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Nuclear Threat Escalating Beyond Political Rhetoric



UNITED NATIONS - As a new cold war between the United States and Russia picks up steam, the nuclear threat is in danger of escalating – perhaps far beyond political rhetoric. Dr Randy Ryddel, a former senior political affairs officer with the U.N. Office for Disarmament Affairs (UNODA) told IPS he pities the general public. **⇒** Pages 2-3

France Sees Nuclear Arms As Deterrent



Israel and Iran Obstacles to Nuke Free Mideast Depending on Perspective



TEL AVIV | RAMALLAH - Six world powers are looking towards the end of June to reach an agreement in regard to Iran's nuclear programme in return for lifting the sanctions imposed on the Islamic theocracy. In the interim Iran's nuclear ambitions are once again dominating the headlines as the Western powers look to the end of March for an agreement on a political framework before June's deadline. ▶ Pages 6-7-8

Opinion: A Legally-Binding Treaty to Prohibit Nuclear Weapons



By Ray Acheson

NEW YORK - Five years after the adoption of the NPT (Nuclear Non-Proliferation Treaty) Action Plan in 2010, compliance with commitments related to nuclear disarmament lags far behind those related to non-proliferation or the peaceful uses of nuclear energy. **2** Pages 9-10

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Is America's Nuclear Arsenal Dying?



By Michaela Dodge

As Russia and other nations around the world flex their "nuclear muscles," when it comes to the United States, maintaining a credible nuclear force is certainly a tough task. Challenges include: declining research, development and acquisition budgets; uncertain prospects for modernization, and an American public that lacks a clear under-standing how nuclear weapons contribute to national security. \bigcirc Pages 11-12

The Challenge of Warning About Nuclear Waste in 10,000 Years

By Scott Beauchamp

"Now I am become death, the destroyer of worlds." It was fitting that J. Robert Oppenheimer, one of the physicists who helped design the atomic bomb, chose to quote from the *Bhagavad Gita* in response to the first successful detonation of a nuclear weapon in the remote sands of New Mexico. Pages 13-15

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Nuclear Threat Escalating Beyond Political Rhetoric

By Thalif Deen



Every nuclear power is spending millions to upgrade their arsenals, experts say. Credit: National Nuclear Security Administration/CC-BY-ND-2.0

UNITED NATIONS (IPS) - As a new cold war between the United States and Russia picks up steam, the nuclear threat is in danger of escalating – perhaps far beyond political rhetoric.

Dr Randy Ryddel, a former senior political affairs officer with the U.N. Office for Disarmament Affairs (UNODA) told IPS he pities the general public.

"They're being fed two competing narratives about nukes," he said, in a realistic assessment of the current state of play.

"Oracle 1 says everybody's rushing to acquire them or to perfect them." Oracle 2 forecasts a big advance for nuclear disarmament, as the bandwagon for humanitarian disarmament continues to gain momentum, said Dr Ryddel, a former senior counsellor and report director of the Weapons of Mass Destruction (WMD) Commission. "The irony is that if Oracle 2 is wrong, Oracle 1 will likely win this debate – and we'll all lose," he grimly predicted about the nuclear scenario.

In a recent cover story, the London Economist is unequivocally pessimistic: "A quarter of a century after the end of the cold war, the world faces a growing threat of nuclear conflict."

Twenty-five years after the Soviet collapse, it said, the world is entering a new nuclear age.

"Nuclear strategy has become a cockpit of rogue regimes and regional foes jostling with the five original nuclear weapons powers (the U.S., Britain, France, China and Russia), whose own dealings are infected by suspicion and rivalry."

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Shannon Kile, senior researcher and head of the Nuclear Weapons Project at the Stockholm International Peace Research Institute (SIPRI) told IPS he agrees with the recent piece in The Economist that the world may be entering a "new nuclear age".

"However, I would not narrowly define this in terms of new spending on nuclear weapons by states possessing them. Rather, I think it must be defined more broadly in terms of the emergence of a multi-polar nuclear world that has replaced the bipolar order of the cold war," he added.

Kile also pointed out that nuclear weapons have become core elements in the defence and national security policies of countries in East Asia, South Asia and the Middle East, where they complicate calculations of regional stability and deterrence in unpredictable ways.

This in turn raises risks that regional rivalries could lead to nuclear proliferation and even confrontation that did not exist when the nuclear club was smaller.

Meanwhile, the signs are ominous: the negotiations to prevent Iran going nuclear are still deadlocked. Saudi Arabia has signed a new nuclear cooperation agreement, presumably for "peaceful purposes", with South Korea; and North Korea has begun to flex its nuclear muscle

On March 20, Hyun Hak Bong, North Korea's ambassador to the UK, was quoted by Sky News as saying his country would use its nuclear weapons in response to a nuclear attack by the U.S. "It is not the United States that has a monopoly on nuclear weapons strikes," Hyun said.

"If the United States strike us, we should strike back. We are ready for conventional war with conventional war; we are ready for nuclear war with nuclear war. We do not want war but we are not afraid of war," Hyun said.

The Economist also pointed out that every nuclear power is spending "lavishly to upgrade its atomic arsenal." Russia's defence budget has increased by over 50 percent since 2007, a third of it earmarked for nuclear weapons: twice the share of France. China is investing in submarines and mobile missile batteries while the United States is seeking Congressional approval for

350 billion dollars for the modernization of its nuclear arsenal.

Kile told IPS a subsidiary aspect of the "new nuclear age" is more technical in nature and has to do with the steady erosion of the operational boundary between nuclear and conventional forces.

Specifically, he said, the development of new types of advanced long-range, precision guided missile systems, combined with the increasing capabilities of satellite-based reconnaissance and surveillance systems, means that conventional weapons are now being given roles and missions that were previously assigned to nuclear weapons.

"This trend has been especially strong in the United States but we also see it in [the] South Asian context, where India is adopting conventional strike systems to target Pakistani nuclear forces as part of its emerging limited war doctrine."

Kile also said many observers have pointed out that this technology trend is driving doctrinal changes that could lead to increased instability in times of crisis and raise the risk of the use of nuclear weapons.

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Kile also said many observers have pointed out that this technology trend is driving doctrinal changes that could lead to increased instability in times of crisis and raise the risk of the use of nuclear weapons.

"What these developments suggest to me is that while the overall number of nuclear warheads in the world has significantly decreased since the end of the cold war (with the fall of the Berlin Wall in November 1989), the spectrum of risks and perils arising from nuclear weapons has actually expanded."

Given that nuclear weapons remain uniquely dangerous because they are uniquely destructive, "I don't think anyone will dispute that we must redouble our collective efforts aimed at reaching a world in which nuclear arsenals are marginalised and can be eventually prohibited," he declared. [IPS | 27 March 2015] .

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France Sees Nuclear Arms As Deterrent

By A.D. McKenze



The French nuclear-powered aircraft carrier Charles de Gaulle and the American nuclear-powered carrier USS Enterprise (left), each of which carry nuclear-capable fighter aircraft | Credit: Wikimedia Commons

PARIS (IDN) - As world leaders prepare to meet in New York next month for the 2015 Review Conference of the Nuclear Non-Proliferation Treaty (NPT), French activists say they are not holding their breath for any real commitment to enforce the 45-year-old accord.

France is the world's third nuclear-arms power, and while its official policy is that stockpiles should not be increased and that testing must be stopped, the Socialist government of François Hollande is not in favour of total nuclear disarramment

Hollande's stance differs little in fact from that of his Conservative predecessor Nicolas Sarkozy, who believed that global disarmament must be based on "reciprocity" – a policy that means essentially 'we'll get rid of ours if you get rid of yours'.

The country has both maritime and air-based nuclear capability, and the government's position, outlined in a 2013 white paper, is that "nuclear deterrence" is a means of protecting "vital interests".

In February 2015, Hollande reiterated that policy in a speech at a French military air base, saying that possessing nuclear arms acts as a deterrent for enemies, in a "dangerous world".

"The current international context doesn't allow for any weakness, and there is no question of letting down one's guard," he said.

"One cannot rule out the possibility of future state conflicts that may concern us directly or indirectly," the president declared.

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Disarmament activists counter this stance, warning that France is not fulfilling its obligations under the NPT. They say the country has equally lagged on measures agreed in 2010, when the previous Review Conference adopted a 64-point action plan to push forward implementation of the Treaty.

"There is no reduction of nuclear stockpiling taking place, so we need a treaty that completely bans nuclear weapons rather than banning proliferation," says Patrice Bouveret, director of the Observatoire des armements, an independent French documentation and research centre devoted to peace-building.

"None of the engagements taken five years ago have resulted in anything concrete," Bouveret told IDN. "States need to now work on launching a different treaty because the current situation is just as ambiguous as it has been."

Bouveret's Observatoire des armements is a member of the Sortir du Nucléaire network (network for Phasing out the Nuclear Age), the main French anti-nuclear coalition that comprises 932 organisations and about 60,500 signatories.

The coalition supports "non-violent actions of civil disobedience" and will participate for instance in a 65-day protest to block Germany's Büchel military air base which has the last nuclear arms on German soil - stored due to an agreement with the United States.

The protest is a show of "opposition to the stationing of arms" at the base and is set to begin on March 26 and continue until the end of the Review Conference in New York, the group says.

Activists are calling for the original five nuclear-weapon states – France, the United Kingdom, China, the United States, and Russia – to do more to forward their own disarmament, even as they try to rein in the "new nuclear states" of North Korea, Israel, Pakistan, India and (perhaps) Iran.

Only P5 have dismantled testing site and fissile material production installations

France says that up to 2008, it reduced its number of air-launched weapons by a third, cutting its nuclear arsenal to "less than" 300 warheads. In February, for the

first time, the government further quantified its nuclear weapons, with Hollande saying that the country has three sets of 16 submarine-launched ballistic missiles and 54 medium-range air-to-surface missiles.

France has also reported that it is the only one of the five original nuclear weapon states to have dismantled its testing site and fissile material production installations, and the government has pledged to continue campaigning for the "definitive end to the production of fissile material" for nuclear arms.

But with France and other countries sticking to the deterrence argument, the stakes remain high, and activists are watching to see what will happen at the April 27-May 22 Review Conference of the 1970 NPT.

"Speaking about disarmament remains complicated in our state," said 10 French parliamentarians in a message to the International Conference on the Humanitarian Impact of Nuclear Weapons, held in Vienna last December with more than 1000 delegates attending.

"Too many high-ranking civilians and military officials perceive nuclear disarmament as an act of treason or threat to French security, increasing the complexity of the debate," said the message, which was notably signed by Hervé Morin, a former defence minister.

"This is a wrong perception, because France is diplomatically engaged 'to adopt policies that are fully compatible with the Treaty and the objective of achieving a world without nuclear weapons'," the parliamentarians added. They said that in order to reduce and eliminate nuclear weapons, France and its government need to "understand the positive gains" of this process.

"Today too few of our colleagues have understood the risks posed by the worldwide arsenal of 16,300 nuclear weapons," said Jean-Marie Collin, director of the French branch of Parliamentarians for Nuclear Non-Proliferation and Disarmament (PNND), an international network that provides up-to- date information on nuclear-weapon policies.

It's clear, however that even if France wants to keep its own weapons, it does not want ownership to spread to "less stable" states. In his February address, Hollande slammed the "race" among some countries to acquire nuclear arms. [IDN | 23 March 2015] ❖

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Israel and Iran Obstacles to Nuke Free Mideast Depending on Perspective

By Mel Frykberg



Samir Awad, a doctor of political science, points to a map of Iran saying it is not a threat to a peaceful nuclear free Middle East. Credit: Mel Frykberg

TEL AVIV | RAMALLAH (IDN) - Six world powers are looking towards the end of June to reach an agreement in regard to Iran's nuclear programme in return for lifting the sanctions imposed on the Islamic theocracy.

In the interim Iran's nuclear ambitions are once again dominating the headlines as the Western powers look to the end of March for an agreement on a political framework before June's deadline.

This framework agreement comes shortly before the next <u>Nuclear Proliferation Treaty (NPT) review conference</u> from April 27 to May 22, 2015 at UN Headquarters in New York.

IDN spoke to Israeli and Palestinian experts on their perspectives in regard to a future Mideast free of nuclear weapons, the likelihood of this ever becoming a reality and what obstacles may prevent this goal from being achieved.

Ephraim Asculai, is a senior research fellow at <u>Israel's Institute for National Security Studies (INSS) in Tel Aviv</u>, an expert on Iran and nuclear issues facing the Middle East, and reflects Israel's conservative point of view.

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"I'm not sure we will see any progress in the framework talks towards the June deadline," Asculai told IDN.

"Deadlines have come and gone and we are hearing conflicting views, nothing is official. Different sources are stating different opinions about reaching agreement with some sources outlining difficulties.

"The Iranians are very clever negotiators. Their main goal isn't an agreement that satisfies the international community but rather to get the international sanctions lifted.

"However, in order to get these lifted they need to be seen as having reached a compromise, while simultaneously not giving up their nuclear ambitions," said Asculai.

"They already have some capability for developing weapons and they don't want any international restrictions on their current capabilities," said Ascalai.

"I don't believe that Iran will attack Israel"

He added: "I don't think the Iranians are trying to develop a nuclear weapon at this point but they want advanced capabilities to be able to develop one should they feel threatened.

"Once they have the advanced capabilities, should they receive orders from the Iranian leadership to develop a weapon they will. Ultimately I think the Iranians are just postponing the inevitable."

Asculai believes that there is a possibility that regional Arab countries would also try to obtain nuclear weapons – should Iran's nuclear programme not be curbed – as part of a mutual Sunni defence against Shi'ite Iran.

Furthermore, Asculai said, Israel's nuclear weapons were not a factor in the Gulf countries possibly pursuing nuclear weapons programmes. He dismissed accusations that current Israeli premier Benjamin Netanyahu was being provocative in his constant accusations that Iran poses an existential threat to the Jewish state.

"I don't believe that Iran will attack Israel. The chances of that are very low. However, Netanyahu is right to be cautious in regard to Israel's security and Israel should reserve the right to attack Iran if necessary," Asculai told IDN.

"Iran consistently attacks Israel verbally. It has denied the Holocaust and this touches a raw nerve with Israelis.

"Teheran has also threatened to wipe Israel off the map which is a very dangerous game. Israel responds by defending itself verbally. Both sides are engaged in a war of word," he said.

"Israel is not a threat to Iran and it's not a case of Israelis being against Iranians. We used to have very good relations with that country prior to the Islamic republic coming into power."

Asculai believes that a nuclear-free Middle East is possible if Iran gives up its nuclear ambitions and decides to become a respected member of the international community.

"But at the moment they are not being transparent, they are blocking nuclear inspectors from sites and they are lying about their capabilities," stated Ascalai.

In regard to whether the public is being told the full story, Asculai believes that the media has not been given access to the full story because of Iranian intransigence but that the International Atomic Energy Agency (IAEA) is even handed and reporting what it knows.

"An agreement with Iran is possible"

However, Political scientist, Professor Samir Awad, from Birzeit University near Ramallah, disagrees with Asculai and challenged his analysis.

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"I think there is a possibility of reaching an agreement with Iran. Iran has made it abundantly clear that it has no intention of pursuing a nuclear programme for military purposes and this claim has been supported by both the Russians and the Chinese," Awad told IDN.

"Iran wants to develop its nuclear programme for civilian purposes to help its economy develop, i.e. to have the same capabilities that are possessed by Germany, Japan, Brazil and South Africa.

"It aims to have sufficient nuclear technology for generating energy and has the same right as other countries to possess this. President Rohani wants to open the country up to the world.

"He doesn't want an isolated and secluded country where Iranians with their high standard of education and level of enterprise are stunted economically because of high unemployment and lack of international investment due to sanctions," said Awad.

"I think recently there has been a more positive approach to Iran by both the Americans and the Europeans.

"The Europeans are less sceptical and less afraid of Europe being threatened by a nuclear Iran.

It is also now less of a national issue of security for Americans and more of partisan politics with hard-line Republicans being anti-Iran and the Democrats being more in favour of reaching a settlement, explained Awad.

"Israel, meanwhile, is being absolutely hypocritical in its approach to Iran by accusing Tehran of not being transparent in regard to its nuclear ambitions.

"However, Israel has the largest nuclear arsenal in the Middle East. In addition to being the strongest power in the region it is also the most belligerent and aggressive.

"Netanyahu has been using the alleged threat of a nuclear Iran as a way of winning political points, especially with the current Israeli election.

"Israelis tend to vote for far right-wing parties when they feel their security is under threat and Netanyahu is an expert at manipulating this for political vantage.

"The Iranian bogeyman is also a very convenient way of avoiding the issue of peace talks with the Palestinians by fabricating a larger more existential threat from Iran," said Awad.

"The fact remains that Israel's intelligence agency Mossad has stated that Iran is not working towards acquiring a nuclear bomb and neither do they want one.

"One should also ask why the proliferation theory should not apply to Israel. Why should Iran feel any less threatened by Israel already possessing over 250 nuclear warheads than Israel feeling threatened by Iran possibly wanting to develop them?

Awad doesn't believe regional Arab countries want to obtain nuclear bombs but like Iran wants to develop nuclear facilities for domestic purposes.

"Egypt has signed a deal with Russia to build two nuclear reactors and the United Arab Emirates has signed a similar deal with France," said Awad.

Awad believes that Israel is the main obstacle to a nuclear-free Middle East.

"Even if Iran did have a nuclear bomb it wouldn't be so stupid as to attack Israel. Israel on the other hand appears to have no real intention of giving up its occupation nor its nuclear weapons and this remains the biggest threat to peace in the region," Awad said. [IDN | 16 March 2015] ❖

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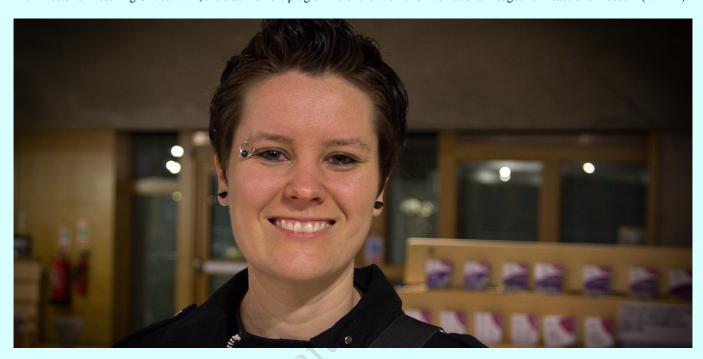
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Opinion: A Legally-Binding Treaty to Prohibit Nuclear Weapons

By Ray Acheson

The Director of Reaching Critical Will, the disarmament programme of the Women's International League for Peace and Freedom (WILPF).



NEW YORK (IPS) - Five years after the adoption of the NPT (Nuclear Non-Proliferation Treaty) Action Plan in 2010, compliance with commitments related to nuclear disarmament lags far behind those related to non-proliferation or the peaceful uses of nuclear energy.

Yet during the same five years, new evidence and international discussions have emphasised the catastrophic consequences of the use of nuclear weapons and the unacceptable risks of such use, either by design or accident. Thus the NPT's full implementation, particularly regarding nuclear disarmament, is as urgent as ever. One of the most effective measures for nuclear disarmament would be the negotiation of a legally-binding instrument prohibiting and establishing a framework for the elimination of nuclear weapons. Not everyone sees it that way.

In fact, ahead of the 2015 Review Conference (scheduled to take place in New York April 27-May

22), the NPT nuclear-armed states and some of their nuclear-dependent allies have argued that any such negotiations would "undermine" the NPT and that the Action Plan is a long-term roadmap that should be "rolled over" for at least another review cycle.

This is an extremely retrogressive approach to what should be an opportunity for meaningful action. Negotiating an instrument to fulfill article VI of the NPT would hardly undermine the Treaty.

On the contrary, it would finally bring the nucleararmed states into compliance with the legal obligations.

Those countries that possess or rely on nuclear weapons often highlight the importance of the NPT for preventing proliferation and enhancing security.

Yet these same countries, more than any other states parties, do the most to undermine the Treaty by preventing, avoiding, or delaying concrete actions necessary for disarmament

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It is past time that the NPT nuclear-armed states and their nuclear-dependent allies fulfill their responsibilities, commitments, and obligations—or risk undermining the very treaty regime they claim to want to protect.

Their failure to implement their commitments presents dim prospects for the future of the NPT. The apparent expectation that this non-compliance can continue in perpetuity, allowing not only for continued possession but also <u>modernisation</u> and deployment of nuclear weapon systems, is misguided.

The 2015 Review Conference will provide an opportunity for other governments to confront and challenge this behaviour and to demand concerted and immediate action. This is the end of a review cycle; it is time for conclusions to be drawn.

States parties will have to not only undertake a serious assessment of the last five years but will have to determine what actions are necessary to ensure continued survival of the NPT and to achieve *all* of its goals and objectives, including those on stopping the nuclear arms race, ceasing the manufacture of nuclear weapons, preventing the use of nuclear weapons, and eliminating existing arsenals.

The recent renewed investigation of the humanitarian consequences of nuclear weapons is a good place to look for guidance. The 2010 NPT Review Conference expressed "deep concern at the catastrophic humanitarian consequences of any use of nuclear weapons."

Since then, especially at the <u>series of conferences</u> hosted by Norway, Mexico, and Austria, these consequences have increasingly become a focal point for discussion and proposed action.

Governments are also increasingly raising the issue of humanitarian impacts in traditional forums, with 155 states signing a joint statement at the 2014 session of the UN General Assembly highlighting the unacceptable harm caused by nuclear weapons and calling for action to ensure they are never used again, under any circumstances.

The humanitarian initiative has provided the basis for a new momentum on nuclear disarmament. It has involved new types of actors, such as the Red Cross and Red Crescent Movement, the United Nations Office for Coordination of Humanitarian Affairs, and a new generation of civil society campaigners.

The discussion around the humanitarian impact of nuclear weapons should be fully supported by all states parties to the NPT.

The humanitarian initiative has also resulted in the <u>Austrian Pledge</u>, which commits its government (and any countries that wish to associate themselves with the Pledge) to "fill the legal gap for the prohibition and elimination of nuclear weapons."

As of February 2015, 40 states have endorsed the Pledge. These states are committed to change. They believe that existing international law is inadequate for achieving nuclear disarmament and that a process of change that involves stigmatising, prohibiting, and eliminating nuclear weapons is necessary.

This process requires a <u>legally-binding international</u> <u>instrument</u> that clearly prohibits nuclear weapons based on their unacceptable consequences. Such a treaty would put nuclear weapons on the same footing as the other weapons of mass destruction, which are subject to prohibition through specific treaties.

A treaty banning nuclear weapons would build on existing norms and reinforce existing legal instruments, including the NPT, but it would also close loopholes in the current legal regime that enable states to engage in nuclear weapon activities or to otherwise claim perceived benefit from the continued existence of nuclear weapons while purporting to promote their elimination.

NPT states parties need to ask themselves how long we can wait for disarmament. Several initiatives since the 2010 Review Conference have advanced the ongoing international discussion about nuclear weapons.

States and other actors must now be willing to act to *achieve* disarmament, by developing a legally-binding instrument to prohibit and establish a framework for eliminating nuclear weapons. This year, the year of the 70th anniversary of the U.S. atomic bombings of Hiroshima and Nagasaki, is a good place to start. [IPS | 6 March 2015] ❖

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What Others Say

Is America's Nuclear Arsenal Dying?

By Michaela Dodge*

As Russia and other nations around the world flex their "nuclear muscles," when it comes to the United States, maintaining a credible nuclear force is certainly a tough task. Challenges include: declining research, development and acquisition budgets; uncertain prospects for modernization, and an American public that lacks a clear understanding how nuclear weapons contribute to national security.

The U.S. nuclear force has prevented a great power war for seven decades. Yet the commitment to maintain a credible nuclear force appears shaky.

That is certainly not the case in competitor nations such as Russia, China and North Korea. While sanctions and low oil prices have crippled Russia's economy, the Kremlin is still doggedly spending billions of dollars on modernizing its strategic rocket forces. Washington's lack of commitment takes a toll on more than investment. It does not go unnoticed by the men and women who man the nation's nuclear submarines, bombers, and intercontinental ballistic missiles (ICBMs). That only makes executing a nuclear mission more difficult, both practically and morally.

Imagine being out on the vast prairie of Montana, North Dakota, Wyoming, Colorado or Nebraska in the dead of winter, the blasts of wind making the sub-zero temperatures nearly unbearable. After driving one to three hours to reach your missile alert facility, you go down into the launch control center (LCC) where the 50-year-old equipment smells the same as it did to your father, who pulled alerts here before you were born.

During winter, heavy snow may trap maintenance and missile alert crews in the missile field for days. When they finally get to go home, the smell of old equipment and chemicals lingers on their clothes.



*Michaela Dodge is a defense and strategic policy analyst in The Heritage Foundation's Allison Center for Foreign and National Security Policy. Dr. Adam Lowther is a research professor at the Air Force Research Institute. This commentary originally appeared in Real Clear Defense and was co-authored by Dr. Adam Lowther.

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Much the same can be said for the bomber crews who fly the exact same aircraft their fathers flew and their sons or daughters will likely fly.

The Heritage Foundation's newly released 2015 "Index of U.S. Military Strength" evaluates the health of the U.S. nuclear complex according to nine categories. In four of those categories—"Warhead Modernization," "Delivery Systems Modernization," Nuclear Weapons Complex" and "Nuclear Test Readiness"—the complex was rated as "weak" (the second worst rating possible).

One of the main factors behind these low scores is sequestration. Its "automatic pilot" budget regimen threatens sustained and predictable funding—a major problem for addressing issues within the nuclear complex. Already it has forced a delay in plans to replace aging delivery systems. This includes everything from a new bomber and its nuclear certifications, to a replacement for the Ohio-class strategic submarine, to a follow-on intercontinental ballistic missile.

Another major factor contributing to lower scores are the government's conflicting policies regarding the nuclear complex. We say we care about the nuclear force and the complex that supports it, yet manpower and resources available to execute the nuclear mission have been steadily declining until recently. We say we are in favor of a robust nuclear modernization program, yet proclaim, at the same time, we need to get to a world without nuclear weapons—all while refusing to truly modernize our weapons.

The President's fiscal year 2016 budget dedicates over \$75 million for the ground-based strategic deterrent, better known as the Minuteman replacement. While the current missiles are in fact woefully archaic—they were first deployed in the 1970s—there is no provision for replacing the even older silos and launch control centers from which a new missile would be launched.

On the bright side, the President's budget accelerates by two years the Long-Range Stand Off missile, an essential advancement in American capabilities. This project is particularly vital considering the limited number of available stealth bombers and the angle of attack needed to counter the tunneling efforts of our adversaries, which make targets hard to reach.

The main question, however, is what Congress will do. At the end of the day, it's the House and Senate that decide which programs get funded and at what level.

The Index's low rankings indicate the areas of America's nuclear force that are in greatest need of investment. And it's a force that must be sustained. The nuclear mission is critical. Its ultimate purpose is to deter a catastrophic attack on our homeland, our forces abroad, and our allies. While it is true that we require a nuclear force we never hope to launch, it is important to recognize that our nuclear weapons serve to keep the peace every day.

[The Heritage Foundation | 3 March 2015] ❖

Other Reports By The Author:

10 Objectives for the FY 2016 National Defense Authorization Act

http://www.heritage.org/research/reports/2015/03/10-objectives-for-the-fy-2016-national-defense-authorization-actBackgrounder

Why Canada Should Join the U.S. Missile Defense Program: Ballistic Missiles Threaten Both Countries

http://www.heritage.org/research/reports/2014/06/why-canada-should-join-the-us-missile-defense-program-ballistic-missiles-threaten-both-countries

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What Others Say

The Challenge of Warning About Nuclear Waste in 10,000 Years

By Scott Beauchamp

"Now I am become death, the destroyer of worlds." It was fitting that J. Robert Oppenheimer, one of the physicists who helped design the atomic bomb, chose to quote from the *Bhagavad Gita* in response to the first successful detonation of a nuclear weapon in the remote sands of New Mexico.

The *Gita*, one of the most venerated Hindu religious texts, chronicles the conversations between Prince Arjuna and the God Krishna — and only the words of a God could appropriately convey the incomprehensible scale on which the United States government had acted. On July 16, 1945, the first nuclear blast in Earth's history erupted with the force of 20 kilotons of TNT. The desert sand within the blast radius was superheated into a radioactive green glass, named trinitite, and a mushroom cloud blossomed over seven miles into the sky.

As impressive as the explosion itself was, the most powerful aspect of the bomb was the invisible force of radiation. On a very limited scale, radiation is something that occurs naturally on Earth. Particles decay, atoms lose energy, and that energy is emitted in the form of radioactive waves. Every time you take a crosscountry flight for instance, you expose yourself to a bath of low-level radiation simply by being closer to space.

It isn't anything to worry about. But the radiation emitted by a nuclear explosion is of another magnitude altogether. After the Trinity test, that first successful detonation in New Mexico, contamination at the blast site was measured at 15 roentgen. Exposure to normal levels of background radiation for most humans is measured at around 200 milliroentgens a year, the equivalent of 0.2 roentgen, as a point of comparison.

Even now, 60 years after the test, levels of radiation at Trinity are about 10 times higher than normal background radiation. The site is open to the public only one weekend a year in April, and visitors are prohibited from touching the still radioactive trinitite.

The most stunning feature of the Trinity test turned out not to be the massiveness of the original blast, but the lingering effects that have survived generations into the future, warping the energy of a specific place and challenging our conceptions of how time is experienced.

Harnessing the power of the atom has forced us to think in new ways about time and energy, specifically when it comes to the safekeeping of nuclear waste.

Radioactivity works on a literally inhuman scale. The waste that's created when building nuclear weapons or running nuclear power plants has a half-life of tens of thousands of years. And we've come up with a surprisingly inelegant way of dealing with it: burying it in the ground. Of course there are sophisticated safety measures in these storage facilities, but there the toxic sludge sits, and should remain there far, far into the distant future. So far into the future, in fact, that the generations of people it will continue to affect stretch so deep into projected time we struggle to imagine what things we might share in common with them. And so a problem arises: How do we tell our distant descendants where nuclear waste is buried and that it's dangerous for humans to be around?

* * *

Radioactive waste could remain dangerous to humans for tens of thousands of years. In the age of the Internet, it's hard to conceive of the difficulties inherent in trying to communicate over such vast amounts of time. We tend to live in a sort of temporal bubble, an eternal present, with communication being made intentionally disposable. We don't tweet for next week, much less for generations yet to be born. And that counter-intuitively makes it easy to lose perspective on what the French Annales School of historians termed *longue durée*, literally the "long term," the deep and almost imperceptible changes over vast stretches of time. It's in these broad historical terms that we should consider communicating messages over something like 300 generations.

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What Others Say

For starters, written language is out. In the *longue durée* it's a relatively new technology anyway, and not necessarily efficient at communicating through deep time. Sumerian, one of the first coherent written languages, was only developed as recently as 3000 BCE. Old, to be sure, but only last week in terms of deep time. Humans have been on Earth for something like a couple hundred thousand years, after all.

Our ability to understand ancient written languages is problematic as well. As Rachel Kaufman wrote for Mental Floss, "Only a few of today's scholars can understand the original *Beowulf* without a translation, and that text is only 1,000 years old." There are at least a handful of ancient languages, such as Isthmian and Olmec, which we still don't quite understand. And there have been instances of civilizations losing the ability to understand written systems as well. According to the 18th-century Scottish historian Alexander Fraser Tytler, the average lifespan of a civilization is about 250 years. Sometimes civilizations decline slowly, like the Western Roman Empire. Or they can collapse almost instantaneously, as in the case of the Mayan. The knowledge accumulated by those societies can be lost over long stretches of time. So any warning to the future about nuclear waste will have to outlast these certainly inevitable collapses, and written language just won't do the trick. We're going to have to be more creative than just posting a sign outside of nuclear waste storage sites.

Fortunately for our distant progeny, people are working on it. And they're coming up with some fascinating propositions. The *Constructing Memory Conference* (or Construire la mémoire) is really a hybrid between a conference and a debate. The most recent took place in Verdun, France, last September and featured contributions from artists, semioticians, philosophers, writers, and archaeologists, offering diverse suggestions of how to communicate warnings through deep time. The artist Cécil Massart, who works with nuclear agencies in France, presented ideas on how each generation can work with and update the ways it explains nuclear dangers to itself, in the hopes of avoiding the sclerotic decay of communication over generations. The British curator Ele Carpenter presented work in creating a **What Others Say**

"Temporary Index," which would consist of countdown clocks being placed at specific nuclear waste facilities, presented in galleries, and featured online.

It makes sense that visual artists would be at the forefront of exploring ways to articulate messages without using written text, and the most ambitious idea featured at the conference was the creation of an Atomic Priesthood. The work of the artists Bryan McGovern Wilson and Robert Williams explores the relationship between the Cumbrian region of England's nuclear industry and it's landscape and folklore, specifically using megalithic monuments to move information in the future. The idea is rather complex, but in a nutshell, it would mean using what they call "atomic folk objects" to create an oral tradition of myths associated with nuclear sites. Imagine stories, objects, costumes, and rituals, all being used to convey the danger and power of nuclear sites and the taboo of digging up the radioactive material buried there. David Barrowclough describes their work as, "[m]eticulous illustrations of a fantastical world juxtaposing industrial mine shafts, nuclear power stations with a prone mummified body and dangerous wolf, all illuminated by an eerie yellow glow; a series of photographs featuring a smartly dressed, yet masked, man in unexpected situations next to a prehistoric standing stone, within a Neolithic stone circle and seated in an armchair in an underground cavern..." It's wonderfully ironic that in order to imagine the far future we have to drudge up the images and implementations of the past.

This is exactly what the Atomic Priesthood idea is all about — using our collective human memory to speculate on our shared future.

The phrase "Atomic Priesthood" was coined by the linguist Thomas Sebok in 1981 while Sebok served on an eclectic team of thinkers assembled by the U.S. Department of Energy and Bechtel Corporation. The team's task was the same as the Construction of Memory Conference — to consider novel ways to communicate the dangers of nuclear waste at least 10,000 years into the future. It was the first of its kind and ushered in what's now known as "nuclear semiotics," human communication along nuclear time.

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Sebok's solution of the creation of an Atomic Priesthood has a few obvious benefits: It doesn't rely solely on written communication, oral traditions and ceremonies can last huge spans of time, and it's modeled on the leadership structure of the Roman Catholic an institution Church, which has already survived two millennia. The Priesthood could dictate



when exposed to high levels of radiation. Cats and humans have cohabitated for thousands of years already and there's no reason why our tight relationship with might end anytime soon. All we would need to do would be to genetically engineer the cats and then create a series of myths or songs about cats' colors changing when they're in dangerous places.

which areas are off limits and help set norms of behavior for dealing with nuclear waste sites. It's a novel idea, but it's not without its flaws. Susan Garfield points out how it might be problematic to artificially create an elite caste (which is what a Priestly caste is by definition) and endow it with so much power. There's also the issue of the priestly caste abdicating its duties in some way. It's a lot of responsibility to put on a very small number of people. What if, instead of limiting themselves to spiritual and nuclear leadership, they got greedy and starting amassing worldly influence like land ownership and political power?

Sebok wasn't the only original thinker to offer up creative ideas to the Department of Energy in 1981. The Polish science fiction writer Stanislaw Lem proposed the creation of artificial satellites that would beam warnings back to Earth. He also proposed the creation of "information plants," vegetation that would somehow convey the danger of nuclear areas to future humans. But these suggestions bring us back to the original problem — who's to say that generations to come would understand the messages that satellites and "information plants" are conveying? The less observer-dependent the messages, the better.

My favorite idea to come out of the 1981 conference was put forth by two French authors, Françoise Bastide and Paolo Fabbri. They suggested the creation of "radiation cats" or "ray cats" whose fur color would change

These proposals are playful, but there's also a sense of seriousness, of necessity. The most down to Earth suggestion came from the Swiss physicist Emil Kowalski, who suggested sealing up the nuclear waste so that it's impossible to reach without a level of technology commensurate with what we currently have. It's safe to assume that if people in the future are able to create tools sophisticated enough to reach the waste they would also have tools that could measure the high levels of radiation and would understand the inherent dangers.

In New Mexico, not too far from where the original Trinity test was held, is the Waste Isolation Pilot Plant. Almost 2 million cubic feet of radioactive waste is buried half a mile deep in the 250-million year old salt deposit. The plant will continue to receive nuclear sludge from around the country until 2070, when it will be sealed up for good. The government half-heartedly anticipated the dangers to future humans and settled on surrounding the plant with obelisks containing messages in Spanish, Navajo, Chinese, Latin, Hebrew, and English. Literal warning signs aren't as inventive as "ray cats," and the drawbacks of using text to communicate through deep time should be obvious by now. But the only thing we should have confidence in when making predictions on this scale is our uncertainty. Maybe, hopefully, the warning signs will be enough. ❖

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Civil Society Perspective

Where Do the Parties Stand on Trident?

By Kate Hudson | General Secretary of the Campaign for Nuclear Disarmament

We have a situation where public opinion against Trident is the strongest it has ever been, at the moment when the final decision on replacement is coming up fast. March 2016 is the date that is being trailed, so the

MPs that are elected this May will comprise the parliament that decides on the future of Britain's nuclear weapons system. Many of us are pulling out the stops to lobby our candidates in advance of the election so they know that Trident is an issue in our voting choices. But what about the political parties and their actual policies? It's all very well individual MPs being against Trident, but it's the party leaderships that will form the government.

Currently, the Conservative Party supports a full 'like-for-like' replacement of the Trident system but it's worth noting that some dissenting voices are appearing – notably Crispin Blunt, MP for Reigate. He opposes Trident on the basis that it damages conventional military spending and no doubt that is a view that will be supported elsewhere too.

The Labour Party wants to retain an independent nuclear deterrent' but is also committed to including Trident in a Strategic Defence Review after the election. In the last few days, Ed Balls has said that Labour might reduce the number of subs from 4 to 3. So Labour is beginning to move at the leadership level.

The Lib Dems are well-known for wanting an end to the current system but are looking for something cheaper – maybe fewer subs and an end to continuous at-sea patrol.

The Green Party, Plaid Cymru and the Scottish National Party are all opposed to Trident and its replacement. In the past this might have been dismissed as what you might expect from fringe parties, but as they have received a surge in support in recent months, it's possible that these parties might hold the balance of power in a hung parliament. So their policies are actually very significant.

So in terms of post-election outcomes, there are some combinations

which could spell a change on nuclear weapons. As it stands currently, only the Conservative Party stands definitively for 'like-for-like' replacement. With Labour and Lib Dems looking at fewer subs that could mean a further delay to starting to build any more – and a further opportunity for us to ensure that the building never starts. With three parliamentary parties outright opposed, it is profoundly to be hoped that if they find themselves supporting a minority government they will never pass a budget, which includes any Trident spending. That is the very minimum we should expect from them. [CND | 20 March 2015] ❖



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