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Briefs:

Chernobyl Disaster: 29 Years and Counting!

Nuclear reactors present a variety of risks and can trigger emergency situations during internal sabotage, external attack or natural calamities like earthquake or tsunami that could result in accidents, thefts or spillage of harmful radioactive materials. The history of civil nuclear power has already witnessed some of devastating accidents, for e.g. the Three Mile Island (US) accident in March 1979 and Windscale (UK) accident in October 1957 and the most recent Fukushima Daiichi (Japan) incident of March 2011. However, the most infamous one was the Chernobyl (Ukraine) disaster of April 1986, primarily due to its effect on the civilian population and the exposure of people to radiation. It is considered one of the worst incidents also due to the overreaching spread of radioactive gas that reached as far as Finland and Sweden.

Chernobyl nuclear power station comprised of four operating 1,000-megawatt power reactors located near the Pripyat River, some 60 miles north of Kiev. In 2008, a report prepared by the Chernobyl Forum indicated 56 direct deaths (47 accident workers, and nine children with thyroid cancer) and estimated that as many as 9,000 people among the approximately 6.6 million most

highly exposed may die from some form of cancer. It should be underscored that at least 28 people died as a result of Acute Radiation Syndrome (ARS) within 100 days of the accident.

While many of the surviving plant workers suffered from cataracts and skin injuries, more than 5,000 cases of thyroid cancer have been found. It has relatively been proved that drinking milk contaminated with radioiodine caused most of such cases. The radiation has caused enormous damage to humans and the environment surrounding the epicenter. Around 100,000 people fled their homes in Ukraine and Belarus following the event. The accident triggered a rise in cancer, neurological disorders and genetic mutations every year since. It is estimated that the disaster released as much as 300 times more radioactive fallout in comparison to the atomic bomb detonated at Hiroshima. After the accident, more than 3,30,000 people were resettled outside the most severely contaminated areas.

The defunct plant still possess danger and a new confinement shelter for reactor 4 should be put in place before the sarcophagus completely collapses. The concrete sarcophagus, which was built hastily to contain the escaping radiation, is crumbling fast and increasingly becoming unstable. There has been an ongoing international effort to cover the reactor with a mammoth steel arch (*Novarka*) adjacent to the reactor and slide it along a runway to cover the building. The arch is planned to reach 105 metres high, with a span of 257 metres, weighing nearly 32,000-ton. With a life span of 100 years and at the cost of roughly \$1.5 billion, the *Novarka* is expected to be in place by 2017.

The Greenpeace foundation has correctly observed the situation by stating, “[the damaged reactor is still a danger](#)”. Nearly 29 years have passed since the accident; the region is still under the spell of lethal radioactive fallout.



(Birds eye view of the Chernobyl Plant, Ukraine, Courtesy: Google Map)

Readings:

Wil Mara, “The Chernobyl Disaster: Legacy and Impact on the Future of Nuclear Energy”, Marshall Cavendish, September 2010.

Mark Peplow, “Chernobyl's Legacy”, Nature, No 471, March 28, 2011.

Henry Fountain, "Chernobyl: Capping a Catastrophe", New York Times, April 27, 2014, <http://www.nytimes.com/interactive/2014/04/27/science/chernobyl-capping-a-catastrophe.html>

Denise Chow, "Giant Steel Arch Will Cover Debris from Chernobyl Reactor", Live Science, April 28, 2014, <http://www.livescience.com/45184-chernobyl-arch-radioactive-contamination.html>

History Snippet

Horrors of Ypres: First Military Use of Chemical Weapon

Throughout the history of warfare number of attempts have been made to somehow use chemical agents as weapons of war. Most attempts were unsuccessful until the growth of the chemical industry during the later half of the 19th century. The French were the first to use chemical agents in the form of tear gas grenades against the Germans. Their effect was minimal, mainly due to a complete lack of understanding of how to utilize such weapons. One hundred years ago, the world has witnessed the first ever large-scale military use of Chemical weapon during the World War-I. The Germans launched a massive chlorine gas attack against the allied forces (included British, French, Algerian and Canadian) on April 22, at the second battle of Ypres, Belgium, fought from April 22 – May 25 (1915), resulting in over 5000 deaths. Some 5,730 gas cylinders were used and approximately 150–168 tonnes of chlorine gas were released in the attack. This marked the first use of weapon of mass destruction on a battlefield. The success has triggered a series of chemical weapon use by powers engaged in the War throughout Europe resulting in massive human casualties.

The chief architect of this German gas offensive was Fritz Haber., who later received the Nobel Prize in Chemistry in 1918 for his development of the Haber process.

CBRN News Update

UNITED NATION: “Ban Ki Moon urges ridding the world of chemical weapons ‘once and for all’ on 100th anniversary of their first use”, *UN News Center*, April 21, 2015. URL: <http://www.un.org/>

United Nations Secretary-General Ban Ki-moon has reminded the international community on the anniversary of the first use of chemical weapons in a Belgian battlefield 100 years ago and amid allegations of their continued use, the only fitting tribute is to rid the world of these indiscriminate arms “once and for all.” Confirmation of the use of chemical weapons in Syria two years ago served as “a shocking reminder” that their use has not yet been consigned to history said the Secretary-General in a message delivered on his behalf by Virginia Gamba, Deputy to the UN High Representative for Disarmament Affairs, at a ceremony in Ypres, Belgium, where the first chemical attack was recorded 100 years ago today. “The only fitting tribute to the memory of those who died at Ypres, and to all victims of chemical warfare, is to rid the world of chemical weapons once and for all,” Mr. Ban said in a message delivered by Virginia Gamba, Deputy to the High Representative for Disarmament Affairs, at an event held at the site of the Second Battle of Ypres. “The horrors of the First World War must be recalled as we grapple with today’s security challenges,” he said. “On this solemn anniversary, we remember the atrocities with the resolve to make sure that unlike that gas, the threats do not linger.”

The UN chief recalled that the first time that chemical weapons had been deployed on a large scale in battle helped prompt the 1925 Geneva Protocol, which banned the use of chemical weapons outright. And some 70 years later, the Chemical Weapons Convention prohibited the development, production, acquisition, stockpiling, retention, transfer and use of chemical weapons, and it also required States Parties to destroy any chemical weapons they owned or possessed. “The Geneva Protocol and the Chemical Weapons Convention are accepted as an indispensable part of the international norm against chemical weapons,” Mr. Ban said. He also praised the multinational effort to eliminate the chemical weapons programme of Syria “as a momentous undertaking and an important achievement” that “reaffirmed international resolve against chemical weapons, and it illustrated the power of collective action in the service of a common goal.” But at the same time, he said: “We owe it to the victims of chemical weapons over the past 100 years – and future generations at risk of attacks – to remember that the world is not free from this threat.” Noting that “allegations of the use of chemical weapons continue,” Mr. Ban said that “some of these allegations surround the use of chlorine gas is a bitter irony and a reminder that the international community cannot be complacent about its achievements, nor can it allow the taboo that surrounds such weapons to fade.” Chlorine gas was used at Ypres on April 21, 1915, and is reportedly the same type of gas used in Syria. The Organization for the Prohibition of Chemical Weapon (OPCW) marked the Centennial Commemoration of the first large-scale use of chemical weapons at Ypres and honoured the memory of and paid tribute to all victims of chemical weapons.

According to OPCW, chemical weapons resulted in more than one million casualties, and nearly 100,000 deaths during the First World War.

JAPAN/CANADA: Trace Amounts of Fukushima Radiation Turn Up in Canada, LiveScience.com /Yahoo.com, APRIL 08, 2015. URL: <http://news.yahoo.com/>

Very low levels of radioactive chemicals that leaked from Japan's 2011 Fukushima nuclear disaster have been detected along the North American coast for the first time, scientists said yesterday (April 6). Trace amounts of cesium-134 and cesium-137 (radioactive isotopes) were found in seawater collected Feb. 19, 2015, at a dock in Ucluelet, a town on the west coast of Vancouver Island, British Columbia, said Ken Buesseler, a marine chemist at Woods Hole Oceanographic Institution (WHOI). The radioactive isotope numbers refer to the different numbers of neutrons carried by different versions of the cesium isotope. In the Ucluelet seawater, the amount of cesium-134 was 1.4 Becquerels per cubic meter of water (a unit of measure based on the number of radioactive decay events per second per 260 gallons of water). That's about 1,000 times lower than the drinking water limit set by the U.S. Environmental Protection Agency, Buesseler said. The water also contained 5.8 Bq/m³ of cesium-137.

Buesseler is leading a crowd funded citizen science program to track Fukushima pollution in the Pacific Ocean and along the U.S. and Canadian West Coast. Volunteers from the Ucluelet Aquarium collected the seawater, raised money for testing and shipped the samples to WHOI in Woods Hole, Massachusetts, for analysis. Two factors make cesium-134 the perfect tracer for tracking pollution from the Fukushima Daiichi nuclear power plant meltdown. First, cesium-134 does not occur on its own in nature, only forming in nuclear reactors. Second, the isotope has a two-year half-life, which means any cesium-134 in the ocean today must have a recent source: Fukushima.

United States: "780,000 chemical weapons being destroyed in Colorado", USA Today, April 25, 2015, URL: <http://www.usatoday.com>

Workers have begun destroying a massive stockpile of American chemical weapons stored at a former Army munitions depot near Colorado's ninth-largest city, blasting the artillery rounds open with explosives and neutralizing them with solvents. Workers perform their slow, painstaking task under heavy security and strict safety precautions, which include constant monitoring for leaks, armed guards on random patrols and video monitoring by independent observers. About 780,000 shells and mortar rounds filled with mustard agent are stored at the military-run Pueblo Chemical Depot, and all of them must be destroyed under a 1997 international law.

"You can't be too safe about what we're doing here," said Thomas Schultz, a spokesman for the Pueblo Chemical Agent Destruction Pilot Plant. "As long as things are dull, we're all happy." Chemical weapons were once stored across the USA, including in Oregon and Utah, but the United States has been destroying the stockpile for years. Most were incinerated, but community concerns in Pueblo, about 115 miles south of Denver, and at the Blue Grass Army Depot near Richmond, Ky., delayed destruction until the military could develop new techniques to reduce the risk of mercury contamination from the smoke.

In 2004 and 2005, some chemical munitions were accidentally dredged up off the New Jersey coast and ended up buried in residential driveways. The Army apparently dumped the munitions

in relatively shallow water, said Lenny Siegel, the executive director of the California-based nonprofit Center for Public Environmental Oversight.

About 90% of America's chemical weapons have been destroyed, and Pueblo Depot holds the bulk of the remainder. Blue Grass, about 40 miles south of Lexington, Ky., has a small amount that includes nerve-agent munitions. Neutralization work in Kentucky isn't expected to begin for several more years and likely will last until 2023, officials say.

SYRIA/OPCW: “Chemical weapons watchdog analyzes alleged chlorine attack in Idlib, Syria”, *Daily Sabah*, April 10, 2015. URL: <http://www.dailysabah.com>

The Organization for the Prohibition of Chemical Weapons (OPCW), an international chemical weapons watchdog, is currently analyzing the information related to allegations concerning the latest chlorine attack in Idlib, Syria and will decide on a course of action accordingly, OPCW Director-General Ahmet Uzumcu said yesterday during a speech at the Brookings Institute in Washington.

Uzumcu, a Turkish career diplomat who previously served as the permanent ambassador of the Republic of Turkey to the United Nations Office in Geneva, hinted that if the allegations of a chemical attack in Syria are substantiated, the OPCW's fact-finding mission will collect the evidence and prepare a report as it did for similar attacks last year.

Last month a new series of allegations were raised by the U.K.-based Syrian Observatory for Human Rights in Idlib on YouTube regarding the use of chlorine gas following victory by opposition groups in the region. A statement from the group said the forces of the regime of President Bashar Assad had killed at least six people, including three children.

Assad refuted the allegations that his military used chlorine gas on civilians in a recent CBS News interview, and said: "Chlorine gas is not military gas." However, increasing amounts of new evidence is suggesting that Assad's denial is not true. The OPCW's report on the past attacks that took place in Idlib and Hama in 2014 alleged that gas bombs were systematically dropped by helicopters, which only the regime has the capability to do. Uzumcu also added that although chlorine gas is not a chemical weapon per se, the convention defines that any chemical substance that could be used for hostile purposes is considered such a weapon.

U.N. Security Council Resolution 2209, passed last month, condemned the 2014 attacks and warned the Syrian government that this was the first documented instance of the use of toxic chemicals as weapons within the territory of a State Party to the Chemical Weapons Convention. The U.N. Security Council then decided that in the event of future noncompliance, it will impose measures against the Assad regime, including military action. This is why the verification of the recent allegations in Idlib could put Assad in a very bad position.

Robert Ford, former U.S. ambassador to Damascus, warned about the increasing use of chemical weapons in the country because of the absence of accountability. "Russians never acknowledged [it] and the Syrian regime has never accepted that they had used sarin gas nor said that they had a chemical weapons program. The Syrian government so far is still not deterred. We will probably see, I regret to say, additional allegations on the use of chlorine gas."

Ford, speaking at Brookings's Syrian weapons panel, said the Syrian government was in a minority position in a war of attrition, and that the Assad regime could use chlorine gas in the future to equalize the military balance on the ground as it has done in the past. "That can encourage terrorist groups in the region that they can get away with gas attacks as the regime does. We should find ways to put pressure on the Syrian government and hold it accountable. The party that uses chlorine gas needs to be named publicly by the international organizations to deter future use."

SRI LANKA: “Sri Lanka Assures CWC Support”, *Sunday Leader*, April 19, 2015; <http://www.thesundayleader.lk/>

The Government has assured its serious commitment and meaningful contributions to achieve the goals of the Chemical Weapons Convention (CWC), the Foreign Ministry said. A Foreign Ministry statement said that Deputy Foreign Minister Ajith P. Perera, visited the Organisation for the Prohibition of Chemical Weapons (OPCW) and met with the Director-General, Ambassador Ahmet Üzümcü. Ambassador Üzümcü acknowledged Sri Lanka's role in implementation of the CWC, including its contributions to OPCW training and assistance activities aimed at enhancing international cooperation and capacity-building efforts.

The Director-General updated the Deputy Foreign Minister on progress made by the OPCW on chemical disarmament and non-proliferation, and discussed ways of further enhancing cooperation between the Organisation and Sri Lanka. He further expressed OPCW's support and assistance towards the full and effective implementation of the CWC in the country. Deputy Foreign Minister Perera highlighted Sri Lanka's long standing cooperation with the OPCW as one among the State Parties that signed the CWC upon its opening for signature. He acknowledged the OPCW's efforts towards disarmament and non-proliferation, and assured the Director-General of Sri Lanka's serious commitment and meaningful contributions to achieve the goals of the CWC.

He thanked the OPCW for the continuous training assistance provided to Sri Lanka and expressed interest in exploring the possibility of broader cooperation with the OPCW. Both parties underscored the necessity of meaningful engagement with each other to ensure the peaceful use of chemistry and to address future challenges in chemical terrorism related matters.

The Hague: OPCW Commemorates Day of Remembrance for All Victims of Chemical Warfare, *OPCW*, April 29, 2015, <https://www.opcw.org/>

The annual Day of Remembrance for all Victims of Chemical Warfare was observed at a ceremony today in the Ieper Room of the OPCW headquarters, so named after the site of the first chemical weapons attack in April 1915 in Ieper, Belgium. The Chairperson of the Conference of States Parties, Ambassador Vesela Mrđen Korać of Croatia opened the commemorative session. Statements were also delivered by the OPCW Director-General, Ambassador Ahmet Üzümcü; Mayor of The Hague, Mr Jozias van Aartsen and Ambassador for International Organisations at the Dutch Ministry of Foreign Affairs, H.E. Mrs Nora Stehouwer-van Iersel. In his remarks to the ceremony the Director-General said: “On this Remembrance Day, following the issue of the historic Ieper Declaration by States Parties, we renew our resolve

to achieve a world truly free of chemical weapons. We must re-dedicate ourselves to this mission, with the same political will that fuelled the creation of the global ban against these weapons”.

INDIA/POKHRAN: Excerpts: “RADIATION HAZARD, The People Of The Fallout”, *Outlook India*, April 27, 2015. <http://www.outlookindia.com>

In Khetolai, death from cancer has become a common occurrence; the connection to the nuclear tests is hard to miss. Nathuram, the village pradhan, says that, since the 1998 nuclear test, five-six villagers have died every year—all taken by cancer. It’s just 5 km from the Khetolai military range in Pokhran city. Located 80 km from the Jaisalmer district headquarters, in the forbidding Thar desert, the site was first used for Operation Smiling Buddha in 1974 and Operation Shakti in 1998 to test a series of nuclear weapons. Since then, it is used as an active military exercise and testing range. “After the explosions in 1974, we had big craters everywhere,” says Padam Jaani, a retired postmaster. “The craters are gone, but the cracks are still frequent.” Every house bears cracks, some spreading like spider webs. The army continues to mark its presence with exercises on the range. Every few hours, explosions are heard. “The sound does not even register in our minds any more,” says Vinod Bishnoi, a gram sahayak.

Says Pramila, another aunt of Neeraj, “In the last few years, lots of women have died of breast cancer. They are shy to speak of the early symptoms, so it goes unaddressed. By the time it is detected, the cancer is in its last stages. Even the families don’t want to talk about it.” There are other signs of the troubles brought upon this village by the two big nuclear explosions that happened nearby.

Even the cattle are affected. The women, who usually take them out for grazing, say there’s no pasture land left. “In the 1960s, the biggest stretch of pasture land we had was taken over by the army for a testing zone,” says Asha Devi, who is in her seventies. “They have expanded bit by bit since then. There’s not enough to eat for the cattle and this has affected milk production. And unusual cancers are now a common affliction even for the animals. Cows don’t produce milk from all the glands anymore.” Many cows have gone blind, they even deliver calves that are blind, and some develop rashes that keep worsening.

A response to an RTI filed last year by Chetan Kothari to the Bhabha Atomic Research Centre (BARC) under the Department of Atomic Energy revealed in September last year that 70 per cent of the health-related deaths in the atomic energy hubs across the country in the last 20 years were because of cancer. But despite this alarming finding, no further studies were conducted.

Dr Satyajit Rath of the National Institute of Immunology in Delhi says, “In principle, it is possible that the proximity of the village to the nuclear testing site may be a cause of these adverse medical events but anecdotal reliability is not enough to establish that these nuclear radiations are the reason for this. These incidents should have been a starting point to generate reliable data to study the extent of impact on health and surroundings in the village.” But in the last 31 years—since the first tests in 1974—the government has not cared to commission a study to find out.

Kavita Srivastava, an activist with the People's Union of Civil Liberties (PUCL) who has worked in Rajasthan for over three decades, says, "The problem is that all governments have constantly undermined people's health and shown lack of concern for their economy near the Pokhran region. It is proven by the fact no government has conducted in-depth research to study the impact of radiation on people's health and on the cattle in so many years." It is this lack of political will to investigate that many activists like Srivastava find troublesome. Dr N.R. Nayak, the chief medical officer of the district, denies any knowledge of the rise in cancer cases in Pokhran. He says, "We have no such information about the rise of cancer deaths in the area. It is not true. How can villagers know that the cancer is because of radiation? It is political motivation that makes them say that."

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