

Fukushima Nuclear Crisis Timeline

February 2014

March 2011

11 March

A magnitude 9.0 earthquake strikes off the east coast of Japan. A large tsunami follows. The Fukushima Daiichi nuclear power plant loses power; back-up generators also go down. Without power, cooling systems fail. Within days, three of the plant's reactors experience meltdown, and hydrogen explosions destroy the reactor buildings. [1]

12 March

Japan declares a 20km evacuation zone around the Fukushima Daiichi plant, displacing tens of thousands of residents [2]. The government later expands the zone to other highly contaminated areas, leading to the eventual evacuation of 150,000 people [3].

23 March

New analysis prepared for Greenpeace by a nuclear safety expert shows that enough radioactivity was released into the atmosphere to rank at Level 7 on the International Nuclear Event Scale (INES). This is the scale's highest level, and equal to the 1986 Chernobyl nuclear disaster. [4] Despite clear facts and INES criteria, TEPCO – the operator of the Fukushima nuclear plant – only upgrades its ranking at this time from Level 4 to Level 5 scale of accident. [5]

26 March

Greenpeace specialists begin independent measurements of radiation in the contaminated region and immediately find radiation levels high enough to require evacuation in several locations to the northwest of the crisis stricken Fukushima Daiichi nuclear plant, including Iitate village, 40km from the plant and 20km beyond the official evacuation zone. [6] Although the Japanese government rejects these findings, experts of IAEA confirm the need for evacuation two days later [7].

[1] http://en.wikipedia.org/wiki/Fukushima_Daiichi_nuclear_disaster

[2] <http://en.ria.ru/world/20110315/163008635.html>

[3] <http://www.bbc.co.uk/news/world-asia-18718486>

[4] <http://www.greenpeace.org/international/en/publications/reports/Fukushima--INES-scale-rating/>

[5] http://en.wikipedia.org/wiki/Accident_rating_of_the_Fukushima_Daiichi_nuclear_disaster

[6] <http://www.greenpeace.org/international/en/press/releases/Greenpeace-radiation-team-pinpoints-need-to-extend-Fukushima-evacuation-zone-especially-to-protect-pregnant-women-and-children/>

[7] <http://www.reuters.com/article/2011/03/31/idINIndia-56004520110331?feedType=RSS&feedName=worldNews>

April 2011

TEPCO admits that radioactive water from Fukushima reactor #2 is leaking into the ocean from a crack in the maintenance pit near the reactor [8]. In addition, TEPCO intentionally dumps 11,500 tonnes of radioactive water into the sea, ignoring protests from other nations and its own fisheries industry [9]. Measurements show levels of radioactive iodine-131 in seawater at 7.5 million times the legal limit.

4 April

Greenpeace expands its radiation team operating in Fukushima Prefecture. Based on more detailed findings, Greenpeace calls for an expanded evacuation zone, and urges the evacuation of pregnant women and children from high-risk areas [10].

6 April

Greenpeace radiation experts begin testing food and find radiation levels above official limits in vegetables collected from gardens near Fukushima City, Koriyama and Minamisoma, and from a supermarket in Fukushima City [11]. In the meantime, Japan announces it will raise the allowable radiation levels for children to 20 times higher than the internationally recognised and legal limit of 1 millisievert a year [12].

12 April

Japan finally and officially rates the disaster at Level 7 on the INES scale, a decision Greenpeace calls “woefully late” [13].

22 April

The government finally concedes that radiation levels remain too high in Iitate and other contaminated areas, and urges residents to evacuate – one month after Greenpeace’s demand to widen the evacuation zone [14].

[8] <http://www.csmonitor.com/USA/2011/0402/Japan-nuclear-update-Repairing-crack-to-stop-radioactive-water-leak>

[9] <http://edition.cnn.com/2011/WORLD/asiapcf/04/04/japan.nuclear.reactors/>

[10] <http://www.greenpeace.org/international/en/news/Blogs/makingwaves/expanded-fukushima-radiation-monitoring-team-/blog/34077/>

[11] <http://www.greenpeace.org/international/en/news/Blogs/makingwaves/field-team-finds-high-levels-of-contamination/blog/34118/>

[12] http://www.mext.go.jp/b_menu/houdou/23/04/1305174.htm

[13] <https://www.facebook.com/notes/international-atomic-energy-agency-iaea/iaea-update-on-fukushima-nuclear-accident-12-april-2011-445-utc/209209679108826>

[14] http://seattletimes.com/html/nationworld/2015259302_apasjapanearthquakeleavingiitate.html

May 2011

TEPCO finally admits that the meltdown began in reactor #1 within five hours after loss of power, and also occurred in reactors #2 and #3 [15].

Greenpeace’s flagship *Rainbow Warrior* arrives in Japan [16]. Greenpeace urges the Japanese authorities to undertake comprehensive radiation testing of seaweed along the Fukushima coast, after it carries out the first marine radiation monitoring [17]. Initial tests by Greenpeace register significantly high levels of radioactive contamination, far beyond allowable limits for food consumption.

[15] http://www.tepco.co.jp/en/press/corp-com/release/betu11_e/images/110515e10.pdf

[16] <http://www.greenpeace.org/international/en/news/Blogs/makingwaves/rainbow-warrior-begins-sampling-off-fukushima/blog/34542/>

[17] <http://www.greenpeace.org/international/en/press/releases/Japanese-Government-must-immediately-investigate-seaweed-contamination/>

June 2011

NISA, Japan’s nuclear regulator, announces that radiation releases of radioactive isotopes of iodine and caesium from the accident are more than double what they originally stated: 770,000 terabecquerels, up from 370,000 terabecquerels of iodine-131 equivalent [18].

Greenpeace radiation experts find very high levels of contamination in the backyards of Fukushima City schools and kindergartens, as well as on access roads that children use. Radiation levels at a public playground actively used by families and kids reach 9.5 microsieverts an hour, and a hotspot next to a public school reads 45 microsieverts an hour, even after decontamination efforts.

Greenpeace again calls the government to implement better monitoring, to provide better information and protection of people, and to give support to highly vulnerable members of the community – such as children and pregnant women – to allow them to voluntarily evacuate from highly contaminated places [19].

[18] <http://www.bbc.co.uk/news/world-asia-pacific-13678627>

[19] <http://www.greenpeace.org/international/en/press/releases/Statement-from-Greenpeace-International-Executive-Director-Kumi-Naidoo-at-Tokyo-Press-Conference/>

July 2011

Prime Minister Kan calls for a nuclear-free Japan [20]. Under pressure, he later says this is his personal view and not government policy [21]. Kan is eventually pushed out and replaced by Yoshihiko Noda, who is considerably more pro-nuclear. Reports surface that TEPCO and NISA were aware of the possibility of a major tsunami since the 1990s, and in 2006 shared a report concluding that the resulting flooding could cause a power loss and cooling failure of nuclear reactors, but downplayed the risk [22].

Japan bans cattle shipments from Fukushima after cows eat contaminated straw. Over the next month, this affects thousands of cattle from prefectures around the nation. The beef industry is decimated, affecting farmers nationwide. Nuclear Minister Goshi Hosono says that the government will move to lift some of the evacuation zones.

Greenpeace responds, arguing that the situation at the Fukushima nuclear plant is not under control and supplies of uncontaminated food remain in jeopardy.

[20] http://www.washingtonpost.com/world/reports-japan-plans-for-nuclear-phaseout-by-2030s/2012/09/12/02c7f866-fd3c-11e1-8adc-499661afe377_story.html

[21] <http://ajw.asahi.com/article/0311disaster/fukushima/AJ201107154682>

[22] *The official report of The Fukushima Nuclear Accident Independent Investigation Commission, National Diet of Japan, 2012*

August 2011

Japan's Foreign Minister announces that, as a result of the beef crisis, Japan can no longer vouch for the safety of the food it exports [23]. In a related discovery, radioactive rice – a staple of the Japanese diet – is found [24].

The outgoing NISA chief says that nuclear regulation in Japan is inadequate and admits that as early as March 12 he knew that the reactor fuel at Fukushima Daiichi power plant might have been damaged [25].

Greenpeace calls on the Prime Minister to delay the opening of schools in Fukushima City after finding radiation dose rates again exceeding international safety standards at several schools and many public areas in the city. The findings, released shortly before schools were to restart, indicate that schools should not re-open until properly decontaminated [26].

[23] <http://www.japantimes.co.jp/news/2011/08/09/news/stop-claiming-food-is-safe-ministry-told/>

[24] <http://www.asahi.com/special/10005/TKY201108190385.html>

[25] <http://www.japantimes.co.jp/news/2011/08/12/news/nuke-regulation-inadequate-admits-sacked-nisa-chief/>

[26] <http://www.greenpeace.org/international/en/press/releases/Greenpeace-calls-on-new-Japan-PM-to-delay-school-start-for-Fukushima-kids/>

September 2011

Scientists at the Japan Atomic Energy Agency (JAEA) report that the disaster may have released more than three times as much radiation into nearby ocean waters as initially reported by TEPCO: up to 15,000 terabecquerels of iodine-131 and caesium-137. TEPCO only reported 4,720 terabecquerels [27].

[27] <http://www.reuters.com/article/2011/09/09/us-japan-tepco-idUSTRE7882E720110909>

October 2011

The Japan Nuclear Energy Safety Organisation (JNES) reveals that NISA officials secretly acknowledged the possibility of full nuclear meltdown on 25 March – at the same time that both NISA and TEPCO were only saying that the reactors were “slightly damaged” [28].

For the first time, Japan admits that decommissioning the Fukushima reactors will take more than 30 years [29], a figure later amended to 40 years. In May, TEPCO said the plant would only be shut down for six to nine months.

TEPCO announces the discovery of xenon-133 and -135 in reactor #2, a sign that criticality and possible nuclear fission are occurring. The utility later retracts its statement and blames the discovery on spontaneous fission. The incident highlights the instability of the reactors, as well as TEPCO’s lack of information about their current state [30].

[28] <http://news.asiaone.com/News/Latest%2BNews/Asia/Story/A1Story20111016-305273.html>

[29] <http://www.theguardian.com/world/2011/oct/31/fukushima-nuclear-plant-30-years-cleanup>

[30] <http://ajw.asahi.com/article/0311disaster/fukushima/AJ2011110316446>

November 2011

Japan’s largest retailer, AEON, announces that it is moving to zero radiation contamination of its food products after Greenpeace’s campaign focusing, in particular, on seafood [31].

[31] <http://ajw.asahi.com/article/0311disaster/fukushima/AJ2011110916977>

December 2011

TEPCO releases an interim report, saying that its employees made no errors in the handling of the nuclear disaster [32]. Meanwhile, a government panel publishes a highly critical report, charging that both TEPCO and NISA directly contributed to the nuclear crisis [33].

Prime Minister Noda announces that “cold shutdown” of the Fukushima reactors has been achieved [34]. The milestone is symbolic and political, designed to adhere to a schedule announced in September by Nuclear Crisis Minister Goshi Hosono and to allay public fears [35]. Members of Noda’s own party call the declaration “a fiction” [36].

Nine months after the triple meltdown at the Fukushima Daiichi nuclear plant, Greenpeace finds radioactive hotspots and signs that the official decontamination programme is both uncoordinated and thoroughly inadequate.

[32] <http://ajw.asahi.com/article/0311disaster/fukushima/AJ201112030028>

[33] <http://ajw.asahi.com/article/0311disaster/fukushima/AJ201112260076>

[34] <http://www.iaea.org/newscenter/news/2011/coldshutdown.html>

[35] http://ajw.asahi.com/article/behind_news/politics/AJ2011092011276

[36] <http://ajw.asahi.com/article/0311disaster/fukushima/AJ201112170007>

January 2012

In spite of the increased risk of earthquakes, Japan's nuclear industry continues to push nuclear power. Meanwhile, scientists from the University of Tokyo report that there is a 70% chance that a magnitude 7.0 earthquake will hit the Tokyo region, home to 12.9 million people, in the next four years. The chance of a similar quake hitting the same area within the next 30 years is 98% [37].

Over 90% of Japan's reactors are offline. Only three of 54 reactors are operating and no significant problems with the electricity supply are evident [38].

Greenpeace makes a submission to the OSPAR Commission's Radiation Substances Committee, sharing monitoring and warning against the ongoing contamination of ocean from the Fukushima leaking plant, requesting it be closely monitored and evaluated. Greenpeace emphasises that dumping contaminated water is unacceptable.

[37] <http://blogs.voanews.com/breaking-news/2012/01/23/japanese-scientists-98-percent-chance-of-major-quake-by-2042/>

[38] <http://www.neimagazine.com/news/newsnoda-calls-for-reduction-of-nuclear-in-japan-where-only-three-reactors-remain-in-operation>

February 2012

Prime Minister Yoshihiko Noda says that his country's dependence on nuclear power should be reduced to the "maximum extent". [39]

Japan approves a bill to create a new government entity, the Nuclear Regulatory Authority (NRA), which will oversee nuclear power and manage nuclear disasters [40].

Japan's Nuclear Safety Commission (NSC) reveals that the government concealed radiation exposure in children's thyroid glands in March 2011. A total of 1,080 children aged 15 and under were tested; some received annual doses as high as 35 millisieverts [41].

Greenpeace's report *Lessons from Fukushima* blames the disaster on "a failure of human institutions to acknowledge real reactor risks, a failure to establish and enforce appropriate nuclear safety standards and a failure to ultimately protect the public and the environment" [42].

A report by the Rebuild Japan Initiative Foundation reveals the chaos at the Fukushima plant in the days after the disaster began. The report blames then Prime Minister Naoto Kan's "haphazard micromanagement" and "poorly thought out stop-gap measures" by his subordinates [43].

[39] <http://www.neimagazine.com/news/newsnoda-calls-for-reduction-of-nuclear-in-japan-where-only-three-reactors-remain-in-operation>

[40] <http://www.nsr.go.jp/archive/nisa/shingikai/700/14/240724/AT-6-1.pdf>

[41] <http://ajw.asahi.com/article/0311disaster/fukushima/AJ201202220053>

[42] <http://www.greenpeace.org/international/en/publications/Campaign-reports/Nuclear-reports/Lessons-from-Fukushima/>

[43] http://ajw.asahi.com/article/behind_news/politics/AJ201202290019

March 2012

A year after the disaster, an independent panel investigating the nuclear disaster at the Fukushima Daiichi plant releases a report highly critical of TEPCO, then-Prime Minister Naoto Kan, and other government agencies. The report asserts that TEPCO's "systematic negligence" made "light of the culture of nuclear safety", and as a result, the utility failed to prepare for a severe accident [44].

For the first time, Yukio Edano, head of the ministry of Economy, Trade, and Industry (METI), admits that Japan might have no reactors in operation in the upcoming summer [45].

Experts estimate that 10,000 tons of radioactive water leak from the damaged Fukushima Daiichi reactors each month; in January and February alone, 28 new leaks were discovered [46]. A study by the Meteorological Research

Institute estimates that 40,000 trillion (or 40 quadrillion) becquerels of radioactive caesium were released as a result of the disaster last March. That amount is twice what scientists originally estimated [47].

Human Rights Watch criticises the Japanese government for failing to provide timely health checks and accurate information to residents of Fukushima Prefecture [48].

New tests performed on reactor #2 at the Fukushima Daiichi plant show that conditions are much worse than previously thought [49]. In addition to discovering that water levels in the containment vessel are only 60 cm, as opposed to three metres, TEPCO detects fatally high radiation levels measuring 72,900 millisieverts per hour: enough to kill a person after being exposed for just seven minutes [50].

[44] <http://ajw.asahi.com/article/0311disaster/fukushima/aj201202280030>

[45] <http://ajw.asahi.com/article/0311disaster/fukushima/AJ201203010076>

[46] <http://online.wsj.com/news/articles/SB10001424052970203833004577251150563609254>

[47] <http://ajw.asahi.com/article/0311disaster/fukushima/AJ201202290025>

[48] <http://ajw.asahi.com/article/0311disaster/fukushima/AJ201203060075>

[49] http://www.nytimes.com/2012/03/30/world/asia/inquiry-suggests-worse-damage-at-japan-nuclear-plant.html?_r=1

[50] <http://ajw.asahi.com/article/0311disaster/fukushima/AJ201203280034>

April 2012

For the first time, the Japanese government lifts a no-entry ban on certain parts of three municipalities within the evacuation zone around the crippled Fukushima Daiichi plant: Tamura City, Kawauchi Village, and Minamisoma City, all in Fukushima Prefecture [51].

TEPCO reports yet another leak of 12 tons of radioactive water at the Fukushima Daiichi site and admits that much of it may have run into the ocean [52].

A computer simulation by JAEA shows that radiation-contaminated water will reach the Hawaiian coast—over 5,000 kilometres from the Fukushima Daiichi plant—by March 2014 [53].

Japan's government announces that reactors #1 - #4 at Fukushima Daiichi are formally "decommissioned". [54]

[51] <http://ajw.asahi.com/article/0311disaster/fukushima/AJ201203310013>

[52] <http://ajw.asahi.com/article/0311disaster/fukushima/AJ201204050045>

[53] <http://ajw.asahi.com/article/0311disaster/fukushima/AJ201204030004>

[54] <http://www.neimagazine.com/news/newstepco-will-decommission-fukushima-daiichi-56-4149387>

May 2012

Japan's last remaining nuclear reactor shuts down leaving the country entirely nuclear-free for the first time in 42 years [55].

High levels of caesium in wild herbs and plants, considered springtime delicacies in Japan, prompts the central government to ban their shipment [56].

A research team from Fukushima University releases a new study showing that radiation from the Fukushima Daiichi nuclear disaster was distributed around the globe within just 40 days after it occurred last March [57].

[55] http://www.japantimes.co.jp/news/2012/05/04/news/last-reactor-halts-saturday/#.UvOFI_l_uSo

[56] <http://www.asiatraveltoday.com/2012/05/04/caesium-pushing-wild-plants-off-menu/>

[57] <http://www.houseofjapan.com/local/fukushima-fallout-spread-globally-in-40-days>

June 2012

Japan continues to struggle with an estimated four million tons of radioactive debris. Over 90% of that debris is still waiting to be disposed of, because many cities and towns refuse to accept it out of fear of spreading contamination [58].

After months of discussions, Japan's central government agrees to accept a plan by opposition parties to establish a new independent five-member nuclear regulatory commission that will be called the Nuclear Regulatory Commission (NRC) [59].

Anti-nuclear activists led by Nobel laureate Kenzaburo Oe submit 7.48 million signatures to Takahiro Yokomichi, Speaker of the Lower House calling for the permanent elimination of nuclear power in Japan [60].

TEPCO admits that it studied the effect of a 13.5-metre tsunami at the Fukushima Daiichi plant in 2006, and determined that all power at the plant would be lost should a such a large tsunami strike the coast there. Staff estimated that making upgrades to prevent power loss would cost \$25m. TEPCO never addressed the issue [61].

TEPCO also releases a report on the Fukushima nuclear disaster. Although it admits that it inadequately prepared for the tsunami and subsequent power loss that occurred after the earthquake, the company insists that there was no way it could have predicted the tsunami [62].

[58] <http://www.theatlantic.com/international/archive/2012/06/japans-latest-nuclear-crisis-getting-rid-of-the-radioactive-debris/257963/>

[59] <http://www.foronuclear.org/en/news/news-archive/japan-launches-independent-nuclear-regulatory-commission>

[60] <http://ajw.asahi.com/article/0311disaster/fukushima/AJ201206130046>

[61] <http://www.houseofjapan.com/local/tepcostudiedhuge-tsunamis-in-in-house-training>

[62] http://edition.cnn.com/2012/06/20/world/asia/japan-fukushima-report/index.html?_s=PM:ASIA

July 2012

Ignoring widespread public opposition, Kansai Electric Power Company (KEPCO) restart reactors #3 and #4 at the Oi power plant in Fukui Prefecture [63].

The cooling system at the spent fuel pool of reactor #4 at the Fukushima Daiichi plant unexpectedly stops, resulting in an almost 10 degree temperature increase over 33 hours before the system was restarted [64]. The spent fuel pool contains 1,533 fuel rods and has been widely labelled as precarious by nuclear experts; if they melt down, the Tokyo metropolitan area, with a population of 35 million, would have to be evacuated.

A study of radiation contamination in Fukushima children between the ages of birth and seven years, conducted by the Isotope Research Institute in Yokohama, revealed 141 urine samples containing as much as 17.5 Bq/kg of radioactive caesium. Those children with the highest contamination had eaten home-grown fruits and vegetables grown in Fukushima soil [65].

The Fukushima Nuclear Accident Independent Investigation Commission, a Diet-appointed panel of experts tasked with determining the causes of the Fukushima nuclear disaster, releases a damning report. It blames TEPCO, lax government regulatory agencies, and a Japanese culture that bows to authority [66].

An independent study conducted by the National Institute of Radiological Sciences of 1,080 children in Fukushima Prefecture says they received an average of 12 mSv and maximum 42 mSv lifetime thyroid gland doses of radiation [67].

Data released by TEPCO shows that workers at the Fukushima Daiichi plant received 16 times more radiation after the nuclear disaster there last March than they did before the crisis began [68].

[63] <http://www.nytimes.com/2012/07/02/world/asia/japan-restarts-a-nuclear-reactor.html>

[64] http://www.world-nuclear-news.org/RS-All_cool_at_Fukushima_pool-0207127.html

[65] <http://www.deccanherald.com/content/260997/small-amount-caesium-detected-fukushima.html>

[66] <http://www.bbc.co.uk/news/world-asia-18718057>

[67] <http://ajw.asahi.com/article/0311disaster/fukushima/AJ201207110058>

[68] <http://us.topnewstoday.org/us/article/2904909/>

August 2012

For the first time since last year's nuclear disaster at the Fukushima Daiichi plant, Japan's central government begins decontaminating within the no-entry zone [69].

Japan injects ¥1tn (\$12.78bn) into TEPCO in an effective government takeover, in order to prevent the utility from declaring bankruptcy. In addition, ¥2.5tn in public funding will be used to underwrite compensation to victims of the Fukushima nuclear disaster [70].

Concerns about worker safety at the plant continue to rise as new reports surface about subcontractors who willingly hid the amount of radiation doses they received, or were urged to do so by their employers [71].

A new study released by the journal Scientific Reports reveals physiological and genetic damage to Japanese butterflies, as well as premature death rates, and those abnormalities become even more common in future generations of butterflies [72].

Reactor #4 at the Oi nuclear power plant in Fukui Prefecture begins commercial operations [73].

Despite dire warnings from the nuclear industry and its backers, Japan's hot summer passes with no power blackouts or shortages even though none of the country's nuclear reactors were in operation [74].

Government officials order the halt of cod shipments from Aomori Prefecture, after high levels of caesium are discovered in two sample fish tested there [75].

[69] <http://www.youtube.com/watch?v=pAT9VIQAano>

[70] <http://ajw.asahi.com/article/0311disaster/fukushima/AJ201207310068>

[71] <http://ajw.asahi.com/article/0311disaster/fukushima/AJ201208040044>

[72] <http://www.bbc.co.uk/news/science-environment-19245818>

[73] <http://www.houseofjapan.com/local/oi-nuclear-reactor-returns-to-commercial-operation>

[74] http://www.huffingtonpost.com/samuel-s-epstein/fukushima-nuclear-_b_1790423.html

[75] <http://ajw.asahi.com/article/0311disaster/fukushima/AJ201208290059>

September 2012

Fukushima Prefecture promises to conduct lifelong thyroid examinations on 360,000 young people who were aged 18 and younger at the time of the Fukushima nuclear disaster [76].

Japan announces that it plans to abandon nuclear power by 2030 and will not begin construction on new nuclear reactors in that period [77].

Operations begin at the newly formed watchdog, the Nuclear Regulatory Authority (NRA).

Members of the town assembly in Okuma, Japan, home to the crippled Fukushima Daiichi plant, vote to declare the town off-limits to any residents for the next five years [78].

Japan's central government continues to encounter stiff opposition from local communities as it struggles to find places to deposit 42,000 tons of radioactive waste, including ash and sewage sludge, from nine prefectures [79].

For the first time since the nuclear disaster occurred, TEPCO releases video of the inside of reactor #1 at Fukushima Daiichi.

[76] <http://ajw.asahi.com/article/0311disaster/fukushima/AJ201209120067>

[77] <http://ajw.asahi.com/article/0311disaster/fukushima/AJ201209140105>

[78] <http://www.houseofjapan.com/local/town-in-fukushima-adopts-5-year-no-return-policy>

[79] <http://www.houseofjapan.com/local/gov-proposes-radioactive-disposal-site>

October 2012

A new survey conducted by public television network NHK reveals that hundreds of thousands of bags of radioactive soil remain on the premises of approximately 1,500 properties from which it was removed, because the government has yet to determine where to store it [80].

In a complete turnaround from previous statements, including a comprehensive report released in June in which it denied all blame, TEPCO admits that the Fukushima nuclear disaster could have been avoided if it had prepared for tsunamis it was well aware could possibly occur, held more effective safety drills, diversified power sources, adhered to international standards, and was better organised [81].

New radiation monitoring conducted by Greenpeace in Fukushima City and Iitate reveals that more than 75% of 40 government monitoring posts showed lower radiation levels than those of their immediate surroundings, with contamination levels within 25 metres of the posts measuring up to six times higher than at the posts themselves [82].

TEPCO continues to struggle with increasing amounts of contaminated water in the basements of reactor buildings. Although the utility is now recycling water used to cool melted fuel, groundwater continues to seep into the damaged reactor buildings and become radioactive. Currently, TEPCO is storing 200,000 tons of highly radioactive water, enough to fill 50 Olympic-sized swimming pools [83].

[80] <http://enformable.com/2012/10/in-focus-fukushima-fukushima-nuclear-disaster-causes-50-drop-in-value-in-one-of-worlds-largest-uranium-producers-only-1-1-of-houses-decontaminated-as-contaminated-soil-remains-un/>

[81] <http://www.usnews.com/news/world/articles/2012/10/12/japan-utility-agrees-nuclear-crisis-was-avoidable>

[82] <http://www.greenpeace.org/international/en/campaigns/nuclear/safety/accidents/Fukushima-nuclear-disaster/Radiation-field-team/>

[83] http://www.huffingtonpost.com/2012/10/25/fukushima-nuclear-disaster_n_2016407.html?ncid=edlinkusaolp00000003

November 2012

A new study by Japan's Ministry of Health, Labour, and Welfare shows that TEPCO has poorly monitored radiation doses of workers at the crippled Fukushima Daiichi plant—and the problem may be far vaster than that study suggests [84].

Over 10,000 people have joined a new criminal lawsuit against TEPCO, its top managers, and government officials, charging death and injury through professional negligence in the wake of the nuclear disaster at the Fukushima Daiichi plant in March 2011 [85].

TEPCO announces plans to build an arched cover over Fukushima Daiichi's reactor #3 nuclear plant, which will allow cranes and other equipment to remove 566 nuclear fuel assemblies there while containing at least some of the radiation currently escaping [86].

Shinzo Abe, head of the opposition Liberal Democratic Party (LDP), promises that if his party wins December's Lower House of Parliament elections, he will restart the nation's idled nuclear reactors [87].

United Nations Special Rapporteur Anand Grover, representing the UN Human Rights Council, criticises Japan's government for failing to protect the human rights of those affected by the Fukushima nuclear disaster, including those who were exposed to radiation [88].

[84] <http://ajw.asahi.com/article/0311disaster/fukushima/AJ201210310059>

[85] <http://ajw.asahi.com/article/0311disaster/fukushima/AJ201211020069>

[86] <http://ajw.asahi.com/article/0311disaster/fukushima/AJ201211150055>

[87] http://www.world-nuclear-news.org/NP-Japanese_policy_waits_for_election_outcome-1511127.html

[88] <http://www.ohchr.org/en/NewsEvents/Pages/DisplayNews.aspx?NewsID=12831&LangID=E>

December 2012

Japan's Environment Ministry reports that over 80% of almost 100,000 homes across Fukushima Prefecture are still contaminated with radioactive substances, more than a year and a half after the disaster [89].

A magnitude 7.4 earthquake strikes off the northeastern coast of Japan, triggering three small tsunamis and highlighting the fact that the crippled Fukushima Daiichi plant remains vulnerable to the country's frequent quakes [90].

More than a year and a half after the Fukushima nuclear disaster, Japan declares 96% of Okuma, home to the Daiichi plant, uninhabitable for the foreseeable future because of extremely high radiation levels [91].

The pro-nuclear Liberal Democratic Party (LDP), led by Shinzo Abe, beats the incumbent Democratic Party of Japan (DPJ), led by Prime Minister Yoshihiko Noda in the Lower House of Parliament elections.

Takefumi Anegawa, leader of an internal TEPCO reform task force, admits a "lack of safety culture and bad habits", as well as "collusion" with the nuclear industry, led to the Fukushima nuclear disaster. It is TEPCO's most open admission of guilt so far [92].

Over a year and a half since the Fukushima nuclear disaster began, and one year since Prime Minister Yoshihiko Noda's government declared the damaged plant to be in "cold shutdown status", Nuclear Regulation Authority (NRA) Chairman Shunichi Tanaka admits that the Fukushima reactors remain "volatile". [93]

A new study by the Ministry of Education, Culture, Sports, Science, and Technology (MEXT) shows that children in Fukushima Prefecture have the highest obesity rates in Japan, a result, officials believe, of lack of outdoor exercise in the wake of the Fukushima nuclear disaster and resultant fear of radiation exposure [94].

The Liberal Democratic Party (LDP) leader Shinzo Abe is elected Japan's prime minister.

[89] http://www.world-nuclear-news.org/RS-Cleaning_up_Fukushima_City-1412121.html

[90] <http://www.aaj.tv/2012/12/7-4-quake-hits-northeast-japan-tsunami-warnings-issued/>

[91] <http://www.savechildren.or.jp/jpnem/eng/fukushima>

[92] <http://ajw.asahi.com/article/0311disaster/fukushima/AJ201212140093>

[93] <http://ajw.asahi.com/article/0311disaster/fukushima/AJ201212180087>

[94] <http://ajw.asahi.com/article/0311disaster/fukushima/AJ201212260025>

January 2013

New reports from employees working at the Fukushima Daiichi nuclear plant reveal that TEPCO failed to monitor radiation exposure to arms, legs, and heads of workers, even those who worked in highly contaminated water or rubble [95].

The Mayor of Futaba, Katsutaka Idogawa, says it will be at least 30 years before residents can return to their homes, which are now in a no-entry zone after being contaminated in the wake of the Fukushima nuclear disaster [96].

Japan's *Asahi Shimbun* newspaper reveals companies contracted to decontaminate areas surrounding the damaged Fukushima reactors dumped radioactive materials in rivers and forested areas instead of collecting and storing them properly. Contaminated water from pressure hoses used to spray radioactive mud from boots and equipment was allowed to flow into rivers and ditches [97].

TEPCO begins installation of a cover over Fukushima Daiichi's crippled reactor #4 at the Fukushima Daiichi plant, which suffered major damage after a hydrogen explosion in March 2011. The new cover will contain a special crane that will allow workers to remove 1,533 fuel rods stored in a spent fuel pool there [98].

TEPCO says that murasoi fish (similar to rockfish) caught off the coast of Fukushima Prefecture, near the Daiichi plant, measure 254,000 Bq/kg of radioactive caesium, which is 2,540 times the government's legal limit. The company once again says it plans to dump massive amounts of contaminated water into the Pacific Ocean, although it says it will remove enough radiation to bring the wastewater within legal limits [99].

Prime Minister Shinzo Abe says that the government plans to take a significant role in decommissioning of the Fukushima Daiichi reactors. The government allots an additional ¥156.4bn to the Ministry of Economy, Trade, and Industry (METI) to speed up decommissioning efforts [100].

[95]

<http://web.archive.org/web/20130115192250/http://mainichi.jp/english/english/newsselect/news/20130104p2a00m0na015000c.html>

[96] <http://ajw.asahi.com/article/0311disaster/recovery/AJ201301050053>

[97] <http://ajw.asahi.com/article/0311disaster/fukushima/AJ201301170063>

[98] http://www.world-nuclear-news.org/RS-Fukushima_4_frame_takes_shape-1501138.html

[99] <http://www.independent.co.uk/news/world/asia/fish-caught-close-to-the-fukushima-nuclear-plant-was-2500-times-over-the-legal-safe-radiation-limit-8460034.html>

[100] <http://www.houseofjapan.com/local/japan-gov-to-fund-speeding-up-of-fukushima-reactor-decommissioning>

February 2013

Greenpeace criticises the World Health Organisation after it downplays the health impacts of Fukushima nuclear disaster. “The WHO report is clearly a political statement to protect the nuclear industry and not a scientific one with people’s health in mind,” says Dr. Rianne Teule, Greenpeace International nuclear radiation expert. [101]

The government announces it will give TEPCO an additional ¥696.8bn (\$7.5bn) in taxpayer money to cover compensation costs owed to victims of the Fukushima nuclear disaster. TEPCO says it will post a net loss of ¥120bn (\$1.29bn) for the 2012 fiscal year, almost three times more than the ¥45bn (\$485m) it originally predicted [102].

For the first time, workers from Japan’s Ministry of the Environment begin to remove radioactive waste and debris left over from earthquake and tsunami from areas near Minamisoma in Fukushima Prefecture. The area was previously off-limits because radiation levels there were so high. Officials estimate that 183,000 tons of debris needs to be removed [103].

A new Greenpeace report – *Fukushima Fallout* - shows how the nuclear industry evades responsibility for its failures and how it is largely protected from the financial liability for the Fukushima accident. [104].

[101] <http://www.greenpeace.org/international/en/press/releases/World-Health-Organisation-downplays-health-impacts-of-Fukushima-nuclear-disaster/>

[102] http://www.tepco.co.jp/en/corpinfo/ir/tool/presen/pdf/130204_3-e.pdf

[103] <http://ajw.asahi.com/article/0311disaster/fukushima/AJ201302010004>

[104] <http://www.greenpeace.org/international/en/publications/Campaign-reports/Nuclear-reports/Fukushima-Fallout/>

March 2013

Two years after the Fukushima nuclear crisis began, hundreds of thousands of people in Japan still lack the proper support, with the public forced to pick up the costs of the triple meltdown [105].

In another example of how radiation leaked from the Fukushima Daiichi reactors into the ocean accumulates in sea life. TEPCO reports that it has captured a greenling fish containing 510,000 Bq/kg of radioactive caesium [106].

An investigation by the Ministry of Health, Labour, and Welfare reveals that so far, records for 63 workers underreported the amount of radiation they received while working at TEPCO’s Fukushima Daiichi plant between November 2011 and October 2012 [107].

Workers confirm illegal dumping practices of radioactive materials by subcontractors assigned to remove contaminated waste created by the Fukushima disaster [108].

Tests on food conducted between April 2012 and January 2013 reveal that approximately 2,000 samples of mushrooms, seafood, and wild game contained more than 100 Bq/kg of radioactive caesium, which is the government's limit for human consumption [109].

A rat disables equipment leading to a loss of power causing cooling functions to fail at the spent fuel pools of reactor #1, #3, and #4 for 29 hours [110].

"Our safety culture, skills, and ability were all insufficient. We must humbly accept our failure to prevent the accident, which we should have avoided by using our wisdom and human resources to be better prepared," admits TEPCO President Naomi Hirose [111].

The government reclassifies the town of Namie into three zones and allows evacuees whose homes are in zone one ("areas being prepared for lifting of evacuation orders") and zone two ("residency restriction areas") to return for day trips [112].

[105] <http://www.greenpeace.org/international/en/press/releases/Unjust-laws-for-nuclear-power-leave-Fukushima-victims-suffering/>

[106] <http://ajw.asahi.com/article/0311disaster/fukushima/AJ201303010040>

[107] <http://ajw.asahi.com/article/0311disaster/fukushima/AJ201303020048>

[108] <http://ajw.asahi.com/article/0311disaster/fukushima/AJ201303010084>

[109] <http://ajw.asahi.com/article/0311disaster/fukushima/AJ201303060066>

[110] <http://ajw.asahi.com/article/0311disaster/fukushima/AJ201303260044>

[111] http://www.washingtonpost.com/world/japanese-utility-takes-blame-for-nuclear-crisis/2013/03/29/45a53462-98bb-11e2-97cd-3d8c1afe4f0f_story.html

[112] <http://web.archive.org/web/20130528032541/http://mainichi.jp/english/english/newsselect/news/20130401p2a00m0na014000c.html>

April 2013

The contaminated water crisis begins as tanks storing radioactive water from the stricken reactors leak [113]. About 400 tons a day of contaminated water is produced by the cooling operations needed to keep fuel from overheating at the plant [114]. A monitoring group criticises TEPCO's efforts: "It requires sophisticated supervision to store contaminated water. The work is sloppy." [115]

TEPCO admits that 14 workers tasked with dealing with the highly radioactive water were working without dosimeters; making it difficult to assess how much radiation exposure they received [116].

Rats halt the cooling of the Fukushima Daiichi spent fuel pools for a third time in five weeks, as one is electrocuted by a transformer [117].

Despite the government injecting ¥1tn into TEPCO to keep it afloat, in effect nationalising the utility, TEPCO refuses to repay the ¥10.5bn costs of decontaminating areas around the Fukushima Daiichi power plant [118].

Despite just two of Japan's 50 nuclear reactors being in operation, the government decides not to order mandatory power saving targets during the summer [119].

[113] <http://ajw.asahi.com/article/0311disaster/fukushima/AJ201304150116>

[114] <http://online.wsj.com/news/articles/SB10001424127887323550604578408121573745076>

[115] <http://web.archive.org/web/20130606123222/http://mainichi.jp/english/english/newsselect/news/20130425p2a00m0na013000c.html>

[116] <http://ajw.asahi.com/article/0311disaster/fukushima/AJ201304200045>

[117] <http://ajw.asahi.com/article/0311disaster/fukushima/AJ201304220119>

[118] <http://ajw.asahi.com/article/0311disaster/fukushima/AJ201304210011>

[119] <http://web.archive.org/web/20130428032921/http://english.kyodonews.jp/news/2013/04/221888.html>

May 2013

Groundwater is entering the damaged Fukushima Daiichi reactor buildings at the rate of almost 300 litres a minute where it becomes highly contaminated [120]. Storage tanks for the contaminated water cover 42 acres of the site and contain enough water to fill 112 Olympic-sized swimming pools. Workers dig wells in an attempt to divert groundwater before it can become contaminated. A 6.1 magnitude earthquake on May 18 causes water to overflow from a storage tank [121].

New information emerges regarding the widespread influence of so-called yakuza organised crime gangs in Japan's decontamination industry, a trillion-yen business that has flourished in the wake of the Fukushima nuclear crisis [122].

Highly radioactive hotspots are discovered by the non-profit Citizen's Radioactivity Measuring Station in two parking lots in Fukushima City [123].

The Japan Agency for Marine Earth Science and Technology reports that tests on plankton samples gathered at 10 sites in the Pacific Ocean, between Hokkaido Prefecture and Guam, show presence (8.2 to 10.5 becquerels per kilogram) of radioactive caesium-134 [124].

A no-entry zone is lifted in part of the town of Futaba allowing residents to enter. It is still considered too dangerous for them to remain there overnight [125].

[120] http://www.nytimes.com/2013/04/30/world/asia/radioactive-water-imperils-fukushima-plant.html?pagewanted=all&_r=2&

[121] <http://www.4-traders.com/TOKYO-ELECTRIC-POWER-CO-I-6491247/news/Tokyo-Electric-Power-Co-Incorporated--Earthquake-Occurred-on-May-18-2013-Fukushima-Daiichi-and-Da-16896043/>

[122] <http://ajw.asahi.com/article/0311disaster/fukushima/AJ201305060062>

[123] <http://ajw.asahi.com/article/0311disaster/fukushima/AJ201305080058>

[124] <http://www.japantimes.co.jp/news/2013/05/22/national/researchers-find-high-caesium-in-some-pacific-plankton/>

[125] http://www.world-nuclear-news.org/RS-Futaba_access_restrictions_relaxed-1305134.html

June 2013

TEPCO reluctantly agrees to install a system that will freeze soil near the crippled Fukushima Daiichi reactors, effectively creating an ice barrier that will prevent up to 75% of nearby groundwater from entering the buildings [126]. A tank built to store contaminated water is found to be leaking [127]. TEPCO moves 24,000 tons of contaminated water from underground tanks to new above ground storage [128]. It also says it has discovered high levels of radioactive strontium-90 and tritium in a well located just 27 metres from the Pacific Ocean, but waited for nearly a month before revealing the news to the public [129].

Radioactive tritium found in samples of ocean water near intakes at Fukushima Daiichi are the highest ever recorded there as a result of the Fukushima nuclear crisis [130].

A Nuclear Regulation Authority team inspects the fourth floor of the reactor #1 building. They are only able to stay for 15 minutes because of exceedingly high radiation levels in the building [131].

A non-profit group in Tokyo begins offering thyroid checks for children from Fukushima Prefecture, saying examinations offered by the Prefecture are inadequate and do not provide enough feedback to the children and their families [132].

The Advanced Liquid Processing System (ALPS), designed to remove a wide variety of radioactive contaminants from water used to cool the reactors at Fukushima Daiichi is leaking [133] as is a desalination system used to remove salt from highly radioactive cooling water [134].

At its annual general meeting, TEPCO's shareholders vote down a Greenpeace resolution to hold GE, Hitachi and Toshiba – the suppliers of the Fukushima Daiichi nuclear reactors – financially accountable for the accident [135].

Some officials in Fukushima Prefecture request the government perform a second round of decontamination for many areas in the prefecture, after recent surveys show radiation levels there still exceed safe limits [136].

The government injects another ¥660bn (\$6.6bn) into TEPCO. So far, the Fukushima disaster has cost Japanese taxpayers \$38bn [137].

Greenpeace draws attention to the ongoing mismanagement of contaminated waters at Fukushima by TEPCO at the London Convention and Protocol's consultative meeting [138].

[126] <http://ajw.asahi.com/article/0311disaster/fukushima/AJ201305310067>

[127] <http://ajw.asahi.com/article/0311disaster/fukushima/AJ201306060083>

[128] <http://ajw.asahi.com/article/0311disaster/fukushima/AJ201306050085>

[129] <http://ajw.asahi.com/article/0311disaster/fukushima/AJ201306190064>

[130] <http://ajw.asahi.com/article/0311disaster/fukushima/AJ201306250085>

[131] <http://ajw.asahi.com/article/0311disaster/fukushima/AJ201306250085>

[132] <http://www.japantimes.co.jp/news/2013/06/09/national/fukushima-kids-thyroids-screened/#.UbXaSOs8xXI>

[133] <http://ajw.asahi.com/article/0311disaster/fukushima/AJ201306170042>

[134] <http://ajw.asahi.com/article/0311disaster/fukushima/AJ201306220045>

[135] <http://www.greenpeace.org/international/en/news/Blogs/nuclear-reaction/tepco-fails-on-its-responsibilities-from-the-/blog/45755/>

[136] <http://www.houseofjapan.com/local/fukushima-municipalities-want-2nd-round-of-decontamination>

[137] <http://www.globalpost.com/dispatch/news/kyodo-news-international/130625/tepco-get-more-support-compensation-aid-totals-38-tril>

[138] http://www.umweltbundesamt.de/sites/default/files/medien/376/dokumente/report_of_the_thirty-fifth_consultative_meeting_london_convention_2013_10_21.pdf

July 2013

The International Atomic Energy Agency calls the Fukushima Daiichi power plant a “blueprint” for terrorists. “Fukushima sent a message to terrorists that if you manage to cause a nuclear power plant to melt down, that really causes major panic and disruption in society. All you need to do that is to cut off power for an extended period of time,” says Matthew Bunn, a former White House advisor [139].

Readings for radioactive strontium, caesium and tritium found in contaminated groundwater are very high, nearly a million Bq/litre [140]. TEPCO and the government are unable to determine the cause of the leaks or prevent the contamination of groundwater [141].

Nuclear Regulation Authority Chairman Shunichi Tanaka says: “It is strongly suspected that highly concentrated contaminated waste has leaked to the ground and spread to the sea,” adding that it has probably been doing so for more than two years [142].

TEPCO admits for the first time and after repeated denials that radioactive water is leaking into the sea [143].

The Advanced Liquid Processing System (ALPS) is out of operation again after corrosion by contaminated water caused leaks in the system's tanks [144].

Japan's Ministry of Health, Labour, and Welfare announces radiation exposure records of 452 workers at the Fukushima Daiichi nuclear power plant are inaccurate, and in fact, they were exposed to greater amounts of radiation than TEPCO reported [145]. After stating in December that only 178 workers at Fukushima Daiichi had been had exposed to hazardous levels of radiation, TEPCO says the number is actually nearer 2,000 [146].

Almost two and a half years after the Fukushima nuclear crisis first began, 160,000 people are still not able to return to their homes; of these, approximately 100,000 remain in temporary housing [147].

[139] <http://www.japantimes.co.jp/news/2013/07/03/national/fukushima-a-blueprint-for-terrorists-iaea-warns/#.UdQThFNQ1xo>

[140] <http://web.archive.org/web/20130710130552/http://www.japantimes.co.jp/news/2013/07/10/national/toxic-groundwater-reaching-sea-nra/>

[141] http://www.nytimes.com/2013/07/11/world/asia/japanese-nuclear-plant-may-have-been-leaking-for-two-years.html?_r=1&

[142] <http://www.foxnews.com/world/2013/07/10/japan-atomic-watchdog-suspects-fukushima-ocean-leak/>

[143] http://www.huffingtonpost.com/2013/07/22/fukushima-radioactive-water-leaks-into-sea_n_3634352.html

[144] <http://ajw.asahi.com/article/0311disaster/fukushima/AJ201307260051>

[145] <http://ajw.asahi.com/article/0311disaster/fukushima/AJ201307060066>

[146] <http://web.archive.org/web/20130828154150/http://english.kyodonews.jp/news/2013/07/236468.html>

[147] <http://www.japantimes.co.jp/news/2013/07/14/national/reconstruction-work-still-slow-under-abe/#.UeQQe1NQ1XI>

August 2013

On August 19, TEPCO announces 300 tons of highly radioactive water has leaked from a storage tank [148] and likely directly into the Pacific Ocean 500 metres away [149]. Eighty percent of the water storage tanks at the Fukushima Daiichi site are now full [150].

The Japanese government announces its intention to take the lead in dealing with the ongoing water crisis [151]. Nuclear Regulation Authority commissioner Toyoshi Fuketa says TEPCO “has not left any record of inspections of the tanks. I have to call this sloppy.” [152]

TEPCO estimates 20 trillion to 40 trillion becquerels of radioactive tritium has contaminated the ocean since the beginning of the nuclear crisis [153]. Government estimates show that approximately 300 tons of highly radioactive water is flowing into the Pacific Ocean each day [154]. Caesium levels found in underground water are also eight times greater than what it recorded right after the accident [155].

[148] <http://ajw.asahi.com/article/0311disaster/fukushima/AJ201308200059>

[149] <http://ajw.asahi.com/article/0311disaster/fukushima/AJ201308220060>

[150] http://www.europe-solidaire.org/IMG/article_PDF/article_a29568.pdf

[151] <http://www.bloomberg.com/news/2013-08-26/fukushima-filter-shutdown-adds-to-tepcos-water-management-woes.html>

[152] <http://www.foxnews.com/world/2013/08/23/fukushima-water-handling-sloppy-nuclear-watchdog/>

[153] <http://www.japantimes.co.jp/news/2013/08/03/national/huge-leak-of-tritium-feared-in-fukushima/#.UgEWPWRQ2Ey>

[154] <http://www.reuters.com/article/2013/08/08/japan-fukushima-pm-idUSL4N0G80HK20130808>

[155] <http://ajw.asahi.com/article/0311disaster/fukushima/AJ201308160041>

September 2013

The International Federation of Red Cross and Red Cross Societies reports that the evacuation from the Fukushima disaster has killed 1,600 people in Fukushima Prefecture – more than the number of those who died in that prefecture during the 2011 earthquake and tsunami combined [156].

Reactor #4 at the Oi nuclear power plant is shut down meaning Japan is once again nuclear power free [157].

Japan wins the right to host the 2020 Olympic games after Prime Minister Shinzo Abe insists the situation at the Fukushima Daiichi plant is “under control” [158]. His statement is immediately questioned by government officials, municipal leaders, international media, and even TEPCO itself [159].

More leaks in storage tanks containing highly radioactive water are discovered. Radiation levels near the tanks measure up to 1,800 millisieverts per hour, capable of killing humans within four hours [160]. Estimates put the

amount of groundwater flowing through the plant at 800 to 1,000 tons every day [161]. There are now more than 1,000 storage tanks at the site.

The government announces funding to build a frozen wall around the reactor buildings, in order to try to reduce the flow of contaminated groundwater into the sea [162]. It emerges TEPCO rejected the idea in 2011, worried about the costs involved [163]

Radioactive contamination of groundwater continues to worsen at the site. TEPCO are forced to dump 1,130 tons of reportedly low-level radioactive water into the nearby Pacific Ocean after heavy rainfall [164].

The Advanced Liquid Processing System (ALPS) is shut down again after being in operation again for just 24 hours [165].

South Korea bans imports of all fishery products from eight Japanese prefectures, including Fukushima [166].

The Tokyo District Public Prosecutors Office announces it will not prosecute 40 high-ranking TEPCO and government officials linked with the Fukushima nuclear disaster [167].

[156] http://worldnews.nbcnews.com/_news/2013/09/10/20420833-fukushima-evacuation-has-killed-more-than-earthquake-and-tsunami-survey-says?lite

[157] <http://www.bbc.co.uk/news/world-asia-24099022>

[158] <http://www.reuters.com/article/2013/09/09/us-olympics-2020-japan-idUSBRE98806P20130909>

[159] <http://ajw.asahi.com/article/0311disaster/fukushima/AJ201309100071>

[160] <http://ajw.asahi.com/article/0311disaster/fukushima/AJ201309010021>

[161] <http://ajw.asahi.com/article/0311disaster/fukushima/AJ201309180074>

[162] <http://ajw.asahi.com/article/0311disaster/fukushima/AJ201309180074>

[163] <http://www.japantimes.co.jp/news/2013/09/18/national/tepcu-ditched-water-containmen-solution-in-11/#.Ujv4clasg1g>

[164] <http://www.telegraph.co.uk/news/worldnews/asia/japan/10314444/Fukushima-nuclear-plant-dumps-1000-tons-of-polluted-water-into-sea.html>

[165] <http://ajw.asahi.com/article/0311disaster/fukushima/AJ201309290110>

[166] <http://ajw.asahi.com/article/0311disaster/fukushima/AJ201309060027>

[167] <http://ajw.asahi.com/article/0311disaster/fukushima/AJ201309100060>

October 2013

Heavy rain from typhoons causes more leaks of radioactive water from storage tanks at Fukushima [168][169][170]. “We believe that contaminated water flowed into the ocean,” says TEPCO [171]. Six workers are splashed with highly radioactive water [172].

“TEPCO has said it would place priority [on the contaminated water crisis] and that it would inject corporate resources to deal with it, but I doubt that their actions match what they have said,” says the Governor of Fukushima Prefecture [173].

Radiation levels in seawater, collected just off the coast of reactor #2, reach the highest measured in nearly two years [174]. Over the course of October, radiation levels in drainage ditches on the site break record levels again [175] and again [176].

As the Advanced Liquid Processing System (ALPS) shuts down again [177], and power is lost to the cooling system for reactor #2 after a worker hits the wrong switch [178], Prime Minister Shinzo Abe finally calls for international assistance in dealing with the Fukushima crisis [179].

Greenpeace radiation experts visit the Tamura City region in Fukushima Prefecture where they find high levels of radiation despite government decontamination efforts. They see many bags filled with radioactive waste, some close to a kindergarten [180].

Officials for Japan's environment ministry admitted that the decontamination of six towns and villages around the Fukushima Daiichi plant will take up to three years longer than expected [181].

The site is now storing 340 million litres of contaminated water, enough to "fill Yankee Stadium to the brim". Four hundred tons run into the Pacific Ocean every day [182].

Meanwhile, documents have emerged showing TEPCO's refusal to pay for the costs for the Fukushima clean-up, with the refusal apparently being accepted by the government [183].

[168] <http://ajw.asahi.com/article/0311disaster/fukushima/AJ201310020020>

[169] http://cached.newslookup.com/cached.php?ref_id=268&siteid=2208&id=3295120&t=1380776253

[170] <http://ajw.asahi.com/article/0311disaster/fukushima/AJ201310040068>

[171] <http://ajw.asahi.com/article/0311disaster/fukushima/AJ201310030067>

[172] <http://ajw.asahi.com/article/0311disaster/fukushima/AJ201310090053>

[173] <http://ajw.asahi.com/article/0311disaster/fukushima/AJ201310030067>

[174] <http://ajw.asahi.com/article/0311disaster/fukushima/AJ201310100095>

[175] http://www.japantimes.co.jp/news/2013/10/17/national/radiation-level-in-fukushima-no-1-ditch-hits-record-high/#at_pco=tcb-1.0&at_tot=8&at_ab=-&at_pos=0

[176] <http://ajw.asahi.com/article/0311disaster/fukushima/AJ201310240061>

[177] <http://ajw.asahi.com/article/0311disaster/fukushima/AJ201310040062>

[178] http://worldnews.nbcnews.com/_news/2013/10/07/20849414-fukushima-worker-accidentally-switches-off-cooling-pumps-backup-kicks-in?lite

[179] <http://www.cbsnews.com/news/japan-seeks-international-help-on-fukushima-leaks/>

[180] <http://www.greenpeace.org/international/en/news/Blogs/nuclear-reaction/Fukushima-Tamura-radiation/blog/46950/>

[181] <http://www.bbc.co.uk/news/world-asia-24606357>

[182] <http://www.japantimes.co.jp/news/2013/10/22/national/no-1-water-woes-laid-to-tepcos-ineptitude/#.Ume6OPmsjt>

[183] <http://ajw.asahi.com/article/0311disaster/fukushima/AJ201310270048>

November 2013

TEPCO says it has 2,700 tons of radioactive rainwater from last month's typhoons in underground storage tanks and no solution for how to deal with it [184].

Despite the ongoing crisis at Fukushima, Japan's Prime Minister Abe recommits Japan to a future using nuclear power [185].

For the first time, a leak from one of the damaged reactors is confirmed – highly contaminated water is leaking from the primary containment vessel of reactor #1 at the Fukushima Daiichi nuclear power plant [186]. Another record level of radiation is discovered on the site [187].

Work to remove 1,533 nuclear fuel assemblies from a storage pool in the damaged and unstable building of reactor #4 begins. The operation is expected to take a year [188]. "The process involves a very large risk potential. In a sense, it is more risky than the radioactive water crisis," says chief of Japan's Nuclear Regulation Authority, Shunichi Tanaka [189].

The temporary housing, home to 29,500 people evacuated after the Fukushima disaster, is deteriorating, leaving crumbling floors and walls, and cold entering through gaps in walls of subsiding units [190].

TEPCO announces it will permanently close the undamaged reactors #5 and #6 at the Fukushima Daiichi plant and convert them into research facilities to help plan for the removal of fuel from reactors #1, #2, #3 which suffered core meltdowns. [191].

Once of the Advanced Liquid Processing System (ALPS) is shut down again after found to be leaking hydrochloric acid [192].

[184] <http://ajw.asahi.com/article/0311disaster/fukushima/AJ201311070079>

[185] <http://web.archive.org/web/20131109225905/http://jen.jiji.com/jc/eng?g=eco&k=2013110900294>

[186] <http://ajw.asahi.com/article/0311disaster/fukushima/AJ201311140046>

[187] <http://ajw.asahi.com/article/0311disaster/fukushima/AJ201311120055>

[188] http://www.tepco.co.jp/en/press/corp-com/release/2013/1232257_5130.html

[189] <http://www.theguardian.com/environment/2013/nov/07/fukushima-nuclear-cleanup-spent-fuel>

[190] http://www.japantimes.co.jp/news/2013/11/17/national/fukushima-evacuees-housing-units-crumbling/?utm_source=rss&utm_medium=rss&utm_campaign=fukushima-evacuees-housing-units-crumbling#.UooS7cS-3gu

[191] <http://www.japantimes.co.jp/news/2013/11/20/national/reactors-5-6-to-be-test-units-for-scrapping-plant>

[192] <http://www.japantimes.co.jp/news/2013/12/02/national/alps-system-shut-down-over-leak/>

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TEPCO finds radioactive contamination 36,000 times permissible levels in water taken from an observation well [193]. Potentially lethal levels are found on piping near reactors #1 and 2#'s exhaust stack [194]. Records are broken again [195].

It emerges that leaking water storage tanks were built by workers hired illegally [196]. TEPCO will run out of space to store contaminated water in two years if the issue is not addressed [197]. It is now storing 390,000 tons of radioactive water at the site [198].

A survey of the evacuated residents of Okuma and Futaba, close to Fukushima Daiichi, finds 70% saying they will not return home [199]. One thousand days after the disaster began, many evacuees are still living in temporary accommodation [200].

Unprotected contaminated waste left by clean-up operations is found in the open in Fukushima Prefecture. Radiation readings taken from the debris were as high as 10 times the national limits with bags of radioactive soil being stored in children's playgrounds at apartment complexes [201].

A special report by the Reuters news agency finds that Japan's homeless people are being recruited by labour recruiters, to work on clean-up operations in Fukushima Prefecture [202]. Reuters found that criminal gangs were also heavily involved in the supply of workers.

[193] <http://mainichi.jp/english/english/newsselect/news/20131203p2a00m0na011000c.html>

[194] <http://ajw.asahi.com/article/0311disaster/fukushima/AJ201312070041>

[195] <http://ajw.asahi.com/article/0311disaster/fukushima/AJ201312140043>

[196] <http://www.reuters.com/article/2013/12/05/us-japan-nuclear-fukushima-labor-insigh-idUSBRE9B415P20131205>

[197] <http://ajw.asahi.com/article/0311disaster/fukushima/AJ201312040025>

[198] <http://ajw.asahi.com/article/0311disaster/fukushima/AJ201312050043>

[199] <http://ajw.asahi.com/article/0311disaster/fukushima/AJ201312070045>

[200] <http://www.japantimes.co.jp/news/2013/12/04/national/many-evacuees-still-in-temp-housing/>

[201] <http://mainichi.jp/english/english/newsselect/news/20131216p2a00m0na016000c.html>

[202] http://www.reuters.com/article/2013/12/30/us-fukushima-workers-idUSBRE9BT00520131230?feedType=RSS&feedName=topNews&utm_source=dlvr.it&utm_medium=twitter&dlvrit=992637

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One of the Advanced Liquid Processing Systems (ALPS) is shut down again after its crane fails [203].

The Nuclear Regulation Authority asks TEPCO to address rising radiation levels at the Fukushima Daiichi plant's boundaries [204]. Radiation measurements taken from an observation well at the Fukushima Daiichi nuclear power plant are increasing. Groundwater in the well measured 2.4 million becquerels per litre for strontium-90 and other emitting beta particles [205].

Water is leaking from reactor #3 through a 30-centimetre opening. Water samples measure 2.4 million becquerels per litre of radioactive caesium and 24 million becquerels per litre for beta-ray emitting substances including strontium [206].

A black sea bream caught in waters 37 kilometres from the Fukushima Daiichi plant is found to be contaminated with 12,400 becquerels per kilogram of radioactive caesium. This is 124 times the government's safety standard for food [207].

[203] http://www.disclose.tv/action/viewvideo/162236/Decontamination_system_stops_working/

[204] <http://ajw.asahi.com/article/0311disaster/fukushima/AJ201401100083>

[205] http://www.japantimes.co.jp/news/2014/01/15/national/radiation-rising-in-fukushima-well/?utm_source=rss&utm_medium=rss&utm_campaign=radiation-rising-in-fukushima-well#.UtkLFJ5_uSr

[206] <http://ajw.asahi.com/article/0311disaster/fukushima/AJ201401200049>

[207] <http://ajw.asahi.com/article/0311disaster/fukushima/AJ201401110029>

For more information, contact:
pressdesk.int@greenpeace.org

Greenpeace International
Ottho Heldringstraat 5
1066 AZ Amsterdam
The Netherlands
Tel: +31 20 7182000

greenpeace.org