams49.

## AT: Sprinklers CP

### It actually makes things net worse in case of an accident

Alvarez et al. 3 (\*Robert, a Senior Scholar at IPS, where he is currently focused on nuclear disarmament, environmental, and energy policies, served as a Senior Policy Advisor to the Secretary and Deputy Assistant Secretary for National Security and the Environment. \*Jan Beyea, PhD, earth science and environmental studies \*Klaus Janberg, \*Jungmin Kang, \*Ed Lyman, \*Allison Macfarlane, \*Gordon Thompson, \*Frank N. von Hippel, PhD Princeton University. “Reducing the Hazards from Stored Spent Power-Reactor Fuel in the United States” Science and Global Security, 11:1–51, 2003 www.irss-usa.org/pages/documents/11\_1Alvarez.pdf) MFR

Another circumstance in which the spray could aggravate the situation would be if the spent-fuel racks were crushed or covered with debris, blocking the ﬂow of air. In such a case, steam generated from water dripping into the superheated fuel could react with the zirconium instead. The circumstances under which sprays should be used would require detailed scenario analysis.

## AT: Reprocessing CP

### Reprocessing fails – doesn’t extract all radioactive material, decrease the size of the waste, and still means extra plutonium is stored in interim facilities, it also can’t solve nuclear terrorism

UCS 9 (Union of Concerned Scientists. “Ensuring the Safe Disposal of Nuclear Waste” <http://www.ucsusa.org/assets/documents/nuclear_power/NPWWch5.pdf> Nuclear Power in a Warming World) MFR

Some argue that reprocessing spent fuel will reduce the volume of high-level waste needing disposal in a geologic repository. Because spent fuel from light-water reactors is mainly uranium, these proponents of reprocessing maintain that removing it would result in a smaller quantity of waste. However, it is the level of heat generated by the waste—not the volume—that determines how much waste a repository can store. If the waste is packed too densely in the tunnels, and the heat output is high enough that the temperature exceeds the boiling point of water, permanent changes could occur in the chemical, mechanical, and hydrological properties of the surrounding rock. Such changes could compromise the ability of the repository to isolate the waste from the environment over the required time period. As Chapter 4 noted, some countries have used the PUREX method to reprocess spent fuel over the past several decades (or contracted with other countries to do so). This process separates both plutonium and uranium from spent reactor fuel, and then from each other. The transuranic elements plutonium, americium and curium are the main sources of heat in spent fuel after a few hundred years; americium and curium remain in the waste stream and would require disposal in a permanent repository. Thus, the PUREX process does not significantly reduce the heat output, or the size of the required repository. 103 Countries that reprocess spent fuel stockpile the plutonium in interim storage facilities. Some of these countries, including Great Britain, have no plans for this material. Other countries have used some of the plutonium as MOX fuel in reactors, or plan to do so. However, separating the plutonium for potential use does not eliminate its hazards—it greatly aggravates them, as the stockpiles are much morevulnerable to release from an accident or a terrorist attack than if they were immobilized in a stable matrix such as glass and placed in a permanent repository. Transporting, processing, and irradiating the plutonium also increase the risk that it will be released into the environment. If the plutonium is used in MOX fuel, the spent MOX fuel contains more long-lived transuranics than spent uranium fuel. No country has reprocessed the plutonium in spent MOX fuel and then reused it, because the costs and safety risks rise with each reprocessing cycle. In fact, although France has a policy of reusing the plutonium in spent MOX fuel, it has not done so, and ultimately may not (see Box 5, p. 50). Thus, spent MOX fuel must also be placed in a permanent geologic repository, further diminishing the benefits of the repository. Moreover, while spent fuel consists mostly of uranium with roughly the same composition as natural uranium, separated uranium is contaminated with other uranium isotopes that are more radioactive, and with trace quantities of transuranic isotopes. This contaminated uranium can cause difficulties for enrichment plants and reactors. Thus France and other countries that reprocess spent fuel have not used the separated uranium as new fuel, but have instead stockpiled it. This uranium is not high-level waste, but it is difficult to classify in the U.S. system, so the method for disposing of it is uncertain. It would most likely require disposal in a geologic repository similar to the Waste Isolation Pilot Plant (WIPP) in New Mexico. (WIPP itself can accept only transuranic waste from military activities, and could not accept such uranium—see Box 6, p. 52)

### Can’t solve proliferation or nuclear terrorism

Kokkinidou 11 (Aggeliki, Staffwriter for Brighthub, “Is Nuclear Waste Recycling Possible?” 2/23 <http://www.brighthub.com/environment/renewable-energy/articles/107743.aspx>) MFR

Arguments against Nuclear Recycling The recycling of nuclear waste could provide a long-term solution for the energy problem; however there are those who believe waste reprocessing to be a problem itself: Nuclear terrorism is a major risk. Separated plutonium, along with other elements such as neptunium, is less radioactive and therefore dangerous, and thus may be an easy target for thieves or terrorists. These elements are used for building nuclear weapons. Only a small quantity of plutonium (~20 pounds) would be enough to build a nuclear weapon. One claim is that reprocessing contributes to nuclear proliferation, a strategy that would increase the use and process of weapon usable-materials. This is compounded by the difficulty involved in controlling and keeping track of the quantities used as fuel and the quantities reprocessed and disposed of. The recycling process does not eliminate the need for storage and disposal facilities since reprocessing itself produces further waste such as low-level contaminated uranium. This could require the building of new reprocessing facilities to recycle the low-level waste. The cost of nuclear waste reprocessing is too high. Recycling and using plutonium for reactor fuel is far more expensive than using the original uranium fuel and then disposing it. Furthermore, the operation of fast reactors that burn up plutonium is more expensive compared to conventional reactors. These reactors run a greater risk of failure or damage, and they are less reliable.

### Reprocessing links to spending

Healutah No Date Cited (Healthy Environment Alliance of Utah “REPROCESSING: THE MYTHICAL SILVER BULLET” http://healutah.org/nuclearutah/waste/reprocessing) MFR

In theory, the extracted uranium, which comprises 95% of the volume of the spent fuel rods, could be refabricated into nuclear fuel rods. However, in practice, no significant amount of this reprocessed uranium is reused in countries that currently reprocess, including France and Britain. This is because the extracted uranium is contaminated with highly radioactive and hazardous fission products. The process of turning this contaminated uranium into nuclear fuel rods is prohibitively dangerous for workers and would be **extremely expensive**. The result is that most of the radioactive materials from spent fuel rods are not reused, and must still go into a deep geologic repository. The United States' only foray into reprocessing commercial nuclear waste was an environmental and economic disaster. Between 1966 and 1972, the West Valley reprocessing facility, located in New York State, reprocessed only one-sixth of the spent fuel slated for processing while creating radioactive waste that is threatening evenutal leakage into Lake Erie. Thirty-three years after the facility's close, taxpayers are still footing the $5.2 billion remediation tab. 1

### Links to spending – reprocessing is super expensive

UCS 11 (Union of Concerned Scientists, “Nuclear Reprocessing: Dangerous, Dirty, and Expensive” 4/5 http://www.ucsusa.org/nuclear\_power/nuclear\_power\_risk/nuclear\_proliferation\_and\_terrorism/nuclear-reprocessing.html) MFR

Reprocessing would be very expensive.

Reprocessing and the use of plutonium as reactor fuel are also far more expensive than using uranium fuel and disposing of the spent fuel directly. In the United States, some 60,000 tons of nuclear waste have already been produced, and existing reactors add some 2,000 metric tons of spent fuel annually. The Energy Department recently released an industry estimate that a reprocessing plant with an annual capacity of 2,000 metric tons of spent fuel would cost up to $20 billion to build—and the U.S. would need two of these to reprocess all its spent fuel. An Argonne National Laboratory scientist recently estimated that the cost premium for reprocessing spent fuel would range from 0.4 to 0.6 cents per kilowatt-hour—corresponding to an extra $3 to $4.5 billion per year for the current U.S. nuclear reactor fleet. The American public would end up having to pay this charge, either through increased taxes or higher electricity bills.

### It also causes proliferation – all your empirics arguments aren’t true, reprocessing is faulty around the world and it links to spending

Healutah No Date Cited (Healthy Environment Alliance of Utah “REPROCESSING: THE MYTHICAL SILVER BULLET” http://healutah.org/nuclearutah/waste/reprocessing) MFR

Current reprocessing technology involves the separation of uranium, plutonium, and other fission products (i.e. shorter-lived, but extremely radioactive elements) to make new fuel for reactors. This process, which was initially created to help the United States produce plutonium for the nuclear bomb, is currently used by France, Britain, Russia, India and Japan. Wherever it has been used, it has been an unequivocal environmental disaster. Three of the most contaminated sites in the western hemisphere: Hanford, Washington, Idaho National Laboratory and the Savannah River Site, were home to reprocessing facilities and will be forever contaminated. It is also an economic boondoggle. The only attempt to commercialize reprocessing was conducted in West Valley, New York and after 6 years of technical failures, the site was scrapped leaving taxpayers with a multi-billion dollar bill. Furthermore, reprocessing creates stockpiles of weapons usable plutonium that can be easily converted to make bombs**.** There is enough plutonium sitting around the world today to make over 30,000 bombs! These grim facts are not enough to sway the likes of this administration and EnergySolutions. They argue GNEP will reduce the amount of waste created AND that they can develop a “proliferation-resistant” reprocessing technology. They fail to mention, of course, that the “new” reprocessing technology is not new and is yet unproven.1 Not only that, GNEP will also rely up the existence of so-called “fast reactors” to burn plutonium and other long-lived waste products from irradiated fuel rods. Unfortunately, despite the $100 billion that has been spent in developing “burner” reactors on a global scale, no country has yet invented a commercially viable model.2

### The likelihood of terrorist threat as a result of reprocessing technology is high—lost stashes of plutonium have already been found

Healutah No Date Cited (Healthy Environment Alliance of Utah “REPROCESSING: THE MYTHICAL SILVER BULLET” http://healutah.org/nuclearutah/waste/reprocessing) MFR

A particularly controversial aspect of nuclear fuel reprocessing is that one byproduct of the process is the creation of separated plutonium, which increases the risks of nuclear proliferation. There is enough plutonium sitting around the world today to make over 30,000 bombs. Adding credence to the concern that these materials could get into the hands of terrorist groups is the fact that a 2003 report found enough plutonium to make five nuclear bombs had gone missing from the Sellafield plant. In fact, auditors have regularly found plutonium missing from the plant, with 24.9kg missing in 1999, 5.6kg in 2001, and 19.1kg 2003, none of which has been accounted for.1 It only takes about 6kg to make a nuclear bomb

### It seriously links to spending – costs billions of dollars

Healutah No Date Cited (Healthy Environment Alliance of Utah “REPROCESSING: THE MYTHICAL SILVER BULLET” http://healutah.org/nuclearutah/waste/reprocessing) MFR

Even critics and advocates can agree that reprocessing, simply put, is prohibitively expensive. In order for reprocessing to be economically feasible, the price of uranium would have to increase from its current price of $32-$70/kg to $400/kg.1 If the U.S. were to require all nuclear power plants on-line today to reprocess spent fuel, roughly $2 billion each year would be added to the cost of nuclear-generated electricity – costs that would be passed on either to ratepayers or taxpayers.2 Reprocessing the United States' waste is estimated to cost over $100 billion. The Department of Energy has requested $405 million this year to begin a reprocessing program called GNEP.

### Reprocessing doesn’t solve nuclear leadership – other countries perceive it as part of GNEP impositions

Fairley 7 (PETER, Staffwriter for free spectrum “Nuclear Wasteland” http://spectrum.ieee.org/energy/nuclear/nuclear-wasteland/5) MFR

France and Japan suddenly look less isolated in their reprocessing strategy, thanks to U.S. President George W. Bush. Early last year, Bush singled out France’s nuclear program for a rare bit of cross-Atlantic praise, telling the American people in a Saturday radio chat that reprocessing will ”allow us to produce more energy, while dramatically reducing the amount of nuclear waste.” Surprisingly, Bush has endorsed reprocessing as not only a means of handling domestic nuclear waste but as a bold response to proliferation as well. Turning a conventional argument on its head, Bush is saying that the risk of additional countries’ using reprocessing to arm nuclear weapons can be lower, not greater, if the United States reprocesses. Under his proposed Global Nuclear Energy Partnership (GNEP), nations with ”secure, advanced nuclear capabilities” would guarantee a steady supply of nuclear fuel to non-nuclear-weapons countries that agree to return the resulting spent fuel and the plutonium within for reprocessing, forgoing reprocessing plants of their own. But many proliferation experts worry that Bush’s plan could backfire. It’s not clear that many countries will agree to forgo reprocessing, letting others do the work for them, while they themselves agree to take back the noxious wastes. If participation in GNEP is disappointing, the program could end up encouraging rather than impeding the spread of reprocessing technology--Areva, for one, is plainly interested in licensing its technology.

### Congress is skeptical of the counterplan – empirics and budget

Lyman and von Hippel 8 (\*Edwin, a senior staff scientist at the Union of Concerned Scientists’ Global Security Program. \*Frank N. a professor of public and international affairs at Princeton University’s Program on Science and Global Security. “Reprocessing Revisited:The International Dimensions of the Global Nuclear Energy Partnership” <http://www.armscontrol.org/print/2779>) MFR

In 2007, Congress became alarmed about the Energy Department’s proposal to commit quickly tens of billions of dollars to the construction of a huge reprocessing plant in the United States. The House Appropriations energy and water development subcommittee was particularly concerned and stated bluntly in the report on its proposed fiscal year 2008 energy and water appropriations bill that the “aggressive program proposed by the Department is at best premature” and that “before the Department can expect the Committee to support funding for a major new initiative, the Department must provide a complete and credible estimate of the life-cycle costs of the program.”[28] A few months later, a review of the Energy Department’s nuclear energy research and development program by the National Academy of Sciences’ National Research Council came to a similar conclusion when it reported that “[a]ll committee members agree that the GNEP program should not go forward and should be replaced by a less aggressive research program.”[29] Finally, in the House-Senate conference report that accompanied the consolidated appropriations act for fiscal year 2008, Congress instructed the Energy Department that “no funds are provided for facility construction for technology demonstration or commercialization.”[30] Accordingly, in its fiscal year 2009 budget request, submitted in February 2008, the Bush administration postponed plans to select sites for construction of a commercial-scale reprocessing plant and a fast-neutron reactor and only sought funds for research and development. It still proposes, however, to build a smaller facility at a national lab site to develop reprocessing techniques on a pilot-plant scale.[31] The decision on whether to push forward beyond the research and development stage will be left to the next administration and Congress.

### Pyro-processing is reprocessing – no difference

Horner 11 (Daniel, writer for the arms control association “Pyroprocessing Is Reprocessing: U.S. Official” <http://www.armscontrol.org/act/2011_04/Pyroprocessing>) MFR

In what appears to be the U.S. government’s strongest public statement to date on the issue, a Department of State official said last month that the U.S. government now views pyroprocessing, a spent fuel treatment process that South Korea is developing, as a form of reprocessing with proliferation risks similar to those of other forms. In March 29 remarks at a nuclear policy conference in Washington, Richard Stratford, the State Department official who is responsible for U.S. nuclear cooperation agreements, said the Department of Energy “states frankly and positively that pyroprocessing is reprocessing. Period. Full stop.” The Energy Department, which is the U.S. government’s main source of technical expertise on nuclear issues, “did not say that five years ago when we started down the road of cooperation on pyroprocessing,” Stratford said. “Then the product was not weapons usable.” However, he said, electroreduction and electrorefining, the key elements of pyroprocessing, have “moved to the point that the product is dangerous from a proliferation point of view. So, for that reason, pyroprocessing is reprocessing, and that’s part of the problem.” Previous public statements on pyroprocessing by the Bush and Obama administrations had indicated proliferation concerns about the technology, but had not been as unequivocal as Stratford’s. (See ACT, July/August 2009.) Pyroprocessing differs from PUREX (plutonium-uranium extraction) reprocessing, which has been used in nuclear energy and weapons programs around the world, because the plutonium separated from spent fuel by pyroprocessing remains mixed with other elements. South Korean officials have argued that this difference makes pyroprocessing more proliferation resistant than traditional reprocessing. The current U.S.-South Korean nuclear cooperation agreement, which is due to expire in 2014, gives the United States a strong say in South Korean reprocessing of U.S.-origin fuel. As part of the negotiations on the successor to that pact, South Korea is hoping to gain a freer hand in activities such as pyroprocessing. The two countries have agreed to sign a memorandum of understanding to conduct a 10-year joint feasibility study on pyroprocessing and other options for handling spent fuel. The study is to be conducted in parallel with negotiations on other aspects of nuclear cooperation.