### 2NC Impact Overview

#### Russian collapse causes terrorist nuclear theft and escalates all conflicts

Patrick, Speice 2006 J.D. Candidate 2006, Marshall-Wythe School of Law, College of William and Mary, “NEGLIGENCE AND NUCLEAR NONPROLIFERATION: ELIMINATING THE CURRENT LIABILITY BARRIER TO BILATERAL U.S.-RUSSIAN NONPROLIFERATION ASSISTANCE PROGRAMS,” William & Mary Law Review, Lexis

The potential consequences of the unchecked spread of nuclear knowledge and material to terrorist groups that seek to cause mass destruction in the United States are truly horrifying. A terrorist attack with a nuclear weapon would be devastating in terms of immediate human and economic losses. (49) Moreover, there would be immense political pressure in the United States to discover the perpetrators and retaliate with nuclear weapons, massively increasing the number of casualties and potentially triggering a full-scale nuclear conflict. (50) In addition to the threat posed by terrorists, leakage of nuclear knowledge and material from Russia will reduce the barriers that states with nuclear ambitions face and may trigger widespread proliferation of nuclear weapons. (51) This proliferation will **increase the risk of nuclear attacks** against the United States or its allies by hostile states, (52) as well as increase the likelihood that **regional conflicts will draw in the United States and escalate to the use of nuclear weapons**. (53)

#### US-Russia nuclear war causes extinction and outweighs

Nick Bostrum March 2002 faculty of philosophy at Oxford and winner of the esteemed Eugene Gannon Award, <http://marukuwato.multiply.com/journal/item/157>

A much greater existential risk emerged with the build-up of nuclear arsenals in the US and the USSR. An all-out nuclear war was a possibility with both a substantial probability and with consequences that might have been persistent enough to qualify as global and terminal. There was a real worry among those best acquainted with the information available at the time that a nuclear Armageddon would occur and that it might annihilate our species or permanently destroy human civilization.[4] Russia and the US retain large nuclear arsenals that could be used in a future confrontation, either accidentally or deliberately. There is also a risk that other states may one day build up large nuclear arsenals. Note however that a smaller nuclear exchange, between India and Pakistan for instance, is not an existential risk, since it would not destroy or thwart humankind’s potential permanently. Such a war might however be a local terminal risk for the cities most likely to be targeted. Unfortunately, we shall see that nuclear Armageddon and comet or asteroid strikes are mere preludes to the existential risks that we will encounter in the 21st century.

#### Even if Russia doesn’t collapse, opportunistic aggression by China would escalate – causes extinction

AlexanderSharavin2001 Director of the Institute for Military and Political Analysis, What the Papers Say, Oct 3)

Now, a few words about the third type of war. A real military threat to Russia from China has not merely been ignored; it has been denied by Russia's leaders and nearly all of the political forces. Let's see some statistic figures at first. The territory of Siberia and the Russian Far East comprises 12,765,900 square kilometers (75% of Russia's entire area), with a population of 40,553,900 people (28% of Russia's population). The territory of China is 9,597,000 square kilometers and its population is 1.265 billion (which is 29 times greater than the population of Siberia and the Russian Far East). China's economy is among the fastest-growing economies in the world. It remains socialistic in many aspects, i.e. extensive and highly expensive, demanding more and more natural resources. China's natural resources are rather limited, whereas the depths of Siberia and the Russian Far East are almost inexhaustible. Chinese propaganda has constantly been showing us skyscrapers in free trade zones in southeastern China. It should not be forgotten, however, that some 250 to 300 million people live there, i.e. at most a quarter of China's population. A billion Chinese people are still living in misery. For them, even the living standards of a backwater Russian town remain inaccessibly high. They have absolutely nothing to lose. There is every prerequisite for "the final throw to the north." The strength of the Chinese People's Liberation Army (CPLA) has been growing quicker than the Chinese economy. A decade ago the CPLA was equipped with inferior copies of Russian arms from late 1950s to the early 1960s. However, through its own efforts Russia has nearly managed to liquidate its most significant technological advantage. Thanks to our zeal, from antique MiG-21 fighters of the earliest modifications and S-75 air defense missile systems the Chinese antiaircraft defense forces have adopted Su-27 fighters and S-300 air defense missile systems. China's air defense forces have received Tor systems instead of anti-aircraft guns which could have been used during World War II. The shock air force of our "eastern brethren" will in the near future replace antique Tu-16 and Il-28 airplanes with Su-30 fighters, which are not yet available to the Russian Armed Forces! Russia may face the "wonderful" prospect of combating the Chinese army, which, if full mobilization is called, is comparable in size with Russia's entire population, which also has nuclear weapons (even tactical weapons become strategic if states have common borders) and would be absolutely insensitive to losses (even a loss of a few million of the servicemen would be acceptable for China). Such a war would be more horrible than the World War II. It would require from our state maximal tension, universal mobilization and complete accumulation of the army military hardware, up to the last tank or a plane, in a single direction (we would have to forget such "trifles" like Talebs and Basaev, but this does not guarantee success either). Massive nuclear strikes on basic military forces and cities of China would finally **be the only way out**, what would exhaust Russia's armament completely. We have not got another set of intercontinental ballistic missiles and submarine-based missiles, whereas the general forces would be extremely exhausted in the border combats. In the long run, even if the aggression would be stopped after the majority of the Chinese are killed, our country would be absolutely unprotected against the "Chechen" and the "Balkan" variants both, and even against the first frost of a possible nuclear winter.

### 1NC/2NC Skolkovo

#### Oil revenue is key to Skolkovo development

James Melik 7-4-2012; Reporter, Business Daily, BBC World Service; Russia moves to diversify economy with technology projects, <http://www.bbc.co.uk/news/business-18622834>

Twenty miles west of Moscow, a new technology race, rather like the space race of the 1960s, is opening up. In the area of farmland, Russia is trying to build its own version of Silicon Valley - the Skolkovo Innovation Centre. It is part of the government initiative to divert the country away from its economic dependence on oil and gas and towards a new kind of industry. It has been a key policy for Dmitry Medvedev, the man who was Russia's president until he was replaced by Vladimir Putin at the beginning of May 2012. The Skolkovo project is widely criticised in Russia and construction work has still not started in earnest more than two years after the proposals was announced. Another aim of this proposed technology drive is to keep clever Russians in the country, along with their money-making ideas, rather than them leaving because they are fed up with corruption and the weight of bureaucracy. Cash not credit Many of these technology companies are able to start up because of funds acquired from venture capitalists. But how do these venture capitalists decide who to back? "We look for proven business models that work abroad and we basically copy them and bring them to Russia," says Richard Creitzman at Fast Lane Ventures. "We find the ideas, we find the people, we find the funding," he says. "We give a management team the opportunity to start up a company, assisted with infrastructure, and let them try to build that company." The Russian government is promoting technology and internet-based companies, and Mr Creitzman says the development at Skolkovo is a good example of using state money along with private funding. The success of such ventures depends on Russians adapting to new ideas. "The use of the internet and e-commerce sites, buying things online, which is a normal thing to do in the West, is just starting here," Mr Creitzman says.n"People tend not to pay by credit cards, they tend to pay the courier that delivers the item. "There is less trust of credit cards, less trust of the goods, so the market isn't as developed here yet as it is in the West." Business as usual Looking ahead, with the new Vladimir Putin presidency, thoughts turn to what the business climate is going to be in the next few years. "We are not planning for any major changes," says Mr Creitzman. “Every couple of weeks there is an investment committee that sits down and goes through a range of ideas that are developed by the management, the shareholders and the business analysts," he says. He maintains that the state has money, especially as the oil price is probably going to remain good in the medium-term - maybe three to five years. "Skolkovo was created under President Medvedev's presidency. I don't think that is going to change. I think that will continue to have support because it's for the good of the state to develop new businesses," he says.

#### Key to global cybersecurity – cooperation with multinational software companies ensures commercialization

Gregory Feifer 11-14-2010; Sr. Correspondence for RFE/RL - Former Moscow Correspondent for NPR Russia's Silicon Valley Dreams May Threaten Cybersecurity

Still, cybersecurity experts say the U.S. record of cracking down against cybercrime is worse. Last month, Moscow police launched an investigation into a legendary spammer whose subsequent disappearance coincided with a drop in global spam levels of 20 percent. Legislator Markov agrees the authorities need to do more to tackle cybercrime. Along with the scientists who turned to hacking after their livelihoods all but vanished following the Soviet collapse, he blames the weakness of postcommunist institutions. "If you want to increase cybersecurity in the world," he says, "help [Russian Prime Minister Vladimir] Putin and [President] Medvedev." **That's precisely what Silicon Valley companies are doing.** Earlier this month, Microsoft said it would take part in developing Skolkovo in projects possibly worth tens of millions of dollars, after Cisco Systems agreed to invest $1 billion last summer.

#### The plan collapses oil prices

James Bartis and Lawrence Van Bibber 2011; Bartis, senior policy researcher at the RAND Corporation, and Lawrence Van Bibber, RAND Corporation, National Research Defense Institute, Prepared for the Secretary of Defense, "Alternative Fuels for Military Applications", <http://www.rand.org/content/dam/rand/pubs/monographs/2011/RAND_MG969.pdf>

Nevertheless, despite the absence of a specific military benefit, there are nationally important benefits to be gained from the use of alternative fuels. If the Department of Defense were to encourage early production experience, government decisionmakers, technology developers, and investors would obtain important information about the technical, financial, and environmental performance of various alternative fuel options. If favorable, that information could lead to a commercial alternative-fuels industry producing strategically significant amounts of fuel in the United States. Once established, a large, commercially competitive alternative fuel industry in the United States and abroad would weaken the ability of the Organization of the Petroleum Exporting Countries to assert its cartel power. Lower world oil prices would yield economic benefits to all fuel users—civilian and military alike. Lower prices would also decrease the incomes of “rogue” oil producers, and thereby likely decrease financial support to large terrorist organizations such as Hamas and Hizballah.

### Link – Financial Incentives

#### Financial incentives for alternative energy reduce prices

Anatole Kaletsky, 3-4-2011; writer for The Australian “Two ways to avert catastrophe”, Lexis

Just as important as increasing the supply of Saudi oil is action to reduce demand. It should now be clear that long-term demand reduction is needed, not only for environmental and geopolitical reasons but also because of the economic instability created by oil. Ratcheting up oil taxes and using part of the revenue to subsidise other energy sources is the best way to achieve this. The right objective is not a ``level playing field'' between oil and other technologies. Instead, nuclear power and alternative energy should be heavily subsidised.

### Link – Natural Gas Switch

#### Nuclear power causes a transportation switch to natural gas

Matthew L. Wald 5-9-2005; When It Comes to Replacing Oil Imports, Nuclear Is No Easy Option, Experts Say http://www.nytimes.com/2005/05/09/politics/09energy.html?\_r=1&pagewanted=all

The electric system consumes another fuel that nuclear power could replace: natural gas. Last year, American utilities burned just under 5.4 trillion cubic feet of natural gas, out of total consumption of 22.3 trillion cubic feet. "You can get a scenario where nuclear would free the gas to go to other things," replacing oil and gasoline, said Thomas Capps, the chairman of Dominion, one of several electric companies that have expressed interest in building new nuclear reactors. "You can run cars on natural gas," he said.

#### Economic collapse causes nationalist takeover

Monica Friedlander, 2009 “Black Leather Pragmatist,” UC Berkeley College of Letters and Science, Jowitt is Professor Emeritus of Political Science Ken Jowitt, <http://www.ias.berkeley.edu/node/351>)

Instead, quite the opposite may be true, Jowitt cautioned. Far from becoming more democratic, Russia could fall prey to what he described as “rage-filled, anti-Western” forces” who could take power in a crisis. And leadership that comes out of a crisis, he said, is always unpredictable. “The threat to Russian stability today comes from the inside,” Jowitt said. “If the Russian economy collapses … we might be in a situation where we see the appearance of nihilistic ideologies and movements clustered around leaders trying to form an alliance with parts of the Russian military.” The result of such developments, Jowitt concluded, would be a far less palatable alternative to Putin’s rule. “In light of the economic recession and what Russia is today and what it is not, a state mercantilistic Russia led by non-ideological Putin may not be the optimal political outcome for Russia. But in 2009, it’s not at all a bad second-best.”

### 2NC Internal Link Wall

**High prices are key to the Russian economy –**

#### --Stable foreign investor perception

RT 4-3-2012; Russia Today, “Oil prices: The make or break of the Russian economy - World Bank” http://rt.com/business/news/world-bank-report-russia-543/

Russia has to thank high oil prices for the better state of its economy. A World Bank report says it has the edge over other emerging countries and the EU, but the rosy picture will become bleaker unless the country deals with a number of challenges. The growth rose from 3.8% year-on-year in the first half to 4.8% in the second half of 2011 and in September was 0.3% better than predicted in the previous Russian Economic Report. Restocking and growing consumptions were the most important growth drivers in 2011 after the sharp decline in 2009. Private consumption was supported by growing employment, solid wage growth, lower inflation, and a strong rouble in the first half of the year. Although the Russian economy returned to pre-crisis level by the end of 2011, the recovery from the crisis was slower than that in 1998. By comparison, GDP took 7 quarters to recover to pre-crisis level after 1998 crisis, yet twice as long after the 2008 crisis. However consumption held up better in 2008 than in 1998 partly due to stronger fiscal policy. Imports recovered faster in 2008. The capital investment showed slowest recovery in 2011. Overall investment reached 22% of GDP in the third quarter of 2011, some 4.4% of GDP below the pre-crisis level in the second quarter of 2008. “It is going to be very important for the Russian government to make sure that investors want to put money in Russia,” said Kaspar Richter, World Bank's Lead Economist and Country Sector Coordinator for Russia. “Macroeconomic policy should emphasize stability; all buffers have to be rebuilt. So when the next crisis comes Russia is a good place to address this crisis”. The lower inflation rate is among the major achievements of Russian economy, according to the World Bank. CPI inflation fell for 10 months in a row from 9.7% in April 2011 to 3.8% in February 2012, the lowest level since the early 1990s. Russia’s labor market improved in 2011, as unemployment was 6.5 % in July, and remained around this level through to the end of the year, according to the report. Though real income growth was 1.1% in 2011, the lowest rate in many years, real wages increased 4.2%, although only 2% for the public sector. In 2011 the Russian budget turned in a surplus thanks to surging oil prices and moderate spending. But the World Bank expects the budget to turn to a deficit in 2012 as spending on extra-budgetary funds and social policy is projected to jump from 5.8% of GDP in 2011 to 7.5% of GDP in 2013. World Bank also warns against increasing reliance on resources exports as oil and gas revenues grew to 10.4% of GDP from 7.6% in 2009. “Even a moderate correction in the oil prices could reverse improvements on the revenue side achieved in 2011,” experts say.

#### --New spending commitments make higher prices necessary – lower prices risk a credit downgrade

Andrew Kramer 3-16-2012; Moscow correspondent for the New York Times, Putin Needs Higher Oil Prices to Pay for Campaign Promises http://www.nytimes.com/2012/03/17/business/global/vladimir-putins-big-promises-need-fueling-by-high-oil-prices.html?\_r=1

In all, the new commitments would add up to about $98 billion a year, Citigroup estimates. The spillover from the Arab Spring and the specter of an Israeli attack on Iran’s nuclear development plants are propping up oil prices now. But over the long term, economic stagnation in Europe could help bring them down. Even before the election, Russia’s government spending was up, helping reinforce Mr. Putin’s message that he was the best candidate to deliver prosperity and stability. In January, the Russian military ministry, for example, doubled salaries in the nation’s million-person army. It was ostensibly a long-planned move. But coming just two months before the presidential vote, the political message was clear. Also smoothing the path for Mr. Putin’s victory was a national cap on utility rates that helped keep inflation at the lowest level in Russia’s post-Soviet history for January and February, at a 3.7 percent annual pace. “Putin made large spending commitments,” the Fitch rating agency said in a statement released the day after the election. “The current high price of oil cushions Russia’s public finances,” Fitch said. “But in the absence of fiscal tightening that significantly cuts the non-oil and gas fiscal deficit, a severe and sustained drop in the oil price would have a damaging impact on the Russian economy and public finances and would likely lead to a downgrade” of the nation’s credit rating. As Mr. Putin’s spending promises started to be introduced in January, Fitch altered Russia’s outlook to stable, from positive.

#### --Stock market performance tracks oil prices

FrankStocker7-6-2011, Die Weltm “IS RUSSIA REALLY SUCH A SOLID INVESTMENT?”, <http://www.worldcrunch.com/russia-really-such-solid-investment/3403>,

Even if a few innovative Internet companies have cropped up, like the Mail.ru e-mail service or the Yandex search engine, both of which are listed on the stock market, they are mostly active only in Russia and therefore remain small players. They don’t have what it takes to be an international success story; they couldn’t even begin to compete with companies like Google or Facebook. Russia‘s stock market will for the foreseeable future remain geared to oil and gas prices. That much is clear from the share prices on the Moscow exchange -- in dollars they **follow oil prices almost slavishly**. Let me rephrase: make that followed. Over the past few months, they’ve been a little lower than the price of oil. Definitely not a growth story.

#### --Bond yields too

Bloomberg6-27-2011;, Jun 27, 2011, “Russia’s Ruble Declines to Four-Week Low Versus Dollar as Oil Price Slides”, http://www.bloomberg.com/news/2011-06-27/russia-s-ruble-declines-to-four-week-low-versus-dollar-as-oil-price-slides.html

The ruble slid to its weakest against the dollar in a month as oil, Russia’s chief export earner, dropped on speculation the International Energy Agency may release more of its stockpiles to steady prices. The ruble lost 0.6 percent to 28.33 per dollar at the 5 p.m. close in Moscow, the weakest since May 25. The Russian currency was down 0.2 percent at 40.2 per euro, leaving it 0.4 percent weaker at 33.6715 versus the central bank’s target dollar-euro basket, its lowest level in two months based on closing prices. The IEA will act again if needed after announcing its third release of emergency stockpiles since its creation in 1974 last week, aimed at stabilizing prices as the war in Libya chokes global crude supplies, Executive Director Nobuo Tanaka said in Beijing June 25. Crude for August delivery dropped as much as $1.34 a barrel today, and last traded down 1 percent at $90.22 a barrel. “**The oil and Russia relationship remains close**,” Chris Weafer, chief strategist and head of research for Russia at ING Groep NV in Moscow, wrote in an e-mailed note June 25. Oil prices “will again be one of the major factors determining Moscow’s bourses and the ruble,” he wrote. Crude prices slipped 15 percent in the three months after the IEA last released emergency supplies in September 2005. The agency released stockpiles after Hurricane Katrina knocked out 10 percent of U.S. refining capacity. Russian government dollar bonds due 2015 fell, pushing the yield up eight basis points to 2.996 percent. The country’s ruble Eurobond yielded two basis points more at 7.021 percent. Non-deliverable forwards, which allow companies to hedge against currency movements, show the ruble at 28.6088 per dollar in three months.

#### --Equity markets and social spending depend on oil prices

Owain Bennallack3-3-2011 – executive editor of Develop, “The one market you can buy on higher oil prices” <http://www.fool.co.uk/news/investing/2011/03/03/the-one-market-you-can-buy-on-higher-oil-prices.aspx>

Yes, we're talking about Russia. As Matthias Siller, Investment Manager at Baring Asset Manager explains: "There is generally a close relationship between the performance of the Russian equity market and the oil price, with Russia lagging slightly. In a stronger oil price environment, it is our belief that the Russian market will gain upward momentum." The following graph shows the relationship between the oil price and the Russian market very clearly: Source: Baring Asset Management / Datastream, as at 24 Feb 2011 You can clearly see that going on this prior trend, the Russian market could be about to shoot upwards. It's already started 2011 with a bang in comparison with most other emerging markets, which have wilted. More reasons to buy Russia We're not habitual graph followers at the Fool. But there are very strong reasons why Russia rises when the oil price does -- principally, that the country is a huge exporter of oil, and its markets are stuffed to overflowing with oil producers. In the short term at least, higher oil prices will massively boost their profitability. It's estimated that a $150 barrel of oil would increase Russian oil firm's operating profitability by an average of 60-80%. But Baring's Matthias Siller points to two other reasons to be optimistic about Russian equities in this climate: ■More taxes for the government: It's an election year in Russia, and incumbents flush with oil-fuelled tax receipts could well increase infrastructural and social security spending, to the benefit of banks, construction firms, property companies, and retailers. ■A boost to oil production: Russian oil companies badly need to upgrade their facilities to get more of their reserves to market. A higher oil price would give the Russian authorities leeway to introduce better tax incentives to encourage this, which could enable Russia's producers to increase their output and profits. The Russian market is on a P/E of just 10 and forecast to fall to around 7, so on the face of it this is pretty compelling opportunity.

#### The aff has it backwards -- SMR exports magnify the risks, and the US won’t be able to prevent problems.

Lyman, ‘11

[Dr. Edwin, Senior Scientist -- Union of Concerned Scientists, “AN EXAMINATION OF THE SAFETY AND ECONOMICS OF LIGHT WATER SMALL MODULAR REACTORS: HEARING before a SUBCOMMITTEE OF THE COMMITTEE ON APPROPRIATIONS UNITED STATES SENATE ONE HUNDRED TWELFTH CONGRESS FIRST SESSION, SPECIAL HEARING, JULY 14, 2011--WASHINGTON DC,” http://www.gpo.gov/fdsys/pkg/CHRG-112shrg72251/html/CHRG-112shrg72251.htm]

UCS is also concerned that reducing safety and security requirements for SMRs could facilitate their sale to utilities or other entities in the United States and abroad that do not have prior experience with nuclear power. Some SMR vendors argue that their technology is so safe that it can be deployed to remote areas, military bases, and countries in the developing world that have relatively low electric demand and no nuclear experience or emergency planning infrastructure. However, SMRs deployed in this manner could raise additional safety and security concerns compared to their deployment by established and experienced nuclear utilities.

#### SMR development doesn’t bolster credibility.

Smith, ‘11

[Terrence P., CSIS, 2-16, “An Idea I Can Do Without: Small Nuclear Reactors on Military Installations,” http://csis.org/blog/idea-i-can-do-without-small-nuclear-reactors-military-installations]

I do not mean to say this report ignores the risks. In fact they explicitly say, “We acknowledge that there are many uncertainties and risks associated with these reactors.” For example it says, Some key issues that require consideration include securing sealed modules, determining how terrorists might use captured nuclear materials, carefully considering the social and environmental consequences of dispersing reactors. The report also points out that “from a financial perspective, small reactors represent substantial losses in economies of scale.” These issues, which were briefly mentioned, hardly seem like small potatoes. The reports answer to the issues raised: “making reliable projections about these reactors’ economic and technical performance while they are still on paper is a significant challenge,” and “Nevertheless, no issue involving nuclear energy is simple.” On the other hand, the report argues, “failing to pursue these technologies raises its own set of risks for DOD.” “First, small reactors may fail to be commercialized in the United States; second, the designs that get locked in by the private market may not be optimal for DOD’s needs; and third, expertise on small reactors may become concentrated in foreign countries.” Yes these are important issue for a business stand, but I don’t find them to be the primary concern. The reactors are purely for energy purposes, but in a world that seems to be growing tired of U.S. military intervention, the idea of ensuring our ability to do so through the proliferation of mobile nuclear reactors will hardly quell any hostile sentiment. In addition, it can only add fire to the “nuclear = good” flame. So, while even under best case scenario, the reactors are completely proliferation proof and pose no direct threat to the nonproliferation cause (ignoring the spreading of nuclear tech and knowledge in general), I have a tough time seeing how it helps.

### AT: US Renaissance Now

#### No renaissance now

**Rose, 11** [Michael, Michael Rose has directed, written, and or produced over two hundred television programs that have aired around the world. His most recent film, Elvis: Return to Tupelo, premiered last Fall on the bio channel and will be shown on PBS starting this Spring. March 15th, Too Cheap to Meter: The Top 10 Myths of Nuclear Power, <http://www.huffingtonpost.com/michael-rose/too-cheap-to-meter-the-to_b_835730.html>]

Myth #4: The U.S. is in the midst of a nuclear renaissance. We've had a nuclear bubble but "when builders came to realize the costs it started to dissolve," said Bradford. The myth of the nuclear renaissance has been an effective public relations ploy of the nuclear industry but we've seen the operators at the Calvert Cliffs, Maryland reactor pull out and the backers behind a proposed reactor in Houston, Texas have also pulled out. Things are sputtering. "If this is what the original renaissance looked like then we never would have had Michelangelo or Leonardo da Vinci," said Hirsch.

No nuclear power expansion now – claims of a renaissance are overblown

**Becker, 7/23/12** [Becker is chairman of the Koeberg Alert Alliance, “PETER BECKER: Nuclear industry ‘rebirth’ is instead stillborn”, <http://www.businessday.co.za/articles/Content.aspx?id=176811>]

THE nuclear power industry is deeply troubled, with little cause for optimism. There is growing **worldwide** public **resistance** to nuclear power stations, US President Barack Obama has **terminated** government **subsidies for nuclear power**, and Germany and Switzerland have committed to shutting down all their reactors. While the renewable energy industry has seen dramatic growth and constantly falling costs, the nuclear industry grapples with spiralling costs, the seemingly intractable waste-disposal issue, and the huge economic and human costs of the Fukushima nuclear disaster in Japan. We have heard from the nuclear lobby that a "**nuclear renaissance**" **is** just **around the corner** and, as evidence of this, we are told 65 reactors are "under construction" worldwide. Examination of this list reveals some interesting details. The International Atomic Energy Association maintains a database of all commercial reactors, the Power Reactor Information System (PRIS). In March this year, it listed 65 reactors as "under construction". It is instructive to look at the number of years some of these have been "under construction". For example, Lungmen 1 and 2 in China were begun in 1997 and have so far taken 15 years to build. In the Slovak Republic, construction of Mochovce 3 and 4 was started in 1987, making 25 years so far. For Atucha 2 in Argentina, it’s 31 years. Moving from the disappointing to the ludicrous, Watts Bar 2 in the US has been "under construction" since 1972. It is likely these long-delayed projects will eventually be cancelled, and almost certainly they will never be an economic success. Even if they are ever completed, the designs will be frighteningly outdated and their safety features unlikely to satisfy current regulatory requirements or public concerns. It is therefore disingenuous to include these in a list of "success stories" about nuclear power. Eliminating the reactors that have been "under construction" for 15 years or more reduces the list of 65 to 52. Another item in the PRIS data is the estimated start-up year. It is interesting that for many of these reactors across South Korea, India, France, Brazil and China, the PRIS database does not list an estimated start-up year. It is unusual, to say the least, for a construction project to have no estimated completion date. This can be interpreted as either a lack of commitment to the project or a sign that problems have arisen that will delay construction. These can hardly be considered success stories and eliminating them from the list of 52 reactors leaves just 10 reactors. Of these 10, most are in pairs and they are spread over six different nuclear plants. And of these plants, only two (Vogtle in the US and Flamville in France) are in the West. What is more, Vogtle is likely to be the last nuclear plant built in the US and was viable only because of subsidies from the Bush administration. Another statistic offered by the World Nuclear Association is that nuclear power is being "considered" by 45 countries that do not currently use it. At first glance, this seems to be impressive evidence of the nuclear "renaissance". However, any country that is considering using nuclear power is, by definition of the word "considering", also considering not using it. An analysis of the 45 countries reveals interesting examples. It includes Namibia and Mongolia, which both consume about 3000GWh a year. A small nuclear power station such as Koeberg, if operated at 80% capacity, would produce more than 12000 GWh a year. Is it likely any country will pay for generating capacity that will produce more than four times the electricity they need? Including these countries in the "considering" list is a distortion of the facts by the World Nuclear Association, perhaps born of a desperation to conceal the decline of the industry. Nuclear power plants are **very** **long-term commitments**. It is therefore important to have a healthy global nuclear industry in place so that services such as maintenance, spare parts, decontamination after a leak, plant decommissioning and waste handling are available at reasonable prices when they are required, decades from now. The sad truth is that even according to the optimistic International Atomic Energy Agency data from the PRIS data, the number of reactors on which construction was started fell 75% from 2010 to last year, and again 75% from last year to this year. Far from a renaissance, this is a catastrophic collapse. SA would do well to wait a few years to see if this trend reverses before locking itself into the nuclear energy option.

#### Natural gas and Fukushima preclude effective nuclear power investment

**Reuters, 7/30/12** [“Nuclear power hard to justify in cheap gas world-GE”, <http://in.reuters.com/article/2012/07/30/energy-power-nuclear-shale-idINL6E8IU7GV20120730>]

(Reuters) - Nuclear power has become **hard to justify** as the shale gas revolution creates an abundance of natural gas that makes it the fuel of choice to back up renewables, the chief executive of General Electric told the Financial Times on Monday. A sharp rise in shale gas production in North America in the past five years has pulled U.S. natural gas prices down close to 10-year lows and could turn the country into a gas exporter soon. Large conventional offshore gas findings in Europe and Africa in the past two years, vast existing reserves in Russia and Central Asia and increasing production in Australia also mean **gas is abundant elsewhere as well.** At the same time, nuclear power has come under pressure following the meltdown at Japan's Fukushima reactor during the March 2011 earthquake and tsunami, with countries such as Germany and Switzerland pulling out of nuclear power generation. "They're finding more gas all the time. It's just hard to justify nuclear. Gas is so cheap and at some point, economics rule," the newspaper quoted GE CEO Jeff Immelt as saying in an interview on Monday. GE is one of the world's leading power generation engineering companies and, together with Japan's Hitachi , is also active in designing and building nuclear reactors. "It's really a gas and wind world today," said Immelt, referring to two sources of electricity he said most countries were shifting towards as natural gas **became "permanently cheap".**

### AT: Global Nuclear Revival

#### Global nuclear energy production down now – economics and politics

**Bradford, 12** [Energy policy: The nuclear landscape [Peter Bradford](http://www.nature.com.proxy.lib.umich.edu/nature/journal/v483/n7388/full/483151a.html#auth-1) Nature 483, 151–152 (08 March 2012) doi:10.1038/483151a Published online 07 March 2012 Peter Bradford is an adjunct professor teaching nuclear power and public policy at Vermont Law School, South Royalton, Vermont 05068, USA. He served on the US Nuclear Regulatory Commission in 1977–82. [p Nature Magazine accessed online via the university of Michigan libraries](http://www.nature.com.proxy.lib.umich.edu/nature/journal/v483/n7388/full/483151a.html)]

Yet the most implacable enemy of nuclear power in the past 30 years has been the risk not to public health, but to investors' wallets. No new nuclear-power project has ever bid successfully in a competitive energy market anywhere in the world.¶ Fukushima is not the only recent challenge to nuclear power: long-term natural-gas prices and price forecasts have more than halved in the United States, and globally, electricity demand has dropped on average owing to the economic slowdown. But these events have merely worsened the odds for new nuclear reactors: private capital was no more available before these events than it is now. Accidents at nuclear plants and economic changes have occurred before, within the living memory of global financial communities. The knowledge that any of these events — or new future threats — might happen has long discouraged investors.¶ Buffeted by economic forces, new nuclear capacity cannot be expected to contribute significantly to global energy supplies or to climate-policy solutions in the decades ahead. Most of the world's reactors are more than 20 years old, so plant completions will be largely offset by retirements. Wise economic and environmental policy will have to allow nuclear energy whatever place it can earn among other energy sources, and not burden it with unnecessary hopes and fears.¶ The second coming¶ In the United States, where no new reactor has received a construction permit since 1978, a 'second coming' of nuclear construction has been anticipated with as much ballyhoo (and accuracy) as its religious counterpart. In 2009, 31 applications for new reactor projects had been filed or announced. Three years later, only four projects remain on course for construction by 2021. Only on 9 February this year did the US Nuclear Regulatory Commission issue its first licence to build a new reactor in 34 years.¶ Many people have accepted a version of history in which US nuclear construction wound down because of excessive regulation, environmental alarmism and public fearfulness after the 1979 accident at Three Mile Island in Pennsylvania. For them, the new reactor licence for a site in Georgia proves that US regulators and the public have regained their resolve. But this view rests on a fallacy. Three Mile Island happened at about the same time that competitive market forces were unleashed on the process of power-plant selection. This is the true reason for the decline in reactor construction: some 50 US reactor orders had already been cancelled before the accident.¶ Chicago-based firm Exelon, the largest US nuclear operator, predicts that electricity from new nuclear plants will cost 12 cents per kilowatt hour (kWh). In comparison, other low-carbon alternatives — combining natural gas with energy efficiency, expansion of existing nuclear plants and wind — will cost 3–11 cents per kWh. Trying to sell new reactors into US power markets that do not value low carbon, and that are predicted to pay no more than 6 cents per kWh for many years, is a certain route to bankruptcy.¶ ¶ SOURCE: IAEA-PRIS, MSC, 2011¶ This economic impracticality has been felt globally since the early 1990s. Although the number of nuclear plants in operation jumped from a handful in 1960 to 424 in 1989, they then levelled off, peaking at 444 reactors in 2002 (see 'Not going up'). After Chernobyl, at least a dozen plants of the same design were taken out of action. Older, smaller plants were decommissioned. But the determining factor was the drop in construction in the United States and western Europe — a result of the cost of building new plants and the refusal of investors to bear the risks of cancellations, cost overruns and the emergence of cheaper alternatives.¶ At the time of the Fukushima disaster, only four countries (China, Russia, India and South Korea) were building more than two reactors. In these four nations, citizens pay for the new reactors the government chooses to build through direct subsidies or energy price hikes. In a few cases, such as the Olkiluoto 3 reactor under construction in Finland, the company providing the reactor promises a fixed price or looks to its own government for finance. Olkiluoto is being built by Areva, an entity largely owned by the French government, which was gambling that the project would jump-start demand for its newest reactor design. As Olkiluoto is four years behind schedule and more than 2 billion (US$2.7 billion) over budget, that gamble has fallen flat.¶ The only nations for which building high-cost nuclear plants has any prospect of becoming competitive are those that combine very limited access to natural gas with high growth (Japan once among them). Even then, there is no reason to pay over the odds for nuclear. Instead, all greenhouse-gas mitigating measures and alternative-energy sources should have to compete with each other in the marketplace.¶ Political balance¶ On top of the ongoing dire economic situation, **Fukushima has shifted the political equation**. The Chernobyl disaster was widely seen as a product of the lax Soviet safety culture, in which an unsafe design was combined with reckless operation. But Japan was considered to be in the technological and regulatory front rank. Champions of nuclear power in the US Congress (and even President Barack Obama on one occasion) had held up Japan as a nuclear success story that US regulators and energy policy-makers should strive to emulate.¶ “It would be ideal if Fukushima could steer us away from prophecies and towards a sensible assessment.”¶ After Chernobyl, Italy and Germany decided to phase out nuclear energy, as Sweden had done after Three Mile Island. All three later reconsidered as concerns over climate change and years without a conspicuous reactor accident shifted the political balance back towards nuclear energy. The unfavourable economics did not change, but the willingness of governments to override economics with subsidies and mandated purchases did.¶ In the United States, this change has produced a paradox. The right-wing legislators who swept into state and federal office in 2010 have conflicting tendencies towards nuclear energy: they are largely pro-nuclear, pro-market, climate-change sceptics, yet they disparage governmental backing of particular technologies with taxpayers' money. Before Fukushima, the net effect seemed to be towards state and federal measures that were favourable for new nuclear capacity, such as increases in taxpayer-backed loan guarantees or laws that made energy customers responsible for runaway costs or cancelled plants. After Fukushima, those measures quietly died.¶¶ A YEAR AFTER THE TSUNAMI For more content, go to: [www.nature.com/japanquake](http://www.nature.com.proxy.lib.umich.edu/japanquake)¶ In the United Kingdom, too, a conservative government pledged to produce new nuclear power without government subsidies. It is now having to torture the language of new policies to subsidize new reactors without this being recognized as such.¶ It is impossible to say what will happen next for nuclear energy. The indications from emerging carbon markets are that they will not produce a high enough price to support new nuclear. These markets are not providing enough emissions avoidance either, so the price for carbon could go higher. If Exelon's predictions are correct, and if gas prices remain low, carbon prices would have to more than triple to make new nuclear look economical. At that level, many other alternatives could be built on a large scale more quickly.¶ The hopes of the US nuclear industry now rest on the new reactor in Georgia — one of the few states with a law assuring that energy customers will pay all reactor costs regardless of price. Energy secretary Steven Chu, visiting the site last month, intoned: “If this project goes forward and is built on-budget, on-time and on-schedule, that would be a very good thing. A lot of other companies will say, 'OK. We now know we can do this and it would be a good investment.'” But companies will say no such thing unless they can also produce energy at a competitive price. Instead, they will join Exelon in saying 'we can do this and go broke'.¶ Many countries state the unknowable or the implausible with great certainty. Germany has declared that existing nuclear capacity is too dangerous and can be phased out at little cost. The Middle East and the Czech Republic assert that new nuclear is a vital low-carbon energy source. Others, including the United Kingdom, have said that there will soon be new nuclear without subsidies.¶ It would be ideal if Fukushima could steer us away from these prophecies and towards a sensible assessment of market economics, climate science and nuclear risks. Then nuclear power would serve the public, not the other way around. I don't know how many reactors we would get, but we would get the number that we need.

#### Nuclear industry down now – Fukushima had massive ripple effects

**Walker, 11** [March 18th, Fukushima and the Future Shape of the International ‘Nuclear Renaissance’ , Research Intern, IPCS, [The Institute of Peace and Conflict Studies (IPCS)](http://www.ipcs.org/) is the premier [South Asian think tank](http://www.ipcs.org/region/south-asia/) which conducts independent research on and provides an in depth analysis of conventional and non-conventional issues related to national and South Asian security including nuclear issues, disarmament, non-proliferation, weapons of mass destruction, the [war on terrorism, counter terrorism](http://www.ipcs.org/issues/terrorism/) , strategies security sector reforms, and armed conflict and peace processes in the region.http://www.ipcs.org/article/nuclear/fukushima-and-the-future-shape-of-the-international-nuclear-renaissance-3345.html]

To be trite, words are inadequate to describe the trio of disastrous events which have hit Japan recently - from earthquake, to tsunami, to potential nuclear meltdown. While the first two disasters are acts of nature, the third revives the historic trauma of the original detonations of Hiroshima and Nagasaki at a time when the idea of a nuclear energy renaissance had been gaining international popularity. Japan occupies a crucial role in these plans as a manufacturer, investor, and even moral arbitrator related to nuclear technology. Domestically, nuclear power makes up 13.6 per cent of Japan’s total energy supply and a substantial portion of its electricity production. Globally, the destruction of the nuclear plants in Fukushima will have **international consequences** for future nuclear power installations. Europe, India and the United States have all been in the process of shifting more of their future energy needs to nuclear power. How might Fukushima alter that shift? What will be the short-term energy ramifications of such a shift? What might be the more long-term geopolitical consequences? There was a 1999 critical nuclear accident at a small experimental reactor in Tokaimura, Japan. Breaches in existing safety standards caused the accident, damage (resulting in two fatalities) was limited, and it did not grab the imagination of the international public. In contrast to Tokaimura, the present extensive nuclear accident in Japan is dramatic and symbolic; already other countries that use nuclear power are looking into the safety of their own reactors. But change is reactor construction and safety may well not be the most dramatic shift in nuclear energy politics. There will be ripple effects. Even Europe is rethinking its reliance on nuclear power. In Germany, nuclear energy has been a **contentious issue for decades** - nearly 70 per cent of Germans opposed nuclear power even before Fukushima. Henrik Paultiz, of International Physicians for the Prevention of Nuclear War, believes that “the accident in Japan **could lead to a major rethink in Europe.** And not before its time. Governments have not been transparent enough about the safety levels of the nuclear power sector.” If some European countries who have been relying for some of their energy needs on nuclear power for decades are reconsidering nuclear energy in response to Fukushima, the US is in an even more politically charged position. Following the Three Mile Island nuclear accident in 1979, nuclear energy became deeply unpopular. Yet support for nuclear energy has experienced resurgence and is one of the few issues which has support from both Democrats and Republicans. However, Fukushima is causing all to pause in their enthusiasm. Senator Joseph Lieberman captured the new ambivalence around nuclear energy: “I think it calls on us here in the U.S., not to stop building nuclear power plants but to put the brakes on right now until we understand the ramifications of what’s happened in Japan.” In India, the reaction to Fukushima has focused more on safety of domestic facilities rather than doubts about the safety of nuclear energy itself. Prime Minister Manmohan Singh has ordered the Nuclear Power Corporation of India to review its safety systems and security designs. The Government of India is also considering additional environmental safeguards to ensure safety of future nuclear reactors. Even before Fukushima, there have been growing protests of the “not in my backyard” variety related to the construction of Jaitapur reactor in Maharastra. Fukushima could well intensify these protests to the point of halting construction. Yet if the nuclear energy option becomes untouchable, what are current global energy options? Jason Grumet, a former energy consultant for the 2008 Obama presidential campaign says that “it’s not possible to achieve a climate solution based on existing technology without a significant reliance on nuclear power.” Is nuclear energy too politically dangerous for states to touch? Grumet noted that “the world is fundamentally a set of relative risks,” and that disasters occur in coal mining, oil drilling, etc without even taking into consideration the long-term impact of carbon output. If future reliance on nuclear power ceases to be politically viable, alternatives other than oil or coal will not be able to meet energy needs for the next few decades. This could lead to an even greater demand for oil which would strengthen regimes which benefit from higher oil prices, increase resource competition, and the future possibility of resource conflict. In the long-term, an increased reliance on oil would most likely lead to greater emissions of greenhouse gases. In the short-term, Fukushima will make nuclear power plant construction at the very least a much more difficult proposition in many places in the world. But not everywhere. The Chinese Vice Minister of Environmental Protection, Zhang Lijun said on the state news that while “some lessons we learn from Japan will be considered in the making of China’s nuclear power plans … China will not change its determination and plan for developing nuclear power.”

#### Nuclear expansion will be limited to existing nuclear states, barriers prevent a full scale renaissance

**Fuhrmann, 12** [Matthew, professor of Political Science at Texas A&M, Splitting Atoms: Why Do Countries Build Nuclear Power Plants?, International Interactions: Empirical and Theoretical Research in International Relations [Volume 38](http://www.tandfonline.com.proxy.lib.umich.edu/loi/gini20?open=38#vol_38), [Issue 1](http://www.tandfonline.com.proxy.lib.umich.edu/toc/gini20/38/1), 2012 DOI: 10.1080/03050629.2012.640209, p. Taylor and Francis]

Nuclear power plant construction is likely to continue in many of the countries that were building reactors prior to Fukushima—notably China, India, Russia, and South Korea. These countries were heavily invested in nuclear energy before the Japanese accident and the historical experience of Chernobyl suggests that they will be less affected by the disaster as a result. It also helps matters for the nuclear industry and climate change advocates that two of these states—which together accounted for more than 60% of all reactor constructions at the beginning of 2011—are nondemocratic. The problem for pronuclear constituencies is that Fukushima is likely to have an enormous negative effect on states that were not already invested in nuclear energy. [Miller and Sagan (2009](http://www.tandfonline.com.proxy.lib.umich.edu/doi/full/10.1080/03050629.2012.640209#CIT0040)) identify 50 nonnuclear energy states that were exploring civilian nuclear development as part of the nuclear renaissance. Many of these countries are likely to scrap their plans in the wake of the Japanese nuclear accident. It is possible for a new nuclear energy country to emerge post-2011, especially if that state happens to be nondemocratic. The most likely such candidate is the UAE (see [Early 2010](http://www.tandfonline.com.proxy.lib.umich.edu/doi/full/10.1080/03050629.2012.640209#CIT0013)) in light of how aggressively that country was pursuing nuclear power prior to Fukushima. But, ultimately, few new nuclear energy states are likely to emerge. We are likely to observe expansion in states that already rely on nuclear energy rather than a genuine nuclear renaissance. As a result, it will be exceedingly difficult—though not technically impossible—to meet the requisite rates of plant construction. Nuclear power may end up being a small part of the answer to climate change, but those interested in addressing this problem would do well to invest in other possible solutions.

### AT: Prolif Now

**Developed nations will stop prolif attempts and no tech**

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The developed world does not want nuclear proliferation, so they take measures to guard against it. Some argue that these measures are not enough. Some argue that nuclear power plants are contributing to a proliferation problem by increasing the availability of nuclear materials such as used fuel. On the other hand it can be argued that nuclear power plants are steadily using up the world’s supply of nuclear warhead material, and also that their used fuel is in a state that makes it very difficult to turn into a nuclear weapon. It is possible to do however, which is the crux of the argument. This possibility however depends entirely upon advanced technology necessary for extracting certain isotopes of plutonium and uranium from the fuel. This technology is carefully watched for by the nuclear nations. In order for a rogue state to develop a nuclear weapon in this way, they would have to hide their advanced equipment from the countries in the world with the most powerful militaries and economies, and the most extensive intelligence networks on the planet. The rogue state has drawn the short straw in this situation. It seems to be incredibly difficult to create a weapon without the developed world learning about it. Stealing a completed weapon might be easier, but would likely require advanced military ability or espionage, both things that the nuclear nations also pay very close attention to. Regardless, stealing a completed weapon is not the focus of this discussion. This discussion is about whether using nuclear power for electricity contributes to proliferation risk.

### 2nc accidents link block

#### Lax NRC regulations mean you should ignore every pro-SMR claim – it assumes theoretical potential of the technology – not actual implementation

**Lyman, 11** - A physicist, Edwin S. Lyman is a senior staff scientist in the Global Security Program at the Union of Concerned Scientists in Washington. (Edward, “An Examination of the Safety and Economics of Light Water Small Modular Reactors” Congressional Testimony, 7/14, <http://www.ucsusa.org/assets/documents/nuclear_power/lyman-appropriations-subcom-7-14-11.pdf>)

Proponents of small modular reactors (SMRs) claim that their designs have inherent safety features compared to large reactors, and some even argue that their reactors would have been able to withstand an event as severe as Fukushima. We find these claims to be unpersuasive. For any plant, large or small, the key factor is the most severe event that the plant is designed to withstand—the so-called maximum “design-basis” event. Unless nuclear safety requirements for new reactors are significantly strengthened, one cannot expect that either small or large reactors will be able to survive a beyond-design-basis event like Fukushima. Although some light-water SMR concepts may have desirable safety characteristics, unless they are carefully designed, licensed, deployed and inspected, SMRs could pose comparable or even greater safety, security and proliferation risks than large reactors.

#### Actual implementation means it will have the same risks as conventional nuclear power – because no requirements exist to improve the designs, and cost concerns mean the industry won’t do it

**Lyman, 11** - A physicist, Edwin S. Lyman is a senior staff scientist in the Global Security Program at the Union of Concerned Scientists in Washington. (Edward, Surviving the one-two nuclear punch: Assessing risk and policy in a post-Fukushima world, Bulletin of the Atomic Scientists, Sept/Oct, sage pub)

One might think it would be easier to address Fukushima-related issues in reactors that are still on the drawing board than in operating reactors, since any design-related changes could be implemented without the need for backfitting existing structures. Because of the NRC’s reactive approach to reactor safety, however, the opportunity to implement design enhancements in next-generation reactors could be lost. The NRC’s policy on advanced reactors is that they do not have to be safer than operating reactors, because operating reactors are already safe enough. As a result, the current crop of new reactor designs is not clearly safer than what’s in use. New reactor vendors have advertised that their reactors are significantly safer--but this turns out to be true only if the threat of extreme natural phenomena, such as large earthquakes, is not taken into account. In the absence of regulatory requirements, new reactors simply will not be designed with a sufficiently robust capacity to withstand events beyond the current design basis, because if they were, they would likely be too expensive to compete with reactors that meet only minimum standards.

#### The industry will lobby to weaken SMR safety regulations to reduce overall costs

**Lyman, 11** - A physicist, Edwin S. Lyman is a senior staff scientist in the Global Security Program at the Union of Concerned Scientists in Washington. (Edward, Surviving the one-two nuclear punch: Assessing risk and policy in a post-Fukushima world, Bulletin of the Atomic Scientists, Sept/Oct, sage pub)

Given that there is no apparent capital cost benefit for SMRs, it is not surprising that the SMR industry is seeking to reduce operating and maintenance (O&M) costs by pressuring the Nuclear Regulatory Commission to weaken certain regulatory requirements for SMRs. Deputy Assistant Energy Secretary John Kelly told the Nuclear Regulatory Commission in March that the NRC’s regulatory requirements for SMRs will “directly influence the operating cost, which will be a large determinant into the economic feasibility of these plants.”

#### Fukushima demonstrates that having multiple reactors escalates safety risks

**Lyman, 11** - A physicist, Edwin S. Lyman is a senior staff scientist in the Global Security Program at the Union of Concerned Scientists in Washington. (Edward, Surviving the one-two nuclear punch: Assessing risk and policy in a post-Fukushima world, Bulletin of the Atomic Scientists, Sept/Oct, sage pub)

Some vendors of small modular reactors (SMRs) have argued that their designs also have inherent capabilities to protect against Fukushima-type accidents. SMRs are defined as reactors that have a power level of less than 400 MWelectric and are compatible with assembly-line manufacture. One of the main advantages of SMRs is that they could be used by utilities to add nuclear power in smaller increments that would be better matched to gradual increases in demand. The vendors claim that small reactors would be easier to passively cool than large reactors because of the lower amount of heat that they would generate. Also, the vendors say, the smaller reactors could be built underground, providing additional protection against certain natural events. While there is a grain of truth in these claims, once again they do not tell the whole story.

For instance, although underground siting could enhance protection against aircraft attacks and earthquakes, it could also have disadvantages in other circumstances. Emergency diesel generators and electrical switchgear at Fukushima Daiichi were installed below grade to reduce their vulnerability to seismic events, but this increased their susceptibility to flooding. And in the event of a serious accident, emergency crews could have greater difficulty accessing underground reactors.

Moreover, accidents affecting multiple small units at a site may cause complications that could outweigh the advantages of having lower heat-removal requirements per unit. Fukushima has demonstrated the additional challenges presented at nuclear plant sites when multiple reactors are affected. In its June 2011 report to the IAEA, the Nuclear and Industrial Safety Agency of Japan wrote, “The accident occurred at more than one reactor at the same time, and the resources needed for accident response had to be dispersed. Moreover, as two reactors shared the facilities, the physical distance between the reactors was small.... The development of an accident occurring at one reactor affected the emergency responses at nearby reactors” (Nuclear Emergency Response Headquarters, 2011: XII-5).

#### Their leadership advantage magnifies all safety risks

**Lyman, 11** - A physicist, Edwin S. Lyman is a senior staff scientist in the Global Security Program at the Union of Concerned Scientists in Washington. (Edward, Surviving the one-two nuclear punch: Assessing risk and policy in a post-Fukushima world, Bulletin of the Atomic Scientists, Sept/Oct, sage pub)

UCS is also concerned that reducing safety and security requirements for SMRs could facilitate their sale to utilities or other entities in the United States and abroad that do not have prior experience with nuclear power. Some SMR vendors argue that their technology is so safe that it can be deployed to remote areas, military bases, and countries in the developing world that have relatively low electric demand and no nuclear experience or emergency planning infrastructure. However, SMRs deployed in this manner could raise additional safety and security concerns compared to their deployment by established and experienced nuclear utilities.

### 2nc – turns the case

#### A meltdown turns all their solvency – it will end commercialization

**Totty, 8** (Michael Energy “(A Special Report); The case for -- and against -- Nuclear Power.” 2008, June 30) Wall Street Journal  (Eastern Edition),  p. R.1.  Retrieved June 30, 2008, from ABI/INFORM Global database.

The safety of nuclear plants has certainly improved, thanks to changes adopted in the wake of the Three Mile Island accident. But safety problems persist, because the U.S. Nuclear Regulatory Commission isn't adequately enforcing existing safety standards. What's more, countries where nuclear power is likely to expand don't have a strong system for regulating nuclear safety.

The important thing to remember about safety is this: The entire nuclear power industry is vulnerable to the safety standards of its worst performers, because an accident anywhere in the world would stoke another antinuclear backlash among the public and investors.

#### Empirically true

**Tomain, 5** - Dean Emeritus and the Wilbert & Helen Ziegler Professor of Law, University of Cincinnati

(Joseph P, “BIOETHICS SYMPOSIUM: BIOFUELS AND THE NEW ENERGY ECONOMY: Smart Energy Path: How Willie Nelson Saved the Planet,” 36 Cumb. L. Rev. 417, 2005)

<The accident at Three Mile Island in 1979 was the most important event signaling the end of the nuclear power industry. n48 No new nuclear plant has come on line since 1996 and the country has not ordered a new nuclear plant since 1978. n49 In short, the Three Mile Island catastrophe sounded the **death knell** for that industry as safety, waste disposal, and cost-effectiveness became and remain concerns about the future of the nuclear industry. n50 With these events came new energy initiatives from the White House and Congress.>

#### The accidents turn turns their heg advantage

**King et al., ‘11**

[Marcus, Research Analyst and Project Director at CNA Corporation's Center for Naval Analyses, LaVar Huntzinger, Thoi Nguyen, March, “Feasibility of Nuclear Power on U.S. Military Installations,” http://www.cna.org/sites/default/files/research/Nuclear%20Power%20on%20Military%20Installations%20D0023932%20A5.pdf]

DoD must also consider the potential effect of military training on reactor operations. Reactors must be designed to the criteria that no accidents at nearby military facilities may threaten nuclear plant safety [48]. NRC regulations note that accidents at nearby military facilities such as munitions storage areas and ordinance test ranges may threaten safety. Flight training is another area of concern. The NRC stipulates that nuclear plant developers should identify airports within 16 km, and the risks of potential incidents must be taken into consideration [48]. Hybrid concepts that include industrial facilities associated with nuclear reactors raise additional safety concerns. Another factor is whether a nuclear accident would affect critical DoD missions. It is important that DoD consider only those sites that support missions that are not so critical to national security so that if an interruption caused by a nuclear incident, or an evacuation order, would create lasting damage to national security. It should be noted that 1963 legislation granted Southern California Edison Corporation an easement of 90 acres from the Camp Pendleton Marine Corps Base to construct the San Onofre Nuclear Generating Station. Our discussions have indicated that the two facilities have co-existed without significant impact on training and readiness.

#### It explicitly destroys nuclear leadership

**Lyman, 11** - A physicist, Edwin S. Lyman is a senior staff scientist in the Global Security Program at the Union of Concerned Scientists in Washington. (Edward, Surviving the one-two nuclear punch: Assessing risk and policy in a post-Fukushima world, Bulletin of the Atomic Scientists, Sept/Oct, sage pub)

UCS acknowledges the concerns of members of Congress who fear that the United States is lagging in creation of a robust SMR export market and may lose out to a country like China if it takes too long to develop and license SMRs. However, we believe that the best way for the United States to maintain a competitive edge is to establish American brands with the highest 6 safety standards. If, as some say, NRC design certification is seen as a “gold standard” worldwide, it makes sense to preserve that standard rather than erode it by weakening SMR safety requirements.

### 1NC – Solvency

#### The aff can’t solve -- lots of structural obstacles prevent SMR commercialization.

Spencer & Loris, ‘11

[Jack, Research Fellow in Nuclear Energy in the Thomas A. Roe Institute for Economic Policy Studies, Nicolas, Research Associate in the Roe Institute, The Heritage Foundation, 2-2, “A Big Future for Small Nuclear Reactors?” http://www.heritage.org/research/reports/2011/02/a-big-future-for-small-nuclear-reactors]

If SMRs Are So Great, Where Is the Construction?¶ While some designs are closer to market introduction than others, the fact is that America’s regulatory and policy environment is not sufficient to support a robust expansion of existing nuclear technologies, much less new ones. New reactor designs are difficult to license efficiently, and the lack of a sustainable nuclear waste management policy causes significant risk to private investment.¶ Many politicians are attempting to mitigate these market challenges by offering subsidies, such as loan guarantees. While this approach still enjoys broad support in Congress and industry, the reality is that it has not worked. Despite a lavish suite of subsidies offered in the Energy Policy Act of 2005, including loan guarantees, insurance against government delays, and production tax credits, no new reactors have been permitted, much less constructed. These subsidies are in addition to existing technology development cost-sharing programs that have been in place for years and defer significant research and development costs from industry to the taxpayer.¶ The problem with this approach is that it ignores the larger systemic problems that create the unstable marketplace to begin with. These systemic problems generally fall into three categories:¶ Licensing. The Nuclear Regulatory Commission (NRC) is ill prepared to build the regulatory framework for new reactor technologies, and no reactor can be offered commercially without an NRC license. In a September 2009 interview, former NRC chairman Dale E. Klein said that small nuclear reactors pose a dilemma for the NRC because the commission is uneasy with new and unproven technologies and feels more comfortable with large light water reactors, which have been in operation for years and has a long safety record.[11] The result is that enthusiasm for building non-light-water SMRs is generally squashed at the NRC as potential customers realize that there is little chance that the NRC will permit the project within a timeframe that would promote near-term investment. So, regardless of which attributes an SMR might bring to the market, the regulatory risk is such that real progress on commercialization is difficult to attain. This then leaves large light water reactors, and to a lesser extent, small ones, as the least risky option, which pushes potential customers toward that technology, which then undermines long-term progress, competition, and innovation.¶ Nuclear Waste Management. The lack of a sustainable nuclear waste management solution is perhaps the greatest obstacle to a broad expansion of U.S. nuclear power. The federal government has failed to meet its obligations under the 1982 Nuclear Waste Policy Act, as amended, to begin collecting nuclear waste for disposal in Yucca Mountain. The Obama Administration’s attempts to shutter the existing program to put waste in Yucca Mountain without having a backup plan has worsened the situation. This outcome was predictable because the current program is based on the flawed premise that the federal government is the appropriate entity to manage nuclear waste. Under the current system, waste producers are able to largely ignore waste management because the federal government is responsible. The key to a sustainable waste management policy is to directly connect financial responsibility for waste management to waste production. This will increase demand for more waste-efficient reactor technologies and drive innovation on waste-management technologies, such as reprocessing. Because SMRs consume fuel and produce waste differently than LWRs, they could contribute greatly to an economically efficient and sustainable nuclear waste management strategy.¶ Government Intervention. Too many policymakers believe that Washington is equipped to guide the nuclear industry to success. So, instead of creating a stable regulatory environment where the market value of different nuclear technologies can determine their success and evolution, they choose to create programs to help industry succeed. Two recent Senate bills from the 111th Congress, the Nuclear Energy Research Initiative Improvement Act (S. 2052) and the Nuclear Power 2021 Act (S. 2812), are cases in point. Government intervention distorts the normal market processes that, if allowed to work, would yield the most efficient, cost-effective, and appropriate nuclear technologies. Instead, the federal government picks winners and losers through programs where bureaucrats and well-connected lobbyists decide which technologies are permitted, and provides capital subsidies that allow investors to ignore the systemic problems that drive risk and costs artificially high. This approach is especially detrimental to SMRs because subsidies to LWRs distort the relative benefit of other reactor designs by artificially lowering the cost and risk of a more mature technology that already dominates the marketplace.¶

#### SMRs don’t solve problems with conventional reactors.

**Makhijani, ‘11**

[Arjun, President -- IEER, The Hill, “The problems with small nuclear reactors,” http://thehill.com/blogs/congress-blog/energy-a-environment/166609-the-problems-with-small-nuclear-reactors]

The arguments of the proponents are alluring:  since they are small, SMRs could be cheaply mass produced in factories and quickly erected on site.  Being small, no single reactor would be a "bet the farm" risk. Most seductively, there would be highly paid industrial jobs right here in the United States; SMRs would just roll off the assembly lines like the Model Ts of yesteryear in contrast to the custom made Lamborghinis of today. The devil, as usual, is in the details. For instance, the cost of a nuclear reactor per unit of electrical generating capacity declines with increasing size. This is because, contrary to intuition, larger reactors use less material per unit of capacity than smaller reactors. When the size of given type of reactor is reduced from 1,000 to 100 megawatts, the amount of material used per megawatt will more than double. And the notion that U.S. workers would get the bulk of the factory jobs is entirely fanciful, given the rules of the World Trade Organization on free trade. Most likely the reactors would be made in China or another country with industrial infrastructure and far lower wages. And what would we do if the severe quality problems with Chinese products, such as drywall and infant formula, afflict reactors? Will there be a process for recalls, as has happened with factory products from Toyotas to Tylenol? How do you recall a radioactively-contaminated, mass-produced nuclear reactor if it has problems? There are economies of scale associated with security, too. Today, large crews staff a reactor control room round-the-clock and guard the site. To reduce operating costs, some vendors are advocating to lower the number of security staff and to require only one operator for three modules, raising serious questions about whether there would be sufficient personnel in the event of an accident or attack. The same problem is associated with safety. The cost of electricity from SMRs would skyrocket if each reactor had to have its own secondary containment structure. Such containment is needed to prevent large-scale releases of radioactivity in case of a severe accident. To ameliorate this problem, it has been proposed to put a number of SMRs in a single containment structure. The result is that a typical reactor project would still have to be very large with several reactors per project; a single small reactor at a site would become prohibitively expensive if security and safety standards are to be maintained. This would defeat the purpose of the flexible "modular" design. All these problems would be associated with SMRs even if we stuck with the basic design approach - light water reactors - that is well-known.  They would be compounded with new reactor designs and new types of waste. Nuclear power advocates have long promised far more than they can deliver, ignoring essential hurdles such as cost, safety, and performance. Decades of experience, however, have proven those promises to be hollow and hazardous. The notion that "small is beautiful" for nuclear reactors is not just fanciful; it is whistling past the graveyard of the "nuclear renaissance" that never was.

#### You should be skeptical of their ev -- SMR designs are untested on a commercial scale -- tons of technical details could hinder effectiveness.

Szondy, ‘12

[David, freelance writer -- Gizmag, 2-16, “Feature: Small modular nuclear reactors - the future of energy?” <http://www.gizmag.com/small-modular-nuclear-reactors/20860/>]

As impressive as many of these reactors sound, most of them are still in one stage or another of development or approval. It is a long way from there to flipping a switch and watching the lights go on. Most of these designs have roots that go back over half a century.¶ In the 1950s, Admiral Hyman Rickover, the architect of the US nuclear fleet, pointed out that the small research reactors, the precursors of SMRs, had a lot of advantages. They were simple, small, cheap, lightweight, easy to build, very flexible in design and needed very little development. On the other hand, practical reactors must be built on schedule, need a huge amount of development spent on "apparently trivial matters", are expensive, large, heavy and complicated. In other words, there's a large gap between what is promised by a technology in the design phase and what it ends up as once it's built.¶ So it is with the current stable of SMRs. Many hold great promise, but they have yet to prove themselves. Also, they raise many questions. Will an SMR need fewer people to run it? What are its safety parameters? Will they fulfill current regulations? Will the regulations need to be changed to suit the nature of SMRs? Will evacuation zones, insurance coverage or security standards need to be altered? What about regulations regarding earthquakes?

### 2NC Exts – Not Ready

#### Even SMR advocates concede they’re nowhere near completion -- 90% of designs aren’t complete, and adequate data isn’t available.

WNA, ‘12

[World Nuclear Association, September, “Small Nuclear Power Reactors,” <http://www.world-nuclear.org/info/inf33.html>]

A 2011 report for US DOE by University of Chicago Energy Policy Institute says development of small reactors can create an opportunity for the United States to recapture a slice of the nuclear technology market that has eroded over the last several decades as companies in other countries have expanded into full‐scale reactors for domestic and export purposes. However, it points out that detailed engineering data for most small reactor designs are only 10 to 20 percent complete, only limited cost data are available, and no US factory has advanced beyond the planning stages. In general, however, the report says small reactors could significantly mitigate the financial risk associated with full‐scale plants, potentially allowing small reactors to compete effectively with other energy sources. In January 2012 the DOE called for applications from industry to support the development of one or two US light-water reactor designs, allocating $452 million over five years. Other SMR designs will have modest support through the Reactor Concepts RD&D program.

### 2NC Exts – Alt Causes

#### SMR expansion fails -- the US nuclear supply chain has atrophied.

ITA, 11

[International Trade Administration -- U.S. Department of Commerce, February, “The Commercial Outlook for U.S. Small Modular Nuclear Reactors,” http://trade.gov/mas/ian/build/groups/public/@tg\_ian/@nuclear/documents/webcontent/tg\_ian\_003185.pdf]

There are also domestic policies that hinder U.S. SMR competitiveness, with some policies relevant to all nuclear suppliers and some specific to SMR deployment, both at home and abroad. One obstacle is diminished manufacturing capacity. U.S. nuclear competitiveness is hampered because U.S. manufacturing capacity has been eroded through the lack of new reactor construction during the past few decades. Some government resources to help manufacturers are not appropriate for nuclear suppliers, or the resources exclude the suppliers entirely. For example, only two U.S. nuclear manufacturers qualified for the advanced energy manufacturing tax credit. The timeline to be eligible for the credit requires a facility to be up and running four years from certification. Some U.S. firms say that the timeline is too short for many nuclear suppliers; just acquiring the high-precision machines necessary to retool and rebuild capacity can require a lead time of several years.

#### Decades to operational readiness.

ITA, 11

[International Trade Administration -- U.S. Department of Commerce, February, “The Commercial Outlook for U.S. Small Modular Nuclear Reactors,” http://trade.gov/mas/ian/build/groups/public/@tg\_ian/@nuclear/documents/webcontent/tg\_ian\_003185.pdf]

Although SMRs have significant potential and the market for their deployment is growing, their designs must still go through the technical and regulatory processes necessary to ensure that they can be safely and securely deployed. Lightwater technology–based SMRs may not be ready for deployment in the United States for at least a decade, and advanced designs might be even further off. Light-water SMRs and SMRs that have undergone significant testing are the most likely candidates for near-term deployment, because they are most similar to existing reactors that have certified designs and significant operating histories. NuScale is on track to submit its reactor design to the NRC by 2012, as is Babcock & Wilcox for its mPower design. In addition, GE-Hitachi, which already completed an NRC preapplication review for its PRISM reactor in 1994, plans to submit its PRISM design for certification in 2012.

### 2nc accidents link block

#### Lax NRC regulations mean you should ignore every pro-SMR claim – it assumes theoretical potential of the technology – not actual implementation

**Lyman, 11** - A physicist, Edwin S. Lyman is a senior staff scientist in the Global Security Program at the Union of Concerned Scientists in Washington. (Edward, “An Examination of the Safety and Economics of Light Water Small Modular Reactors” Congressional Testimony, 7/14, <http://www.ucsusa.org/assets/documents/nuclear_power/lyman-appropriations-subcom-7-14-11.pdf>)

Proponents of small modular reactors (SMRs) claim that their designs have inherent safety features compared to large reactors, and some even argue that their reactors would have been able to withstand an event as severe as Fukushima. We find these claims to be unpersuasive. For any plant, large or small, the key factor is the most severe event that the plant is designed to withstand—the so-called maximum “design-basis” event. Unless nuclear safety requirements for new reactors are significantly strengthened, one cannot expect that either small or large reactors will be able to survive a beyond-design-basis event like Fukushima. Although some light-water SMR concepts may have desirable safety characteristics, unless they are carefully designed, licensed, deployed and inspected, SMRs could pose comparable or even greater safety, security and proliferation risks than large reactors.

#### Actual implementation means it will have the same risks as conventional nuclear power – because no requirements exist to improve the designs, and cost concerns mean the industry won’t do it

**Lyman, 11** - A physicist, Edwin S. Lyman is a senior staff scientist in the Global Security Program at the Union of Concerned Scientists in Washington. (Edward, Surviving the one-two nuclear punch: Assessing risk and policy in a post-Fukushima world, Bulletin of the Atomic Scientists, Sept/Oct, sage pub)

One might think it would be easier to address Fukushima-related issues in reactors that are still on the drawing board than in operating reactors, since any design-related changes could be implemented without the need for backfitting existing structures. Because of the NRC’s reactive approach to reactor safety, however, the opportunity to implement design enhancements in next-generation reactors could be lost. The NRC’s policy on advanced reactors is that they do not have to be safer than operating reactors, because operating reactors are already safe enough. As a result, the current crop of new reactor designs is not clearly safer than what’s in use. New reactor vendors have advertised that their reactors are significantly safer--but this turns out to be true only if the threat of extreme natural phenomena, such as large earthquakes, is not taken into account. In the absence of regulatory requirements, new reactors simply will not be designed with a sufficiently robust capacity to withstand events beyond the current design basis, because if they were, they would likely be too expensive to compete with reactors that meet only minimum standards.

#### The industry will lobby to weaken SMR safety regulations to reduce overall costs

**Lyman, 11** - A physicist, Edwin S. Lyman is a senior staff scientist in the Global Security Program at the Union of Concerned Scientists in Washington. (Edward, Surviving the one-two nuclear punch: Assessing risk and policy in a post-Fukushima world, Bulletin of the Atomic Scientists, Sept/Oct, sage pub)

Given that there is no apparent capital cost benefit for SMRs, it is not surprising that the SMR industry is seeking to reduce operating and maintenance (O&M) costs by pressuring the Nuclear Regulatory Commission to weaken certain regulatory requirements for SMRs. Deputy Assistant Energy Secretary John Kelly told the Nuclear Regulatory Commission in March that the NRC’s regulatory requirements for SMRs will “directly influence the operating cost, which will be a large determinant into the economic feasibility of these plants.”

#### Fukushima demonstrates that having multiple reactors escalates safety risks

**Lyman, 11** - A physicist, Edwin S. Lyman is a senior staff scientist in the Global Security Program at the Union of Concerned Scientists in Washington. (Edward, Surviving the one-two nuclear punch: Assessing risk and policy in a post-Fukushima world, Bulletin of the Atomic Scientists, Sept/Oct, sage pub)

Some vendors of small modular reactors (SMRs) have argued that their designs also have inherent capabilities to protect against Fukushima-type accidents. SMRs are defined as reactors that have a power level of less than 400 MWelectric and are compatible with assembly-line manufacture. One of the main advantages of SMRs is that they could be used by utilities to add nuclear power in smaller increments that would be better matched to gradual increases in demand. The vendors claim that small reactors would be easier to passively cool than large reactors because of the lower amount of heat that they would generate. Also, the vendors say, the smaller reactors could be built underground, providing additional protection against certain natural events. While there is a grain of truth in these claims, once again they do not tell the whole story.

For instance, although underground siting could enhance protection against aircraft attacks and earthquakes, it could also have disadvantages in other circumstances. Emergency diesel generators and electrical switchgear at Fukushima Daiichi were installed below grade to reduce their vulnerability to seismic events, but this increased their susceptibility to flooding. And in the event of a serious accident, emergency crews could have greater difficulty accessing underground reactors.

Moreover, accidents affecting multiple small units at a site may cause complications that could outweigh the advantages of having lower heat-removal requirements per unit. Fukushima has demonstrated the additional challenges presented at nuclear plant sites when multiple reactors are affected. In its June 2011 report to the IAEA, the Nuclear and Industrial Safety Agency of Japan wrote, “The accident occurred at more than one reactor at the same time, and the resources needed for accident response had to be dispersed. Moreover, as two reactors shared the facilities, the physical distance between the reactors was small.... The development of an accident occurring at one reactor affected the emergency responses at nearby reactors” (Nuclear Emergency Response Headquarters, 2011: XII-5).

#### Their leadership advantage magnifies all safety risks

**Lyman, 11** - A physicist, Edwin S. Lyman is a senior staff scientist in the Global Security Program at the Union of Concerned Scientists in Washington. (Edward, Surviving the one-two nuclear punch: Assessing risk and policy in a post-Fukushima world, Bulletin of the Atomic Scientists, Sept/Oct, sage pub)

UCS is also concerned that reducing safety and security requirements for SMRs could facilitate their sale to utilities or other entities in the United States and abroad that do not have prior experience with nuclear power. Some SMR vendors argue that their technology is so safe that it can be deployed to remote areas, military bases, and countries in the developing world that have relatively low electric demand and no nuclear experience or emergency planning infrastructure. However, SMRs deployed in this manner could raise additional safety and security concerns compared to their deployment by established and experienced nuclear utilities.

### 2nc – turns the case

#### A meltdown turns all their solvency – it will end commercialization

**Totty, 8** (Michael Energy “(A Special Report); The case for -- and against -- Nuclear Power.” 2008, June 30) Wall Street Journal  (Eastern Edition),  p. R.1.  Retrieved June 30, 2008, from ABI/INFORM Global database.

The safety of nuclear plants has certainly improved, thanks to changes adopted in the wake of the Three Mile Island accident. But safety problems persist, because the U.S. Nuclear Regulatory Commission isn't adequately enforcing existing safety standards. What's more, countries where nuclear power is likely to expand don't have a strong system for regulating nuclear safety.

The important thing to remember about safety is this: The entire nuclear power industry is vulnerable to the safety standards of its worst performers, because an accident anywhere in the world would stoke another antinuclear backlash among the public and investors.

#### Empirically true

**Tomain, 5** - Dean Emeritus and the Wilbert & Helen Ziegler Professor of Law, University of Cincinnati

(Joseph P, “BIOETHICS SYMPOSIUM: BIOFUELS AND THE NEW ENERGY ECONOMY: Smart Energy Path: How Willie Nelson Saved the Planet,” 36 Cumb. L. Rev. 417, 2005)

<The accident at Three Mile Island in 1979 was the most important event signaling the end of the nuclear power industry. n48 No new nuclear plant has come on line since 1996 and the country has not ordered a new nuclear plant since 1978. n49 In short, the Three Mile Island catastrophe sounded the **death knell** for that industry as safety, waste disposal, and cost-effectiveness became and remain concerns about the future of the nuclear industry. n50 With these events came new energy initiatives from the White House and Congress.>

#### The accidents turn turns their heg advantage

**King et al., ‘11**

[Marcus, Research Analyst and Project Director at CNA Corporation's Center for Naval Analyses, LaVar Huntzinger, Thoi Nguyen, March, “Feasibility of Nuclear Power on U.S. Military Installations,” http://www.cna.org/sites/default/files/research/Nuclear%20Power%20on%20Military%20Installations%20D0023932%20A5.pdf]

DoD must also consider the potential effect of military training on reactor operations. Reactors must be designed to the criteria that no accidents at nearby military facilities may threaten nuclear plant safety [48]. NRC regulations note that accidents at nearby military facilities such as munitions storage areas and ordinance test ranges may threaten safety. Flight training is another area of concern. The NRC stipulates that nuclear plant developers should identify airports within 16 km, and the risks of potential incidents must be taken into consideration [48]. Hybrid concepts that include industrial facilities associated with nuclear reactors raise additional safety concerns. Another factor is whether a nuclear accident would affect critical DoD missions. It is important that DoD consider only those sites that support missions that are not so critical to national security so that if an interruption caused by a nuclear incident, or an evacuation order, would create lasting damage to national security. It should be noted that 1963 legislation granted Southern California Edison Corporation an easement of 90 acres from the Camp Pendleton Marine Corps Base to construct the San Onofre Nuclear Generating Station. Our discussions have indicated that the two facilities have co-existed without significant impact on training and readiness.

#### It explicitly destroys nuclear leadership

**Lyman, 11** - A physicist, Edwin S. Lyman is a senior staff scientist in the Global Security Program at the Union of Concerned Scientists in Washington. (Edward, Surviving the one-two nuclear punch: Assessing risk and policy in a post-Fukushima world, Bulletin of the Atomic Scientists, Sept/Oct, sage pub)

UCS acknowledges the concerns of members of Congress who fear that the United States is lagging in creation of a robust SMR export market and may lose out to a country like China if it takes too long to develop and license SMRs. However, we believe that the best way for the United States to maintain a competitive edge is to establish American brands with the highest 6 safety standards. If, as some say, NRC design certification is seen as a “gold standard” worldwide, it makes sense to preserve that standard rather than erode it by weakening SMR safety requirements.