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'No safe levels' of radiation in Japan

Experts warn that any detectable level of radiation is "too much".

Dahr Jamail Last Modified: 04 Apr 2011 15:46



According to the US Department of Energy, no level of radiation is so low that it is without health risks [EPA]

In a nuclear crisis that is becoming increasingly serious, Japan's Nuclear Safety Agency confirmed that radioactive iodine-131 in seawater samples taken near the crippled Fukushima Daiichi nuclear power complex that was seriously damaged by the recent tsunami off the coast of Japan is 4,385 times the level permitted by law.

Airborne radiation near the plant has been measured at 4-times government limits.

Tokyo Electric Power Company, the company that operates the crippled plant, has begun releasing more than 11,000 tons of radioactive water that was used to cool the fuel rods into the ocean while it attempts to find the source of radioactive leaks. The water being released is about 100 times more radioactive than legal limits.

Meanwhile, water that is vastly more radioactive continues to gush into the ocean through a large crack in a six-foot deep pit at the nuclear plant. Over the weekend, workers at the plant used sawdust, shredded newspaper and diaper chemicals in a desperate attempt to plug the area, which failed. Water leaking from the pit is about 10,000 times more radioactive than water normally found at a nuclear plant

Thus, radiation from a meltdown in the reactor core of reactor No. 2 is leaking out into the water and soil, with other reactors continuing to experience problems.

Yet scientists and activists question these government and nuclear industry “safe” limits of radiation exposure.

“The U.S. Department of Energy has testified that there is no level of radiation that is so low that it is without health risks,” Jacqueline Cabasso, the Executive Director of the Western States Legal Foundation, told Al Jazeera.

Her foundation monitors and analyzes U.S. nuclear weapons programs and policies and related high technology energy, with a focus on the national nuclear weapons laboratories.

Cabasso explained that natural background radiation exists, “But more than 2,000 nuclear tests have enhanced this background radiation level, so we are already living in an artificially radiated environment due to all the nuclear tests.”

“Karl Morgan, who worked on the Manhattan project, later came out against the nuclear industry when he understood the danger of low levels of ionizing radiation-and he said there is no safe dose of radiation exposure,” Cabasso continued, “That means all this talk about what a worker or the public can withstand on a yearly basis is bogus. There is no safe level of radiation exposure. These so-called safe levels are coming from within the nuclear establishment.”

Risk at low doses

Karl Morgan was an American physicist who was a founder of the field of radiation health physics. After a long career in the Manhattan Project and at the Oak Ridge National Laboratory, he became a critic of nuclear power and weapons. Morgan, who died in 1999, began to offer court testimony for people who said they had been harmed by the nuclear power industry.

“Nobody is talking about the fact that there is no safe dose of radiation,” Cabasso added, “One of the reasons Morgan said this is because doses are cumulative in the body.”

The National Academy of Sciences (NAS) published a report in 2006 titled Biological Effects of Ionizing Radiation (BEIR) report, VII Phase 2. NAS BEIR VII was an expert panel who reviewed available peer reviewed literature and wrote, “the committee concludes that the preponderance of information indicates that there will be some risk, even at low doses.”

The concluding statement of the report reads, “The committee concludes that the current scientific evidence is consistent with the hypothesis that there is a linear, no-threshold dose-response relationship between exposure to ionizing radiation and the development of cancer in humans.”

This means that the sum of several very small exposures to radiation has the same effect as one large exposure, since the effects of radiation are cumulative.

For weeks engineers from Tokyo Electric Power (Tepco) have been working to restore power to the plant and have resorted to having seawater sprayed on radioactive fuel rods that have been at risk of meltdown.

Despite this, Japanese officials conceded to the public on March 31 that the battle to save four crippled nuclear reactors at the Fukushima Daiichi nuclear plant has been lost. On March 29 a US engineer who helped install the reactors at the plant said he believed the radioactive core in unit No. 2 may have melted through the bottom of its containment vessel and on to a concrete floor.

Tepco’s chairman, Tsunehisa Katsumata, said they had “no choice” but to scrap the No’s 1-4 reactors, but held out hope that the remaining two could continue to operate, despite the fact that he admitted the nuclear disaster could last several months. It is the first time the company has admitted that at least part of the plant will have to be decommissioned.

But the government’s chief spokesman, Yukio Edano, repeated an earlier call for all six reactors at the 40-year-old plant to be decommissioned. “It is very clear looking at the social circumstances,” he said.

Even after a cold shutdown, scrapping the plant will likely take decades, and the site will become a no-man’s land.

Tonnes of nuclear waste sit at the site of the nuclear reactors, and enclosing the reactors by injecting lead and encasing them in concrete would make it safe to work and live a few kilometres away from the site, but is not a long-term solution for the disposal of spent fuel, which will decay and emit fission fragments over tens of thousands of years.

Near the plant, the radiation levels dangerously escalated to 400 milliseiverts/hour. Considering background radiation is on the order of 1 milliseivert per year, this means a yearly background dose every 9 seconds, based on industry and governmental “allowable” radiation exposure limits.

That compares with a national “safety standard” in the U.S. of 250 milliseiverts over a year. The U.S. Environmental Protection Agency says a single dose of 1,000 milliseiverts is enough to cause internal hemorrhaging.

Meanwhile, more than 168 citizens organizations in Japan submitted a petition to their government on March 28 calling for an expanded evacuation zone near the Fukushima nuclear disaster site. The groups are also calling for other urgent measures to protect the public health and safety.

Residents of evacuated areas near the stricken Fukushima nuclear plant have been warned that they may not be able to return to their homes for months as Japan’s nuclear crisis stretched into a third week.

The neighbourhoods near the plant will remain empty “for the long term”, Yukio Edano, the country’s chief cabinet secretary, said on April 1.

Though he did not set a timetable, he said residents would not be able to return permanently “in a matter of days or weeks. It will be longer than that”.

The official evacuation zone remains only 20 kilometres, while the government has encouraged people within 30 kilometres to evacuate.

Yet levels of cesium-137 in the village of Iitate, for example, have been measured at more than twice the levels that prompted the Soviet Union to evacuate people near Chernobyl. Iitate is 40 kilometres northwest of Fukushima.

Radioactive Iodine has already been found in the tap water in all of Tokyo’s 23 wards.

The U.S. Nuclear Regulatory Commission had already recommended an 80-kilometre evacuation zone for U.S. citizens in Japan.

Fukushima as Chernobyl

This month marks the 25th anniversary of the Chernobyl nuclear disaster.

“There are still no-go areas there, and the workers town has long since been abandoned, and we are seeing radioactive refugees from there, like we are now seeing generated in Japan,” Dr Kathleen Sullivan, a disarmament educator and activist who has been engaged in the nuclear issue for over 20 years told Al Jazeera, “Tepco is trying to cover their rear-end, and the Japanese government is being cagey about it, and I believe people don’t understand that radiation is a major problem and issue.”

Dr Sullivan, cited Albert Einstein, who said, “The splitting of the atom changed everything, save man’s mode of thinking; thus we drift towards unparalleled catastrophe.”

“So we don’t understand this mistake because of the timeless invisible nature of the problem that radiation is,” Sullivan, who has been an education consultant to the UN Office for Disarmament Affairs, added.

Some experts have warned of a nightmare scenario where clouds of radioactive material could spread lethal toxins across the planet for months on end if the spent fuel rods catch fire due to lack of coolant.

The Central Institute for Meteorology and Geodynamics of Vienna told New Scientist on March 24: “Japan’s damaged nuclear plant in Fukushima has been emitting radioactive iodine and caesium at levels approaching those seen in the aftermath of the Chernobyl accident in 1986. Austrian researchers have used a worldwide network of radiation detectors – designed to spot clandestine nuclear bomb tests – to show that iodine-131 is being released at daily levels 73 per cent of those seen after the 1986 disaster. The daily amount of caesium-137 released from Fukushima Daiichi is around 60 per cent of the amount released from Chernobyl.”

The same group of scientists stated, “The Fukushima plant has around 1760 tonnes of fresh and used nuclear fuel on site,” while, “the Chernobyl reactor had only 180 tonnes.”

According to a report from the New York Academy of Sciences, due to the Chernobyl disaster, 985,000 people have died, mainly from cancer, between 1986-2004.

Monitors have detected tiny radioactive particles which have spread from the reactor site across the Pacific to North America, the Atlantic and even Europe.

Andrea Stahl, a senior scientist at the Norwegian Institute for Air Research, told Reuters, "It's only a matter of days before it disperses in the entire northern hemisphere."

Tens of thousands of people living near the plant have been evacuated or ordered to stay indoors, while radioactive materials have leaked into the sea, soil and air.

Last week also marked the 32nd anniversary of the Three Mile Island nuclear disaster in Middletown, Pennsylvania, in the United States.

250,000 years of radiation

Sullivan explained that when dealing with long-lived radioactive materials, in addition to carcinogens there are inter-generational effects that include the mutation of the genetic structure of life.

"This is permanent and irreversible," she added.

Sullivan uses Fukushima reactor No. 3 as an example, because it is fueled with Mox fuel uranium and plutonium. Plutonium has a half-life of 24,000 years, which means it is carcinogenic and mutagenic for up to 250,000 years, or 12,000 human generations.

A radioactive half-life means that in this case, in 24,000 years, half of the ionizing radiation will have decayed, then in another 24,000 years half of that radiation will decay, etc.

"That's not really understandable or explainable in a conventional sense of knowing," Sullivan said, "We have to apply our moral imagination to 12,000 generations to even begin to understand what we are doing in this moment."

Source: Al Jazeera

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Matthew Nelson ★ 12 hours ago

More FUD. Yes, radiation levels near the plant are dangerous, but "any detectable level" can be perfectly safe. You're already exposed to 2-10 mSv annually from natural sources. The cosmos and dirt constantly irradiate everybody. You need an exposure of 50-100 mSv before an observable increase in the incidence of cancer.

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Evan Parker ★ 12 hours ago in reply to Matthew Nelson

Are you daft? The article references 400mSv/hr radiation levels... how many bananas are you consuming, exactly?

Flag



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ArmanS ★ 12 hours ago in reply to Evan Parker

Reconstructing the logic of the OP, it seems like a reference to "any detectable level". You should be able to make a difference for a sensitive detector with just one banana: bananas are rich with K and K (40) is naturally radioactive. Also it's organic which means C (14). The article is a total crock: any cosmic ray avalanche from a high-energy particle slamming upper atmo not to mention distant GRB not to mention really bad-azz solar flair that breaks through Earth protective layers is going to give you a jolt of electromagnetic in X to gamma spectrum. Getting it all the time any time.

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Josh Strike ★ 12 hours ago in reply to Matthew Nelson

FUD? You're saying it's wrong to be fearful, uncertain or doubtful about statements made by TEPCO and the Japanese government, who say "don't worry" in the face of

what the US government (not exactly the most forthcoming or wholesome member of global society) has already deemed to be dangerous?

Why don't you put your zygotes where your mouth is and buy some beachfront property in Fukushima?

Flag



- and 10 more liked this



Andrew Strauss ★ 12 hours ago in reply to Josh Strike



I'm with you, Josh. These cowards should let their genetic material do the talking.

Flag



Josh Strike and 2 more liked this



go2goal ★ 12 hours ago in reply to Matthew Nelson



Asbestos occurs naturally....I hear that's really good for you as well. I think you should move to Diablo canyon and insulate your house with asbestos. This isn't FUD.....

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defhigh and 10 more liked this



ArmanS ★ 12 hours ago in reply to Matthew Nelson



And you get even more if you go up from the sea level to the Continental Divide and/or close to granite rocks naturally rich with U, Th and K(40). This article is indeed reeks of moronitude.

Flag



Ryan D. Brady and 9 more liked this



- - ★ 12 hours ago in reply to ArmanS



Only people with no concern for the welfare of others, like you two, are the idiots!! I guess you two idiots didn't read the part that those "natural sources" of radiation have gone-up over the decades because of nuclear testing! And it's sure to go up again with every nuclear power plant, especially from these ones leaking in Japan. I hope you people that keep pushing for coal, oil, and nuclear energy get all the ill effects from it, because you obviously think that you are immune to it and think that it's somebody else that has to suffer.

Flag



myob noisy and 12 more liked this



rattboo ★ 11 hours ago



It is surely interesting how people who think nuclear power is so good, can deny scientific facts and deny human nature, to force their opinions on others, yet these same people will willingly take advantage of the benefits of science if they so choose. People, get it through your heads - the information in this article not exaggerated - and actually may even understate the dangers of nuclear power. Understand the meaning of "half-life" and what that means for 24,000 years. Its math - its non-linear. It takes way longer than two times

24,000 for all the radiation to go away, and once the genetic material that reproduces life has been mutated it is changed FOREVER - got it FOREVER - understand the ramifications of that - they are horrendous. The "straw man" argument using the comparison to "background radiation" is meaningless blather. With all the nuclear bomb testing that has been done, the nuclear accidents and holes in the ozone layer, it will be thousands of years before we really know what the actual "background" radiation "should" be. We do have options, we just need to keep the rich - the very rich - from destroying this world with their greed. The paid skills posting on the Internet about the wonderfulness of nukes should be forced to work cleaning up the reactors with their bare hands, and the ignorant sheep people following them need an education.

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myob noisy and 15 more liked this



Geoff Strickler ★ 8 hours ago in reply to rattboo

- So, you're saying that the most inflated and unsubstantiated claims about the dangers of radiation given in this article may be understated? You should try reading up on the actual evidence (yes, those same benefits of science you mention, but then choose ignore the results you don't like, read it anyway).

And, we do now what the background radiation "should be", we've been measuring it since before all the nuclear bomb tests and nuclear power plants. It varies tremendously based upon altitude and the geology of each region. Those black sand beaches in Brazil, cause a much higher level of background radiation. Live in the Rocky Mountains? Higher because of elevation and the presence of granite. Plenty more examples around the world. There are places where the natural background radiation is greater than 50x higher than "average", yet people live there just fine.

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3 people liked this.



Ryan D. Brady ★ 12 hours ago

- Never thought I'd call out AlJazeera for poor reporting. Might want to mention that Western States Legal Foundation is an anti-nuke organization?

If radiation damage is strictly cumulative, then why has dose fractionation been observed to increase survival?

Flag



ADiff and 15 more liked this



Eric Edwards ★ 11 hours ago

- Funny that they say no level is without health effects, yet say that the x-ray machines at airports are completely safe. hmm?

Flag



Leyli Cecil and 14 more liked this



Julia Spiegel ★ 12 hours ago

- whoevers genius idea it was to put a nuclear power plant on the ring of fire... stupid.

Flag

- and 13 more liked this *coconutgirl* ★ 11 hours ago

I've been stating these things in so many words quoting physicists and nuclear scientists, teachers, biologists, etc. but I only got the safe banana comparisons. Finally an article that puts some of it together... Wish you guys would focus more on Japan. I liked your Japan blog and feel there is NO reason that should have stopped - it's just as important - it's still a seriously scary situation evolving. We need you real time.

Flag

VictorytothePeople and 9 more liked this *Alan* ★ 11 hours ago

One thing I've noticed about so called 'safe' levels is that they are regularly revised and lowered. This has been going on since the 50s.

Flag

ADiff and 6 more liked this *Andrew Strauss* ★ 12 hours ago

I find the comments on this article appalling. I hope that these commenters move to Japan, get cancer and die.

Flag

rattboo and 5 more liked this *Ryan D. Brady* ★ 12 hours ago in reply to Andrew Strauss

If I had a good job offer in Japan, I would move there. The economic damage from the tsunami and earthquake will far outweigh the effects of the Fukushima reactor crisis.

Flag

2 people liked this. *Jon Blackmon* ★ 11 hours ago in reply to Ryan D. Brady

There are plenty of jobs in Japan in the nuclear power industry, and since many workers have already exceeded their "safe dosage" levels weeks ago, there will be many openings for brave people like you. The economic damage of the earthquake and tsunami will pale in comparison to the damage caused by ongoing radiation which will last (for all practical purposes) FOREVER. Long after you are dead your survivors will suffer DNA damage. Chances are after you work for TEPCO for a short while in their "safe" environment, your children (if you can even produce children) will be defective, and their children, and their children... Ryan, you are either a agent provocateur or really stupid. Once again you need to be told, there is NO SAFE level of radiation, and if you still believe 400 mr/h is safe, please go to Japan or Chernobyl and help promote nuclear energy by sacrificing yourself.

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unconvinced333 and 15 more liked this [Like](#)



Andrew Strauss ★ 12 hours ago in reply to Ryan D. Brady

Are you a skill for the nuclear industry?

Flag



- - and 11 more liked this [Like](#)



Ryan D. Brady ★ 10 hours ago in reply to Ryan D. Brady

I didn't say I'd get a job at Fukushima Daiichi. The workers there are undeniably brave, and I wouldn't be surprised if they have long-term health ramifications - so do workers in coal mines, and so do people living in the areas affected by the BP oil spill.

If I had a good enough offer for a biotech (my industry) job in Japan, I would take it.

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CriticalEye21 6 hours ago

From twitter via BackType

'No safe levels' of #radiation in #Fukushima, #Japan <http://bit.ly/hcXVQT>



sitazo 6 hours ago

From twitter via BackType

あまりにひどいので記事を紹介。やっぱりアルジャジーラよりトリジャジーラだな。

<http://t.co/ksAG5Eu>



estrellacometa 6 hours ago

From twitter via BackType

'No safe levels' of radiation in Japan - Features - Al Jazeera English <http://t.co/OqXIGML> via @ajenglish



David_Erwin 6 hours ago

From twitter via BackType

Generations will Face the Fallout A sobering look at Japan's nuclear crisis. AJE

<http://bit.ly/gDWkrX> #japan #Fukushima



satokeiichi 7 hours ago

From twitter via BackType

この記事を見たら、東京も危ないって思うだろうばかやろう。 <http://bit.ly/gcN423>



AmeliaJSmith 7 hours ago

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Is nuclear a flexible platform? It's irreversibility suggests not. 'No safe levels' of radiation: Al Jazeera English <http://bit.ly/eaYpPw>



davidwsumner 7 hours ago

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stephensnyder3 7 hours ago

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