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As a result of an earthquake on 11 March 2011, the Japanese nuclear power plant Fukushima Dai-ichi experienced a worst case disaster scenario, which included multiple meltdowns. A great deal of what nuclear regulatory authorities and the nuclear industry typically dismiss as irrelevant and "practically impossible" played a role in the course of the disaster in three reactors and four fuel rod pools – an earthquake, an electricity blackout, the failure of emergency batteries, steam powered cooling pumps, explosions, etc. On 12 April 2011, Japan's Nuclear and Industrial Safety Agency (NISA) categorized the reactor accident as being at Level 7 (catastrophic accident), the highest level on the International Nuclear Event Scale (INES), as a result of the massive release of radioactivity. An international research team concluded in a study published on 21 October 2011 that the Fukushima nuclear disaster led to the release of 2.5 times as much of the radioactive noble gas xenon-133 as was the case in Chernobyl. The study, conducted under the auspices of the Norwegian Institute for Air Research, estimates a release of 16,700 petabecquerels of xenon-133 in the period from 11-15 March. According to the authors, this was "the largest non-military release in the history of mankind."

The study further indicates that a total of 36 petabecquerels of radioactive caesium-137, especially dangerous for human health, was released during March and April. The amount released in this period equalled around 40% of the estimated release of caesium-137 by Chernobyl. Approximately 20% of the caesium-137 fell on Japan, while around 80% contaminated the Pacific Ocean, the study reports.

2011: A MOTHER AT YONEZAWA GYMNASIUM – A SHELTER FOR PEOPLE WHO LIVED NEAR FUKUSHIMA NUCLEAR POWER STATION.

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Initially, the greater Tokyo area with its 36 million inhabitants was spared the worst. As the heaviest radiation clouds passed over the capital on 15 March, it did not rain. Between the 20 and 22 March, however, radioactivity once again blew over an even larger area of the main Japanese island stretching from the north of the nuclear plant to Osaka in the south. Strong rains led to practically all of the caesium-137 being washed out of the atmosphere. As a result, there was considerable caesium contamination of a large area of Japan, including Tokyo.

The study came to another alarming finding. According to the analyses of the international research team, there are "strong indications" that the release of radiation on 11 March 2011 began very quickly as a result of the earthquake and possibly even before the tsunami hit the plant. Even the documents published by Tepco, the plant operator, raise suspicions that there were major problems with the reactor cooling system in the immediate wake of the earthquake. The High Pressure Coolant Injection system (HPCI) of Unit 1 completely failed to operate. The operators then manually turned off the only

Fukushima: Put an end to the nuclear age

other available cooling system, the isolation condensers, minutes after the earthquake, because the reactor was cooling off much too quickly. It subsequently heated up again with dangerous speed. The cooling system was once again quickly turned on, but by 15:34, minutes before a total electricity blackout, it was no longer operating – for whatever reason.

What actually took place at the Fukushima plant before it was hit by the tsunami – the cause of the catastrophe in the official version of events – remains unexplained both in Japan and in Germany. Reports commissioned by the German government from the Gesellschaft für Reaktorsicherheit (GRS), a non-profit organization that provides safety assessments of nuclear facilities, avoid any conclusive analyses or statements on this issue. There are strong indications of serious safety flaws in Fukushima's boiling water reactors, which were designed by General Electric. For instance, there was the lack of heat exchangers in the emergency cooling system (HPCI, Core Spray System) to cool the water. According to the American nuclear engineer Arnold Gundersen, the unusually large explosion in Unit 3 on 14 March could have been the result of a nuclear explosion in the spent fuel pool. The German government has not commented at all on this possibility. Similarly, the German mass media has remained silent on the issue. Evidently, the German public is meant to remain in the dark about a nuclear explosion that may have taken place at Fukushima.

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This policy of silence has had dramatic consequences for the people of Japan. The Japanese government, for instance, has long withheld information from the "Speedi" computer simulation system. This led to tragic repercussions for the 21,000 inhabitants of Namie, a city some eight kilometres northwest of the stricken nuclear plant. They fled more than 20 kilometres to Tsushima, where, on 15 March 2011, the largest amount of radioactive fallout rained down. The Japanese Ministry of Science and Technology later measured 4 Becquerel per square meter (Bq/m^2) of plutonium-238 in the soil of Namie. In the coastal city of Minamisoma, readings indicated 15 Bq/m^2 of plutonium-239 and plutonium-240. Radioactive strontium was even measured some 79 kilometres from the nuclear plant, along with many other locations, in the city of Shirakawa, which has 64,000 inhabitants.

Evacuation of the population

Approximately 100,000 to 150,000 people had to flee the region around Fukushima. The widening of the evacuation zones, however, only occurred gradually and was by no means comprehensive. This provoked international outrage towards the Japanese government. On 24 March 2011, the IPPNW, for instance, expressed the need to expand the evacuation zone, especially for pregnant women and children. Japan, a highly industrialized country, was completely overwhelmed by the situation. People from the contaminated zones were even denied emergency shelter, in part out of fear from radiation. Permissible levels of radiation for children were "officially" raised. In April, the Japanese Ministry of Education raised the radiation level in schools to 3.8 microsieverts per hour. Massive protests by parents followed. Even the IPPNW appealed to the Ministry. Last August, the maximum levels were finally reduced.

The consequences of the nuclear catastrophe are dramatic and they affect the

German nuclear policy before Fukushima

Just a few months before the Fukushima catastrophe, the German section of the International Physicians for the Prevention of Nuclear War (IPPNW) highlighted the real danger posed by a new nuclear catastrophe in a leaflet distributed to hundreds of thousands of people. In recent years, there have been a number of near misses that could have turned into major nuclear accidents in the USA, Taiwan, and Sweden, as well as serious incidents in France, Bulgaria, and Germany. The IPPNW has warned for years about the dangers posed to nuclear power plants from earthquakes and blackouts caused by extreme weather conditions. Yet, the media and politicians have been more interested – if at all – in the possibility of terrorists crashing airplanes into nuclear plants. They have resisted any serious discussion of severe gaps in safety and the constant danger of a nuclear accident. The IPPNW has urgently stressed the danger of hydrogen explosions in nuclear reactors, yet the German nuclear authorities, safety inspection agencies, and the nuclear industry have treated this issue as irrelevant, just as they have other concerns, such as the lack of steam operated cooling pumps not dependant on electricity or the inadequate capacities of emergency batteries.

Failure at the state level can also be observed in the justice system. For years, the Administrative Court in Hessen refused to seriously consider a lawsuit by the IPPNW calling for the closure of nuclear plants. The German Federal Constitutional Court refused to accept a constitutional complaint. Even politicians did not dare to decommission nuclear power plants against the will of the nuclear industry, and yet they allowed the industry to earn a 280 percent return on their equity from electricity customers. The "fourth estate," the media, had been writing articles sympathetic to extending the operating life of nuclear plants only months before the Fukushima catastrophe. Top politicians as well as upper echelon bureaucrats in nuclear energy administrative bodies accepted high-paying positions in the nuclear industry. Even some members of the German Parliament were on their payroll. A managing supervisor at the German nuclear supervisory agency took a job with a nuclear power plant operator and then returned to the top of a toothless supervisory agency. Everything ran smoothly – in Germany just as it did in Japan …

whole of Japan, not merely the Fukushima region. According to a publication by Japanese scientists in the journal "Proceedings of the National Academy of Sciences" in November 2011, soil in the western parts of the country is contaminated with around 25 Becquerels per kilogramme (Bq/kg), while eastern regions are usually burdened with levels of more than 100 Becquerels. In the prefects of Fukushima, Miyagi, Tochigi, and Ibaraki, caesium contamination was measured to levels of around 5000 Bq/kg (with considerably higher values in the vicinity of the damaged nuclear plant). The caesium contamination in four Japanese prefects thereby exceeds or is barely under the (very high) permissible limits, above which the Japanese government forbids agriculture and the raising of livestock.

Dangerous levels of radioactivity have also been measured in tens of thousands of tons of sewage sludge. According to information from Japanese environmental organizations, the government plans to take contaminated debris from the Fukushima region and distribute it around the whole country for incineration. The Japanese Ministry of the Environment estimates that the amount of radioactive contaminated construction debris alone in the coastal regions of Iwate, Miyagi, and Fukushima amounts to more than 23.8 million tonnes.

According to a Japanese government report submitted to the IAEA in June 2011, the population has already been contaminated by numerous airborne radioactive particles. This dangerous radioactive cocktail consists of xenon-133, caesium-134 and 137, strontium-89 and 90, barium-140, tellurium-127m, 129m, 131m, and 132, ruthenium-103 and 106, zirkonium-95, cerium-141 and 144, neptunium-239, plutonium-238, 239, 240, and 241, yttrium-91, praseodym-143, neodym-147, curium-242, iodine-131, 132, 133, and 135, antimon-127 and 129, as well as molybdian-99.

Huge quantities of highly radioactive water used to cool the reactors has leaked or been pumped directly into the Pacific Ocean. This practice is far from ended, even today. Never before has so great an amount of radioactive fission products been released into the sea.

Radioactive contamination of food

The massive contamination of soil and sea water will have grave consequences for the health of the Japanese people. For example, seaweed, which is cultivated along the coasts of Japan, is a very important ingredient in Japanese cuisine. The German GRS has clearly laid out the dangers facing the Japanese. An analysis entitled "On Seawater Contamination near Fukushima Dai-ichi (as of 6 April 2011)" provides readings estimating radiation contamination of seawater in the vicinity of the nuclear power plant. The result is that the consumption of only 100 g of seaweed results in an effective dose contamination of between 2.2 millisieverts (mSv) for red algae and 220 mSv for the brown kombu algae. At a distance of 10 kilometres from the plant, the brown algae still showed readings of 2.2mSv. This means that a single serving of seaweed can contain twice or even 220 times more than the official annual radiation limit. This lies far above the exposure limit of 1 mSv set by the German Regulations on Radiation Protection.

It should nonetheless be taken into consideration that even exposure at a minute level of radiation poses a health risk and can provoke serious illness such as cancer. This has been the general scientific consensus for decades. Every assignment of exposure limits is merely a decision determining a tolerable number of fatalities. In accordance with the calculation guidelines set by the International Commission on Radiological Protection, the EU accepts with its current high exposure limits at least 7700 additional fatalities a year in Germany alone, even when exposure corresponds to only five percent of the limit.

The current EU exposure limits for food lie between 200 and 600 Becquerels of caesium per kilogramme (Bq/kg). Similarly, in Japan, radioactive contamination of milk and baby food is permitted to a level of up to 200 Bq/kg of caesium, while other food products can contain up to 500 Bq/kg. In the case of radioactive iodine, the levels allowed for milk and drinking water are 300 Bq/kg and 2000 Bq/kg for vegetables.

According to a report by the International Atomic Energy Agency (IAEA) from 24 March 2011, almost all plant and milk samples taken from the Ibaraki and Fukushima prefects contained radioactive iodine and caesium contamination in excess of the already high official exposure limits. The Japanese Ministry of Science (MEXT) reported that one month after the nuclear catastrophe, vegetable samples in some regions were showing readings of more than 100,000 Bq/kg of iodine-131 and 900,000 Bq/kg of caesium-137. A single serving of vegetables (500 g) would thereby exceed an annual exposure limit of 1 mSv by seven times.

The IAEA also reported that in March 2011, drinking water in numerous prefects between Fukushima and Tokyo contained iodine-131 in excess of permissible limits. In one district of Tokyo, drinking water was contaminated with 210 Bq/l of iodine-131. Considering that the limits are set at 100 Bq/l for children and 300 Bq/l for adults, these findings provide evidence of considerable radiation exposure in the highly populated capital region.

The degree of danger posed by the contamination measured in Japan becomes clearer when one recalls that after the Chernobyl catastrophe, independent radiation protection experts recommended adult levels for contaminated food consumption not exceed concentrations of 30 to 50 Bq/kg caesium in accordance with the radiation protection guidelines valid at that time. The recommended limit for children as well as for nursing and pregnant women was set at 5 to 20 Bq/kg. Previously published analysis results also indicate that the fallout from Fukushima contains a higher proportion of short-lived – and therefore more aggressive – caesium-134 than did the Chernobyl fallout.

REPORT

"Calculated Fatalities from Radiation" report

After the devastating reactor catastrophe in Japan, there was a great deal of concern in Germany about radioactive contaminated food. Although absurd, the EU nonetheless eased radiation contamination limits for food products imported from Japan. Only after massive protest did the EU correct its policies. The report "Calculated Fatalities from Radiation," which was published in mid-September 2011 by the consumer advocacy organization foodwatch and the IPPNW, concludes that the current maximum radiation limits in Japan and the EU do not offer adequate health protection and must be drastically reduced. The report is available in German, English, French, and Japanese:
http://tinyurl.com/5rhs4es

ACT NOW

Support the setting up of independent radioactivity measuring stations in Japan

Citizens in Japan have initiated Project 47: A measuring station is to be set up in every prefect for ordinary citizens (CRMS: Citizens' Radioactivity Measuring Station). There are a total of 47 prefects in Japan. The first measuring stations have already been set up in the Fukushima prefect. They allow people to measure the extent of radioactive contamination in their food. A similar project was initiated after Chernobyl by 40 citizens' groups in German-speaking countries. The project, however, is still in need of additional measuring devices. A gamma ray measuring station with sufficient sensitivity to determine contamination in foodstuffs currently costs around 30,000 Euros. These devices are urgently needed. In November 2011, the first donations totalling 5.600 Euros were sent to Japan. Aya Marumori, the chairperson of the CRMS association, wrote, "As you know, since the reactor accident at Fukushima Dai-ichi, the government and the authorities have concealed the resulting damage and have played down and intentionally manipulated the dangers to health by repeating false information. Our activities in Fukushima are carried out under great stress and we are attempting to find some light in the darkness. We often find ourselves fighting an uphill battle. Your heartfelt sympathy for our activities is all the more encouraging. Thank you very much!"

CRMS homepage: **http://en.crms-jpn.com**

Please send donations to:
Bank account holder: Gesellschaft für Strahlenschutz
Purpose: Fukushima Projekt 47
Bank code: 200 100 20, Account number: 294 29 208
BIC: PBNKDEFF, IBAN: DE45 2001 0020 0029 4292 08

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Fukushima:
Put an end to the nuclear age!

Imprint

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