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Monitored this issue:

Dutch court grants WISE access to data on radioactive emissions of Ru-106

Jan Haverkamp – senior expert, nuclear energy and energy policy at WISE

In April, the Council of State, the Netherlands's highest administrative court, upheld the appeal of the World Information Service on Energy (WISE) to access measurement data following an accident at the Mayak nuclear reprocessing plant in the Southern Urals, Russia. It had requested the original of a document from the International Atomic Energy Agency (IAEA) in Vienna that was leaked on a Russian website.[1] The document provides a list of measurement data of the ruthenium-106 (Ru-106) isotope as observed by monitoring stations across Europe.

A study by dozens of renowned European institutes and scientists, based on this and following data, showed that the source of Ru-106 had to be the Mayak reprocessing plant located near the closed city of Ozhersk.[2] The accident allegedly occurred when Russia's nuclear giant Rosatom attempted to manufacture a Cerium-144 source from relatively fresh burnt-out fuel rods from a Russian nuclear power plant for an Italian / French Euratom research project in late September 2017.

Although the measured values did not pose a danger to the population around the measuring points, the French institute IRSN concluded in November 2017 that "an accident of this magnitude in France would have required to implement locally measures of protection of the populations on a radius of the order of a few kilometres around the location of the release."[3] To this day, Russia continues to deny that anything happened in Mayak.

Several days after the accident, several research institutes and nuclear authorities reported to the IAEA that they measured Ru-106 in the atmosphere. The IAEA then distributed a list of measurement data via the "*for authorities use only*" web page USIE, which consequently appeared on the Russian *geoenergetics.ru* website. The latter is an energy news site close to Rosatom. Also immediately, all kinds of fake news stories started singing around in Russia. Ru-106 would come from Ukraine, or from Romania, or from a satellite that had returned into the atmosphere. Everything, but no incident in Russia.

Meanwhile, WISE received concerned messages from the Mayak area, among others asking whether the document on *geoenergetics.ru* was genuine. WISE contacted the IAEA, who referred it to the national nuclear authorities, in the case of WISE the Netherlands Authority for Nuclear Safety and Radiation Protection (ANVS).[4] WISE asked ANVS to compare the *geoenergetics.ru* document with the original, or provide access to the original document.

WISE also indicated the possibility to black out data from countries not covered by the Aarhus Convention (and therefore not obliged to release such data) – this concerned the "0" values of all Russian measuring points and a small number of Turkish measurements. Or to give the list in a different form. The ANVS refused to grant access, and also to check with the IAEA whether another solution could be found.

WISE then appealed to the Court of Amsterdam and from there to the Council of State.

There are two fundamental points for WISE:

1. International emissions data must be available to the public under the Aarhus Convention. Only in this way could the people in the Mayak area have been able to put pressure on the Russian authorities in case the leaked list would have appeared to be manipulated.

2. Under the Aarhus Convention, ANVS is required to proactively assist citizens in accessing such information and should therefore have contacted the IAEA.

In January of this year, WISE suddenly received from ANVS the surprising message that the IAEA had produced a public list of all measurement data[5], although this document is not available on the IAEA website. Presumably after the ANVS contacted the IAEA, after having been severely criticised on our second point – to actively facilitate access to information – by the Council of State during its hearing.

Since then, WISE is in the process of comparing both lists (which have a different format). What becomes clear is that the *geoenergetics.ru* list is a mess. Almost a third of the reported measurements turn out to be doubled – sometimes with changed times, sometimes with values made 1000 times smaller. Especially measurements from Ukraine, Italy, and the Czech Republic. Romanian measurements appear to have shifted in time. The crucial question now remains whether the IAEA is responsible for such a sloppy list, or whether it concerns Russian manipulations before it was leaked via *geoenergetics.ru* – possibly to cause confusion. Both cases are highly problematic.

WISE is happy with the decision of the Council of State to grant access to the requested information and make clear that ANVS has to be proactive in searching access to environmental information it holds from international institutions. Without national and international transparency in nuclear incidents like this, citizens can never fully trust authorities. And trust is the key to good communication in nuclear accidents.

More information, 'Clarity, secrecy and fake news around ruthenium-106 measurements', Nuclear Monitor #859, 15 March 2018, https://wiseinternational.org/nuclear-monitor/859/clarity-secrecy-and-fake-news-around-ruthenium-106-measurements

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The coronavirus pandemic's impacts on the energy sector

Jim Green – Nuclear Monitor editor

The effects of the coronavirus pandemic on the energy sector will, of course, depend on how the pandemic unfolds over the coming months and years, and the effects will vary from country to country. In the short term, the International Energy Agency (IEA) estimates that global electricity demand in 2020 will be 5% below 2019 demand, and broader energy demand down 6%.[1]

Economic stagnation and mass unemployment will persist beyond the lockdowns. The pandemic will lead to a severe global economic recession, worse than the Global Financial Crisis (GFC).[2] That means reduced energy demand in some countries and reduced demand growth in others.

Coal demand fell 8% in the first quarter of 2020 compared to the first quarter of 2019 (with part of the fall due to the pandemic), oil demand was down 5% and gas demand was down 2%.[1] Global greenhouse gas emissions are expected to decline by 8% in 2020 compared to 2019 emissions, but the IEA warns that the rebound in emissions could be larger than the decline, as has happened after previous crises.

Fossil fuel industries have friends in high places – they have received and will continue to receive strong support from conservative governments in the US[3], Australia[4] and in numerous other countries. Ted Nace, director of Global Energy Monitor, is more optimistic: "Coal is definitely on the downturn and this pandemic is going to accelerate that. Demand should come back to some degree next year. But there is a very strong argument that it is not going to just bounce back."[5]

Renewables have been more resilient to covid-19 lockdown measures than other energy sources, the IEA notes.[1] Renewable electricity generation increased by almost 3% in the first quarter of 2020 compared to the first quarter of 2019, amounting to 28% of total global electricity generation. Renewable electricity generation in 2020 is expected to exceed the 2019 figure by 5%, reaching nearly 30% of generation from all sources.

Nuclear power

How is the covid-19 pandemic effecting the nuclear power industry? For the most part, it's business as usual. With the emphasis on business: nuclear facilities are continuing to operate, and construction projects are proceeding, even in circumstances when prudence would suggest a suspension of activities until the pandemic is under control.[6] Examples include 200+ workers testing positive for covid-19 at both the Vogtle[7] and Fermi[8-9] nuclear power plants in the US.

Nuclear electricity generation fell by about 3% in the first quarter of 2020 compared to the first quarter of 2019, according to the IEA, due to permanent reactor closures (unrelated to the pandemic) and temporary closures (and extended planned outages) due to reduced demand.[1] Nuclear generation in 2020 is expected to be 2.5–3% below the 2019 figure. Reactor construction projects will likely be delayed in Finland (where a delay has already been announced), the UK, the US and perhaps elsewhere.

World Nuclear Association Director General Agneta Rising argues that "governments need to take urgent action to invest in nuclear energy as a major part of a global low-carbon energy mix."[10] But there's no joy for nuclear in the IEA's post-pandemic prescriptions. IEA executive director Fatih Birol has discussed how the response to the pandemic can learn from the post-GFC experience.[11] He notes key differences between the current situation and the GFC: the current economic crisis is far more severe, the decarbonisation challenge is even more urgent, and some vital components for building a clean energy future are more mature and ready to scale up.

Birol notes that governments around the world are considering massive stimulus packages to try reboot their economies.[11] He urges governments to favor energy technologies that are "ready for the big time" such as wind and solar (which "can be pillars of post-pandemic stimulus efforts"), offshore wind ("now ready for massive investment"), lithium-ion batteries and hydrogen electrolysers ("important emerging technologies" with "the potential to be the coming decade's breakout technologies").

Birol urges governments to be wary of large, highly complex projects.[11] He doesn't say so directly, but he surely has nuclear in mind when noting problems with previous investments in Europe and the US in "very large, complex engineering projects, often with difficult licensing and social acceptance dimensions." Birol encourages government support for projects that are relatively simple to implement but where access to financing is constrained, such as energy efficiency projects in the residential and municipal sectors.

UN Secretary-General Antonio Guterres has spoken strongly about the importance of a "clean, green and just transition" in the aftermath of the pandemic, ending fossil fuel subsidies and not "bailing out outdated, polluting, carbon-intensive industries".[12]

Guterres is championing South Korea's "very ambitious green deal" plan for its recovery from the pandemic and encourages other countries to follow suit.[13] The South Korean government's plan envisages halving the number of the country's 60 coal-powered plants by 2034; reducing the number of nuclear reactors from a peak of 26 in 2024 to 17 in 2034 (while also investing massively in nuclear decommissioning research centers[14]); and increasing renewables' share of electricity generation to 20% by 2030 and 30–35% by 2040.[15]

More than 200 workers at the Vogtle nuclear plant in Georgia have tested positive for coronavirus.

Nuclear power already in trouble

Lower energy demand and demand growth as a result of the pandemic will mean fewer new electricity-generating plants. Nuclear will find it even harder to stake a claim for new power generation given the high capital costs and the high risks of massive cost blowouts and delays. S&P Global Ratings summarized nuclear's sick and sorry state late last year:[16]

"Concerns about the safety of nuclear plants and nuclear waste storage solutions, an aging global nuclear fleet, and massively escalating costs for many new projects have added to the industry's woes. ... In developed markets, we see little economic rationale for new nuclear build. Renewables are significantly cheaper and offer quicker payback on scalable investments at a time when power demand is stagnating. New nuclear construction requires massive upfront investments in complex projects with long lead times and risk of major cost overruns."

Writing in *Nuclear Engineering International*, independent communications consultant Jeremy Gordon is skeptical about the nuclear industry's ability to benefit from covid-19 fiscal stimulus packages:[17]

"The nuclear industry is orders of magnitude too small to have any influence on the new global direction and is caught flat footed and weak. Its current range of products and projects will be lucky to scoop up any of the coming stimulus cash, most of which will go to developments with short lead times, more visibility and more integration with the wider economy."

Yes, the situation varies from country to country and some nuclear projects will likely benefit from fiscal stimulus programs. But the broader context is that governments will have greater demands placed upon them in the looming economic recession, and less revenue to meet those demands. And private-sector funding will be even more constrained.

Even before the pandemic, funding for small modular reactors (SMRs), from both national governments and the private sector, was typically 1–2 orders of magnitude too low to establish a viable SMR industry.[18] The endless, tiresome SMR rhetoric will likely fade away, albeit slowly. The main exception is that China, Russia and perhaps other countries will pursue small reactors (including floating reactors) and nuclear-powered icebreakers insofar as they intersect with military and geopolitical objectives, and insofar as they are seen to be useful to pursue fossil-fuel mining ventures in places such as the Arctic, the Bohai Sea and the South China Sea.[19]

Nuclear power on the edge of a cliff

The recent disruptions could hardly come at a worse time for the nuclear industry. The disruptions won't just slow the trajectory of nuclear power – or hasten its downward trajectory. Nuclear power is on the edge of the cliff and the latest problems could push it right over. The GFC helped to put the brakes on the momentum developed by the nuclear industry in the mid-2000s and the post-pandemic recession is likely to be worse than the GFC. The nuclear power industry had some momentum going into the GFC but it has no momentum to weather the coming storm. And the reactor fleet is considerably older than it was during the GFC.

As the catastrophic failure of reactor projects in the US demonstrates, the industry has largely lost the capacity to build reactors. Rebuilding that capacity was shaping up to be a herculean task and may now be impossible. A related problem is the shortage of skilled nuclear workers. The 2019 Global Energy Talent Index reported "an acute need for talent" in the nuclear sector, which has a workforce older than in other energy sectors with nearly one-third of nuclear professionals aged 55 or above.[20] That loss of experience and expertise is affecting and will continue to affect operating reactors, construction

projects, the 'advanced' nuclear and SMR sectors, and other stages of the fuel cycle from uranium mining and processing to waste management and decommissioning.

Of course, the patterns vary from country to country. But even in those countries that nuclear advocates once had the most hope for, progress is underwhelming.

A Chinese nuclear official said the pandemic will have no effect on the progress of nuclear power plant construction.[21] Only time will tell if that proves to be true. The number of reactor construction starts in China has slowed to a trickle – about one per year – and the number of reactors under construction has fallen from 29 in 2014[22] to 12 currently.[23]

Russia is one of a number of countries that routinely projects massive nuclear power growth but fails to deliver. Now, the Russian government is no longer projecting massive growth. The Ministry for Economic Development recently published a draft strategy which would see nuclear grow by 28% from 2017 to 2050[24], a compound annual growth rate of just 0.67%. And Russia is reaching the limits of its ability to fund soft-power diplomacy with generous financial packages for nuclear power plants abroad. The Russian government has already committed about US$90 billion in financial support for overseas nuclear projects (including some funding taken from the beleaguered pension system).[25] A senior Rosatom official said in 2017 that the world market for the construction of new nuclear power plants is shrinking, and the possibilities for building new large nuclear power plants abroad are almost exhausted.[26] Nuclear advocate and commentator Dan Yurman notes that falling oil prices will further constrain Russia's ability to fund nuclear projects abroad (and the ability of Saudi Arabia to pay for reactors).[27]

South Korea was once a leading light for the nuclear industry. But the Democratic Party won a landslide election victory in April 2020 and, as mentioned, plans to reduce the number of reactors to 17 by 2034. South Korea's nuclear industry will outlast the anti-nuclear government of President Moon Jae-in (whose term ends in 2022) but it has lost a great deal of momentum.

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The coronavirus pandemic and the uranium industry

Jim Green – Nuclear Monitor editor

The uranium industry has been harder hit by the coronavirus pandemic than other sectors of the nuclear fuel cycle. Major producers have sharply cut production.

First, a quick summary of the past 15 or so years to put the current turmoil in context. Uranium mine production increased by 50% from 2007 to 2016.[1] But the expected nuclear renaissance didn't eventuate so increased uranium production has resulted in ever-growing stockpiles. Those stockpiles alone would suffice to keep the entire global reactor fleet operating for roughly eight years.[2]

Surplus production and stagnant demand have put persistent downward pressure on uranium prices. AMP Capital estimated in 2018 that around half the world's uranium mines are losing money.[3] The World Nuclear Association acknowledged in September 2019 that oversupply in recent years has led to a sizable reduction in uranium production levels at existing mines and a sharp decrease in investment in the development of new and existing mines.[4] In 2011, according to a uranium company executive, there were about 420 companies around the world exploring for or mining uranium; now, the number is 62, of which 27 have "limited to non-existent resources".[5]

Even before the recent pandemic-related cutbacks, numerous mines had been put into care-and-maintenance or production was reduced:[6]

- In Australia, the Beverley, Beverley North and Honeymoon mines were put into care-and-maintenance (and at the Ranger mine, mining has ceased and the processing of stockpiled ore will be soon be completed).
- Cameco has put several uranium mines into care-and-maintenance in recent years: McArthur River (and the Key Lake mill) and Rabbit Lake in Canada, and the Crow Butte and Smith Ranch-Highland in-situ leach mines in the US.[7] Plans to expand Crow Butte were abandoned in 2019.
- Kazakhstan's (mostly) state-owned uranium producer Kazatomprom cut uranium production by 20% in late 2017. Kazatomprom announced last year that the 20% curtailment of production will be extended until 2021, and its statement left plenty of wriggle-room for curtailment beyond then.[8]
- In Africa, the Langer Heinrich and Kayelekera mines were put into care-and-maintenance (and Paladin has since sold the Kayelekera mine).[9]

As a result of those cutbacks, uranium supply last year (from mines and secondary sources) roughly matched demand, ending years of oversupply.[10]

Further cutbacks

In recent months, the covid-19 pandemic has led to another round of cutbacks.

Kazatomprom said in early April that its uranium production this year will be about 4,000 tons lower than last year as a result of pandemic protection measures, a drop of about 18% of Kazakhstan's production and 8% of global production.[11-13] The curtailment of production will last for three months, Kazatomprom said – and clearly there are uncertainties beyond that period. Kazatomprom says that it has stockpiles to cover reduced production and will therefore meet all sales contracts.[14]

Cigar Lake was until recently the largest operating uranium mine in the world (6,900 tons in 2019) and Cameco's only operating mine in Canada. But in April, Cameco closed Cigar Lake for an "indeterminate" period.[15] Cameco cited precautions and restrictions put in place by the federal and provincial governments, concern among leaders in remote communities of northern Saskatchewan, and the challenges of maintaining physical distancing at fly-in/fly-out sites with a full workforce.[16] Orano announced the suspension of operations at the McClean Lake Plant, which processes uranium ore from Cigar Lake, for an indefinite period.[15] Cameco will also lose about 272 tons of U3O8 from curtailed production at the Inkai in-situ leach mine in Kazakhstan.[15]

Thus Cameco's current global uranium production is zero or near-zero. Cameco said in November 2019 that it planned to produce only 9 million pounds of uranium oxide from its mines in 2020, with the remainder of its requirement of 30–32 million pounds supplied from spot market purchases.[17] With the recent cutbacks, Cameco will be even more heavily reliant on spot market purchases to meet its contractual requirements.

Cameco placed the Port Hope conversion facility and its Blind River refinery in Ontario in lockdown on April 8 in accordance with government directives, but announced on May 18 that the two plants would reopen.[18]

In Namibia, CNNC Rössing Uranium has suspended mining at the Rössing uranium mine.[15] And mining has been suspended at the Husab uranium mine.[19-20] Rössing and Husab accounted for about 10% of global uranium production.[21]

Supply and demand were roughly in balance before the pandemic, but now at least one-third of uranium production has been suspended – as much as 55% according to Canadian uranium exploration company Purepoint Uranium.[22]

The recent shocks have increased uranium prices: the long-term price increased from US$32.50 / lb U3O8 on March 31 to $36.00 on April 30, while the spot price increased from $27.35 on March 31 to $33.25 on April 30.[23]

Purepoint Uranium says that the pandemic has "crippled" production and moved the market closer to the market's long-awaited tipping point with prices sufficient to justify

The Inkai ISL uranium mine in Kazakhstan.

investment in new mines.[24] That's wishful thinking – there are massive stockpiles, mines closed in the past few months that can come back online quickly, and mines put into care-and-maintenance in recent years that will mostly be cheaper to bring online than new mining ventures.

According to investment firm Cannacord Genuity, there was a small global surplus in 2019 (uranium supply exceeded demand by 5.3 million pounds, about 3% of global requirements), there will be a small deficit this year (8.7 million pound) and a negligible deficit in 2021 (0.14 million pounds).[25]

Of course, the estimates for this year and beyond could easily be proven wrong given the upheavals in the market. Nonetheless, claims that the uranium market is about to be revived should be treated with skepticism. One uranium company executive told the Murdoch press that the uranium supply gap is closing on critical levels, that demand is recovering from the Fukushima bear market, and that about 20 reactors will be turned on within the next 12 months.[26]

Wrong, wrong and wrong. The supply deficit has only emerged in the past two months and will likely be rectified as shutdowns and lockdowns are eased. Demand isn't recovering: it has been stagnant for a quarter-century and nuclear power generation in 2020 is expected to be 2.5–3% below the 2019 figure according to the International Energy Agency.[27] In the longer term, nuclear power generation (and thus uranium demand) will almost certainly decline because of long-standing problems (the aging reactor fleet, hopeless economics, etc.) and a new, serious problem – deep economic recession resulting from the covid-19 pandemic. Only the Murdoch press would publish the claim that 20 reactors will be turned on within the next 12 months without noting that the claim is absurd. As of mid-May, the IAEA's database records zero reactor start-ups in 2020, zero construction starts, and two permanent closures.[28]

Even with the significant price increases over the past month, prices would need to roughly double before there is significant investment in new mines.

Speculators selling to sellers

Ironically, according to March 2020 data from UxC, the largest buyer in the spot market is Cameco.[15] As noted, Cameco is producing far less uranium than it is buying on the spot market ... so the company is partly responsible for driving the spot price increase and it is losing from the price increase rather than profiting. Most of the recent uranium sales are not from producers but from traders, with no more than a "smattering" of demand from nuclear utilities.[29]

FNArena asks: "How long can this speculator-driven spot price rally last?" And provides this answer: "Ask the virus."[29]

Bailouts

Uranium companies have their hands out for as much pandemic-related corporate welfare as they can get. In the US, for example, Energy Fuels Resources and Ur-Energy USA are calling for a US$150 million bailout.[30] Seventy-five groups signed a letter opposing the proposal, noting that there is no shortage of uranium nor substantial risk of supply chain disruption, even during the global pandemic.[31]

The joint letter further states:[31]

"Uranium mining already has an extensive legacy in the United States of harming the health and wellbeing of local communities, especially tribal communities who bear the brunt of impacts. A 2019 study by the U.S. Department of Health and Human Services, the University of New Mexico, and Navajo agencies found that Navajo Nation citizens, including infants, had elevated levels of uranium in their bodies. Additionally, lung cancer and silicosis have been shown to be frequent occupational hazards for uranium miners – and we know that those with respiratory issues are especially at risk from COVID-19.

"Congress should prioritize spending that creates jobs that heal our lands and waters from mining's toxic legacy and provide new economic opportunities without further endangering public health and putting national and cultural treasures like the Grand Canyon and Bears Ears at risk. Rather than aiding an industry that has never paid any federal royalties for the more than $300 billion worth of hardrock minerals it has extracted from our public lands, while leaving taxpayers with an estimated $54 billion clean-up bill and ongoing health problems, we urge Congress to invest stimulus funds towards the assessment, reclamation, and cleanup of the hundreds of thousands of abandoned hardrock mines on public and tribal lands, which are currently polluting roughly 40 percent of western headwaters."

Energy Fuels Resources and Ur-Energy USA are the two companies that led the charge to persuade the US government to establish a 25% quota for domestic uranium supply of US nuclear power plants. That lobbying effort was unsuccessful, but the near-dormant uranium industry in the US won a significant consolation prize: the Trump administration's proposal in the Fiscal Year 2021 President's Budget to spend US$1.5 billion over 10 years to establish a national 'Uranium Reserve' supplied by domestic mines.[32] According to the Department of Energy, the stockpile is expected to support the operation of at least two US uranium mines.[32]

The stockpile – and the broader strategy in which it is embedded – will also support the nuclear weapons complex. The Department of Energy states:[33]

"The U.S. has well-defined defense needs that also depend on a healthy nuclear fuel cycle in the long-term. There are currently two defense needs for uranium: low-enriched uranium is needed to produce tritium required for nuclear weapons, and highly- enriched uranium is used to fuel Navy nuclear reactors."

The uranium industry's big problem: it's really small

The most likely scenario is that most uranium mines taken offline in recent months will resume operations over the next year or so and the industry will return to something resembling normality.

The bigger problem for the industry is that it is small, and getting smaller. Last year, uranium requirements for nuclear power plants totaled 67,244 tonnes.[34] If we assume that all that uranium was traded at the current long-term price of US$36 / lb U3O8 (ignoring the lower spot price, different prices for uranium from secondary sources, and contracts signed in earlier times at different prices), it is a US$6.4 billion industry. It is pitiful compared to metals and minerals such as iron ore (US$205 billion), copper (US$ billion), and gold (US$133 billion).[35]

Investment in new uranium projects is near-zero: only four projects are in development globally, with six planned.[25] As the World Nuclear Association noted in September 2019, oversupply "has led to a sizable reduction in uranium production levels at existing mines and a sharp decrease in investment in the development of new and existing mines."[36] Investment in nuclear power in recent years has been well short of 10% of investment in renewables.[37]

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Nuclear safety and the coronavirus pandemic: expert views

Here is an excerpt from a March 26 post by Dr. Ed Lyman from the Union of Concerned Scientists, discussing nuclear safety issues in the US:[1]

"In 2006, the NRC [Nuclear Regulatory Commission] held a workshop to consider the impacts of a pandemic flu outbreak on safety. A number of difficult policy questions were discussed, including the potential need to sequester workers early in an outbreak and the effect of high rates of absenteeism. But little was done to resolve these questions.

"In 2007 the Nuclear Energy Institute (NEI), the nuclear industry's main trade organization in Washington, submitted a draft "Pandemic Licensing Plan"[2] to the NRC for review. The plan recognized "the potential for an influenza pandemic to reduce nuclear plant staffing below the levels necessary to maintain full compliance with all NRC regulatory requirements," described "the regulatory actions necessary to permit continued operation with reduced staffing levels for approximately four to six weeks" and recommended, "NRC enforcement discretion as the most efficient and effective licensing response to a pandemic."

"In justifying this approach, NEI argued that "regulatory relief to permit rescheduling of selected activities and deferral of most administrative and programmatic requirements would balance the risk from continued operation with the risk from regional blackouts and grid instability."

"At the time, the NRC did not buy NEI's argument for broad and pre-approved enforcement discretion that would increase radiological risk during a pandemic, responding that:

"the NRC staff finds that without bounding entry conditions and more specific technical bases for the proposed regulatory relief, NEI's approach still presents significant challenges that may prevent meaningful overall progress in pandemic preparation. For instance, the plan contains only limited justification concerning the public health and safety need for nuclear power plants to remain on-line during a pandemic; likewise, the plan does not adequately explain why increased safety and security risk may be offset by considerations of need for electric power. Moreover, the plan continues to raise other significant legal and policy issues that would need to be resolved."[3]

"Although the NRC and NEI continued to discuss these issues more than a decade ago, there is no indication that their differences were ever resolved. Concern about an influenza pandemic was overshadowed by the Fukushima accident. Today, the NRC is in a different place. Three of the four sitting commissioners are Republicans who embody the spirit of the pro-industry, anti-regulation Trump administration. It would be shocking to see the NRC staff criticize an NEI proposal in 2020 the way it did back in 2008.

"In an NRC public meeting on March 20 to discuss regulatory issues related to the coronavirus pandemic, an NEI representative referred to the 2007 NEI Pandemic Licensing Plan as the basis for the industry's regulatory contingency approach, and no one from the NRC raised the staff's previous concerns about the plan. The NRC staff said that the agency was planning to issue a memorandum to provide guidance on enforcement issues, but did not address the standards it would be using to approve enforcement discretion – and in particular, whether it now accepted NEI's argument that a net increase in radiological risk would be appropriate to reduce the unlikely risks to the electrical grid."

The International Nuclear Risk Assessment Group summarizes nuclear safety risks associated with the pandemic in a paper released in April:[4]

"While nuclear utilities emphasise the importance of worker health and safety, they nevertheless remain determined to keep their plants running, which ... implies shortening refuelling outages by requesting regulatory exemptions for scheduled and necessary repairs. In this context, our key concern is that the reductions in staffing, inspections, outages and necessary maintenance being implemented in many countries in response to the pandemic will adversely affect safety margins at nuclear facilities, potentially leading to a serious accident. This is being done with approval by regulators.

"However, no regulatory body has provided a current, transparent framework to justify these kinds of decisions. Thus, regulators should provide greater information about the factors used to decide whether any deferred activity is acceptable and transparently share whether these are being strictly adhered to. For example, the minimum workforce needed for the safe operation of nuclear facilities including during incidents and accidents, should be publicly specified. Once this minimum workforce is no longer guaranteed, plants must be shut down. In the longer term, the adequacy of these standards for periods such as this and their implementation should be openly debated.

"A severe nuclear accident under pandemic conditions would inevitably exacerbate the inevitable highly adverse consequences. In addition to the radiological contamination, the task of evacuating large numbers of people from the most contaminated areas may prove an almost insurmountable challenge. The ongoing forest fires around Chernobyl are a reminder that a major nuclear accident can lead to widespread contamination that remains hazardous for many decades. High vigilance is needed in order to make sure at all times that the sanitary, social and economic crisis of the Covid-19 pandemic is not exacerbated bya serious nuclear safety or security failure.

"Although electricity demand is plunging due to the pandemic, countries with a very high dependence on nuclear power generation may eventually be impacted if NPPs must be shut down for safety and security reasons. While meeting electricity demand is important under the circumstances of a pandemic, the measures to continue NPP operation that we have described above might well impact the safety and security level of nuclear power plants, enhance the risk for safety related incidents to occur, and may reduce the likelihood that an evolving event could be effectively controlled. We emphasize that any nuclear accident evolving during the time of a pandemic will put a severe and additional burden on national emergency systems already under pressure to deal with the immediate effects of the pandemic.

"Claims about need for nuclear power to ensure electricity service security should also be balanced with the fact that demand for electricity has fallen everywhere and this has affected nuclear power generation.

"Given this scenario, the justification for imposing the potential for nuclear accidents has to be weighed with extreme care.

"To summarize, the pandemic must not lead to any reduction in nuclear safety standards. That requires international and national regulators to determine, publicise, rigorously enforce and maintain safety and security standards."

Victor Gilinsky, a former member of the US Nuclear Regulatory Commission, and Henry Sokolski, a former deputy for nonproliferation policy in the office of the US secretary of defense, wrote in an April 27 article:[5]

"The coronavirus crisis has revealed a significant Achilles' heel in civilian nuclear power: The plants can't operate if their relatively few highly skilled operators get sick or become contagious and have to be quarantined … Unlike other types of electric-generating plants, nuclear plants need operators to remain in control even after they are shut down because their radioactive uranium fuel cores, typically about 100 tons, continue to generate large amounts of heat. If the heat is not removed by cooling water, it can melt the core. During the 1979 Three Mile Island accident in Pennsylvania, over half the inadequately cooled core melted in hours. …

"Just operating in safe shutdown state could be challenging. The details differ from plant to plant and are spelled out in technical specifications that are part of each plant's federal license, but generally it takes a supervisor and several operators to man the control room and some number of maintenance staff. Altogether, counting all shifts, there may be a couple of dozen operators per plant. That doesn't sound like much, but these are highly skilled personnel who are licensed to operate an individual plant. You can't just pull in operators from elsewhere. If the licensed operators are unavailable because of disease or medical concerns, you are out of luck.

"The operators would surely not abandon their plant so long as they could remain at their posts, but having a skeleton crew of sick and fatigued individuals operating a nuclear plant is, to say the least, not a desirable state of affairs. …

"A COVID-19-related notice on the NRC website states the commission "will require plants to shut down if they cannot appropriately staff their facilities," but during a March 20 teleconference the NRC representative assured the industry that the agency was prepared to issue blanket exemptions from license requirements.

"Operating a plant at power takes a lot more staff than maintaining it in safe shutdown state. Nuclear plant managements around the world have been forced to consider the consequences of coronavirus infections and the need to quarantine employees who have been in contact with infected people. The conclusions are stark. According to a Reuters report, EDF, the utility that runs all the nuclear plants in France, said its plants "could operate for three months with a 25% reduction in staffing levels and for two to three weeks with 40% fewer staff." At one plant in the north of France, Flamanville, EDF announced it was reducing the staff at the plant from 800 to 100, keeping only those "in charge of safety and security." There are reports that U.S. nuclear plants may ask essential staff to live on-site if the pandemic worsens, and plants have stockpiled bedding and ready-to-eat meals.

"During this emergency, nuclear plant managers are doing their best to keep the lights on and the public safe. But the pandemic exposes a vulnerability of the nuclear plants that we will have to take account of in future decisions. One thing is clear: The picture painted by the trade association for the nuclear industry, the Nuclear Energy Institute, of the essential invulnerability of nuclear plants is not correct. …

"Nuclear plants are not without their advantages. But they also come with serious disadvantages, one of which – the safety imperative for constant, highly trained staffing no matter what – has become evident during the current pandemic. They are an inflexible source of energy that carries an enormous overhead in terms of safety and security, when what we need in our energy system for dealing with inevitable emergencies is not rigidity, but resilience."

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U.S.: 86 organizations call for immediate action on covid-19 nuclear risks

A letter from 86 organizations to Vice President Michael Pence, chair of the Coronavirus Task Force, and six federal agencies points to the failure of industry regulators to act in response to the pandemic.[1] The groups call for an immediate, multi-agency, industry-wide response to protect nuclear workers and the rural and suburban communities where facilities are located, and to ensure nuclear safety is not compromised.

To date, the Nuclear Regulatory Commission (NRC) has not required the companies that operate nuclear power plants and other radiological facilities to implement COVID-19 plans in accordance with federal guidelines for essential workers, nor to report infections among the workforce. Some local media reports have indicated significant rates of infection at reactor sites.

"The Nuclear Regulatory Commission (NRC) has abdicated its legal responsibility to protect nuclear workers and the public during the COVID-19 pandemic. The federal government must step up to rein this situation and protect nuclear workers and rural communities, who are paying the cost of NRC's inaction," said Tim Judson, Executive Director of the Nuclear Information and Resource Service, a non-profit environmental organization.

Since March, NRC has granted exemptions to increase limits on the number of hours employees can be required to work, and to postpone scheduled safety inspections and maintenance for up to two years. Nuclear power plants typically employ a staff of 600-1,000 full-time employees.

Workers have complained of a lack of social distancing, sanitation, PPE, and testing. Conditions make social distancing difficult, with large work crews, confined spaces, heavy equipment, contact with radiation detectors, and physical security screenings.

"NRC's absurd decision to radically increase worker overtime is strongly argued against by findings from the National Safety Council, the CDC and OSHA, all of whom conclude that the effects of excessive overtime on already stressed workers can be the functional equivalent of drinking three beers on the job – something even Homer Simpson is not permitted," notes Dave Kraft, Director of the Chicago-based Nuclear Energy Information Service.

At the same time, NRC has permitted the industry to proceed with refueling operations at 30 reactor sites, introducing 1,000-2,000 temporary workers and contractors to each site. Most refueling workers work a series of jobs, traveling from reactor site to reactor site for a few days or weeks at a time. Because people can transmit the coronavirus without exhibiting symptoms, infection can spread quickly, unknown to public health officials. While NRC requires workers to pass background checks and drug tests, NRC is not requiring coronavirus screening or quarantining of workers prior to beginning work.

"Proceeding with refueling outages at this time is creating a vector for transmission of coronavirus to dozens of rural and suburban communities, placing public health at risk," the letter states. "The federal government must act to ensure that nuclear operations do not result in transporting the virus from community to community."

The industry has also deluged NRC with potentially hundreds of requests to postpone or cancel safety inspections and maintenance projects for up to two years, until the next refueling outage. NRC is expediting approval of the requests to meet industry's refueling schedules. By not evaluating the cumulative safety risk of multiple exemptions for each reactor, NRC is permitting them to operate with otherwise impermissible levels of risk. Safety incidents and actual accidents with releases of radiation have resulted in cases when the NRC has permitted inspections to be postponed for only a few weeks or months.

"This current pandemic situation puts Illinois – the most nuclear-reliant state in the nation – on the horns of a safety dilemma: decreased reactor safety through skipped maintenance vs. spreading the pandemic," Kraft points out. "Neither is acceptable."

"What NRC is doing is grossly negligent," said Judson. "The White House must not permit increased risk of a radiological disaster during and beyond the duration of the COVID-19 pandemic. The health and safety of workers, first responders, and the public have to come first."

The joint letter recommends the following immediate actions:

- An Interagency COVID-19 Nuclear Task Force to develop plans and protective measures for nuclear workers and reactor operations. The task force should include, at a minimum, NRC, CDC, NIAIA, OSHA, FEMA, and FERC.
- Immediate halt to additional refueling and decommissioning operations at nuclear power stations until the Task Force has developed, and licensees have implemented, site-specific plans to protect workers and prevent the spread of the disease in the host regions, while also ensuring radiological health and safety.
- Reconsider increased overtime limits for nuclear workers from 72 to 86 hours per week. Increased fatigue affects workers' vulnerability to COVID-19 and nuclear safety.
- Prepare required Disaster Initiated Reviews of the impact of the pandemic on emergency response plans at all reactor sites and fuel cycle facilities.
- All requests to postpone and exempt maintenance and inspections subject to (a) a cumulative risk analysis and (b) an integrated review by the COVID-19 Task Force.
- Ensure reactors do not operate with increased safety risks, even when their operation is determined necessary to operate to maintain the electricity supply.

The letter is posted at https://www.nirs.org/wp-content/uploads/2020/04/Nuclear-COVID19-letter_WH-CoV-Task-Force_86-organizations.pdf

Covid-19: The pandemic of nuclear weapons

Ray Acheson – Director, Reaching Critical Will, Women's International League for Peace and Freedom

It's 2020, we're in the midst of a global pandemic, we are facing unprecedented challenges ahead from the climate crisis, there are vast inequalities and suffering in the world, and … oh yeah. We still have nuclear weapons. In fact, the United States has more nuclear warheads than it does hospitals![1]

In each of the nuclear-armed states, the money spent on nuclear weapons has directly impacted the resources available to deal with COVID-19. In 2019, the nine nuclear-armed states (China, Democratic People's Republic of Korea, France, India, Israel, Pakistan, Russia, United Kingdom, and United States) spent nearly US$73 billion on their nuclear weapon systems.[2] This comes to $138,699 spent on nuclear weapons per minute.

While this is a fraction of the $1.9 trillion[3] spent in 2019 on all aspects of militarism, the money wasted on nuclear weapons is still a substantial amount that could have gone towards, say, health care and equipment that is vital during a global pandemic. Research by the International Campaign to Abolish Nuclear Weapons (ICAN) shows, for example, that France, which spends approximately €4.5 billion a year right now on its nuclear weapon programme, could redirect those funds to pay for 100,000 hospital beds for intensive care units, 10,000 ventilators, and the salaries of 20,000 nurses and 10,000 doctors.[4]

Yet even now we are witnessing the nuclear-armed states continue to invest in not just the maintenance but also the "modernisation" – the upgrading, updating, and life-extending – of nuclear weapons.

These political and economic choices are absurd, dangerous, and immoral. But it's just not just the wasted money that is concerning. The much bigger problem is the threat that nuclear weapons pose as tangible objects designed and constructed to incinerate human bodies and buildings. Nuclear weapons are not magical tools of security. They are monstrous weapons meant to melt and burn human flesh one city at a time.

Fortunately, there is something we can do to get rid of the threat of nuclear weapons and release the funds we desperately need to deal with real, rather than imagined, crises of security, safety, and stability: we can divest, demilitarise, and disarm.[5] We can start this process by shaking off the rhetoric about nuclear weapons that we have been force-fed for generations and remembering the terrifying reality that these bombs impose upon us all.

"Nuclear deterrence," aka a masterclass in gaslighting

The nuclear age began nearly seventy-five years ago when a bunch of scientists working for the US government detonated an atomic bomb in the middle of a New Mexican desert in July 1945. A few weeks later, a US president sitting in Washington, DC, decided to drop two nuclear weapons on the people of Japan – one on the city of Hiroshima, the other on Nagasaki. Since then, the world has been plagued by the construction of multiple "doomsday machines" programmed for global conflagration.[6]

For seventy-five years, the world has lived under the threat of radioactive blast and firestorm, the effects of which are immediately devastating and punishingly intergenerational.[7] For seventy-five years, from production to testing, and use to storage of radioactive waste, nuclear weapon activities have contaminated land and water – and will continue to do so for thousands of years more.[8] For seventy-five years, corporations like Lockheed Martin, Boeing, and Bechtel have reaped incredible profits from government contracts for bombs and bombers.[9] Certain academics, politicians, and bureaucrats have risen through the ranks of think tanks or government administrations in positions bankrolled by the nuclear profiteers, spinning theories of "nuclear deterrence" and "strategic stability" to justify this massive, unconscionable investment in technologies of massive violence.

For seventy-five years, we have been told that these weapons are absolutely necessary for (some, a select few) governments to possess, in order to ensure "international security" or "strategic stability". Eliminating nuclear weapons, we are told, will lead directly to another global conflict. As if the globe is not embroiled, right now, in conflicts of mass slaughter and destruction. We are told that without these weapons we would be subjected the whims of the "irrational" Others who will seize our moment of vulnerability to strike at the heart of the "free world" … blagh blagh blagh.

This is nuclearism – the faith that nuclear weapons are necessary and essential for security, and the investments in both building the weapons and bolstering this culture. Nuclearism is an epic feat of gaslighting[10] that insists that weapons that can kill everyone on the planet many times over are the only things keeping us safe.

Operation Crossroads, Bikini Atoll, 1946

Preparing for major apocalypse in the midst of a "minor" one

But we are far from safe. Right now, we are in the midst of a global pandemic for which no governments were sufficiently prepared. We do not have enough basic equipment like ventilators and protection for health care workers. Capitalist economies are tanking as the majority of workers have been ordered to stay at home to prevent the virus from spreading even more rampantly than it has already. Millions of people have lost or will lose their jobs. Hundreds of thousands will lose their lives.

But don't worry: the nuclear-armed states can still use their nuclear weapons! US Strategic Command has said that the coronavirus has had "no impact" on the ability of the United States to launch its nuclear weapons.[11] "Right now across the command, we are working to make sure that our ICBMs remain on alert and our critical command and control capabilities stay viable," say those in charge of the US doomsday machine.[12]

While nuclear weapon forces in all nuclear-armed states are likely to be affected[13] by the pandemic and may have to delay or reduce active deployments or other activities, the fact is that there are still approximately 13,410 nuclear weapons in the world.[14] While this is significantly less than the 70,000+ kicking around in the 1980s, it is still more than enough to destroy our planet many, many times over. While we can celebrate the 80 per cent decrease in stockpiles, we also have to recognise that reductions of nuclear weapons tapered off in the 1990s, only to be replaced, as a recent joint activist statement has noted, "by a lavishly-funded new race to develop novel and diversified abilities to unleash nuclear violence."[15] (A forthcoming report from WILPF's Disarmament Programme Reaching Critical Will[16], *Assuring Destruction Forever*, will highlight each of the nine nuclear-armed states programmes for nuclear modernisation.)

The US government has been quick to reassure that the coronavirus pandemic will not affect its nuclear weapon investments.[17] The current US president's latest budget proposal, released earlier this year, called for an increase of nearly 20 per cent in spending on nuclear weapons while cutting funds for the Center for Disease Control, World Health Organisation, and other public health agencies.[18] BAE Systems, Boeing, General Dynamics, Lockheed Martin, Northrop Grumman, Raytheon, and all other major weapons producers have all indicated they are "open for business".[19] While many have instituted work-from-home policies for certain employees, they have all assured the Pentagon that they will continue to operate throughout the crisis.

In the United Kingdom, the government has so far indicated it is also full-steam-ahead with its nuclear weapon modernisation programme. Estimated to cost about £205 billion, the efforts to replace the UK's Trident nuclear weapon system has already suffered from cost overruns.[20] Furthermore, as the chapter on the United Kingdom in Reaching Critical Will's forthcoming publication notes, when it comes to accounting for other potential costs, "[e]nvironmental considerations and risks become externalities that are neither considered nor identified, with no analysis of remediation requirements or responses to climate change impact, accidents, or the protection of civilian populations."[21]

Other costs of nuclearism

Even without the detonation of a nuclear bomb, accidentally or on purpose, these weapons are costing lives.

Past nuclear weapon activities have direct impact on populations now facing the pandemic. Survivors of exposure to radiation from nuclear weapon use, testing, production, and waste are at greater risk from COVID-19. Exposed populations are disproportionately from Indigenous communities, communities of colour, low-income, and rural communities, all of which typically face barriers to receiving adequate health care.[22] Land, water, and animals have been contaminated by radioactivity around the world from nuclear weapons and nuclear energy.[23]

Nuclear weapons also cost our imagination. They trap us in a construct of the most violent forms of masculinity[24] and patriarchy[25], of might makes right, where weapons equal security and thus nuclear weapons equal The Most Security.[26] We can – we must – imagine more for ourselves as a species. We must imagine new conceptions of security[27] and solidarity.[28]

Women's March to Ban the Bomb, June 2017.

The imperatives of divestment and disarmament

This is why since the beginning of the pandemic, activists have been demanding an end to nuclear weapon modernisation and a redirection of resources.[29] Former Navy Commanders, members of parliament, academics, and activists have urged the UK government to redirect the billions of pounds spent on the operation and modernisation of the Trident nuclear weapon system towards responding to the pandemic instead.[30] US advocates have called for the government to reduce its "bloated nuclear arsenal and invest in more urgent security priorities" such as "preventing or mitigating any future mass outbreak of disease."[31] US activists have also demanded that stimulus packages include equitable health care access for communities harmed by nuclear weapon activities.[32]

But it is not just during the COVID-19 pandemic that we need to be concerned with nuclear weapon maintenance, modernisation, and use. This is a pandemic we live with every day, to the point where it has become completely normal for the vast majority of people in the world. Out of sight, out of mind. Missile tests don't even make the news. Nuclear weapon tests, such as those most recently by the Democratic People's Republic of Korea (DPRK), grab the headlines for a moment – but the fact that those most vocally condemning the DPRK's actions possess far larger nuclear arsenals themselves is virtually never discussed outside of antinuclear activist circles.

We cannot wait until a nuclear weapon is used again before we pay attention and act to end the threat of nuclear war. We don't have to.

From prohibition to elimination

In 2017, the majority of the world's countries negotiated and adopted the Treaty on the Prohibition of Nuclear Weapons.[33] It outlaws the possession, use, threat of use, and development of nuclear weapons. It closes existing legal gaps in international law, provides for nuclear disarmament, and categorically rejects the idea that nuclear weapons provide security or stability.

Among other things, this treaty precludes nuclear weapon modernisation, and bans any assistance – material or otherwise – with such programmes. This follows the nuclear Non-Proliferation Treaty (NPT)[34], which obligates nuclear-armed states both to achieve nuclear disarmament and to cease the nuclear arms race. None of the nuclear-armed governments are in compliance with either treaty.

It is here, on the basis of international law and all of the commitments and actions to which these governments have voluntarily subscribed over the past fifty years, that we can demand an end to nuclear weapons.

It is also on the basis of public health, environmental protection, and of morality and human rights[35], that we can demand nuclear weapon divestment and disarmament.[36] It is past time to unleash the funds and the forces of human ingenuity to more productive, positive, progressive ends: towards a Green New Deal[37] and a Red Deal.[38] Towards health care, housing, education, food, decarceration and prison abolition, migration, and more. Towards international relations and transnational cooperation based on peace, equity, justice, and solidarity, instead of weapons and war.

Actions for abolition

In our current world, with so many converging crises, it can be difficult to figure out what to focus our attention on, what to spend energy on. But it is clear that throughout history, social pressure is what leads to change. While the single-issue antinuclear organising of the past may not be possible, the time is riper than ever for activism based on the fundamental redirection of security concepts and funding priorities, of which nuclear weapons issues are an important aspect.

The threat of nuclear war, the waste of resources on nuclear weapon modernisation, maintenance, and deployment, the risks to health and environment of nuclear weapon production, are all very real, tangible costs of the atomic bomb that need to be considered within social movements looking to change how we can achieve safety, solidarity, and security as well as peace and justice. To address these concerns, it is imperative to incorporate feminist, racial and Indigenous justice, and environmental perspectives in the actions we undertake.

Right now, there are several opportunities to help promote nuclear abolition:

- Encourage your government to join the Treaty on the Prohibition of Nuclear Weapons[39];
- Fight against nuclear weapon modernisation projects;
- Protest and raise awareness of other nuclear weapon activities – such as the nuclear weapon convoys in the United Kingdom or nuclear sharing in several NATO countries;
- Divest your money from nuclear weapon producers and encourage your financial institutions to do the same[40];
- Get your city or municipal council to join the ICAN Cities Appeal[41];
- Write op-eds about the amount of money being spent on nuclear weapons in the midst of COVID-19.

These are all important actions we can take from our homes during this crisis. But it is also imperative to recognise how these actions can support other initiatives for social change, what the connections are between issues of local, national, and global concern, and how we can work together to mount a formidable, meaningful challenge to the nuclear-industrial complex but also to militarism and the other systems of our violent political economy.

Reprinted from www.wilpf.org/covid-19-the-pandemic-of-nuclear-weapons

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