### CP

The cp solves the entire case – it’s still a fast reactor which is the only reason IFRs solve prolif – using a different coolant doesn’t change the fuel input

American Nuclear Society 2005 (Fast Reactor Technology: A Path to Long-Term Energy Sustainability, November 2005, [www.world-nuclear.org/reference/pdf/ans\_fast\_reactors.pdf](http://www.world-nuclear.org/reference/pdf/ans_fast_reactors.pdf)

The American Nuclear Society believes that the development and deployment of advanced nuclear reactors based on fast-neutron fission technology is important to the sustainability, reliability and security of the world’s long-term energy supply. Of known, proven, energy technologies, only nuclear fission can provide the large quantities of energy required by industrial societies in a sustainable and environmentally acceptable manner. Natural uranium mined from the earth's crust is composed primarily of two isotopes: 99.3% is U- 238, and 0.7% is the fissile U-235. Nearly all current power reactors are of the “thermal neutron” design and their capability to extract the potential energy in the uranium fuel is limited to less than 1% of that available. The remainder of the potential energy is left unused in the spent fuel and in the uranium, depleted in U-235, that remains from the process of enriching the natural uranium in the isotope U-235 for use in thermal reactors. With known fast reactor technology, this un-utilized energy can be harvested, thereby extending by a hundred-fold the amount of energy extracted from the same amount of mined uranium. Fast reactors can convert U-238 into fissile material at rates faster than it is consumed making it economically feasible to utilize ores with very low uranium concentrations and potentially even uranium found in the oceans1,2,3. A suitable technology has already been proven on a small scale4. Used fuel from thermal reactors and the depleted uranium from the enrichment process can be utilized in fast reactors and that energy alone would be sufficient to supply the nation’s needs for several hundred years. Fast reactors in conjunction with fuel recycling can diminish the cost and duration of storing and managing reactor waste with an offsetting increase in the fuel cycle cost due to reprocessing and fuel refabrication. Virtually all long-lived heavy elements are eliminated during fast reactor operation, leaving a small amount of fission product waste which requires assured isolation from the environment for less than 500 years.4 Although fast reactors do not eliminate the need for international proliferation safeguards, they make the task easier by segregating and consuming the plutonium as it is created. The use of onsite reprocessing makes illicit diversion from within the process highly impractical. The combination of fast reactors and reprocessing is a promising option for reasons of safety, resource utilization, and proliferation resistance.5

The IFR vs. Lead-fueled reactor distinction was in the 2nc

Meltdowns = extinction, ionizing radiation destroys bones and body of all life on earth – no impact defense on the impact level so it’s try-or-die for the CP

Conceded t/ case arg – ONE severe accident destroys the nuclear industry

Also conc that CP has a lower boiling point so no risk of accidents – no allow new 1ar args

Also, their ev that a demonstration project has to be successful proves that the aff doesn’t solve by including sodium coolant – ONLY the cp has a chance of being a successful demo – independent reason to vote neg on presumption

#### Sodium-cooled reactors aren’t reliable -- empirics prove there will be massive technical difficulties and get shut down quickly.

von Hippel, ‘10

[Frank, Professor and Co-Director, Program on Science and Global Security, [Princeton University](http://en.wikipedia.org/wiki/Princeton_University), [Woodrow Wilson School of Public and International Affairs](http://en.wikipedia.org/wiki/Woodrow_Wilson_School_of_Public_and_International_Affairs), February, “Fast Breeder Reactor Programs: History and Status,” Research Report 8, International Panel on Fissile Materials, Section 1 -- Overview: The Rise and Fall of Plutonium Breeder Reactors, <http://fissilematerials.org/library/rr08.pdf>]

Sodium-cooled reactors have severe reliability problems. The reliability of light-water reactors has increased to the point where, on average, they operate at about 80 percent of their generating capacity. By contrast, a large fraction of sodium-cooled demonstration reactors have been shut down most of the time that they should have been generating electric power. A significant part of the problem has been the difficulty of maintaining and repairing the reactor hardware that is immersed in sodium. The requirement to keep air from coming into contact with sodium makes refueling and repairs inside the reactor vessel more complicated and lengthy than for water-cooled reactors. During repairs, the fuel has to be removed, the sodium drained and the entire system flushed carefully to remove residual sodium without causing an explosion. Such preparations can take months or years. In contrast, when a water-cooled reactor is shut down, the top of the pressure vessel can be removed and the reactor cavity that holds the pressure vessel can be flooded with water to provide shielding against the radioactivity of the fuel and the irradiated steel. Repairs can take place guided by underwater periscopes and video cameras.

#### Sodium-cooled reactors can’t stand up to critical stresses -- causes fires and massive radioactive leaks.

von Hippel, ‘10

[Frank, Professor and Co-Director, Program on Science and Global Security, [Princeton University](http://en.wikipedia.org/wiki/Princeton_University), [Woodrow Wilson School of Public and International Affairs](http://en.wikipedia.org/wiki/Woodrow_Wilson_School_of_Public_and_International_Affairs), February, “Fast Breeder Reactor Programs: History and Status,” Research Report 8, International Panel on Fissile Materials, Section 1 -- Overview: The Rise and Fall of Plutonium Breeder Reactors, <http://fissilematerials.org/library/rr08.pdf>]

Sodium’s major disadvantage is that it reacts violently with water and burns if exposed to air. The steam generators, in which molten-sodium and high-pressure water are separated by thin metal, have proved to be one of the most troublesome features of breeder reactors. Any leak results in a reaction that can rupture the tubes and lead to a major sodium-water fire.¶ As the country studies detail, a large fraction of the liquid-sodium-cooled reactors that have been built have been shut down for long periods by sodium fires. Russia’s¶ BN-350 had a huge sodium fire. The follow-on BN-600 reactor was designed with its steam generators in separate bunkers to contain sodium-water fires and with an extra steam generator so a fire-damaged steam generator can be repaired while the reactor continues to operate using the extra steam generator. Between 1980 and 1997, the BN-600 had 27 sodium leaks, 14 of which resulted in sodium fires (see chapter 5).

#### Even if they solve some problems, they create new safety concerns.

Lovins, ‘9

[Amory, cofounder, Chairman, and Chief Scientist -- Rocky Mountain Institute, “"New" Nuclear Reactors, Same Old Story,” <http://www.rmi.org/sitepages/pid601.php>]

IFRs might in principle offer some safety advantages over today's light-water reactors, but create different safety concerns, including the sodium coolant's chemical reactivity and radioactivity. Over the past halfcentury, the world's leading nuclear technologists have built about three dozen sodium-cooled fast reactors, 11 of them Naval. Of the 22 whose histories are mostly reported, over half had sodium leaks, four suffered fuel damage (including two partial meltdowns), several others had serious accidents, most were prematurely closed, and only six succeeded. Admiral Rickover canceled sodium-cooled propulsion for USS Seawolf in 1956 as "expensive to build, complex to operate, susceptible to prolonged shutdown as a result of even minor malfunctions, and difficult and time-consuming to repair." Little has changed. As Dr. Tom Cochran of NRDC notes, fast reactor programs were tried in the US, UK, France, Germany, Italy, Japan, the USSR, and the US and Soviet Navies. All failed. After a half-century and tens of billions of dollars, the world has one operational commercial-sized fast reactor (Russia's BN600) out of 438 commercial power reactors, and it's not fueled with plutonium.

### DA

Da o/w turns case – blank ev says great powers get involved in ctrl asia instability

#### Spreads throughout the region

Assenova 8 (Margarita Assenova, IND Director; Natalie Zajicova, Program Officer (IND); Janusz Bugajski, CSIS NEDP Director; Ilona Teleki, Deputy Director and Fellow (CSIS); Besian Bocka, Program Coordinator and Research Assistant (CSIS), “Kazakhstan’s Strategic Significance,” 2008, CSIS-IND Taskforce Policy Brief team, European Dialogue, <http://eurodialogue.org/Kazakhstan-Strategic-Significance>)

The decision by the Organization for Security and Cooperation in Europe (OSCE) to award Kazakhstan the chairmanship of the organization for 2010 underscores a growing recognition of the country’s regional and continental importance. Kazakhstan is a strategic linchpin in the vast Central Asian-Caspian Basin zone, a region rich in energy resources and a potential gateway for commerce and communications between Europe and Asia. However, it is also an area that faces an assortment of troubling security challenges. Ensuring a stable and secure Central Asia is important for the international interests of the United States and its European allies for several prescient reasons: • Asian Security: Because of its proximity to Russia, China, Iran, and the South Asian sub-continent, Kazakhstan’s security and stability is an increasingly vital interest to all major powers. Kazakhstan’s tenure as chair of the OSCE will become an opportunity for greater multilateral cooperation in achieving this objective while strengthening the role and prestige of the OSCE throughout Central Asia.

#### Nuclear war

Ahrari 1 (M. Ehsan, Professor of National Security and Strategy of the Joint and Combined Warfighting School at the Armed Forces Staff College, August 2001, “Jihadi Groups, Nuclear Pakistan and the New Great Game,” http://www.strategicstudiesinstitute.army.mil/pdffiles/pub112.pdf)

South and Central Asia constitute a part of the world where a well-designed American strategy might well help avoid crises or catastrophe. The U.S. military would provide only one component of such a strategy, and a secondary one at that, but has an important role to play through engagement activities and regional confidence building. Insecurity has led the states of the region to seek weapons of mass destruction, missiles and conventional arms. It has also led them toward policies which undercut the security of their neighbors. If such activities continue, the result could be increased terrorism, humanitarian disasters, continued low-level conflict and potentially even major regional war or a thermonuclear exchange. A shift away from this pattern could allow the states of the region to become solid economic and political partners for the United States, thus representing a gain for all concerned.

#### Central Asia war would trigger WWIII with Russia

F. William Engdhal, Global Research Associate, 10/11/08, “The Caucasus —Washington Risks nuclear war by miscalculation” http://www.globalresearch.ca/index.php?context=va&aid=9790

So far, each step in the Caucasus drama has put the conflict on a yet higher plane of danger. The next step will no longer be just about the Caucasus, or even Europe. In 1914 it was the "Guns of August" that initiated the Great War. This time the Guns of August 2008 could be the detonator of World War III and a nuclear holocaust of unspeakable horror. Nuclear Primacy: the larger strategic danger Most in the West are unaware how dangerous the conflict over two tiny provinces in a remote part of Eurasia has become. What is left out of most all media coverage is the strategic military security context of the Caucasus dispute. Since the end of the Cold War in the beginning of the 1990’s NATO and most directly Washington have systematically pursued what military strategists call Nuclear Primacy. Put simply, if one of two opposing nuclear powers is able to first develop an operational anti-missile defense, even primitive, that can dramatically weaken a potential counter-strike by the opposing side’s nuclear arsenal, the side with missile defense has "won" the nuclear war. As mad as this sounds, it has been explicit Pentagon policy through the last three Presidents from father Bush in 1990, to Clinton and most aggressively, George W. Bush. This is the issue where Russia has drawn a deep line in the sand, understandably so. The forceful US effort to push Georgia as well as Ukraine into NATO would present Russia with the spectre of NATO literally coming to its doorstep, a military threat that is aggressive in the extreme, and untenable for Russian national security. This is what gives the seemingly obscure fight over two provinces the size of Luxemburg the potential to become the 1914 Sarajevo trigger to a new nuclear war by miscalculation. The trigger for such a war is not Georgia’s right to annex South Ossetia and Abkhazia. Rather, it is US insistence on pushing NATO and its missile defense right up to Russia’s door.

#### Solves prolif

**Kassenova 8** [Togzhan, Bulletin of Atomic Scientists, Apr 28, “Kazakhstan's nuclear ambitions”]

Benefits of Kazakhstan's nuclear energy push¶ First and foremost, Kazakhstan responsibly defends nonproliferation and export controls. It is a member of the Nuclear Non-Proliferation Treaty and the Nuclear Suppliers Group. And in addition to its general IAEA membership, Kazakhstan has signed the IAEA Safeguards Protocol and signed and ratified the IAEA's Additional Protocol. Adherence to the Additional Protocol subjects all of Kazakhstan's nuclear facilities to stringent IAEA oversight, including comprehensive declarations, reporting, and site-access obligations. Together with Kyrgyzstan, Tajikistan, Turkmenistan, and Uzbekistan, Kazakhstan established a [nuclear-weapon-free zone in Central Asia](http://cns.miis.edu/pubs/week/pdf_support/060905_canwfz.pdf) PDF in September 2006, which prohibits it from possessing or attempting to possess nuclear weapons and from assisting or encouraging other nations to acquire them. Its enthusiasm for the nuclear-weapon-free zone makes it extremely unlikely Kazakhstan will use its nuclear know-how to pursue nuclear weapons or to help another country develop them.¶ Other reasons to support the country's nuclear plans:¶ As revenue generated by the uranium industry increases, money can be invested back into further improving the physical protection of domestic plants, internal control measures, the safeguarding of radioactive material, and the training of nuclear industry workers in the ethics of nonproliferation. Since the Soviet collapse, significant improvements have been achieved in all aspects of nuclear safety and security at Kazakh nuclear sites and facilities, mostly with the help of U.S.-funded nonproliferation assistance programs. Due to cooperation with the IAEA, the most sensitive facility--the Ulba Metallurgical Plant at Ust-Kamenogorsk--has the highest level of safeguards in Central Asia, which brings it close to Western standards. Although according to analysts, more resources should be channeled into nuclear security culture and nonproliferation education.¶ By participating in the Nuclear Threat Initiative's (NTI) proposed international fuel bank, the IUEC, and the U.S.-sponsored Global Nuclear Energy Partnership (GNEP), **Kazakhstan can contribute to limiting proliferation of full fuel-cycle technologies**. Laura Holgate, NTI's vice president for Russia/newly independent states programs, has suggested that Kazakhstan could become a site for such a bank because of its nuclear infrastructure, strong nonproliferation record, and large Muslim population, making Kazakhstan perhaps a more appealing host from the perspective of non-Western countries.10 Russia's IUEC is complimentary to GNEP, which seeks to expand the use of nuclear energy while **decreasing the risk of proliferation** and addressing the challenge of nuclear waste disposal.

### Link

Charles E. **Boardman** **et al**, General Electric Co. (retired), Carl E. Walter,

Lawrence Livermore National Laboratory (retired), Marion L. Thompson, General Electric Co. (retired)

Chester S. Ehrman, Burns & Roe Co. (retired), February 20**02,** National Center for Public Policy Research, <http://www.project21.org/NPA396.pdf>

It is time for the U.S. to re-evaluate its policy on spent fuel processing as the nuclear genie is already out of the bottle and proliferation risks must be addressed on an international basis. Other nations that are less fortunate with respect to their fossil energy reserves and are more dependent on nuclear power will proceed with processing whether or not the U.S. continues its self imposed “ban.” An in-depth assessment of these complex issues is needed now so that the U.S. can complete the necessary research and development work on a schedule that will allow its introduction when needed for low-cost energy and low-cost waste disposal. It is anticipated that the assessment will confirm that an ALMR/Fuel Recycle System will significantly reduce the demand on the uranium supply and stabilize the price of uranium for future LWRs and that the system will save the U.S. taxpayers billions of dollars in ultimate disposal costs by reducing the size and complexity of the Yucca Mountain repository. The development programs for the ALMR and for the pyro metallurgical processing system should be continued so that commercialization of the integrated ALMR/Fuel Recycle System can begin as close to the original 2010 target date as possible. This will allow the U.S. to take advantage of: (1) the vast energy potential of the fissile material contained in present and future inventories of LWR spent fuel, and (2) the benefits derived by conditioning the waste prior to placing it in an ultimate repository.12

#### Uranium prices will skyrocket because of the US

**Slaughter 12** – editor of Scarcity and Real Wealth

(Nathan, “The World Has to Have this Resource,” <http://www.streetauthority.com/energy-commodities/world-has-have-resource-there-simply-isnt-enough-it-458945>, dml)

Most people have never heard of the "Megatons to Megawatts" program. Put simply, the agreement ships uranium harvested from dismantled Russian nuclear weapons to use as fuel in nuclear reactors in the United States. In 2013, this 20-year nuclear warhead agreement between the United States and Russia will expire.

Here's the kicker: This program accounts for half the U.S.' nuclear fuel and 10% of our total electricity. The amount of electricity produced thanks to this program is more than solar, wind and hydroelectric combined. But when it expires in 2013, there's going to be a massive shortfall of uranium in the United States.

In fact, our power plants need about 40-60 million pounds of uranium annually to operate, but domestic mines spit out just 4 million (about 6-10% of what we need).

Then there's the rest of the world....

It might come as a surprise after all the negative headlines... but nuclear power is still a growth industry, despite the Fukushima disaster in Japan.

Only 10 of the world's 445 reactors have stopped operating since the accident. Meanwhile 60 new ones are under construction... and 370 more are in the planning stage.

The hundreds of new reactors being planned are driving a frantic scramble for uranium inventories. You need 1.5 million pounds of uranium at startup to get a reactor going. And you need 500,000 more pounds to burn every year. Utilities like to hold three to four years of inventories. This adds up to big numbers when you consider that the world digs up only 140 million pounds a year.

If we look out over the next 8-10 years, which is how long it takes a nuclear power plant to become operational, the market is about 400 million pounds short of demand.

In other words, the uranium we're now digging out of the earth covers just 65% of what these reactors will need. The new supply will have to come from somewhere, or the price of the existing supply will skyrocket.

OK, so we'll just find more of the stuff, right? Wrong.

Greg Hall, director of one of Australia's top uranium explorers, recently told the World Nuclear Association to expect no more than five significant new finds in the next decade.

Nuclear power generators know they're soon going to be standing in a much longer line for Uranium. Consequently, uranium-poor countries are scrambling to lock up as much uranium as they can.

Indian power generators are hoarding huge quantities... and buying stakes in African mines.

China is buying out foreign uranium miners lock, stock and barrel. Reuters recently reported that China Guangdong Nuclear Power is trying to take over London-based Kalahari Minerals. Kalahari is the biggest shareholder in one of the world's largest uranium projects. This will give the Chinese company access to a world-class uranium project.

China mines just 2 million pounds of uranium a year -- even less than we do. So it has no choice but to buy it where it can.

China says it will boost uranium imports fourfold to 50-60 million pounds a year by 2020. At that point, China will be gobbling up 25% to 30% of total global production. There's no way to do this without sparking a price war.

We could see uranium prices soar to $100, $200, even $1,000 a pound. That's a long way up from today's $55.