

# समाचार पत्रों से चयित अंश Newspapers Clippings

दैनिक सामयिक अभिज्ञता सेवा

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## Of Mazar-e-Sharif and Pathankot

The last weekend witnessed two almost simultaneous attacks on Indian soil. The first was an attack on the Pathankot air base, and the second was an almost simultaneous attack on the Indian mission in Mazar-e-Sharif, Afghanistan. Though the attack in Pathankot captured the minds and hearts of the country, the assault in Afghanistan received just passing attention in the media. Both attacks were effectively dealt with, though there was no loss of life in Afghanistan. In both cases, the terrorists failed to achieve their laid down objectives. However, one common thread flows through both. The groups involved in both assaults have the support of the Pakistan military. While the one in Afghanistan was dealt with by their army, the one in India was handled with complete lack of military knowledge. Criticism has been rife on the shortcomings in the conduct of the operation in Pathankot. The mix of forces, each trained for a different type of mission, being employed for something they have not rehearsed, with no single appointment to coordinate, shows immaturity and bureaucratic interference with no knowledge on matters military. However, there are issues not yet considered. In every single case of infiltration, the targets have been police stations and army units. Never has the air force been a target. However this time, the assessment led the NSA and the army chief to firmly deduce the air force base as the actual target. If the chaotic confusion of movement of troops and conduct is anything to go by, then I wonder if any specific information was given to the NSA by relevant intelligence agencies, or even by the Pakistani civilian government, which though against the attack would be unable to stop it. At the same time, while since no terrorists are alive to answer the question, why did it take them so long after entering India to launch the actual assault? It would never be known whether it was done intentionally to give notice to India, or was accidental. This gave the security agencies enough reaction time to actually thwart the attack. Of greater surprise is the fact that once the objective was clear, why action was not taken immediately to beef up defences. The DSC should have been replaced by the regular army. It is but simple military logic to enhance the defences of any target once an attack is imminent to thwart the enemy's designs. The above if viewed positively would suggest that efforts were made to enable us to thwart an attack when the same could not be stopped from their side. If viewed as circumstantial evidence then the government needs to review its policies of dealing with Pakistan. If the meeting held by the NSA also had the Chief of Army Staff present, then logically the COAS should have stated that the authority responsible for operations should be the general officer commanding of the local infantry division, rather than the operation being remotely controlled by the NSA from Delhi. Moving the head of the Western Air Command from Delhi truly made no sense, as he has no experience of counter-terrorist operations. Pathankot has an armoured brigade. Employment of tanks and armoured personnel carriers would have ensured a faster and easier destruction of the terrorists. It was a simple case of too many cooks, headed by a chef with no knowledge of his ingredients. The civil police too have to accept a large share of the blame. Not trusting their own SP, that too when there is news of an infiltration, clearly smacks of carelessness and ineptness. Not spreading the word to the local villages, employing sniffer dogs or conducting rigorous search and seek operations indicates complete carelessness. The only worthwhile action they took was to lock themselves into the stations to prevent an attack on themselves. The BSF know that the area is prone to infiltration and smuggling. They are aware of regular movement from across. Yet over the years they have failed to enhance their security systems to cater for changing times. Accepting infiltration to be the norm, rather than an exception, has caused untold harm to the state. In brief, when we compare the two operations, the one which should have been easily handled was completely blundered, whereas the one (Afghanistan) which should have caused more casualties was better handled. The reasons were clear - simpler and easier command and control, better coordination and cohesive employment of force, in spite of it being in the middle of the city, with more chances of collateral damage. The lessons we need to draw are clear. Firstly we must revamp the border responsibility. There cannot be multiple agencies responsible, reporting to different ministries. Make it simple and clear. Secondly, the Punjab Police need to be shaken up. Such ineptness and shoddy police work can never do. Thirdly, bureaucrats, even with an intelligence background, should not attempt what is not their forte. They should avoid taking over operations employing remote controls. Leave dealing with terrorists to the one organization trained for the task, the army. Make an appointment responsible, and let him handle the crisis. That is how it has been handled and that too successfully so far; let it continue. Fourthly, reconsider the importance of navy and air force bases. Raise specialist units for their security. The DSC is good for checking and monitoring movement within and around, not active security. Finally, as a country, we have to be capable of defending ourselves. We cannot cry ourselves hoarse every time. The crisis in Afghanistan and West Asia would affect us also in the days ahead. Therefore we need to be prepared and develop our capability to defeat such terrorist designs, and unless we do so we would never be safe. Talks or no talks, we have to be strong within.

## What North Korea's 'hydrogen bomb' means for Asia and the world

North Korea's claim of having successfully tested a thermonuclear device, if true, could have serious implications for the non-proliferation of nuclear weapons and the balance of power in the Korean Peninsula. This claim comes barely weeks after the country's leader Kim Jong-Un stated his country is developing the capability for a thermonuclear device, or hydrogen bomb, as it is popularly called. While a 5.1 seismic event from near the country's nuclear testing site was reported by international seismic stations, there is no clarity as yet on whether the test was indeed a thermonuclear one and, if so, a successful one. North Korea is unlikely to have mastered the technological capability to make highly sophisticated thermonuclear weapons, and therefore the device tested on Tuesday may well be a "boosted fission weapon", more sophisticated than an atomic (or fission) bomb but not as powerful as a hydrogen bomb. The country has been on the nuclear path for some time now. Having declared its plans in 2003, it tested its nuclear weapons in 2006, 2009 and finally in 2013. Moreover, the country has been conducting submarine-launched ballistic missile (SLBM) tests, a weapon system that when perfected could add great value to North Korea's nuclear delivery capability while, of course, increasing the insecurity of its neighbours. Regional balance of power North Korea's nuclear ambitions have undeniable consequences for the stable balance of power in the Korean peninsula and beyond. For one, this will make Japan and South Korea deeply insecure, especially at a point in time when a rising China is perceived as a challenge by them, and the US' ability to be the security provider for its allies in the region is in serious doubt. Secondly, with the breakdown of the six-party talks with Pyongyang, both the US and China have lost their traction within North Korea. Finally, the only country with some influence in Pyongyang is Russia, with whom the West has no meeting of minds on a variety of geopolitical issues, particularly after the conflict over Ukraine. It also shows that China, the rising superpower, does not enjoy much political and strategic influence in its own backyard. North Korea's nuclear tests, whether or not their thermonuclear claims are valid, pose serious challenges to the global non-proliferation regime even as this order is under immense stress, particularly after the failure of the NPT Review Conference last year. Moreover, if Pyongyang continues to develop more sophisticated, and miniaturised, nuclear weapons and advanced delivery mechanisms, it could potentially force South Korea and Japan to follow similar paths. This also calls into question the efficiency of the global non-proliferation regime to prevent the further spread of nuclear weapons and technology. Recall how Pakistan, when the AQ Khan nuclear black market was flourishing, had given nuclear technology and weapon designs to North Korea. Failure of nuclear diplomacy While the Obama administration was able to successfully defuse the Iranian nuclear impasse, it has summarily failed to address the North Korean nuclear challenge. The so-called six-party talks, as part of which China, Japan, South Korea, Russia and the US negotiated with North Korea to terminate its nuclear weapons programme, collapsed in 2009 after six years of fruitless efforts to contain Pyongyang's nuclear ambitions. For the talks to begin again, the Obama administration and the West would need to re-engage not only North Korea but also Russia. By testing its nuclear devices, Pyongyang has not really violated any treaties: It had withdrawn from the Non-Proliferation Treaty (NPT) in 2003, and had never signed the Comprehensive Test Ban Treaty (CTBT). However, given the potential implications that the recent North Korean test have for the global non-proliferation regime, the international community needs to immediately re-engage Pyongyang.

The Statesman

07 January 2016

## North Korea nuclear test a "wake-up call" for the world

SEOUL | BY JAMES PEARSON - The head of an international body set up to monitor a planned ban on nuclear testing condemned North Korea's fourth nuclear test on Wednesday and called it a "wake-up call" for the international community. North Korea said it had successfully conducted a test of a miniaturised hydrogen nuclear device, which would mark a significant advance in the isolated state's technological capability. "This act constitutes a breach of the universally accepted norm against nuclear testing," Lassina Zerbo, head of the Comprehensive Nuclear-Test-Ban Treaty Organisation (CTBTO). "It is also a grave threat to international peace and security." Wednesday's detonation was North Korea's fourth nuclear test, and second since young leader Kim Jong Un came into power in 2011. The isolated country last tested a nuclear device in 2013. More than 160 countries have ratified the Comprehensive Nuclear Test Ban Treaty (CTBT) since 1996. India and Pakistan have also conducted nuclear tests since then and are among eight countries including the United States and China preventing the treaty coming into force. "I sincerely hope that this will serve as the final wake-up call to the international community to outlaw all nuclear testing by bringing the CTBT into force," Zerbo said.

## Kim thrilled by H-bomb show

North Korea said on Wednesday it successfully detonated its first hydrogen bomb, a claim that if confirmed would signal a major advancement in the isolated country's nuclear capabilities. The announcement - made a month after North Korean leader Kim Jong Un suggested the secretive Northeast Asian nation had the capacity to launch an H-bomb - sparked immediate regional tensions and drew international condemnation. Yet, some officials and analysts raised doubts whether the explosion was indeed a full-fledged test of a hydrogen device. Al Jazeera examines the most important questions surrounding North Korea's announcement. People in the capital Pyongyang cheered their country's claimed military success on Wednesday, images showed, but it could be a long time before it has actually been proved a hydrogen device was indeed tested. H-bombs are much more difficult to design and produce compared to atomic bombs - and can be thousands of times more powerful. "Such a device could evaporate the entire city of New York completely - no one would stay alive," Andrei Lankov, a professor of Korean Studies at Kookmin University in Seoul, told Al Jazeera. "With an atomic bomb you can kill half of Manhattan, at most." While much more potent, H-bombs are also much more costly. "For the North Koreans to have such a powerful and expensive [device] is a bit of overkill - it simply does not make sense," Lankov told Al Jazeera. "It's like buying a Porsche to go shopping in a shop nearby... It's a very expensive programme which will not really make a major contribution towards their security - but governments sometimes do crazy things. I'm sceptical but it might be the case." Adam Cathcart, a lecturer in Chinese history at the University of Leeds, said North Korea has previously made claims over huge scientific leaps that have not been substantiated. "However, Kim Jong Un's statement back on December 10 about the state's H-bomb abilities certainly telegraphed this test, and at least tells us that the supreme leader has staked his prestige on the claim," he told Al Jazeera. From 2006 to 2013, North Korea conducted three nuclear tests of atomic weapons - all at the Punggye-ri site, near which a 5.1 magnitude earthquake was detected on Wednesday. Regardless of the validity of the hydrogen bomb claims, Wednesday's announcement has left no doubt about Pyongyang's commitment to its nuclear programme, analysts said. "[It is showing] that it's relatively successful and making progress," Remco Breuker, a professor of Korean Studies at Leiden University, told Al Jazeera. "And more importantly perhaps that the possession of nuclear weapons is non-negotiable for this regime." Lankov agreed. "What's important is to know it [the nuclear programme] exists. When North Koreans began to talk about their nuclear programme initially there were some people who suspected that they were bluffing." From the moment the H-bomb test was announced on state television, speculation has been rife about what prompted North Korea's action. Some analysts said although they were not completely surprised by the move, there are still questions over its timing. In recent months North Korea appeared to have had increased its efforts to improve relations with several other countries, from its traditional regional ally China to Russia and nations in Southeast Asia.

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The Hindu

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## Kim reasserts his complete control over North Korea

With a surprise nuclear test two days before his birthday, North Korea's young leader Kim Jong-un has once again asserted his personal control over the hermit state he inherited from his late father four years ago. When he came to power after Kim Jong-Il's death in December 2011, the younger Kim was considered untested, vulnerable and likely to be manipulated by senior figures. But he has proved his metal in dealing harshly with any sign of internal dissent, even at the highest levels, while maintaining an aggressively provocative stance with the international community. Alienating China He has shown himself willing to alienate the North's sole major ally China with his unstinting efforts to advance the country's nuclear and missile programmes that culminated in Wednesday's announcement of a "successful" hydrogen bomb test. With the H-bomb claim, Kim can now boast of a "great achievement that even [founding leader] Kim Il-Sung or Kim Jong-Il could not realise," said Toshimitsu Shigemura, a professor at Tokyo's Waseda University and an expert on North Korea.



## North Korea claims 'Hydrogen-bomb' test, world outraged

North Korea said it successfully tested a miniaturised hydrogen nuclear bomb on Wednesday, prompting scepticism among experts and officials who doubt Pyongyang has achieved such a major advance in its strike capability. The test, the fourth time the isolated state has exploded a nuclear device, was ordered by leader Kim Jong-un and successfully conducted at 10.00 a.m. local time (0130 GMT), North Korea's official KCNA news agency said. "Let the world look up to the strong, self-reliant nuclear-armed state," Kim wrote in what North Korean state TV displayed as a handwritten note. South Korean intelligence officials and several analysts questioned whether Wednesday's explosion was a test of a full-fledged hydrogen device, pointing to the fact that it was roughly as powerful as North Korea's last atomic test in 2013. But the development unnerved South Korea and Japan and drew international criticism, including from China and Russia, North Korea's two main allies. United Nations Secretary-General Ban Ki-moon condemned North Korea's action, calling it "profoundly destabilising for regional security", while US House Speaker Paul Ryan said it "looks like a provocation". No countries were given advance warning of a nuclear test, South Korea's intelligence service said, according to lawmakers briefed by intelligence officials. In previous such tests, Pyongyang had notified China, Russia and the United States beforehand, they said. While a fourth nuclear test had been long expected, the claim that it was a hydrogen device, much more powerful than an atomic bomb, came as a surprise, as did the timing. It ensures that North Korea will be a key topic during the US presidential campaign. Republican candidate Marco Rubio blamed North Korea's nuclear activities on President Barack Obama's "failed" foreign policy. Mr Rubio's rival Donald Trump said the onus was on China to solve what he called the North Korean "problem", and if it did not, the United States "should make trade very difficult for China." North Korea has long coveted diplomatic recognition from Washington, but sees its nuclear deterrent as crucial to ensuring the survival of its third-generation dictatorship. "With Iran being off the table, the North Koreans have placed themselves at the top of the foreign policy agenda as far as nation-states who present a threat to the US", said Michael Madden, an expert on the country's secretive leadership. The device had a yield of about 6 kilotons, according to the office of a South Korean lawmaker on the parliamentary intelligence committee - roughly the same size as the North's last test, which was equivalent to 6-7 kilotons of TNT. "Given the scale, it is hard to believe this is a real hydrogen bomb," said Yang Uk, a senior research fellow at the Korea Defence and Security Forum. "They could have tested some middle stage kind (of device) between an A-bomb and H-bomb, but unless they come up with any clear evidence, it is difficult to trust their claim." Joe Cirincione, a nuclear expert who is president of Ploughshares Fund, a global security organization, said North Korea may have mixed a hydrogen isotope in a normal atomic fission bomb. "Because it is, in fact, hydrogen, they could claim it is a hydrogen bomb," he said. "But it is not a true fusion bomb capable of the massive multi-megaton yields these bombs produce". The US Geological Survey reported a 5.1 magnitude quake that South Korea said was 49 km (30 miles) from the Punggye-ri site where the North has conducted nuclear tests in the past. North Korea's last test of an atomic device, in 2013, also registered at 5.1 on the USGS scale. The test nevertheless may mark an advance of North Korea's nuclear technology. The claim of miniaturizing, which would allow the device to be adapted as a weapon and placed on a missile, would pose a new threat to the United States and its regional allies, Japan and South Korea. The North's previous miniaturization claims have not been independently verified. Many experts also doubt whether the North possesses missile technology capable of reliably delivering a warhead to the continental United States. PM Shinzo Abe said Japan would make a firm response to North Korea's challenge against nuclear non-proliferation. "North Korea's nuclear test is a serious threat to our nation's security and we absolutely cannot tolerate it," Abe told reporters. "We strongly denounce it." South Korea said it would take all possible measures, including possible United Nations sanctions, to ensure Pyongyang paid the price after its fourth nuclear test.

## N Korea faces global criticism

**Washington/Beijing, Jan 6** - North Korea's announcement today that it successfully conducted its first hydrogen bomb test drew strong criticism from the reclusive nation's neighbours including key ally China and the West which warned of a robust response to its "grave provocations". The surprise test was personally ordered by North Korean leader Kim Jong-Un and came just two days before his birthday. The US said it was too early to verify North Korea's claim but vowed to "respond appropriately" to "any and all provocations." Japanese Prime Minister Shinzo Abe said, "The nuclear test that was carried out by North Korea is a serious threat to the safety of our nation and we absolutely cannot tolerate this." "This clearly violates UN Security Council resolutions and is a grave challenge against international efforts for non-proliferation," he said. South Korean President Park Geun-Hye called the test a "grave provocation" to its national security and a "threat to our future". She said North Korea's action is a strong challenge to international peace and stability. China, North Korea's key ally, "firmly opposed" the test which was conducted "irrespective of the international community's opposition". "We strongly urge the DPRK side to remain committed to its denuclearisation commitment, and stop taking any actions that would make the situation worse," foreign ministry spokeswoman Hua Chunying said, using the North's official name. The EU condemned North Korea's claimed hydrogen bomb test as a "grave violation" of a UN ban on its development of nuclear weapons and a threat to the region. NATO Secretary-General Jens Stoltenberg called the test as "clear breach" of UN Security Council resolutions and "undermines regional and international security." Yukiya Amano, chief of UN nuclear watchdog International Atomic Energy Agency said that North Korea's test of a hydrogen bomb, if confirmed, is a violation of UN Security Council resolutions and is "deeply regrettable".

**Deccan Herald**

**07 January 2016**

### **India's satellite station in Vietnam to 'stir up trouble', says China**

China views India's newest satellite tracking station in Vietnam as an attempt by it to "stir up trouble" in the disputed South China Sea. China's state-run Global Times on Wednesday quoted a researcher in a social science institution stating that New Delhi's move to set up the satellite tracking station at Ho Chi Minh City in Vietnam "clearly" indicated its "attempt to complicate the regional dispute". Deccan Herald in its November 22, 2015 edition had reported that India had set up a state-of-the-art Data Reception and Tracking and Telemetry Station at Ho Chi Minh City. The satellite monitoring station in Ho Chi Minh City, once activated and linked up with another existing facility at Biak in Indonesia, is likely to give India a strategic edge in and around South China Sea region. It apparently raised hackles in China. In a report titled "Countries outside region play up test flights in South China Sea", the Global Times quoted Gu Xiaosong, an "expert on Southeast Asian studies" at the Guangxi Academy of Social Sciences in Nanning. "India has no territorial disputes with China in the South China Sea. It wants to stir up trouble in the region to serve its own ends, which is to counterbalance China's influence," Gu was quoted by Global Times. New Delhi spent about \$23 million to set up the new facility in Ho Chi Minh City. The facility will primarily help the Indian Space Research Organisation (Isro) to track satellites launched from India and receive data from them. It will, however, also be an important strategic asset for India in and around South China Sea, which has been at the centre of an escalating conflict between China and its maritime neighbours - Brunei, Malaysia, Vietnam, Philippines and Taiwan. India of late raised its pitch on South China Sea arguing in favour of freedom of navigation and over-flight, almost echoing strong positions taken by US and Japan. New Delhi is of the view that South China Sea dispute must be solved through dialogue and in a peaceful manner in accordance with principles of international law, including the 1982 UNCLOS (United Nations Convention on the Law of the Sea).

## 'No fighter jet deal with Pakistan'

The Sri Lankan government has denied reports that it has struck a deal with Pakistan for the purchase of JF-17 Thunder fighter jets. "The matter did not even come up for discussion during the talks [with the Pakistani government]," Karunasena Hettiarachchi, Defence Secretary, told The Hindu, adding that his government was still considering the purchase of fighter jets. Terming the reports as "incorrect," Mahishini Colonne, spokesperson of the Ministry of Foreign Affairs, responded, saying that "if there arises a requirement for Sri Lanka to procure aircraft of this nature, in keeping with the policy of the Government of Sri Lanka to maintain transparency, expressions of interest will be called for, from all concerned." According to the reports, Sri Lanka has been under pressure from the Indian government not to go ahead. Sections of the press, in the last few months, also carried reports that India had offered to Sri Lanka "Tejas," a variant of Light Combat Aircraft, to counter Pakistan's bid to sell JF-17 fighters, which were developed in collaboration with China.

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DESIDOC

## Solar development

I have been long thinking whether the vast solar energy that is wasted in the tropical regions can in any way be utilised. Of course trees consume solar energy. But is there no other way of directly utilising the radiant energy of the Sun? -Excerpt from the personal diary of Acharya Jagadish Chandra Bose (Sunday, 5 March 1885). Acharya JC Bose is recognised the world over as a pioneer in the science of Millimetre waves, using galena (lead sulphide) semiconductor detectors called coherers. Averse to patenting, his only US patent in 1904 was through the intervention of Sister Nivedita. It is not generally known that he did not rest on his words but also invented a 'Tejometer'-a prototype solar cell using galena as the semiconductor. Over a 100 years later India has woken up to the importance of solar energy in its development mission. The Jawaharlal Nehru Mission (JNM) for solar energy initially proposed to install 20,000 MW (20 GW) of solar photovoltaic systems by 2020. The target has been increased to 100,000 MW by 2022, a challenging proposition to say the least. Use of renewables such as solar energy is a major weapon against global warming as there are no fossil fuels involved except in the manufacture of the systems. The intensity of solar radiation varies depending on the location, is subject to the vagaries of the weather, and is not available at night. Nevertheless, it has been shown that villages at a distance of 15 km from the grid are best served by stand-alone solar installations. As such, with other renewables such as micro-hydel and biomass, it is the best solution for supplying electricity to 30 per cent of India's villages that still remain without electricity. JNM's aim is to ensure 'domestic production of critical raw materials, components and products, as a result to achieve grid tariff parity by 2022'. Herein lies the problem. The Prime Minister is fully aware of the importance and relevance of solar energy. It appears that India has forged a "solar alliance" with France which gets over 70 per cent electricity from nuclear plants and is not specially advanced in solar PV though it was the first to install a solar tower for solar thermal power generation. Germany being the most advanced country in Europe with up to 15 per cent electricity generated from Solar PV, it would have been logical to tie up with that country in a solar mission on his recent visit to Germany. Silicon is the material at the base of modern electronics and IT, be it computers, television, mobile phones which all depend on silicon chips for their operation. Semiconductor silicon is now used in 85 per cent of all the photovoltaic (PV) cells in commercial use. However in the 21st century when India is vying to become a world power, it does not manufacture even one kilogram of Semiconductor Silicon. The limited manufacture of silicon chips in SCL, Chandigarh, BEL and ITI in Bangalore all depend on imported wafers. These are required in limited quantities but when it comes to silicon in photovoltaics it's a different matter altogether. One MW capacity of solar modules requires 3-7 tonnes of highly pure semiconductor grade silicon. Thus for 20,000 MW, India requires about 100,000 tonnes of silicon. China has captured the Solar PV market worldwide and now makes more than 90,000 tonnes annually. Even Taiwan produces 8000 tonnes/year while India depends entirely on imports. In 2013 the production of high purity polysilicon reached 200,000 tonnes worldwide. As for the manufacture of photovoltaic modules, China, starting with one per cent in 2001, now accounts for 45 per cent of world production. What was the Planning Commission doing in the last two decades? The much-vaunted Solar Mission has nothing to say about this glaring omission. The members of the Science Advisory Committee are mainly nuclear scientists and metallurgical engineers who have been obsessed with the signing of the Indo-US nuclear accord, the import of uranium from Australia and Canada and most recently the import of 2000 tonnes of uranium from Uzbekistan. On the other hand, Electronics and Renewable Energy has had no strong advocate in the committee. Obsessed with nuclear energy, India neglected the development of electronics. ECIL in Hyderabad was set up mainly as an auxiliary to the nuclear industry to provide instrumentation and control. Thus the first public sector semiconductor industry to be set up, Bharat Electronics (BEL), started its venture into Germanium transistors in the late 1960s when the rest of the world had already switched over to silicon. The electronics revolution has led to a dramatic improvement in mobile communication. The computer market is expanding at the rate of 30 per cent annually (no thanks to the GOI), but where is the 'energy too cheap to meter' promised by nuclear reactors? No more than 4.5 per cent of the electricity generated in India is from nuclear reactors. There is increasing resistance to setting up such reactors after Chernobyl and Fukushima. Since 1000 MW nuclear power reactors require one million gallons of water every day, are our seashores to be dotted with reactors every 100 miles? Decommissioning an early reactor in Britain is estimated to cost \$ 20 billion. Are these figures factored in when calculating the cost of nuclear energy? Given an enormous AEC establishment and after investing thousands of crores over six decades, why do



part-2

## Solar development

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we have to look to France, Russia or the USA for technology? Remember Homi Bhabha's brave assertion that in future 'India should not have to look outside for nuclear technology'. It is not commonly realised that electronic-grade silicon is the purest material on earth. It is like finding a Black Hole among a million million stars. There are now only 6-8 major producers of electronic-grade silicon in the world, Germany, Norway and Taiwan being the other three. All are vigorously expanding their production capacity in view of the worldwide shortage of silicon, which is expected to become even more critical with the rapid expansion of the PV industry, especially in developing economies. Indigenous production of silicon is essential for making large-scale solar PV projects in India viable. After all there is no fuel, no cooling water requirement and hardly any maintenance costs with round-the-year energy generation. The drawback is obviously the limited hours of sunshine, and this requires battery storage. However there are many applications such as irrigation and office air-conditioning where the demand is maximum during daylight hours. Solar lighting has already proved to be a boon in villages near the Sunderbans and has transformed lifestyle. Due to wrong planning and excessive reliance on nuclear energy India has again missed the silicon bus. The Prime Minister's ambitious 'Make in India' project should surely include the manufacture of semiconductor silicon, which is the bedrock of the modern electronics and IT industry.

The Indian Express

07 January 2016

### From potable seawater to cleaner Ganga, the promise of atomic science

When a tsunami devastated coastal Tamil Nadu in 2004, it also wiped out regular supplies of drinking water. New water desalination technologies from the Department of Atomic Energy were deployed to convert seawater into drinking water. Over the years, DAE has notched over half a dozen patents for water purification and desalination to meet what is considered a major requirement in India. Water purification technologies developed by the DAE are now even promising to clean the Ganga. At a special session at the Indian Science Congress to showcase technologies that have evolved from massive investments made in the atomic energy sector over the years, DAE scientists highlighted applications such as the use of radiation and radioisotopes in agriculture to improve crop varieties, control pests and meet drinking water needs. "If you scan the whole country and look at the people working to clean or desalinate water, you will find that the maximum work has been done in the Department of Atomic Energy," former Atomic Energy Commission chairman Srikumar Banerjee said during the conference. "DAE has developed several types of indigenous desalination and water purification technologies addressing the unique challenges faced by the country. The know-how of the technologies has been transferred to many entrepreneurs for wider deployment in a commercially viable manner," said PK Tewari, a leading scientist in the field of membrane technology for water desalination and purification at Bhabha Atomic Research Centre. "Our membrane-based water effluent treatment systems have the potential to play a vital role in the cleaning of the Ganga," he said. "DAE has developed technology and set up the largest nuclear desalination demonstration plant of 6.3-million-litres-per-day capacity for seawater desalination coupled Madras Atomic Power Station," Dr Tewari told the science congress. The desalination plant attached to MAPC is based on a "hybrid multi-stage flash reverse osmosis technology" and is producing and supplying distilled water for high-end applications and water for drinking and other uses, he said. Locating the desalination and power plant near each other enables supply of seawater, steam and electricity for desalination. "Rural adaptability of the technologies has been demonstrated. Field demonstration of the technologies for purification of raw water with bacteria, virus, fluoride, arsenic, iron, uranium and other contaminants had been carried out in different parts of the country. DAE is providing technical support and guidance to clean and develop water bodies," Dr Tewari said. According to Fields medal-winning mathematician Manjul Bhargava, India needs scientists focused on solving local problems since many of these are unique. "A lot of the science that is needed in India is not what is available in the world. The climate is different. The kind of food problems that Chennai had recently are very specific to India," he said. "We need scientists who are on the ground in India solving the problems that India has, making innovations that are specifically required in India. We need to have that basic knowledge ready when it is needed in situations like floods or when there are societal needs."

## India to skip BS-V leapfrog to BS-IV

NEW DELHI: Government, on Wednesday, preponed the implementation of BS-VI emission norm to 2020. The decision was taken at a meeting chaired by transport minister Nitin Gadkari and was attended by ministers of petroleum, environment and heavy industries. Gadkari told TOI that the decision to take necessary steps to reduce air pollution in the country was unanimous. Oil minister Dharmendra Pradhan said that the government has kept the promise of PM in COP-21. India currently has BS-III, equivalent of Euro-III specifications, across the country and BS-IV in major cities. "BS-IV will be supplied in most big cities by April 2016 and all over the country from April 2017," he said. Oil refineries will need to invest Rs 80,000 crore in upgrading petrol and diesel quality to meet cleaner fuel specifications by 2020. Previously, the fuels meeting Euro-IV or Bharat Stage (BS)-IV specifications were to be supplied throughout the country by April 2017 and BS-V or Euro-V grade fuel by April 1, 2020. BS-IV fuels contain 50 parts per million (ppm) sulphur, while BS-V and BS-VI grade fuel will have 10 ppm sulphur. Oil refineries had previously upgraded technology and invested over Rs 55,000 crore for production and supply of BS-III/IV fuels. Another Rs 80,000 crore investment would be required for further upgradation. Currently, BS-IV auto fuels are being supplied in whole of northern India covering J&K, Punjab, Haryana, Himachal Pradesh, Uttarakhand, Delhi, parts of Rajasthan and western UP. The rest of the country has BS-III grade fuel. Oil refineries had previously upgraded technology and invested over Rs 55,000 crore for production and supply of BS-III/IV fuels. Another Rs 80,000 crore investment would be required for further upgradation. Currently, BS-IV auto fuels are being supplied in whole of northern India covering J&K, Punjab, Haryana, Himachal Pradesh, Uttarakhand, Delhi, parts of Rajasthan and western UP. The rest of the country has BS-III grade fuel.

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## Giant black hole 26 mn light years away found

NASA's Chandra X-ray Observatory has found evidence of powerful blasts of gases produced by a super massive black hole about 26 million light years from Earth, an event that may trigger the formation of new stars.

This is one of the nearest super massive black holes to Earth that is currently undergoing such violent outbursts, researchers said. Astronomers found this outburst in the super massive black hole centred in the small galaxy NGC 5195. This companion galaxy is merging with a large spiral galaxy NGC 5194, also known as "The Whirlpool." Both of these galaxies are in the Messier 51 galaxy system, located about 26 million light years from Earth. "For an analogy, astronomers often refer to black holes as 'eating' stars and gas. Apparently, black holes can also burp after their meal," said Eric Schlegel of The University of Texas, who led the study. "Our observation is important because this behaviour would likely happen very often in the early universe, altering the evolution of galaxies," said Schlegel. "It is common for big black holes to expel gas outward, but rare to have such a close, resolved view of these events," said Schlegel. In the Chandra data, the researchers detect two arcs of X-ray emission close to the centre of NGC 5195. "We think these arcs represent fossils from two enormous blasts when the black hole expelled material outward into the galaxy," said Christine Jones of the Harvard-Smithsonian Centre for Astrophysics (CfA) in US. Just outside the outer X-ray arc, the scientists detected a slender region of emission of relatively cool hydrogen gas. This suggests that the hotter, X-ray emitting gas has "snow-plowed," or swept up, the hydrogen gas from the centre of the galaxy. This is a clear case where a super massive black hole is affecting its host galaxy in a phenomenon that astronomers call "feedback." In NGC 5195, the properties of the gas around the X-ray-glowing arcs suggest that the outer arc has plowed up enough material to trigger the formation of new stars. "We think that feedback keeps galaxies from becoming too large. But at the same time, it can be responsible for how some stars form. This shows that black holes can create, not just destroy," said co-author Marie Machacek of CfA. The outbursts of the super massive black hole in NGC 5195 may have been triggered by the interaction of this smaller galaxy with its large spiral companion, causing gas to be funnelled in towards the black hole, researchers said.

## How H-bomb differs from nuclear bomb

North Korea's government claims it has successfully conducted a test of a hydrogen bomb. For now experts are very skeptical of that claim. They agree that North Korea likely tested some sort of atomic weapon on Tuesday, but it remains to be seen what type. This question matters greatly. North Korea already has atomic bombs, similar to the ones used in World War II. But hydrogen bombs can be thousands of times more powerful - they're the most terrifyingly destructive inventions humans have ever assembled. A short overview of the difference is below. The difference between an atomic bomb and a hydrogen bomb

Atomic bombs - like the two the United States used against Japan in World War II - rely on a process known as nuclear fission. Isotopes like uranium-235 and plutonium-239 easily undergo fission - when a neutron hits their nucleus, the nucleus splits, releasing more neutrons and a tremendous amount of energy. And when you have a large critical mass of uranium-235 or plutonium-239, all that splitting and neutron creation leads to a runaway chain reaction. Each time an atom is split apart, it releases more neutrons and energy, which split apart other atoms and release even more energy: To create an atomic bomb, engineers typically design explosives that can force together pieces of uranium-235 or plutonium-239 into a critical mass. Once that happens, boom. These bombs are incredibly powerful: The two dropped on Hiroshima and Nagasaki completely leveled those cities, exploding with forces of 15,000 and 20,000 tons of TNT, respectively. The most powerful fission bombs ever built can produce explosions equal to 500,000 tons of TNT. But they're not the biggest bombs out there. Hydrogen bombs are thousands of times more powerful than their atomic predecessors. The first hydrogen bomb the United States ever tested in the Marshall Islands in 1952, called Ivy Mike, had the force of 10 million tons of TNT (or 10 megatons). The most powerful hydrogen bomb ever - a Russian nuke called Tsar Bomba, literally "king of bombs" - had a yield of 50 megatons of TNT. A blast from Tsar Bomba could cause radiation burns as far as 62 miles away. Windows more than 500 miles away shattered during the Tsar Bomba test. Hydrogen bombs combine both nuclear fission and a different process known as nuclear fusion to produce a far, far more powerful blast. How a hydrogen bomb works

The first stage of a hydrogen bomb involves a fission explosion, as described above. That explosion, in turn, leads to a second stage - fusion. The extreme heat and pressure from the initial atomic blast force together deuterium and tritium (two light gases made of hydrogen). When they are forced together, some of the hydrogen atoms fuse to one another, creating helium. This process of fusion releases even more energy per unit of mass than fission does, and the energy released from the fusion reaction also feeds back into the fission reaction, increasing its output. This all happens nearly instantaneously. Science historian Alex Wellerstein has created an online tool for comparing the impact of the different types of nuclear weapons. For the sake of a demonstration, let's drop "Little Boy," the bomb used in Hiroshima, on Lower Manhattan. This is the resulting blast radius

Now let's look at a hydrogen bomb. This is the blast radius of Ivy Mike - the first (but not the most powerful) hydrogen bomb ever tested: The first is a catastrophe. The second is so horrifying it's unimaginable. How to tell if North Korea tested a hydrogen bomb

Right now, experts seem skeptical that North Korea has actually produced a working hydrogen bomb, which is a much harder technological feat to pull off. The blast recorded in North Korea on Tuesday was of a similar magnitude as the country's last nuclear test in 2013, which suggests the North Koreans have not upped their nuclear capabilities with a more powerful weapon. (Or perhaps they tested a hydrogen bomb design and the second fusion phase failed.) As the Korea Herald reports, North Korea has yet to produce a bomb that even matches the power of the two bombs dropped on Japan in World War II (as best we know). But ultimately, we may not know for sure for days or weeks what North Korea tested. Scientists will have to examine the radioisotopes released into the atmosphere from the blast, to see whether those match the profile of an atomic bomb or a hydrogen bomb. The Preparatory Commission for the Comprehensive Nuclear-Test-Ban Treaty Organization - CTBTO for short - maintains a worldwide network to detect nuclear explosions whether they occur underground, in the air, or underwater.

## Periodic table's seventh row finally filled

The world is going to need new science textbooks. Four new elements have been added to the periodic table, finally filling out its seventh row, in a change approved by the International Union of Pure and Applied Chemistry (IUPAC), which governs such decisions. The elements were discovered in the past several years by researchers in Japan, Russia, and the United States, IUPAC said in a statement on December 30. Chemists and chemistry enthusiasts are, and we mean this in the best way possible, nerding out. "The chemistry community is eager to see its most cherished table finally being completed down to the seventh row," said Jan Reedijk, a Dutch professor and president of IUPAC's Inorganic Chemistry Division, which will now begin accepting suggestions for names and symbols for the new elements from the scientists involved in the discoveries. The new kids on the block—elements 113, 115, 117, and 118—are "superheavy," a label given to elements with more than 104 protons. Saying that researchers "discovered" them is actually misleading—the elements do not occur in nature, and were created in laboratories using particle accelerators. Element 113, whose temporary working name is ununtrium (Uut), was discovered by Japanese researchers at the Riken institute. Elements 115 (Uup), known as ununpentium, and 117, known as ununseptium (Uus), were discovered by researchers from the Joint Institute for Nuclear Research in Dubna, Russia, the Lawrence Livermore National Laboratory in California, and Oak Ridge National Laboratory in Tennessee. Element 118, referred to as ununoctium (Uuo), was discovered by a joint team of Dubna and Livermore researchers. The periodic table is the most important reference for anything chemistry. Elements are arranged left to right and top to bottom in order of increasing atomic number, which is the number of protons in an atom of a given element. The addition of the quartet comes five years after element 114, flerovium (Fl), and element 116, livermorium (Lv), got their permanent spots on the table. Back then, in 2011, NPR offered a handy explanation of the very difficult process by which scientists create new elements these days: **1. Smash together atoms of two elements. 2. Hope their nuclei fuse. 3. If they do, you have a new element. Congratulations!** And then, you don't. At least not until you fire up the particle accelerators and try to re-create that fusion again, which produces only a few atoms of a new element. Such artificial elements usually exist for less than a second before they decay into other elements. The atoms of element 113, for example, lasted for less than a thousandth of a second, according to the Riken. After researchers twice successfully created 113, it took seven years before they could do it again a third time. "To scientists, this is of greater value than an Olympic gold medal," said Ryoji Noyori, former president of Riken and a Nobel laureate in chemistry, to reporters in Japan last week. The researchers behind the newest additions to the periodic table will now suggest permanent names and two-letter symbols for their baby elements. "New elements can be named after a mythological concept, a mineral, a place or country, a property or a scientist" IUPAC said in its statement. The names and symbols will be reviewed for "consistency" and "translatability into other languages," since they are used internationally. This process isn't easy, either. As Malcolm W. Browne wrote in *The New York Times* in 1995, it took more than three years of "sometimes acrimonious debate across the borders of many nations" to come up with names for elements 104 through 109, which were created by researchers in the U.S., Russia, and Germany. "[T]he naming of a chemical element is influenced by national pride, professional rivalry and personal sensitivities," Browne wrote. "[T]he picking of a single name can provoke as much back-room bickering and bargaining as the selection of an international beauty queen."



## India rattled by H-bomb test

North Korea's Hydrogen Bomb test on Wednesday has also rattled India, which has already been concerned over the reclusive communist country's clandestine nuclear and missile cooperation with Pakistan. India conveyed its "deep concern" over North Korea's claim that it tested a thermonuclear weapon, which is also known as "Hydrogen Bomb" or "H-Bomb". "It is a matter of deep concern that DPRK (Democratic People's Republic of Korea or North Korea) has again acted in violation of its international commitments in this regard," Vikas Swarup, official spokesperson of the Ministry of External Affairs, stated in New Delhi, just a few hours after Pyongyang claimed that it had tested the H-bomb. "We call upon DPRK to refrain from such actions which adversely impact on peace and stability in the region." New Delhi said that it was assessing "available information, including claims (by North Korea) that it was "a thermonuclear test". If what North Korea claimed comes out to be true, it will imply that Pyongyang has advanced nuclear technology and can produce weapons, which are energised by fusion of hydrogen isotopes, unlike atomic bombs, which rely on fission of uranium or plutonium. Officials told Deccan Herald here that if Pyongyang really had the advanced technology to produce thermonuclear weapons, it was "a matter of grave concern" for India, given the history of North Korea's secret nuclear cooperation with Pakistan. "Our concerns about proliferation links between North East Asia and our neighbourhood are well known," Swarup stated in New Delhi, underscoring India's concerns over North Korea's nuke ties with Pakistan. New Delhi suspects that the now-revealed Pyongyang-Islamabad secret defence cooperation, which in mid-1990s led to supply of Rodong Missiles and technology to Pakistan, is still continuing. Abdul Qadeer Khan, the founder of Pakistan's nuclear programme, was in 2003 found to have traded the know-how and technology with Iran, Libya and North Korea. Khan in 2011 made public documents in support of his claim that North Korea had bribed senior officials of the Pakistani Army and got them allow him to share nuclear technology and certain equipment with the pariah nation. India's "Pokhran-II" nuke tests on May 11 and 13, 1998, had included a test on a 45 Kiloton thermonuclear device, which is known as a 'Hydrogen Bomb' in common parlance. Late president A P J Abdul Kalam, who as the director-general of the Defence Research and Development Organisation played the lead role in the "Pokhran-II", had in 2009 told a news agency that the 1998 test had been successful and the "design-yield of the thermonuclear device" had been obtained. Speculation has been rife over Pakistan's efforts for further advancing its nuclear technology, including its pursuit for a H-bomb to match the thermonuclear capability of India.

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### **ISRO STATION IN VIETNAM A BID TO STIR UP TROUBLE IN SCS: CHINA**

India's plan to activate a new data reception and tracking station in Vietnam has been criticised by a Chinese think tank, terming it an attempt by India to "stir up trouble" in the disputed South China Sea region to serve its own ends. Indian Space Research Organisation (ISRO) has set up a Data Reception and Tracking and Telemetry Station in Ho Chi Minh City, which will be activated soon and linked with another station in Biakin, Indonesia, State-run Global Times quoted reports from India as saying. India also has a satellite tracking station in Brunei. Reacting to the report, Gu Xiaosong, a researcher of the Southeast Asian studies at the Guangxi Academy of Social Sciences told the daily that "India has no territorial disputes with China in the South China Sea. It wants to stir up trouble in the region to serve its own ends, which is to counterbalance China's influence." It clearly indicates India's attempt to complicate the regional dispute, Gu said. The news comes close on the heels of the foreign ministry's criticism of Vietnam's protest over China landing its first flight on a newly build artificial island.

## Reading goes the 'smart' way

Author ANEES SALIM shares his literary trends for the year, particularly placing a lot of hope on fiction and mobile publishing. When I first heard about it, I was sceptical about its chances. But, in a country with about 160 million smartphones in use, mobile publishing looks like an extremely interesting idea. And why not? When you depend on your smartphone to decide - among many other things - what to eat, when to eat and where to eat, why not let it give you some food for thought? Juggernaut will probably set a new trend in reading by starting mobile publishing this year. But it is not going to be easy to change reading habits in a country where physical books are still much preferred. I think the real challenge lies in getting people prefer literature over social networking sites on their smartphones. It is one behavioural change that can make a big difference. Translations could be bigger this year, and I think it should be. There is more to good literature than the works of Marquez, Kundera and Tolstoy. Literary gems are scattered across the globe, their appeal and magic limited by the language they are written in. I think, in 2016, we are going to discover more of them as more books will be translated from other languages to English and vice versa. There are many books in regional languages like Malayalam, Tamil and Kannada that deserve to be read by a wider audience and recognised with bigger awards. Like in the West, we are going to see a lot of celebrities turning authors this year. Last year we saw Twinkle Khanna and Shilpa Shetty publishing books to considerable success. I am sure lots of Bollywood stars are going to take after them, writing about their lives or about topics they have a fair idea about. Some books by the bigwigs of Bollywood have already been announced and eagerly anticipated. But what would really interest me is a book on Bollywood by someone who failed to make a mark there; a bitter and unrestrained account of the film industry by a failed actor or someone who tried to direct a movie or score music in vain. The print version of a spy cam. That would be a breath of fresh air among those highly predictable books about hard work, sacrifice and the eventual success, glamour and glitz. I think commercial fiction will continue to do well in 2016, and we will probably have new stars in that genre. But I see a welcome dip in the demand for college and school romances. With a huge fan following for J.K. Rowling in India, I wouldn't be surprised if someone manages to strike gold with fantasies with desi backdrops and characters. It is going to be a good year for short stories as well. Of late, short stories are being widely read across the world and they are being acknowledged with accolades too. Probably short stories and novella are the genres that can benefit from innovative publishing initiatives like Juggernaut. I have a feeling that the New Year will flood you with explosive tell-all memoirs by politicians, kingpins and bureaucrats. There should be a long line waiting at bookstores: the retired, suspended, convicted, acquitted, sidelined, defeated...there is a long list of aspirants. And no matter if their memoirs are cooked up or real, they are such entertainers and crowd-pullers. Let me wrap this piece up with a wish, not a prediction. I hope literary fiction will do exceptionally well this year. I hope writers of literary fiction, especially debutants, will find it easier to get publishing deals. I hope they will be read more, discussed more, celebrated more and rewarded better. I hope literary fiction will be promoted with the same zest with which commercial fiction is often promoted. Am I asking for too much? But it is not going to be easy to change reading habits in a country where physical books are still much preferred.

## हाइड्रोजन बम के 'सफल' परीक्षण का दावा किया उत्तर कोरिया ने

उत्तर कोरिया ने बुधवार को दावा किया कि उसने हाइड्रोजन बम का 'सफल' परीक्षण किया। यह उत्तर कोरिया का एक हैरान कर देने वाला कदम है। अगर उसके इस दावे की पुष्टि हो जाती है तो यह प्योंगयांग के अभी तक सीमित परमाणु शस्त्रागार में सुधार की दिशा में उसकी एक बड़ी छलांग होगी। अंतरराष्ट्रीय समुदाय ने इस परीक्षण की घोर निंदा की है। एक टेलीविजन प्रस्तोता ने प्रचार करने के अंदाज में बयान देते हुए कहा कि उत्तर कोरिया ने देश की 'परमाणु शक्ति को अगले स्तर पर ले जाते हुए' एक 'छोटे आकार' के हाइड्रोजन बम का परीक्षण किया है और अमेरिका व अन्य शत्रुओं से रक्षा के लिए देश को एक हथियार मुहैया कराया है। बयान में कहा गया कि यह परीक्षण 'पूर्णतः सफल' रहा और इस घोषणा के बाद प्योंगयांग की गलियों में जश्न मनाया गया। दक्षिण कोरिया की राष्ट्रपति पार्क गेयुन हे ने सेना को अमेरिकी बलों के साथ अपनी संयुक्त रक्षा स्थिति को मजबूत करने का आदेश दिया और इस परीक्षण को 'गंभीर उकसावा' और 'हमारे जीवन और भविष्य को खतरा पैदा करने वाला कृत्य' करार दिया। वाशिंगटन और परमाणु विशेषज्ञ हाइड्रोजन बमों के बारे में उत्तर कोरिया के पूर्व में किए गए दावों पर संदेह जताते आए हैं। ये बम परमाणु बमों की तुलना में कहीं अधिक शक्तिशाली होते हैं और उन्हें बनाना भी अधिक मुश्किल होता है। रैंड कॉरपोरेशन में एक वरिष्ठ रक्षा विशेषज्ञ ब्रूस बेनेट ने बीबीसी से कहा, यह हथियार संभवतया अमेरिका के हिरोशिमा बम के आकार का था। लेकिन यह एक हाइड्रोजन बम नहीं था। यह विखंडन तकनीक पर आधारित था। बेनेट ने कहा, इससे जो विस्फोट होता वह इस विस्फोट से 10 गुणा अधिक जोरदार होता। कार्नेगी एंडोमेंट फॉर इंटरनेशनल पीस में परमाणु नीति कार्यक्रम के सह निदेशक जेम्स एक्शन ने ट्वीट किया कि इससे जो अनुमानित ऊर्जा निकली, उसे देखते हुए इस बात की संभावना नहीं लगती कि यह वास्तव में दूसरे चरण का थर्मोन्यूक्लियर बम था। यह परीक्षण उत्तर कोरिया के नेता किम जोंग के जन्मदिन के मात्र दो दिन पहले किया गया। इस परीक्षण की घोषणा किए जाने से पहले अंतरराष्ट्रीय भूकंप विज्ञान परिषदों ने उत्तर कोरिया के पूर्वोत्तर में देश के प्रमुख पुंगये री परमाणु स्थल के निकट 5.1 भूकंप दर्ज किए जाने की सूचना दी थी। अधिकतर विशेषज्ञों का मानना था कि प्योंगयांग एक थर्मोन्यूक्लियर विस्फोट विकसित करने से वर्षों दूर है जबकि इस बात के मूल्यांकन में मतभेद था कि उसने एक बैलिस्टिक मिसाइल में फिट हो सकने में सक्षम किसी उपकरण को छोटा आकार देने की तकनीक में कितना विकास किया है। यह उत्तर कोरिया का चौथा परमाणु परीक्षण था, फिर भले ही यह हाइड्रोजन बम का परीक्षण था या नहीं। उत्तर कोरिया ने इससे पहले वर्ष 2006, वर्ष 2009 और वर्ष 2013 में परीक्षण किए थे जिसके बाद उस पर संयुक्त राष्ट्र ने प्रतिबंध लगाए थे। प्रतिबंधों के चौथा परीक्षण रोक पाने में नाकाम रहने के बाद सुरक्षा परिषद पर इस बात का दबाव बढ़ जाएगा कि वह इस बार और कड़े कदम उठाए। इस परीक्षण के बाद विशेष रूप से अमेरिका के राष्ट्रपति बराक ओबामा के सामने चुनौती पैदा हो गई है जिन्होंने 2014 में दक्षिण कोरिया की अपनी यात्रा के दौरान उत्तर कोरिया को 'अच्छत देश' करार दिया था और संकल्प लिया था कि अगर प्योंगयांग और परीक्षण करता है तो उसके खिलाफ और कड़े कदम उठाए जाएंगे। इस परीक्षण के संबंध में उत्तर कोरिया के आर्थिक और राजनयिक संरक्षक चीन की प्रतिक्रिया अहम होगी। बीजिंग ने अमेरिका के नेतृत्व में देशों को पहले भी प्योंगयांग के खिलाफ कड़ी कार्रवाई करने से रोका है। लेकिन परीक्षण रोकने से उसके इनकार के बाद चीन ने अपनी बढ़ती हताशा भी जाहिर की है। चीन उत्तर कोरिया में निरस्त्रीकरण के लिए छह पक्षीय सहायता वार्ता को फिर से शुरू करने पर जोर देता रहा है। चीन का कहना है कि प्योंगयांग के साथ वार्ता ही आगे बढ़ने का एकमात्र रास्ता है। दक्षिण कोरिया, उत्तर कोरिया, अमेरिका, चीन, जापान और रूस की संलिप्तता वाली इस छह पक्षीय वार्ता प्रक्रिया पर वर्ष 2007 से अनिश्चितता की स्थिति बनी हुई है और चौथा परमाणु परीक्षण करने के निर्णय के साथ प्योंगयांग के आगे बढ़ने के बाद इस प्रक्रिया के आगे बढ़ने की संभावनाएं लगभग समाप्त हो गई हैं। उत्तर कोरिया ने 2013 में परमाणु परीक्षण के बाद अपने योंगव्योन परिसर में उस प्लूटोनियम संयंत्र को फिर से शुरू कर दिया था जिसे उसने निरस्त्रीकरण के लिए सहायता समझौते के तहत 2007 में बंद कर दिया था। योंगव्योन संयंत्र एक वर्ष में छह किलोग्राम प्लूटोनियम उत्पादन की क्षमता रखा है जो कि एक परमाणु बम बनाने के लिए काफी है। ऐसा माना जाता है कि उत्तर कोरिया के पास अभी इतना प्लूटोनियम है जिससे छह बम बनाए जा सकते हैं। इस बीच पता चला है कि उत्तर कोरियाई नेता किम जांग उन ने तीन सप्ताह पहले आदेश पर व्यक्तिगत रूप से हस्ताक्षर करके प्योंगयांग को नवीनतम परमाणु परीक्षण के लिए अधिकृत किया था। सरकारी टेलीविजन पर इस समाचार का प्रसारण किया गया जिसमें किम के शुरुआती हस्ताक्षर वाले 15 दिसंबर के आदेश की प्रति भी दिखाई गई। किम ने अपने हस्ताक्षर के साथ हस्तलिखित संदेश में लिखा, वर्ष 2016 की शुरुआत हमारे पहले हाइड्रोजन बम विस्फोट की जोरदार आवाज के साथ की जाए, ताकि पूरा विश्व हमारे समाजवादी, परमाणु हथियार संपन्न गणतंत्र और महान 'वर्कर्स पार्टी आफ कोरिया' को देखे। टेलीविजन पर तीन जनवरी का दूसरा आदेश भी दिखाया गया जिसमें किम ने छह जनवरी को परीक्षण के लिए अपनी अंतिम मंजूरी दी। दिसंबर 2011 में पिता किम जांग द्वितीय के निधन के बाद किम ने जिम्मेदारी संभाली थी। उनकी अगुवाई में देश फरवरी 2013 में तीसरा परमाणु परीक्षण कर चुका है। उधर दक्षिण कोरिया के एक सांसद ने कहा है कि देश की खुफिया एजेंसी ने निजी तौर पर उनको बताया है कि जिस तरह से कम तीव्रता का भूकंप महसूस किया गया उससे यह लगता है कि उत्तर कोरिया ने हाइड्रोजन बम का परीक्षण नहीं किया होगा। सांसद ली चोएल वू ने कहा कि राष्ट्रीय खुफिया सेवा ने उनसे कहा है कि विस्फोटक का अनुमानित वजन छह किलोटन था और इसके बाद जो भूकंप आया उसकी तीव्रता 4.8 थी। उनके अनुसार साल 2013 के परमाणु परीक्षण के दौरान 7.9 किलोटन वजन का विस्फोटक था और उस समय भूकंप की तीव्रता 4.9 थी।